

**HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF ECONOMICS AND MANAGEMENT**

Proceedings
The 8th International Conference on Emerging Challenges:
CONTEMPORARY ISSUES
IN INNOVATION AND MANAGEMENT

The Organizing Committee of the 8th International Conference on Emerging Challenges: Contemporary Issues in Innovation and Management would like to acknowledge all organizers and sponsors of this conference, especially Hanoi University of Science & Technology, the National Foundation for Science and Technology Development (Nafosted), CPA Australia and ICAEW.

BACH KHOA PUBLISHING HOUSE

Proceedings
The 8th International Conference on Emerging Challenges:
CONTEMPORARY ISSUES
IN INNOVATION AND MANAGEMENT

Bach Khoa Publishing House, Hanoi
1 – Dai Co Viet – Hanoi
Tel. (84.24) 3868 4569; Fax. (84.24) 3868 4570
<https://nxbbk.hust.edu.vn>

-----***-----

Responsible for Publication

Director – Editor-in-Chief: Dr. Bui Duc Hung

Editor: Pham Thi Thanh Hong, Do Thanh Thuy

Book designer: Vu Thi Hang, Nguyen Thi Thu

Cover designer: Duong Hoang Anh

Printed at: Tandaiviet Printing and Office Services Joint Stock Company, 16 Chua Lang Street,
Dong Da District, Hanoi.

Quantity: 200 copies. Size: (21 × 29.7) cm.

Registration No.: 4292-2020/CXBIPH/05-72/BKHN; ISBN: 978-604-316-008-6.

Decision publish No.: 291/QĐ-ĐHBK-BKHN, 27/10/2020.

Archived: IV/2020.

THE 8TH INTERNATIONAL CONFERENCE ON EMERGING CHALLENGES: CONTEMPORARY ISSUES IN INNOVATION AND MANAGEMENT

November 2020
Ha Long, Vietnam

ORGANIZERS:

School of Economics and Management, Hanoi University of Science and Technology, Vietnam
University of Economics and Business, Vietnam National University, Vietnam
Faculty of Business Management, National Economics University, Vietnam
University of Economics, The University of Danang, Vietnam
AVSE Global, France
University of Hertfordshire, UK
British Council, UK

KEYNOTE SPEAKERS:

Prof. Michael D. Myers, *University of Auckland, Business School, New Zealand*
Prof. Sabri Boubaker, *EM Normandie Business School, Paris, France*

MODERATOR OF ROUND TABLE DISCUSSION:

Prof. Nigel Culkin, *Senior Academic Manager, University of Hertfordshire, UK*

CONFERENCE SCIENTIFIC COMMITTEE:

Prof. Nhut (Nick) Hoang Nguyen, *Auckland University of Technology, New Zealand*
Prof. Nigel Culkin, *University of Hertfordshire, UK*
Prof. Utz Donberger, *Leipzig University, Germany*
Prof. Matsui Yoshiki, *Yokohama National University, Japan*
Prof. Sabri Boubaker, *Department of Law, Finance and Control, EM Normandie Business School, France*
Dr. Nguyen Danh Nguyen, *Dean, School of Economics and Management, Hanoi University of Science and Technology, Vietnam*
Assoc. Prof., Vo Thi Thuy Anh, *Vice Rector, University of Economics, The University of Danang, Vietnam*
Dr. Dang Huu Man, *Department of Research and International Cooperation, University of Economics, University of Danang, Vietnam*
Assoc. Prof. Nguyen Anh Thu, *Vice Rector, University of Economics and Business, The Vietnam National University, Vietnam*
Assoc. Prof. Nguyen Thanh Hieu, *Dean, Faculty of Business Management, National Economics University, Vietnam*
Dr. Dang Anh Tuan, *Vice Dean, School of Banking and Finance, National Economics University, Vietnam*
Prof. Nguyen Duc Khuong, *Deputy Director for Research, IPAG Business School, France*
Assoc. Prof. Dr. Hong Bui, *School of Management, University of Bath, UK; Director of Education Network, AVSE Global*
Dr. Nguyen Nhu Ngoc, *Ton Duc Thang University; AVSE Global*

Assoc. Prof., Pham Thi Thanh Hong, *Vice Dean, School of Economics and Management, Hanoi University of Science and Technology, Vietnam*

Dr. Pham Canh Huy, *Vice Dean, School of Economics and Management, Hanoi University of Science and Technology, Vietnam*

Dr. Nguyen Tien Dung, *Head of Business Administration Department, School of Economics and Management, Hanoi University of Science and Technology, Vietnam*

Dr. Nguyen Thi Thu Thuy, *Head of Economics Department, School of Economics and Management, Hanoi University of Science and Technology, Vietnam*

Dr. Duong Manh Cuong, *Head of Industrial Management Department, School of Economics and Management, Hanoi University of Science and Technology, Vietnam*

Dr. Dao Thanh Binh, *Head of Financial Management Department, School of Economics and Management, Hanoi University of Science and Technology, Vietnam*

Dr. Pham Thi Kim Ngoc, *Head of Management and Law Department, School of Economics and Management, Hanoi University of Science and Technology, Vietnam*

Dr. Nguyen Thi Xuan Hoa, *Director of Center for Research and Consulting on Management, Hanoi University of Science and Technology, Vietnam*

CONFERENCE ORGANIZING COMMITTEE:

Assoc. Prof. Pham Thi Thanh Hong	<i>Hanoi University of Science and Technology, Vietnam</i>
Assoc. Prof. Nguyen Anh Thu	<i>VNU University of Economics and Business, Vietnam</i>
Assoc. Prof. Vo Thi Thuy Anh	<i>University of Economics, The University of Danang, Vietnam</i>
Assoc. Prof. Nguyen Thanh Hieu	<i>Faculty of Business Management, National Economics University, Vietnam</i>
Dr. Ha Son Tung	<i>Faculty of Business Management, National Economics University, Vietnam</i>
Prof. Nguyen Duc Khuong	<i>IPAG Business School, France</i>
Assoc. Prof. Hong Bui	<i>School of Management, University of Bath, UK; AVSE Global, France</i>
Dr. Nguyen Thuc Huong Giang	<i>Hanoi University of Science and Technology, Vietnam</i>
Dr. Thai Minh Hanh	<i>Hanoi University of Science and Technology, Vietnam</i>
Dr. Dang Huu Man	<i>University of Economics, The University of Danang, Vietnam</i>
Prof. Nigel Culkin	<i>University of Hertfordshire, UK</i>
Ms. Hoang Van Anh	<i>British Council, UK</i>

CONFERENCE SECRETARIAT STAFF:

Tran Thi Huong	<i>Hanoi University of Science and Technology, Vietnam</i>
Doan Thi Thu Trang	<i>Hanoi University of Science and Technology, Vietnam</i>
Nguyen Dang Tue	<i>Hanoi University of Science and Technology, Vietnam</i>
Trinh Thu Thuy	<i>Hanoi University of Science and Technology, Vietnam</i>
Nguyen Thi Phuong Dung	<i>Hanoi University of Science and Technology, Vietnam</i>
Ha Thi Thu Trang	<i>Hanoi University of Science and Technology, Vietnam</i>

SPONSORS:

Gold Sponsor	NAFOSTED
Silver Sponsor	CPA Australia
	ICAEW

PREFACE

Welcome to The 8th International Conference on Emerging Challenges (ICECH2020). This conference is organized by Hanoi University of Science and Technology (Vietnam), Vietnam National University (Hanoi, Vietnam), National University of Economics (Faculty of Business Management), University of Economics (The University of Danang, Vietnam), AVSE Global (France), University of Hertfordshire (UK) and British Council (UK).

We are delighted with the number of papers received, in what has been a most difficult of. More than the quantity, however, we have attracted papers of a consistent high quality, which demonstrates the position of ICECH in its role as a space for advanced management research in dealing with topical and controversial issues of faced by Vietnamese enterprises.

The 2020 Conference consists of about 90 papers in across five sections themes: (1) Business Environment; (2) Finance and Accounting; (3) Human Resource Management; (4) Marketing Management; (5) Operation, Innovation, and Entrepreneurship. All the papers published in the Proceedings will make a significant contribution to emerging debates in the field of national, and international innovation management.

With the main focus on firms' competencies, we are delighted that the ICECH2020 brings together domestic and, international researchers and practitioners in the field of management and economics to share their latest ideas, problems and solutions, especially, in the use of new and emerging technologies to enhance MSMEs innovations in products, business process, manufacturing process, and the like.

The 2020 Conference has supports from prestige international and domestic journals, including International Journal of Emerging Markets (Scopus Q2), International Journal of Entrepreneurship and Innovation (Scopus Q2), VNU Journal of Science: Economics and Business and Journal of Economic Studies (The University of Danang – University of Economics).

The conference has received generous support and help from many people and organizations to make this event possible. Firstly, we would like to express our sincere thanks to all the authors for their excellent contributions; and, to all the paper referees for their time and expertise regarding paper review; particularly, to the invited speakers, Prof. Michael D. Myers (University of Auckland, Business School, New Zealand), Prof. Sabri Boubaker (EM Normandie Business School, Paris, France), Prof. Nigel Culkin (University of Hertfordshire, UK), Prof. Richard Hazenberg (University of Northampton, UK) for delivering plenary talks at the conference. In addition, the organizers would like to thank all the program committee members for their efforts and supports to the conference. We would like to thank our Gold Sponsor – Nafosted Fund and two Silver Sponsors – CPA Australia and ICAEW for their great supports. Last but not least, we would like to thank the conference secretariat staffs for their outstanding work for the conference.

Welcome to Ha Long, the city of peace and green. We wish all of you have a productive conference.

Dr. Nguyen Danh Nguyen

Dean of School of Economics and Management

HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Foreword
INTRODUCTION ON
SCHOOL OF ECONOMICS AND MANAGEMENT,
HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Website: <http://hust.edu.vn>, <http://sem.hust.edu.vn>

Since its establishment in 1965, the School of Economics and Management (SEM) has produced managers and leaders for enterprises and industries. Today, SEM provides a broad spectrum of academic programs from bachelor's degree to master's degree, and to doctoral degree. SEM offers a creative diversified outlet for students who want to build a successful career, including full-time and part-time programs. Since 1992, SEM has launched several new programs, including dual-enrollment for bachelor's degree.

Through 55 years of development, SEM now boasts 70 faculties and staff. Its people commit to international education, ethical and sustainable business practices; along with our technology, and innovation SEM draws top-notch undergraduate and graduate students, as well as business leaders, seeking a competitive edge through our executive education programs.

Not just only having precious resource – high-qualified and committed faculties, SEM is enthusiastic in partnering with many domestic and international training- research institutions from France, Germany, Australia, Finland, Holland, Japan, Taiwan, Indonesia, and so on. These meaningful partnerships provide opportunities to improve our training facilities, to build exchange programs for students and faculties in improving knowledge, professional expertise, and touching differentiated training styles.

SEM's strategy focus:

- To diversify training and education programs, with the focus in postgraduate programs. Incorporate theoretical knowledge and practical experiences via training programs for enterprises and short courses.
- To do effective and efficient consultancy for enterprises.
- To develop international cooperation to improve education programs and teaching styles.

Since 2012, the School of Economics and Management, Hanoi University of Science and Technology has been organizing the International Conferences on Emerging Challenges (ICECH), annually. This event has attracted increasing interest among the economics and management research community. This year, we have a great honor to collaborate with the Vietnam National University (Hanoi, Vietnam), National Economics University (Faculty of Business Management), University of Economics (The University of Danang, Vietnam), AVSE Global (France), University of Hertfordshire (UK) and the British Council (UK) to organize the 8th ICECH. This conference with a theme of “Contemporary Issues in Innovation and Management” has created a great occasion for academics and professionals to share their research findings, experiences and knowledge which are expected to contribute to the sustainable development of the Asia Pacific region. We are proud to be the host of this important event. With 90 high quality papers, we believe to have a successful and contributive international conference.

Assoc. Prof. Dr. Pham Thi Thanh Hong

Vice Dean

School of Economics and Management

HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Foreword

INTRODUCTION ON UNIVERSITY OF ECONOMICS AND BUSINESS, VIETNAM NATIONAL UNIVERSITY

Website: <http://ueb.vnu.edu.vn>

VNU University of Economics and Business (VNU-UEB), a member of Vietnam National University, Hanoi, was established in accordance with Decision No. 290/QĐ-TTg dated 6 March 2007 by the Prime Minister of the Socialist Republic of Vietnam. VNU-UEB has experienced several transformations originating from the Faculty of Political Economy, University of Hanoi in 1974.

The University mission is to provide high quality human resources in policy analysis, economic management, and business administration to meet Vietnam's demands for quality, effectiveness, and stable development; To carry out and transfer research outcomes to the Government of Vietnam, organizations, and enterprises; To offer an advantageous environment to create, cultivate and develop talents in fields of economic analysis, modern management and business administration.

During its development process, the VNU-UEB has made constant efforts to improve the quality of the training, scientific research and other services to become a research university. University of Economics and Business has been known as a young and dynamic university with a strategic vision and a strong determination towards international standards in education and research. The University's position and prestige has been strengthened recently.

In training activities, the University has standardized the existing training curricula, opened new programs and strengthened the quality of honors training programs, international standard programs (16+23 program) as well as other postgraduate and international joint programs.

In scientific research, the research prestige of UEB has been evidenced through a growing number of studies in the country and internationally. Those studies have been characterized as the openness, the association between basic and applied research as well as qualitative and quantitative research methods. The research of the UEB has been aimed to facilitate the management and improvement of the quality of training programs; to study the practical and development of socio-economic policy and businesses; to study issues related to new specializations as well as to address urgent problems associated with the economic growth of the country and of the development of the UEB itself.

With the vision of the University to become a research- oriented university of international quality and level, we have proved our research capability through a growing number of studies in the country and internationally. Those studies have been characterized as the openness, the association between basic and applied research as well as qualitative and quantitative research methods. In addition, a number of high-ranked international publications have increased more and more.

Regarding partnership development, to fulfill our goal and mission, we continuously broaden our network of partners, not only domestic but also the international ones. Until 2019, the university has set up collaboration with 40 universities and research institutes from 12 countries and territories all over the world in academic cooperation and especially in student exchange programs. In Vietnam, VNU-UEB has developed a networking system with leading strategic partners including economic corporations, enterprises, associations and banks.

Assoc. Prof. Nguyen Anh Thu

Vice Rector

VNU UNIVERSITY OF ECONOMICS AND BUSINESS

Foreword

INTRODUCTION ON FACULTY OF BUSINESS MANAGEMENT, NATIONAL ECONOMICS UNIVERSITY

Website: fbm.neu.edu.vn

Founded in 1956, National Economics University is one of the leading universities in Economics, Public Management and Business Administration in Vietnam.

NEU places a high priority on the quality of teaching and the employment preparation for students in an increasingly competitive, international environment.

NEU is now chairing a network of more than 40 universities in Vietnam in economics and business administration. The university has become an important hub for academic exchange domestically and internationally. NEU is a prestigious research and consultation center with its extended academic publications and consulting works to the government of Vietnam on policy making and to the business community on business development.

NEU is not only a recognized institution providing high-quality human resource to Vietnam's society but also a faithful partner of the government, non-governmental organizations and reputed research institutes and universities all around the world.

Founded in 1956, Faculty of Business Management (FBM) is one of the oldest faculty of National Economics University, Vietnam. Throughout the establishment and development, FMB is the home of many successful entrepreneurs, excellent leaders and managers in different fields from corporate and business management to state management.

With 52 faculty members and staff, most of them have obtained Master degree and PhD from the top universities in the world, FBM annually offers training to 2,000 full-time students at Bachelor, Master, and PhD levels of business management.

Besides providing training programs, FBM also actively organizes/co-organizes and participates in a number of national and international scientific conferences, research projects and consulting projects. Our academic staff have published thousands of high-quality scientific papers in which hundreds of them have been published in high-ranking international journals. With our achievement, we have been awarded Third Class Labor Medal (two times), Certificate of Merit from the Prime Minister (two times).

Another focus of FBM is building partnership; we have been establishing a vast network of industrial and academic partners, both domestic and international ones. Our partners include JICA, JETRO, Saint Mary University, Tokyo University, Dongseo University, Middlesex University, Pro-Sports, to name a few.

Prof. Nguyen Thanh Hieu

Dean

Faculty of Business Management

NATIONAL ECONOMICS UNIVERSITY

Foreword
**INTRODUCTION ON UNIVERSITY OF ECONOMICS,
THE UNIVERSITY OF DANANG**

Website: due.udn.vn

University of Economics (DUE), located in Danang city, is a member of the University of Danang – one of the three regional universities in Vietnam. With over 45 years of experience in educating and training, the DUE has played an important role in providing a labour force specializing in business, management and economics, partly contributing to Vietnam’s economic development. We offer a wide range of under-graduate and post-graduate programs, including 04 doctoral programs, 06 master programs, and 29 under-graduate programs. By 2019, 5 undergraduate programs are successfully accredited by the AUN. High qualified teaching and research staff, including professors, senior and experienced lecturers together with learner-centered curriculums are the reflection of our aim to ceaselessly raise teaching standard. The University currently has about 14,000 students for both full-time and part-time courses.

The DUE is envisioned as a leading research university in Vietnam, significantly contributing to the prosperity of ASEAN community and human knowledge. As a research-oriented university, we create an innovative academic environment to accelerate knowledge discovery, application, transfer of scientific knowledge of business, economics and management; ensure a successful foundation and lifelong learning capacity for learners; nurture and develop talents; tackle the socio-economic challengers; and serve the prosperous development of the community. Our values are usefulness, respecting individual, creativity, collaboration, integrity and sympathy.

The DUE has cooperated with a number of companies to not only provide our students with opportunities for internship courses, but also equip them with necessary skills and capabilities to work within the context of global integration. Through our work placement programs, the promotion of student entrepreneurship and a focus on employability, we expect that more than 90% of graduates secure employment or enter further study within 12 months of graduation. Until 2019, after graduation surveys shows that 95.2% of our students obtain jobs 6 months after graduating.

We work with many partners around the world on a wide range of international activities including joint teaching and research, consultancy, joint degree programs (2+2, 3+1), exchange programs, internships, summer school courses. Through our strong international links with over 60 partners in 23 countries and territories, we provide knowledge to community members for their specific business purposes, and simultaneously fostering the team of lecturers, academic researchers in order to contribute to national education, academic research and economic development. Our students can take advantage of opportunities to study abroad through the transfer programs, student exchange programs and international projects. Our aim is to provide students with internationalized experience, enhancing their employability through the training courses and opportunities for placement and exchange programs.

Annually, the DUE has about 8 to 10 key research projects carried out at state, ministerial, provincial levels, and university-level projects. Additionally, the DUE collaborates with its international partner network to organize academic conferences, seminars, workshops on business, management and economic matters. These assist the University in improving teaching materials and training quality. Research activities also bring more accessibility to business environment, practices and legal aspects. The DUE has the Journal of Economic Studies (JES) which is the forum to discuss challenges of economic integration, mainly focuses on theoretical, empirical and experimental economic aspects, providing deeply economic analysis and policy recommendations for Vietnam and beyond.

45 years of vigorous growth witnesses our University achieving a variety of historical milestones. The DUE has become not only a nationally prestigious multidisciplinary higher educational institution, but also a leading research center for business management consultancy and business & economic knowledge transfer in Vietnam.

Assoc. Prof. Vo Thi Thuy Anh

Vice Rector

University of Economics

THE UNIVERSITY OF DANANG

Foreword

INTRODUCTION ON THE ASSOCIATION OF VIETNAMESE SCIENTISTS AND EXPERTS

Website: <http://www.avseglobal.org>

The Association of Vietnamese Scientists and Experts (AVSE Global) was founded in May 2011 with the main purpose of connecting intellectual sources in a systematical way to identify ideas, strategies, and implementation in all fields of science and techniques in foreign countries and at the same time orient to make contribution to the development of Vietnam.

AVSE Global aims at:

- Developing a network and database of Vietnamese scientists and experts, clarifying their expertise so that AVSE's partners can connect and cooperate in case necessary.
- Connecting individuals, groups or organizations of Vietnamese scientist and experts all over the world to share and exchange knowledge and experiences.
- Organizing scientific activities, conferences, workshops, trainings, exchanging activities, vocational activities and job seeking activities.
- Playing the role as a bridge linking Vietnamese scientists and experts with the world, cooperating and exchanging with international friends.
- Gathering and strengthening individuals' strength to make contribution to the development of Vietnamese science, technique, economics and society.

Prof. Dr. Nguyen Duc Khuong

Chairman

AVSE GLOBAL

Foreword

INTRODUCTION ON UNIVERSITY OF HERTFORDSHIRE

Website: <http://www.herts.ac.uk>

The University of Hertfordshire is a campus-based institution, located just outside of Greater London, UK, in the Historic industrial town of Hatfield. The University typically has a UK based cohort of 24000 students with a further 4000 students studying a degree awarded by the University at one of our International partners. Strategically the University positions itself as “Internationally Business Facing”, fostering partnerships with businesses, the public sector, policymakers and charities. The latest strategic plan is based around the mission statement, “Transforming lives”; ensuring whatever your background, wherever you are from, we will drive your potential, powering you to succeed.

The University incorporates an Applied learning pedagogical approach, that builds on the University’s heritage in vocational teaching, as former Technical college; that was noted for excellence in Aerospace Engineering. The research agenda seeks to provide solutions to; major societal challenges, supports industrial innovation, enriches lives and informs our teaching.

The University has excellent progression rates to employment with 96.5% of students in employment or further study six months after graduating. The teaching expertise has recently been awarded the top Gold ranking in the Government’s Teaching Excellence Framework (TEF) 2018. It is one of the top 200 universities in the world under 50 years old, according to the new Times Higher Education under 50 rankings 2020.

Working in collaboration with other businesses and organisations, we utilise our creative and enterprising approach to research in order to address the four Grand Challenges identified by the Government; artificial intelligence and data, clean growth, an ageing society and the future of mobility. Our response to the UK Government’s Industrial Strategy demonstrates how we have turned the ideas and innovations of our research community into the products and services for industry. For example, we have developed research excellence in the following multidisciplinary areas: AI and robotics, Astronomy and machine learning, Pharmaceutical and healthcare technologies, Food security and agritech.

As an enterprising and agile institution, passionate about supporting the growth of our local economy, we align our research, innovation and teaching activities to meet the demands of business and society. Our extensive engagement with businesses reflects our institutional history and the entrepreneurial approach we apply to our commercial endeavours and interactions with industry. Nationally and internationally, our research and development, knowledge transfer work and targeted consultancy are empowering companies across sectors to achieve their goals and drive productivity. Fundamental to this is the originality and quality of our ideas, which through a collaborative, multidisciplinary approach tackle the key global challenges of our time. As a result, we were delighted to be recognised by Research England as a *University Enterprise Zone*, following the opening of our campus to new entrepreneurs, start-up businesses and spin-outs – stimulating active “communities of practice” to make knowledge, facilities and equipment accessible to boost enterprise and support business growth.

In line with our primary mission statement our target “communities” are strongly focussed on businesses within our local, regional and international eco-system. Through the Enterprise Zone we are strengthening the Hertfordshire ecosystem, supporting business start-ups, business resilience and growth within our locality. For example, our response to major socio-economic and political shocks to the local economy – leveraging our resources and expertise to support key economic actors to respond to rapid change and business critical issues. E.g. Volunteer Business Support Scheme and Covid-19 response programmes in research and business support.

The University has an experienced regional office team based in Hanoi, led by Mr Hoang Ngoc Tu, and enjoys a good reputation for supporting Vietnamese students with Scholarships and expert guidance.

James Perrin

Head of International Partnerships

UNIVERSITY OF HERTFORDSHIRE

Foreword

INTRODUCTION ON BRITISH COUNCIL

Website: www.britishcouncil.org.vn

We build connections, understanding and trust between people in the UK and other countries through arts and culture, education and the English language.

We work in two ways – directly with individuals to transform their lives, and with governments and partners to make a bigger difference for the longer term, creating benefit for millions of people all over the world.

We help young people to gain the skills, confidence and connections they are looking for to realise their potential and to participate in strong and inclusive communities. We support them to learn English, to get a high-quality education and to gain internationally recognised qualifications. Our work in arts and culture stimulates creative expression and exchange and nurtures creative enterprise.

We connect the best of the UK with the world and the best of the world with the UK. These connections lead to an understanding of each other's strengths and of the challenges and values that we share. This builds trust between people in the UK and other nations which endures even when official relations may be strained.

We work on the ground in more than 100 countries. In 2019-2020 we connected with 80 million people directly and with 791 million people overall, including online and through our broadcasts and publications.

We are funded by a grant-in-aid from the UK government and with significant additional income from partnership agreements, contracts, teaching and exams.

Founded in 1934, we are a UK charity governed by Royal Charter and a UK public body.

CONTENTS

Section 1: Business Environment

- 1. FACTORS CONSTRAINING BUSINESS PRODUCTIVITY IN THE DIGITAL ERA: EMPIRICAL RESEARCH AT HERTFORDSHIRE IN UK AND LESSONS FOR HUNG YEN PROVINCE IN VIETNAM 2**
Christopher Brown (*University of Hertfordshire, UK*)
Nguyen Thuc Huong Giang (*Hanoi University of Science and Technology*)
Tran Thi Huong (*Hanoi University of Science and Technology*)
- 2. AFRICA, THE EL DORADO OF THE TUNISIAN SMES?..... 16**
Khaled Tamzini (*LaREMFiq, IHECs, Sousse University, Sousse, Tunisia*)
- 3. THE POWER SYSTEM TOWARD THE CIRCULAR ECONOMY: CASE OF LAO'S PDR..... 31**
Vatthana Vansyli (*School of Economics and Management, HUST, Vietnam*)
Nguyen Hoang Lan (*School of Economics and Management, HUST, Vietnam*)
- 4. PROJECT OF ELECTRICITY GENERATION FROM SOLID WASTE - A CASE STUDY TO DEVELOP CIRCULAR ECONOMY 39**
Pham Thi Thu Ha (*School of Economics and Management, HUST*)
Nguyen Ngoc Anh (*Institute of Strategy and Public Policy, Ministry of Industry and Trade*)
- 5. THE IMPACT OF CRUDE OIL PRICE ON SOME MACROECONOMICS INDICATORS OF VIETNAM IN THE PERIOD OF 2015-2019..... 48**
Pham Canh Huy (*School of Economics and Management, HUST*)
Pham Thanh Vinh (*School of Economics and Management, HUST*)
Pham Ngoc Duy (*School of Economics and Management, HUST*)
- 6. FOOD SECURITY FOR POVERTY REDUCTION VIA IMPACTS OF MACRO FACTORS ON RICE PRICE IN AN ECONOMETRIC MODEL - A STUDY CASE IN VIETNAM..... 56**
Pham Minh Dat (*Thuongmai University, Vietnam*)
Hoang Thanh Hanh (*Academy of Finance, Vietnam*)
Dinh Tran Ngoc Huy (*Banking University HCMC, Ho Chi Minh city Vietnam - International University of Japan, Japan*)
Bui Thi Thu Hang (*Tay Nguyen University, Daklak, Vietnam*)
Bui Dan Thanh (*Banking University HCMC, Ho Chi Minh city, Vietnam*)
Pham Thi Hong Nhung (*University of Economics and Business Administration, Thai Nguyen, Vietnam*)
Ly Thy Hue (*National University of Public Administration, Vietnam*)
Tran Quoc Tuan (*Banking University HCMC, Ho Chi Minh city, Vietnam*)
- 7. APPLYING GM (1,1) MODEL IN FORECASTING EXPORT AND IMPORT TURNOVER OF VIETNAM 70**
Nguyen Thi Kim Lien (*Thanh Dong University, Hai Duong, Vietnam*)
- 8. STUDY ON THE BARRIERS TO SOCIAL ENTERPRISE GROWTH IN VIETNAM..... 81**
Doan Thu Trang (*Vietnam National University Hanoi, Vietnam*)
Nguyen Thi Ha (*Vietnam National University Hanoi, Vietnam*)
Nguyen Thuy Trang (*Vietnam National University Hanoi, Vietnam*)

9. VIETTEL ENTERPRISE CULTURE WITH CHALLENGES OF THE MULTI-CULTURAL ENVIRONMENT	94
<i>Quach Thi Ngoc Ha (VNU University of Economics & Business)</i>	
10. APPLICATION OF AI TECHNOLOGY TO SUPPORT BUSINESS DECISION-MAKING AND SOME ISSUES FOR VIETNAMESE BUSINESSES	106
<i>Nguyen Thi Thanh Dan (School of Economics and Management, HUST)</i>	
11. FDI INFLOWS TO VIETNAM BEFORE AND IN THE COVID-19 PANDEMIC: STATE OF PLAY AND PROSPECTS FOR THE END OF 2020.....	114
<i>Vu Thanh Huong (University of Economics and Business, Vietnam National University – Hanoi)</i>	
<i>Nguyen Thi Hai Ly (University of Economics and Business, Vietnam National University – Hanoi)</i>	
12. HOW LOCAL ECONOMIC GOVERNANCE AFFECTS THE NON-STATE ENTERPRISE SECTOR DEVELOPMENT IN VIETNAM?.....	126
<i>Dao Thi Bich Thuy (University of Economics and Business, VNU Hanoi)</i>	
13. IMPACT OF DIGITAL PLATFORM ON THE INTERNATIONALIZATION STRATEGY OF MICRO- AND SMALL-SIZED WOMEN-OWNED ENTERPRISES.....	134
<i>Le Huong Linh (VNU International School - Vietnam National University, Hanoi)</i>	
<i>Bui My Trinh (VNU International School - Vietnam National University, Hanoi)</i>	
14. ANALYSING THE IMPACT OF THE COVID-19 PANDEMIC ON GLOBAL TOURISM: SUGGESTION FOR VIETNAM TOURISM.....	142
<i>Doan Hai Anh (School of Economics and Management, HUST)</i>	
15. BOUNDARY CONDITIONS TO THE TRUST - COMMITMENT RELATIONSHIP: TESTING THE MODERATING EFFECT OF PROACTIVENESS IN A TRANSITIONAL, DYNAMIC MARKET.....	149
<i>Ta, Minh Quang (National Economics University, Vietnam; Wageningen University, The Netherlands)</i>	
<i>Le, Cong Tru (Agriculture and Forestry University, Vietnam)</i>	
<i>Li., P. T. M. Ingenbleek (Wageningen University, The Netherlands)</i>	
<i>J.C.M.van Trijp (Wageningen University, The Netherlands)</i>	
16. UNCITRAL ODR – THE DAWN OF AN EXPECTATION FOR A GLOBAL LEGAL FRAMEWORK TO RESOLVE CROSS-BORDER E-COMMERCE DISPUTES	150
<i>Dang Hoang Minh (FPT University - Can Tho Campus, Can Tho, Vietnam)</i>	
<i>Nguyen Dinh Thuy Huong (Vietnam Maritime University, Hai Phong, Vietnam)</i>	
<i>Ngo Ho Anh Khoi (Nam Can Tho University, Can Tho, Vietnam)</i>	
<i>Tran Thi Thuy (Center for Output Standards and Human Resource Development, Can Tho, Vietnam)</i>	
17. RESEARCH ON ECONOMIC AND ENERGY STRUCTURAL FACTORS INFLUENCING CO₂ EMISSION REDUCTION IN VIETNAM	156
<i>Phan Dieu Huong (School of Economics and Management, HUST)</i>	
18. A TAXONOMY OF ESTABLISHING ENTERPRISES IN VIETNAM: LEGAL FRAMEWORK AND MODEL DIVERSIFICATION	164
<i>Nguyen Van Lam (School of Economics and Management, HUST)</i>	
19. STARTING A BUSINESS WITH UNIVERSITY SPIN-OFF MODEL – SOME LEGAL PROBLEMS IN VIETNAM AND EXPERIENCES FROM CHINA	170
<i>Nguyen Thi Thuy Hang (School of Economics and Management, HUST)</i>	

Section 2: Finance and Accounting

20. THE INFLUENCE OF EARNINGS MANAGEMENT ON BANK EFFICIENCY: EVIDENCE FROM FRONTIER MARKETS.....	178
<i>Wil Martens (RMIT University, Hanoi, Vietnam)</i>	
<i>Prem Yapa (RMIT University, Melbourne, Australia)</i>	
<i>Maryam Safari (RMIT University, Melbourne, Australia)</i>	
<i>Pham T M Phuong (FPT University, Hanoi, Vietnam)</i>	
21. CAN THE PERFORMANCE-BASED BUDGETING REAP THE BEST RESULT THROUGH IMPLEMENTATION OF PUBLIC SECTOR SCORECARD? INSIGHT INTO THE MEDIATING ROLE OF ORGANIZATIONAL CULTURE CHARACTERISTICS.....	197
<i>Pham Quang Huy (University of Economics Ho Chi Minh City, Vietnam)</i>	
<i>Vu Kien Phuc (University of Economics Ho Chi Minh City, Vinh Long Campus, Vietnam)</i>	
22. THE MEDIATING ROLE OF MANAGEMENT ACCOUNTING SYSTEMS IN THE RELATIONSHIP BETWEEN CROSS-FUNCTIONAL COOPERATION AND FIRM PERFORMANCE: EMPIRICAL EVIDENCE FROM VIETNAM.....	212
<i>Nguyen Phong Nguyen (University of Economics Ho Chi Minh City, Vietnam)</i>	
<i>Tu Thanh Hoai (University of Economics Ho Chi Minh City, Vietnam)</i>	
23. DETERMINANTS OF CAPITAL STRUCTURE OF LISTED COMPANIES IN THE PHARMACEUTICAL SECTOR: EVIDENCE FROM VIETNAM.....	224
<i>Nguyen Van Dinh (Vietnam National University, Hanoi - International School)</i>	
<i>Nguyen Thi Kim Oanh (Vietnam National University, Hanoi - International School)</i>	
<i>Bui Thi Minh Huyen (Vietnam National University, Hanoi - Vietnam Japan University)</i>	
24. DETERMINANTS OF THE CHOICE BETWEEN ACQUISITIONS AND JOINT VENTURES IN VIETNAM.....	234
<i>Doan Thu Trang (International School, Vietnam National University Hanoi, Vietnam)</i>	
<i>Nguyen Thi Tuyet Lan (International School, Vietnam National University Hanoi, Vietnam)</i>	
<i>Bui Le Thuy Linh (International School, Vietnam National University Hanoi, Vietnam)</i>	
25. EFFECT OF IFRS ADOPTION ON THE RELEVANCE OF FINANCIAL REPORTING: EVIDENCE FROM VIETNAM.....	246
<i>Nguyen Thuc Huong Giang (School of Economics and Management, HUST)</i>	
<i>Thai Minh Hanh (School of Economics and Management, HUST)</i>	
<i>Pham Ngoc Uyen Nhi (School of Economics and Management, HUST)</i>	
<i>Nguyen Thu Huong (School of Economics and Management, HUST)</i>	
<i>Vu Thi Lien (School of Economics and Management, HUST)</i>	
26. PROFITABILITY OF TOURIST ACCOMMODATION SERVICE COMPANIES LISTED ON VIETNAM STOCK MARKET IN CHANGEABLE BUSINESS CONDITIONS	255
<i>Nguyen Van Nam (National Economics University)</i>	
<i>Nguyen Thi Vu Khuyen (School of Economics and Management, HUST)</i>	
<i>Ngo Thu Giang (School of Economics and Management, HUST)</i>	
27. A LITERATURE REVIEW ON THE EFFECTS OF CSR ON AUDIT EFFORTS AND AUDIT QUALITY IN VIETNAM.....	262
<i>Thai Minh Hanh (School of Economics and Management, HUST)</i>	
<i>Dao Thanh Binh (School of Economics and Management, HUST)</i>	
<i>Nguyen Thuc Huong Giang (School of Economics and Management, HUST)</i>	

28. THE CURRENT DEVELOPMENT OF MANAGEMENT ACCOUNTING PRACTICES AT VIETCOMBANK.....	270
Nguyen Thi Phuong Dung (<i>School of Economics and Management, HUST</i>)	
Dao Thanh Binh (<i>School of Economics and Management, HUST</i>)	
29. THE IMPACT OF FINANCIAL STATEMENT COMPARABILITY ON EARNINGS MANAGEMENT: EVIDENCE FROM FRONTIER MARKETS.....	282
Wil Martens (<i>RMIT University, Hanoi, Vietnam</i>)	
Prem Yapa (<i>RMIT University, Melbourne, Australia</i>)	
Maryam Safari (<i>RMIT University, Melbourne, Australia</i>)	
30. INFLUENCES OF ITEMS ON CASH FLOW STATEMENT ON INVESTORS' DECISION IN SECURITIES MARKET: EVIDENCE IN VIETNAM.....	302
Nguyen Duc Dung (<i>National Economics University, Vietnam</i>)	
31. FINTECH FOR PAYMENT – A LITERATURE REVIEW	308
Nguyen Dang Tue (<i>School of Economics and Management, HUST</i>)	
Hua Phuong Linh (<i>University of Language and International Studies, Vietnam National University</i>)	
32. LINKING CORPORATE GOVERNANCE QUALITY AND FIRM PERFORMANCE: LITERATURE REVIEW AND IMPLICATIONS FOR STATE-OWNED ENTERPRISES IN VIETNAM.....	316
Luu Thi Minh Ngoc (<i>University of Economics and Business, Vietnam National University Hanoi, Vietnam</i>)	
Dang Thi Huong (<i>University of Economics and Business, Vietnam National University Hanoi, Vietnam</i>)	
Nguyen Thi Trang Nhung (<i>Hanoi University of Industry, Hanoi, Vietnam</i>)	
Chu Dinh Dong (<i>Party Committee of Central Business Sector , Hanoi, Vietnam</i>)	
Vo Nam D. (<i>University of Danang, Danang, Vietnam</i>)	
Nguyen Phuong Mai (<i>International School, Vietnam National University Hanoi, Vietnam</i>)	
33. RESEARCH FACTORS AFFECTING THE APPLICATION OF IFRS FOR VIETNAMESE SMES.....	327
Nguyen Duc Dung (<i>National Economics University, Vietnam</i>)	
34. CORPORATE GOVERNANCE REFORM, BOARD INDEPENDENCE AND EARNINGS MANAGEMENT: EVIDENCE FROM VIETNAM.....	334
Truc Tran (<i>Management and Social Sciences University of Twente, The Netherlands</i>)	
Rezaul Kabir (<i>Management and Social Sciences University of Twente, The Netherlands</i>)	
Xiaohong Huang (<i>Management and Social Sciences University of Twente, The Netherlands</i>)	

Section 3: Human Resource Management

35. EFFECTS OF PSYCHOLOGICAL EMPOWERMENT ON THE CREATIVITY OF VIETNAM TELECOMMUNICATION ENTERPRISES' EMPLOYEES	336
Nguyen Thi Phuong Linh (<i>National Economics University, Vietnam</i>)	
Doan Xuan Hau (<i>National Economics University, Vietnam</i>)	
36. A CASE STUDY ON IMPACTS OF HUMAN RESOURCE MANAGEMENT PRACTICES ON FIRMS' PERFORMANCE IN VIETNAMESE STATE – OWNED ENTERPRISES.....	345
Ngo Thi Ngoc Anh (<i>Ho Chi Minh National Academy of Politics, Hanoi, Vietnam</i>)	
Le Thu Huong (<i>Vietnam's National University, Hanoi, Vietnam</i>)	

37. PROPOSING ENGLISH TRAINING PROGRAMS TO MEET THE ACTUAL NEEDS OF TRAINEES: AN EMPIRICAL STUDY ON VIETNAMESE AGRICULTURAL SMES.....	353
Le Tien Dat (<i>Thuongmai University, Hanoi, Vietnam</i>)	
Nguyen Thi Lan Phuong (<i>Thuongmai University, Hanoi, Vietnam</i>)	
38. FACTORS THAT INFLUENCE WORKPLACE TRAINING IN STATE – OWNED ENTERPRISES IN VIETNAM.....	373
Nguyen Ngoc Quy (<i>VNU University of Economics and Business, Hanoi</i>)	
39. EXPLORING THE RELATIONSHIP BETWEEN EMPLOYER BRAND EQUITY AND EMPLOYEE RETENTION: CASE STUDY OF A JAPANESE RETAILER IN VIETNAM	379
Tran Cam Tu (<i>Lille University, France</i>)	
40. THE MEDIATING ROLE OF PERFORMANCE MEASUREMENT SYSTEM IN THE RELATIONSHIP BETWEEN TOP MANAGEMENT SUPPORT AND PERFORMANCE IN VIETNAM PUBLIC SECTOR	395
Tran Thi Yen (<i>Quy Nhon University, Vietnam</i>)	
Le Thi Bao Nhu (<i>Accounting and Banking, University of Phan Thiet, Vietnam</i>)	
Nguyen Thi Thu Hao (<i>State Audit Office of Vietnam</i>)	
Nguyen Phong Nguyen (<i>University of Economics Ho Chi Minh City, Vietnam</i>)	
41. TAKING THE UNIVERSAL AND CONTINGENCY APPROACH IN EXPLORING THE RELATIONSHIP BETWEEN TOP MANAGEMENT COMMITMENT, EMPLOYEE COMPENSATION AND AFFECTIVE COMMITMENT	407
Nguyen Thi Lien Huong (<i>National Economics University, Vietnam</i>)	
42. VIETNAMESE STUDENTS’ PERCEPTION OF THE TOP 10 SOFT SKILLS TO THRIVE IN INDUSTRY 4.0	417
Do Thi Dong (<i>National Economics University, Vietnam</i>)	
43. FACTORS AFFECTING TEAM EFFECTIVENESS OF STUDENT CLUBS: CASE STUDY OF NATIONAL ECONOMICS UNIVERSITY	424
Ta Thu Phuong (<i>National Economics University, Vietnam</i>)	
Pham Thu Trang (<i>National Economics University, Vietnam</i>)	
Vo Ha (<i>National Economics University, Vietnam</i>)	
Ngo Anh Quang (<i>National Economics University, Vietnam</i>)	
Dinh Hoang Trung (<i>National Economics University, Vietnam</i>)	
44. FACTORS IMPACTING VIETNAMESE STUDENTS’ CRITICAL THINKING IN VIETNAM.....	430
Bui Thu Van (<i>National Economics University, Vietnam</i>)	
45. ORGANIZATIONAL COMMITMENT: HISTORICAL TRENDS AND FUTURE DIRECTIONS	439
Nguyen Thi Lien Huong (<i>National Economics University, Vietnam</i>)	
Do Quang Anh (<i>National Economics University, Vietnam</i>)	
Do Thi Thu Trang (<i>National Economics University, Vietnam</i>)	
Pham Quynh Nhi (<i>National Economics University, Vietnam</i>)	

46. VIRTUAL-REALITY BUSINESS MODEL FOR IMPROVEMENT OF TRAINING AND TEACHING.....	455
Huynh Nhat Truong (<i>Ho Chi Minh City University of Technology, Vietnam</i>)	
Tran Thi Trang (<i>Ho Chi Minh City University of Technology, Vietnam</i>)	
Le Tran Nguyen Nhung (<i>Ho Chi Minh City University of Technology, Vietnam</i>)	
47. INFLUENCES OF LEADERSHIP STYLES ON ORGANIZATIONAL AND MANAGEMENT PERFORMANCE: EVIDENCE FROM VIETNAMESE SMES.....	462
Le Tien Dat (<i>Thuongmai University</i>)	
Christopher Selvarajah (<i>Swinburne University of Technology</i>)	
Pham Thi Thanh Hong (<i>School of Economics and Management, HUST</i>)	
Nguyen Thi Thu Thuy (<i>School of Economics and Management, HUST</i>)	
48. EFFECTS OF FEMALE DIRECTORS ON GENDER DIVERSITY AT LOWER ORGANIZATION LEVELS AND CSR PERFORMANCE: EVIDENCE IN JAPAN	469
Nguyen Thi Phuong Thanh (<i>School of Commerce, Waseda University, Japan</i>)	
Thai Minh Hanh (<i>Hanoi University of Science and Technology, Vietnam</i>)	
 Section 4. MARKETING MANAGEMENT	
49. STUDY THE INTERNATIONAL TOURISTS' ATTITUDE AND BEHAVIORS TOWARDS JAPANESE CULTURAL AND HERITAGE TOURISM: AN UNDERSTANDING FOR POST – COVID-19 TOURISM POLICY AND MANAGEMENT	472
Nguyen Quynh Hoa (<i>Hanoi University of Science and Technology, Vietnam</i>)	
Vafadari Kazem (<i>Ritsumeikan Asia Pacific University</i>)	
50. VIETNAMESE TOURIST SATISFACTION IN AGRO-TOURISM: A CASE STUDY AT TRA QUE VILLAGE, QUANG NAM PROVINCE, VIET NAM.....	483
Ha Van Trung (<i>Khon Kaen University, Khon Kaen, Thailand</i>)	
Suchint Simaraks (<i>Khon Kaen University, Khon Kaen, Thailand</i>)	
51. KNOWLEDGE, ATTITUDE AND BEHAVIOR TOWARDS SUSTAINABLE CONSUMPTION AMONG STUDENTS: A STUDY AT HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY, VIETNAM.....	490
Nguyen Tien Dzung (<i>Hanoi University of Science and Technology, Vietnam</i>)	
Pham Thanh Khuyen (<i>Hanoi University of Science and Technology, Vietnam</i>)	
52. DETERMINANTS OF VIETNAMESE YOUTHS' INTENTION TO USE ONLINE DATING APPS OR SITES.....	500
Pham Thi Lien (<i>Vietnam National University, Hanoi - International School</i>)	
Mai Anh (<i>Vietnam National University, Hanoi - International School</i>)	
Dang Nguyen Phuong (<i>Vietnam National University, Hanoi - International School</i>)	
53. ZERO LEVERAGE AND PRODUCT MARKET COMPETITION.....	512
Chu Tuan Vu (<i>National Economics University, Vietnam</i>)	
Ha Son Tung (<i>National Economics University, Vietnam</i>)	
54. CUSTOMER ANALYTICS IN E-COMMERCE: A LITERATURE REVIEW	522
Vu Ngoc Thanh (<i>Hanoi University of Science and Technology, Vietnam</i>)	
Tran Thi Huong (<i>Hanoi University of Science and Technology, Vietnam</i>)	

55. AN INTEGRATIVE MODEL TO MEASURE CUSTOMER TRUST IN E-COMMERCE: LITERATURE REVIEW AND SUGGESTIONS FOR FUTURE RESEARCH IN VIETNAM	533
Luu Thi Minh Ngoc (<i>Vietnam National University Hanoi, Vietnam</i>)	
Hoang Trong Truong (<i>Vietnam National University Hanoi, Vietnam</i>)	
Vu Thi Minh Hien (<i>Vietnam National University Hanoi, Vietnam</i>)	
Nguyen Phuong Mai (<i>Vietnam National University Hanoi, Vietnam</i>)	
56. GREEN MARKETING MIX: A SYSTEMATIC REVIEW OF LITERATURE	543
Nguyen Thi Mai Anh (<i>Hanoi University of Science and Technology, Vietnam</i>)	
Pham Thi Thanh Huong (<i>Hanoi University of Science and Technology, Vietnam</i>)	
57. TAXI SERVICE QUALITY - A COMPARATIVE STUDY BETWEEN APP-BASED TAXI SERVICE AND TRADITIONAL TAXI SERVICE.....	550
Nguyen Thi Thu Thuy (<i>Hanoi University of Science and Technology, Vietnam</i>)	
Dang Thi Thu Trang (<i>Hanoi University of Science and Technology, Vietnam</i>)	
58. FACTORS AFFECTING INTENTION TO STUDY HIGHER EDUCATION OF UNDERGRADUATE STUDENTS IN HO CHI MINH CITY	558
Tran Thi Trang (<i>Ho Chi Minh City University of Technology, Vietnam</i>)	
Le Tran Nguyen Nhung (<i>Ho Chi Minh City University of Technology, Vietnam</i>)	
Pham Thanh Huong (<i>Ho Chi Minh City University of Technology, Vietnam</i>)	
Nguyen Thi Ngoc Mai (<i>Ho Chi Minh City University of Technology, Vietnam</i>)	
59. THE IMPACTS OF PACKAGING ELEMENTS ON CONSUMER PURCHASE INTENTION	564
Pham Thi Lien (<i>Vietnam National University, Hanoi - International School</i>)	
Ho Phuong Hong (<i>Vietnam National University, Hanoi - Vietnam Japan University</i>)	
60. EXPLORING CONSUMPTION BEHAVIOR OF VIETNAMESE STUDENTS TOWARDS ENVIRONMENTALLY FRIENDLY PRODUCTS	574
Nguyen Thi Thu Thuy (<i>Hanoi University of Science and Technology, Vietnam</i>)	
Dang Thi Thu Trang (<i>Hanoi University of Science and Technology, Vietnam</i>)	
61. AN EXPLORATORY INVESTIGATION INTO INCONSPICUOUS LUXURY CONSUMPTION IN VIETNAM	585
Nguyen Bao Ngoc (<i>Post and Telecommunications Institute of Technology</i>)	
Nguyen Thi Tuyet Mai (<i>National Economics University</i>)	
62. STUDENTS SATISFACTION ON THE JOINT EDUCATION PROGRAM IN BUSINESS MANAGEMENT AND ADMINISTRATION BETWEEN NATIONAL ECONOMICS UNIVERSITY, VIETNAM AND DONGSEO UNIVERSITY, KOREA	594
Do Minh Diep (<i>National Economics University, Vietnam</i>)	
Do Ngoc Diep (<i>National Economics University, Vietnam</i>)	

Section 5: Operation, Innovation, and Entrepreneurship

63. HOW INTERMEDIARY SERVICES SUPPORT DEVELOPMENT OF ABSORPTIVE CAPACITY IN SMEs?	604
Alireza Ansari Vaghef (<i>Faculty of Economics, Leipzig University, Germany</i>)	
Utz Dornberger (<i>Faculty of Economics, Leipzig University, Germany</i>)	

64. THE NOTION OF MEANINGFUL WORK IN SOCIAL ENTREPRENEURSHIP	612
<i>Wee Chan Au (Monash University Malaysia, Bandar Sunway, Malaysia)</i>	
<i>Andreana Drencheva (Sheffield University, Sheffield, UK)</i>	
65. EXPLORING ENTREPRENEURIAL ORIENTATION – PERFORMANCE RELATIONSHIPS IN THE BANKING SECTOR	618
<i>Mohammed Aliyu Dantsoho (ABU Business School, Ahmadu Bello University Zaria, Nigeria)</i>	
<i>Nasiru Abdullahi (ABU Business School, Ahmadu Bello University Zaria, Nigeria)</i>	
<i>Adamu Ado Abubakar (ABU Business School, Ahmadu Bello University Zaria, Nigeria)</i>	
66. OPERATIONAL MODEL AND MECHANISM OF SCIENCE AND TECHNOLOGY INCUBATION CENTER IN VIETNAMESE UNIVERSITIES AND RESEARCH INSTITUTES	627
<i>Tran Van Binh (Hanoi University of Science and Technology, Vietnam)</i>	
<i>Le Vu Toan (Ministry of Science and Technology, Vietnam)</i>	
67. SOME THEORETICAL ISSUES IN POLICIES TO FORM BUSINESS. INCUBATORS AND UNIVERSITY SPIN-OFFS IN VIETNAM	635
<i>To Hong Duc (Metropolitan University, Vietnam)</i>	
<i>Pham Tuan Anh (Metropolitan University, Vietnam)</i>	
68. PROPOSING A SYSTEM OF KEY PERFORMANCE INDICATORS (KPIs) IN VIETNAM TECHNOLOGY UNIVERSITIES: A CASE STUDY FOR ACADEMIC STAFF	647
<i>Pham Thi Kim Ngoc (Hanoi University of Science and Technology, Vietnam)</i>	
<i>Đoan Hai Anh (Hanoi University of Science and Technology, Vietnam)</i>	
69. TECHNOLOGY INNOVATION FOR VIETNAMESE ENTERPRISES	648
<i>Trinh Thu Thuy (Hanoi University of Science and Technology, Vietnam)</i>	
<i>Trinh Minh Tam (Ministry of Science and Technology, Vietnam)</i>	
70. THE APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN SUPPLY CHAIN MANAGEMENT IN VIETNAM	654
<i>Tran Thi Thu Hai (Vietnam National University, Vietnam)</i>	
<i>Dinh Phuong Hoa (Vietnam National University, Vietnam)</i>	
71. DIGITALIZATION IN OPERATIONS AND SUPPLY CHAIN MANAGEMENT OF VIETNAMESE TEXTILE AND GARMENT ENTERPRISES.....	663
<i>Nguyen Danh Nguyen (Hanoi University of Science and Technology, Vietnam)</i>	
<i>Tran Thi Huong (Hanoi University of Science and Technology, Vietnam)</i>	
72. CURRENT SITUATION OF PRODUCTION TECHNOLOGY AND QUALITY MANAGEMENT OF INDUSTRIAL ENTERPRISES SUPPORTING THE MECHANICAL ENGINEERING INDUSTRY OF HANOI.....	670
<i>Vu Duc Nang (Hanoi University of Science and Technology, Vietnam)</i>	
<i>Pham Canh Huy (Hanoi University of Science and Technology, Vietnam)</i>	
73. A QUICK REVIEW OF OPERATIONS OPTIMIZATION SOFTWARE PACKAGES FOR SMEs	678
<i>Dang Vu Tung (Hanoi University of Science and Technology, Vietnam)</i>	

74. INNOVATIVE SOLUTIONS FOR SUSTAINABLE CITY LOGISTICS: A LITERATURE REVIEW AND IMPLICATIONS FOR HANOI CITY	688
<i>Tran Thi Huong (Hanoi University of Science and Technology, Vietnam)</i>	
75. FACTORS AFFECTING BUSINESSES' PARTICIPATION IN GREEN SUPPLY CHAIN MANAGEMENT	697
<i>Duong Van Bay (National Economics University, Vietnam)</i>	
<i>Nguyen Thanh Hieu (Faculty of Business Management, National Economics University, Vietnam)</i>	
<i>Nguyen Huu Sang (Faculty of Business Management, National Economics University, Vietnam)</i>	
76. RESHAPING SUPPLY CHAINS IN VIETNAM: THE NEED UNDER THE IMPACT OF A CHANGING WORLD AND THE COVID-19 PANDEMIC	708
<i>Nguyen Danh Nguyen (Hanoi University of Science and Technology, Vietnam)</i>	
<i>Tran Thi Bich Ngoc (Hanoi University of Science and Technology, Vietnam)</i>	
<i>Duong Manh Cuong (Hanoi University of Science and Technology, Vietnam)</i>	
<i>Dao Thanh Binh (Hanoi University of Science and Technology, Vietnam)</i>	
77. ESTABLISHING UNIVERSITY VENTURE CAPITAL FUND: THE CASE OF HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY	721
<i>Nigel Culkin (University of Hertfordshire, United Kingdom)</i>	
<i>Nguyen Thuc Huong Giang (Hanoi University of Science and Technology)</i>	
<i>Tran Van Binh (Hanoi University of Science and Technology)</i>	
<i>Le Vu Toan (Technology and Innovation, Ministry of Science and Technology)</i>	
78. ENTREPRENEURSHIP AND HAPPINESS: THEORETICAL INSIGHTS INTO ENTREPRENEURIAL WELL-BEING	732
<i>Pham Lam Hanh Trang (National Economics University, Vietnam)</i>	
79. TRIGGERING INTERNAL TECHNOVATION TRIANGLE BY INTANGIBLE ASSETS AND STRATEGIC PLANNING: EVIDENCE FROM VIETNAM'S SUCCESSFUL AGRO-FOOD MANUFACTURERS	739
<i>Nguyen Thi Minh Chi (Côte d'Azur University, France, The University of Danang, Vietnam)</i>	
<i>Tournois Nadine (Côte d'Azur University, France)</i>	
<i>Le Xuan Quynh (Quy Nhon University, Vietnam)</i>	
80. FIRM INNOVATION IN RESPONSE TO PANDEMIC CRISIS: THE ROLE OF INNOVATIVE INBOUND COLLABORATION, STATUS CERTAINTY, AND TECHNOLOGICAL SPEED	763
<i>Bui My Trinh (VNU International School - Vietnam National University, Vietnam)</i>	
<i>Phi Hong Minh (Vietnam Academy of Social Sciences, Vietnam)</i>	
<i>Tran Thi Thanh Huyen (Banking Academy)</i>	
81. IMPACT OF ENTREPRENEURSHIP EDUCATION ON ENTREPRENEURIAL INTENTION: A MODERATOR EFFECT	772
<i>Nguyen Thu Thuy (National Economics University, Vietnam)</i>	
82. AUTOMATED STORAGE AND RETRIEVAL SYSTEM - A NEW SOLUTION FOR STORAGE AND WAREHOUSE MANAGEMENT IN VIETNAM.....	781
<i>Huynh Minh Anh (National Research Institute of Mechanical Engineering, Vietnam)</i>	
<i>Dang Thi Kim Thoa (National Economics University, Vietnam)</i>	

83. IMPROVING THE LOGISTICS PERFORMANCE OF LAST MILE DELIVERY IN E-COMMERCE BY OPTIMIZING PARCEL LOCKERS AND TRAVELING SALESMAN PROBLEM.....	790
Nguyen Thi Xuan Hoa (<i>Hanoi University of Science and Technology, Vietnam</i>)	
Vu Hai Anh (<i>Hanoi University of Science and Technology, Vietnam</i>)	
Nguyen Dac Viet Ha (<i>Hanoi University of Science and Technology, Vietnam</i>)	
84. SERVICE FAILURES IN HIGHER EDUCATION: A CASE STUDY OF NATIONAL ECONOMICS UNIVERSITY	801
Nguyen Minh Hoa (<i>National Economics University, Vietnam</i>)	
Do Thi Dong (<i>National Economics University, Vietnam</i>)	
85. ENTREPRENEURSHIP INTENTIONS OF YOUNG PEOPLE: A CASE STUDY IN HAI DUONG PROVINCE, VIETNAM	811
Nguyen Thanh Do (<i>National Economics University, Vietnam</i>)	
Bui Duc Thinh (<i>National Economics University, Vietnam</i>)	
86. APPLICATION OF IPCC METHODOLOGY FOR NATIONAL GHG INVENTORY TO VIETNAM FLAT GLASS MANUFACTURING	822
Dang Vu Tung (<i>Hanoi University of Science and Technology, Vietnam</i>)	
87. AFFECTS OF ATTITUDE TOWARD ENTREPRENEURSHIP TO STUDENTS' ENTREPRENEURSHIP INTENTION: RESEARCH ON STUDENTS OF VARIOUS STUDY FIELDS AT HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY	829
Doan Thi Thu Trang (<i>Hanoi University of Science and Technology, Vietnam</i>)	
88. IN WHAT INSTITUTIONAL ENVIRONMENT VIETNAM SMALL PRIVATE ENTERPRISES OPERATE	839
Truong Doan The (<i>National Economics University, Vietnam</i>)	
Cao Thuy Xiem (<i>National Economics University, Vietnam</i>)	

Section 1
BUSINESS ENVIRONMENT

FACTORS CONSTRAINING BUSINESS PRODUCTIVITY IN THE DIGITAL ERA: EMPIRICAL RESEARCH AT HERTFORDSHIRE IN UK AND LESSONS FOR HUNG YEN PROVINCE IN VIETNAM

Christopher Brown*, Nguyen Thuc Huong Giang**, Huong Tran Thi**

* University of Hertfordshire (UK)

**Hanoi University of Science and Technology

Corresponding author: giang.nguyenthuchuong@hust.edu.vn

Abstract

Productivity is a vital issue in businesses today. In the digital era, the economic, social, and technological environment is continuously changing. It is essential to find out what motivates and limits productivity. Hung Yen, one of Hanoi's nearby provinces, enjoys spillover benefits from the capital city's development. However, Hung Yen has to face many difficult challenges from geographical location, infrastructure, and a shortage of high-quality human resources (people who tend to work and develop careers in the capital). Hertfordshire is a county adjacent to London and suffers much the same challenges as Hung Yen, graduate skills mobility and productivity gaps in the STEM skilled sectors. The correlation in business development issues between Hertfordshire and London is similar to the one between Hung Yen and Hanoi, in growth, hard-to-fill skills vacancies and productivity. In recent years, Hertfordshire has made numerous achievements in economic development and improved productivity growth. Therefore, the authors conducted an experimental study focusing on enterprises in Hertfordshire and influencing productivity factors. We have drawn lessons and empirically evaluated the ability to apply these to foster improvements in the business productivity of enterprises located in the Hung Yen province.

Keywords: productivity, constraints, digital era, Hung Yen, Hertfordshire.

1. INTRODUCTION

1.1 Productivity in the digital era

Productivity is a measure of the efficiency of a manufacturing process (Dat T.T, Thanh T.T et al., 2019), which is calculated by the amount of the output generated by the inputs such as labors, materials, capital, assets... The basic principle of maximizing the productivity of the firm is maximizing the outputs in minimizing inputs amount. Outputs of the firm can be measure by total production and business value, value-added, or volume of goods produced. To assess firm productivity, we can use total factor productivity or labor productivity as indicators. In this paper, we choose total factor productivity as it brings more general reflection to evaluate firm's effectiveness.

The 21st-century shift from the industrial revolution to a new economic domination of information technology (Windsor A., 2020). In this "digital era", digital technologies play a prominent role in shaping up and regulating the behaviors, performances, standards... of the societies, communities, organizations, and individuals (Liyanage J. P., 2012). In the world, the digital era started during the 1980s with the Digital Revolution and is ongoing. In Vietnam, personal computers appeared in the same period, and then

developed in the 1990s and 2000s, marked the strong development of the digital economy, the definition attached to the digital age, continues until now. The Government of Vietnam has established a quite completed legal framework to promote the development of digital technology in all the area: electronic government, e-commerce platform development, digital finance, digital bank, online tax, promote innovation and digital ecosystem, implementing digital initiatives in many sectors such as agriculture, health, national defense... Vietnam is assessed to be one of the fastest-growing country in digital technology development. According to The World Bank, the number of Vietnamese citizens using the internet and mobile phone is among the top countries in South East Asia (2019). Besides it, Vietnam's information technology and e-commerce sector, digital financial services are well-developed in recent years (Dat T. T, Thanh T. T et al., 2019).

In the digital era, applying digital technology can help enterprises enhance the effectiveness, reduce costs, rationalize labor demand, strengthen innovative activities to better capture opportunities, reshape the business model, changes the barriers for the integration, improve transparency, and then, increase firm productivity (Mc Kinsey, 2018). In the "Annual economic report of 2019: improving labor productivity

in digital economy”, in doing the literature review of many researches in more than 20 years until now, Dat T. T, Thanh T. T et al (2019) also showed a positive influence of digital technology to total factor productivity (TFP).

Vietnam is a country with a young, dynamic population that is diligent to learn, research and apply science and technology, also situates in the region with the most rapid digital economic development and having a very fast technology innovation speed. TFP of Vietnam has increased in recent years, which contributes significantly to the GDP growth of the country.

Table 1: TFP growth rate and contribution to Vietnam’s GDP from 2011-2017

Unit: %

	GDP growth rate	Capital growth rate	Labor growth rate	TFP Growth rate	Contribution to GDP growth		
					Capital increase	Labor increase	TFP increase
2011	6.24	9.26	2.66	0.85	60.6	25.4	14.0
2012	5.25	7.24	2.13	1.06	54.7	24.7	20.7
2013	5.42	6.77	1.53	1.71	50.9	16.9	32.2
2014	5.98	6.84	1.03	2.15	54.2	9.2	36.6
2015	6.68	7.15	0.18	3.10	51.3	1.5	47.3
2016	6.21	7.45	0.84	2.16	57.3	7.3	35.5
2017	6.81	7.70	0.75	2.63	54.7	5.8	39.5

Source: Vietnam Productivity Report 2017, Vietnam Productivity Institute, 2020

1.2 Local issues for enterprises in Hertfordshire addressing productivity challenges

Over the last twenty years, the focus of the UK government’s economic policy has been on improving UK growth and productivity (Department for Business Innovation and Skills 2016). At a national level, the SME community represents over 99.9% of all businesses in the UK. The UK government’s focus before Covid-19 and after is and will be on increasing the productivity of SME’s to both improve UK economic growth and employment opportunities (Love and Roper 2013). This same body of research suggests that these businesses also recognize the importance of investing in skills, R&D, and general capital assets. Effective supply-side and demand-side policies by the local ecosystem both supports the enterprises’s innovation and export growth aspirations. What is less-known at the local level is the particular ecosystem characteristics that most influence the enterprises’s future innovation activities, potential turnover growth, and improved productivity. Hence, the importance of more research investigating this linkage, and particularly at the regional level (e.g. Hertfordshire) (Department for Business Energy & Industrial Strategy 2019).

Regionally there are 61,765 enterprises in the Hertfordshire Local Enterprise Partnership area, breaking down into micro-enterprises (56,115), small-enterprises (4,540), medium-enterprise (865), and large enterprises (245) (NOMIS 2017). The Hertfordshire

Economic Outlook report of 2018 makes more references to the overall picture of enterprise, innovation and the broader industries (Hertfordshire LEP 2019).

1.3 Productivity issues of enterprises in Hung Yen

Vietnam is composed of 63 provinces and five centrally-governed cities. The Vietnamese government divides the country into three key economic zones (KEZs) (the Northern Key Economic Zone, the Central Key Economic Zone, and the Southern Key Economic Zone). The Northern KEZ covers seven cities and provinces, including Hanoi, Hai Phong, Bac Ninh, Hai Duong, Hung Yen, Vinh Phuc, and Quang Ninh. The region accounts for more than 32% of the country’s GDP, with a total land area of 15,755 km² and a population of 16 billion people, 32%. The area has seen significant development in the past five to ten years. The GRDP growth of Northern KEZs from 2011 to 2017 always equal to or greater than the annual GDP growth of Vietnam (Asia Perspective, 2019). Bac Ninh, Hai Duong, and Hanoi are the highest performing provinces, attracting FDI capital in the industrial and manufacturing sector. In the future, according to the strategy of the Vietnamese government, the Northern KEZ needs to take the lead in scientific and technological innovation and development (VGP News, 2019).

In this research, the authors chose Hung Yen to become the typical case for Hanoi nearby provinces to investigate the research problems. According to the

Vietnamese Enterprises White Paper (2020), there are 5404 enterprises (2654 in micro size, 2066 small, 375 medium, and 309 large size companies) doing business in Hung Yen by 2018. These enterprises earned 322801 billion VND in 2018 and increased by 114.8% compared to 2017 (GSO, 2020). The number

of micro and small business accounts for the majority of business in Hung Yen. However, 75% of revenue comes from large companies. Regarding the classification by capital, private business is the most common type in Hung Yen and has earned the most revenue.

Table 2: Statistics of enterprises in Hung Yen

Type of enterprise	Number of enterprises			Net revenue (billion VND)		
	Average 2011-2015	2017	2018	Average 2011-2015	2017	2018
Classification by size						
<i>Micro</i>	1164	2161	2654	2259	3787	4893
<i>Small</i>	962	1863	2066	16502	32754	39381
<i>Medium</i>	208	346	375	16328	33302	37057
<i>Large</i>	179	290	309	69775	211414	241471
Classification by capital						
<i>State</i>	14	8	8	3739	782	553
<i>Private</i>	2330	4394	5138	74779	217042	245544
<i>FDI</i>	169	258	258	26346	63433	76704
Total	2513	4660	5404	104864	281258	322801

Source: GSO, 2020.

Table 3: The Provincial Competitiveness Index of Hung Yen from 2013 to 2019

Year	2013	2014	2015	2016	2017	2018	2019
PCI	53.91	55.14	55.1	57.01	59.09	60.66	63.6
PCI Ranking	53	51	56	50	56	58	55

Source: PCI Vietnam, 2020

In recent years, Hung Yen is one of the provinces that attracted large numbers of foreign investment enterprises to industrial areas such as Pho Noi A, Thang Long II, Pho Noi Textile and Garment, and Minh Duc industrial zone. The Provincial Competitiveness Index of Hung Yen increases gradually from 2013 to 2019. That shows the efforts of Hung Yen governors to facilitate the business development of enterprise.

Located adjacent to the capital city, Hung Yen and other Hanoi's nearby provinces have enjoyed spillover benefits from the development of the capital. However, they have to face many challenges from geographical location, infrastructure, and a shortage of high-quality human resources (people who tend to work and develop careers in the capital). The government pointed out the weakness of the region: (i) agricultural production remains scattered; (ii) industrial production has mainly expanded horizontally and focused on natural resources exploitation; (iii) high-tech industries,

auxiliary industries, logistics, and high-quality services have not developed incommensurately with the region's potential (VGP News, 2019).

1.4 Research questions

As depicted in the above sections, recently, especially in the digital era, Hertfordshire and Hung Yen are facing many challenges in fostering their productivity. The two cities have a number of similarities, such as (i) located nearby the capital city, (ii) shortage of human resources by the attraction of the capital to labor force, (iii) the majority of enterprise is in micro and small size, and (iii) difficulties in geographical location and infrastructure. Therefore, our research focuses on defining the critical factors encouraging and/or constraining the business productivity of enterprises in Hertfordshire through an in-depth investigation then proposing lessons for Hung Yen. To this end, our research paper raised and researched the answers for the following research questions:

What are the factors constraining business productivity in the digital era, especially of capital city nearby provinces?

How do the enterprises in Hertfordshire perceive and evaluate these factors? Solutions to manage these constraints and improve productivity?

What are the lessons learned for enterprises in Hung Yen province?

2. LITERATURE REVIEW

Productivity is critical to enterprises, which can lead to increase profits, potentially higher wages for workforce and enhance the competitiveness of the enterprises. There are many factors influence firm productivity, in which we can divide in 2 groups: external and internal factors. External factors can be the economic environment, the market situation, government and local regulations. Internal factors include workforce, capital, management, technology. Among these, there is a number of factors that, when they get positive changes, will create a positive effect to enhance productivity. And inverse, negative changes can make constraints to firm's productivity. In digital era, factors constraining firm productivity may have some adjustments. With the development of science and technology, innovation is the leading factor that influences firm productivity. An empirical research from Lee D. (2016) on the role of R&D in the productivity growth of Korean industries found that R&D plays an important role in fostering productivity growth, and the productivity impact of R&D is stronger in more advance industries (industries that are close to the technology frontier) and during economic downturns. The same with UK, R&D is important for both innovation and productivity, while knowledge spillovers are more important than R&D for firm productivity (Audretsch B. D., Belitski M., 2020). Besides innovation and R&D, workforce skills and manager's skills also influence firm productivity. Workforce skills, number of labor, and capital intensity are the main factors influencing labor productivity, therefore influence on the firm productivity (Dat T. T, Thanh T. T et al., 2019). Some of the top competencies in the digital era are lifelong learning, personal attitude, teamwork, dependability, and IT foundations (Sidoo V. et al., 2019). To strengthen the necessary skills for employee in the digital era, training is one of the most important parts of an organization's overall strategy. Needs of training arise due to advancement in technology, need for improving performance or as part of professional development (Min A. S, Mansor N., Anvari R., 2014).

Manager skills, ability, and characteristics (such as competency, communication skills, personality traits) can improve employees' mental health and enhance productivity (Kuroda S., Yamamoto I., 2018). According to Guzman V. E. et al. (2020), leadership is

essential to successfully promote a culture of innovation. Leaders assume a crucial role in the paradigm shift towards Industry 4.0. The four leadership skill groups are necessary in the transition process towards Industry 4.0, including: cognitive skills, interpersonal skills, business skills and strategic skills. Hoffman J. M, Mehra S., (1999) showed that the lack of top management support as well as lack of a leadership-based process-oriented environment can discourage success in productivity promotion of the organization.

Business constraints is one of the other factors that may constrain total factor productivity of the enterprise, which including regulations and policies of the government and local authorities, for example tax policies, insurances or labor policies, or policies on business registration. Management time invested in political ties weakens the positive relationship between organizational innovation and productivity (Li C., 2020). Besides it, complicated public administrative procedures may incur unnecessary costs, and high tax and insurance rates can create the financial difficulties for businesses. And indirectly, these financial constrains have significant implication on firm productivity growth. Financial constrained firms have lower revenue than unconstrained firms (Amos S., Zanhouo K. D, 2019). Tax rate, for example with export companies, export tax rebates can smooth financial constraints through increasing cash flow, substituting working capital, financing fixed assets investment and R&D investments, and can lead to increase firm productivity (Zhang D., 2019). If the government can provide supports, it would help to increase firm productivity. However, these effects may vary by country. In the Chinese mixed market, empirical evidences show that enterprises with government support increase R&D and thus improve their productivity (Wu A., 2017). Nevertheless, in Vietnam, there is no evidence of linkage between financial supports from the government and firm productivity. Access to financial support improves technological progress and growth in a firm scale but has a negative impact on improvement in technical efficiency (Vu Q., Tran Q. T., 2020).

Based on the researches reviewed, we have defined the four main factors that may constrain firm productivity: (1) Innovation and technology through product/service launches; (2) Workforce skills gaps; (3) Leadership and management constraints; and (4) Business constrains. The effects of these factors are now mainly studied on a national scale. These factors should be physically tested at the local level to see if they really influence to the firm productivity in the digital era and suggest solution to promote the productivity and performance of local businesses.

3. RESEARCH METHODOLOGY

The questionnaire has been designed for businesses in Hertfordshire (UK) with over 435 enterprises responding. Almost respondents are SMEs (more than 90%). Locally, the University of Hertfordshire (UoH) plays an important role alongside other anchor institutions in supporting small firms at both the regional, national and international levels. Through this, and working with the likes of other supporting agencies such as Hertfordshire Local Enterprise Partnership, Hertfordshire Growth Hub, and other bodies that UoH can play its part in building successful local communities and economies (UK Commission for Employment and Skills (UKCES) 2015). The survey focuses on seven primary sectors in Hertfordshire: manufacturing & advanced engineering; life sciences & pharmaceuticals; professional, financial & technical services; information, communications & technology services; construction & the built environment; arts, entertainment & recreation services; high-end logistics and retail, which are the sectors that have most influence on digital transformation in the regional economy.

Twenty-four key questions were designed to help understand fully the challenges and issues of productivity, by investigating the driving factors constraining local productivity and growth of small enterprises, defining innovative activities of the community, as well as exploring their upcoming business plan strategies of the local business community.

Besides Hertfordshire, with the same objective, we also conducted in-depth interviews with middle-level

managers of 10 enterprises in Hung Yen province (Vietnam). Among those 10 enterprises, 50% are manufacturing and advanced engineering. The rests are in Construction, Real Estate, Information and Technology, Logistics and Retail, Financial Services. 40% were large-sized businesses, 40% are SMEs and 20% are small size and micro businesses. All the 10 enterprises work in Vietnam for more than 8 years. The questionnaires were a little shorter than those surveyed in Hertfordshire, but detailed explanation is required in some questions. Data obtained from the survey results in Hertfordshire is the basis for the team to provide solutions suggested for improving firm productivity in Hung Yen province.

4. FINDINGS AND DISCUSSIONS

4.1 Business growth of surveyed enterprises

In 2018, about 90% of enterprises surveyed having the same or increase in turnover. Even more than 25% enterprises have the increase of 10% or more. 2018 can be considered as a good year for local enterprises in Hertfordshire. With 435 enterprises in the seven primary sectors in Hertfordshire surveyed, which experiencing over 10% growth of SMEs in Hertfordshire in 2018, we wanted to understand the factors behind this good performance.

Same tendency as Hertfordshire, with the research year of 2019, all of the 10 enterprises surveyed in Hung Yen experienced an increase in turnover (50% having from 5-10% of turnover increase and 50% having more than 10% increase of turnover). Half of them having export activities.

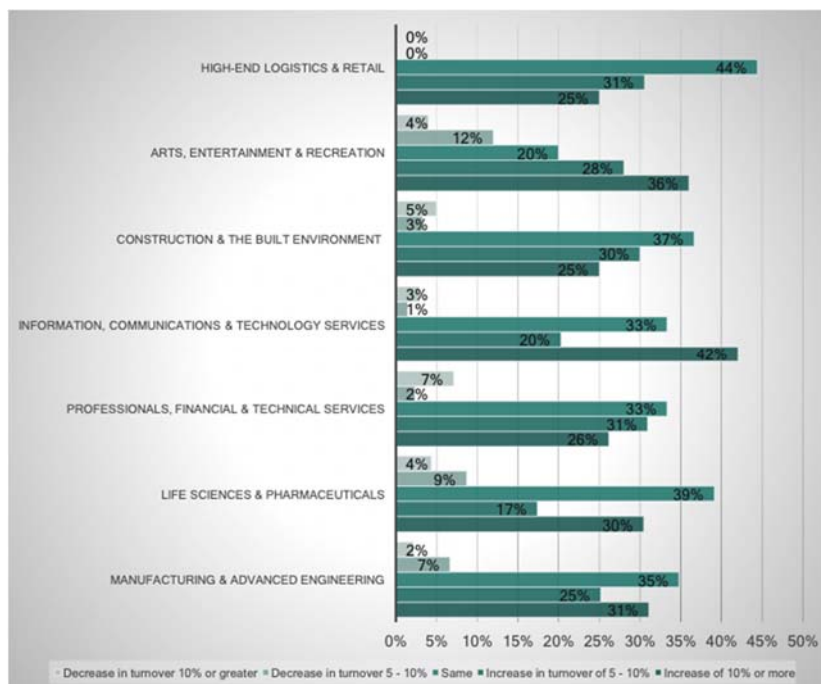


Fig. 1: Growth rate of enterprises in Hertfordshire in 2018

4.2 Perception and evaluation of enterprises in Hertfordshire and Hung Yen about factors constraining their productivity

In this section, we synthesize responses of enterprises in Hertfordshire and Hung Yen to analyze 4 main constraints to firm productivity: (1) Innovation and technology through product/service launches;

(2) Workforce skills gaps; (3) Leadership and management constraints; and (4) Business constrains.

4.2.1 Driving Technology & Innovation through Product/Service Launches

In the Hertfordshire business community, the number one important factor driving their current and perceived future performance was their ability to launch new products into the marketplace.

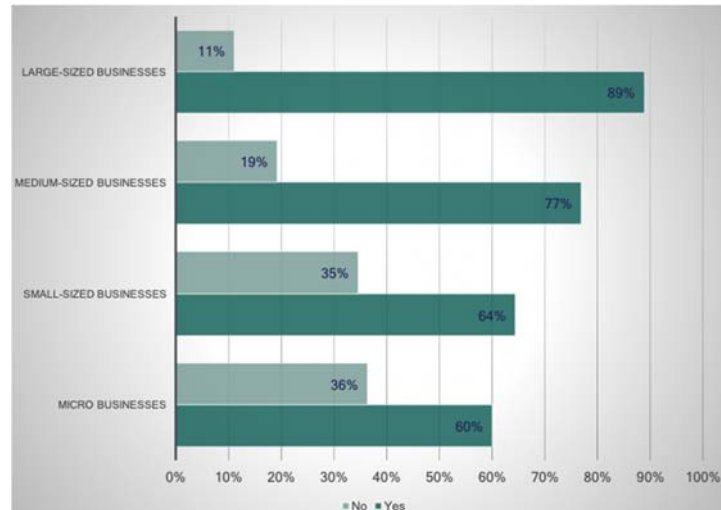


Fig. 2: Introduction of new products/services in the last three years (2017-2019)

The above figure shows the importance that Hertfordshire enterprises place on delivering new goods, services and processes to help maintain their competitiveness, sustainability, future growth, increased productivity and turnover. Clearly some sectors see the need to create, develop and deliver goods/services that are new to the world, being driven by the latest primary and secondary technologies, see figure 3.0 below. Nationally, the proportion of SME's that have introduced new or significantly improved goods, services or processes have dropped over the last five years, more so for the micro- and small-enterprises

(Department for Business Energy & Industrial Strategy 2018a). Suggesting that these small enterprises are struggling to resource these developments, either because of lack of relevantly skilled staff and/or the leaders/managers skills in directing and guiding this activity. Those sectors that are struggling (construction and the built environment; information, communications and technology services; life sciences and the pharmaceuticals, manufacturing and advanced engineering) the most are also witnessing an increased “unfilled higher skilled vacancies” challenge.

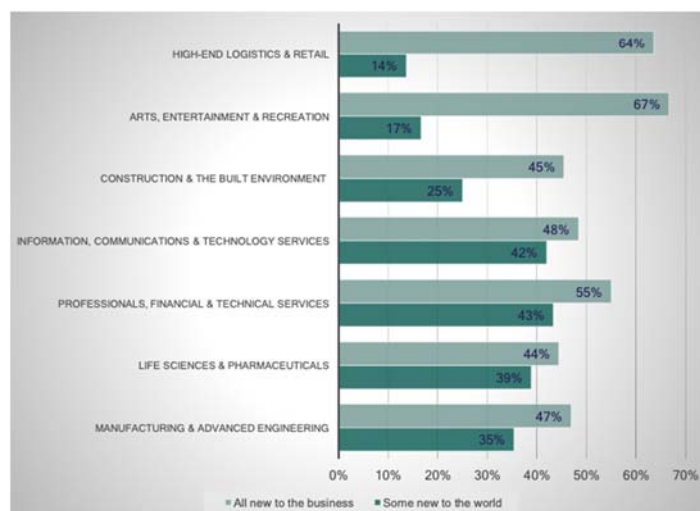


Fig. 3: Hertfordshire Enterprises' Innovation Activity

For Hertfordshire enterprises that export to the EU (36%) over 74% of these have introduced a new or significantly improved product/service in the last three years to both help increase turnover and improve productivity. For those Hertfordshire enterprises not exporting (64%) this drops to 62%.

For those Hertfordshire enterprises that exhibited turnover growth in the last 12 months (50%) over 71% of these had introduced a new product/service in the last 3 years. For those predicting turnover growth in the next 12 months (54%) the introduction of a new product/service over the last 3 years increases to 74%. Both of these facts above supports the national picture of evidence that enterprises that both expose themselves to export markets and have significant innovative activities are more likely to have higher growth and productivity than those enterprises that don't (Love and Roper 2013).

In Hung Yen, 100% of surveyed enterprises have introduced any new or significantly improved goods/services/processes in the last three years. There are 60% of respondents asserted that their innovations have at least some new to the market, and 40% of respondents answered that their innovations just new to the business. Most of companies in Hung Yen appreciated the impact of the following related innovation activities: (i) External R&D, (ii) Acquisition of external knowledge, (iii) Changes in product, service, or process design, and (iv) Market research with the proportion of enterprises evaluate the impact from medium to high are 55.6%, 60%, 70%, and 80% respectively.

The budget for research and development of new goods, services, or processes is a critical factor to drive innovation, especially in the digitalization era, when the cost to install and implement digital technology is

extremely high. According to our survey in Hung Yen, all companies doing business in the field of Manufacturing and Advanced Engineering and the field of Information, Communications, and Technology Services have invested their turnover in R&D activities with the proportion of 0-4% (66.7% of Manufacturing enterprises) or more than 4% (33.3% of Manufacturing enterprises and all of IT companies).

However, according to the project to support Hung Yen Youth startups (2018), most micro, small and new/startup companies in Hung Yen are slow in implementing new technologies in their businesses to innovate products and services, increase their competitiveness, and enhance business efficiency. The two most important reasons are (i) they are facing difficulties in accessing to loans and other financial support from the government and (ii) the lack of management and technical skills of staff and managers (Hung Yen Provincial Youth Union, 2018).

4.2.2 Broader Issues of Workforce Skills Gaps

In 2017, the influential “Employer Skills Survey 2017” suggested that over 20% of UK employers have unfilled vacancies, an increase year on year over the last five years (Department for Business Innovation & Skills 2015). The UK as a whole faces a digital skills crisis, where up to 12.6 million of the adult population lack even the basic digital skills (House of Commons 2018). It is estimated that this digital skills gap is costing the UK economy over £63 billion in lost additional productivity. In the Hertfordshire small enterprise sector, the picture painted is varied and worrying, see figure 4 below. In Hertfordshire the difficulties in recruiting appropriately skilled staff are more acute in the small (35%) and medium-sized (32%) enterprises.

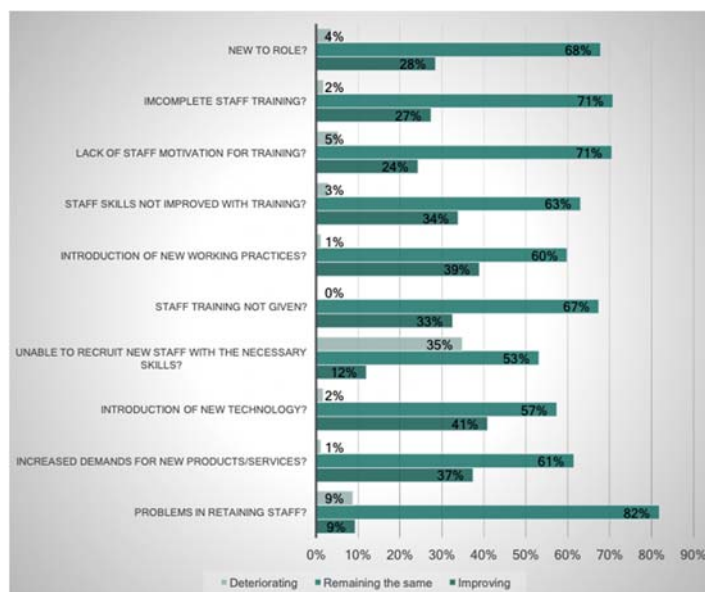


Fig. 4: Hertfordshire Enterprises Workforce Skills Gaps

According to our survey in Hung Yen, 90% of respondents asserted that “Lack of skilled labour” is one of the factors constraining their business turnover/growth and productivity in this digital era. In which 50% of interviewees evaluated the impact as medium, high and very high. One of our informants stated that: “The biggest hindrance to firm productivity is the lack of highly skilled workers because they are directly involved in the value creation process for the company”. 80% of surveyed companies have increased their number of employees in 2019. However, 90% of companies worried about the high labour cost is constraining their business growth and productivity in this digital era. 70% of surveyed companies evaluated performance of their managers in organizing and motivating the staff at medium or poor level. The same number is for the ability to delegate work/responsibility to others. Decision making, organizing resources and coordinating tasks, and developing new goods, services or processes that are superior to the competition are the three skills even got the grade “very poor”. Most of the respondents considered that the most common reasons for MANAGER's skills gaps are as follows:

Increased demands for new products/services (30% of companies stated that the problems remaining the same, even deteriorating in 2019).

Introduction of new technology (50% of companies stated that the problems remaining the same, even deteriorating in 2019).

Problems in retaining managers (75% of companies stated that the problems remaining the same, even deteriorating in 2019).

Unable to recruit new managers with the necessary skills (87.5% of companies stated that the problems remaining the same, even deteriorating in 2019).

The above problems are also the common reasons for STAFF's skills gaps in Hung Yen. Besides that, new to role and incomplete staff training are also significant factors leading to skills gaps.

4.2.3 Leadership and Management Constraints

The UK government can of course do its bit to encourage leadership and management training through initiatives/incentives, and other funding streams that employers can access. However, it's the employer that needs to engage and be the driving force behind improvements in leadership and management, by (Department for Business Innovation & Skills 2015):

- Critically looking at their current leadership practices – key to good management practices and SME performance are their entrepreneurship and leadership skills (Department for Business Innovation & Skills 2015b);
- Being prepared to make changes, even if that means diverting resources away from other activities.

On average one in three Hertfordshire enterprises perceive their leaders and managers to be either poor or just average in their performance, significantly so (42%) in the area of developing new goods, services or improved processes, see figure 5 below.

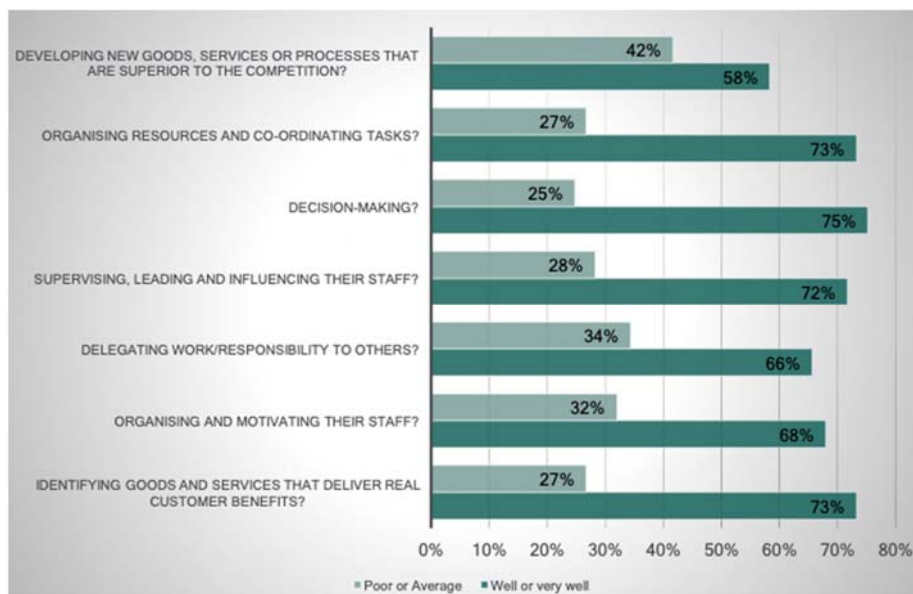


Fig. 5: Hertfordshire enterprises' perception of their leaders and managers performance

Related to the 10 companies surveyed in Hung Yen province, only 1 of them having problem with

manager's skills gap, which can constrain the productivity of the company. This company is in the field of Information and Technology, which requires

the managers to have very good and updated knowledge on new products and services, introduction of new technology. Not all the managers of the company can update the new tendency and new technology application. For them, in the digital age, it is quite difficult to retain the good managers as many others competitors are willing to pay higher salary for high-level managers. And because of the budget capacity, to recruit the new good skills managers is also one obstacle of the company. Nevertheless, others 9 companies interviewed do not have to face with this situation, even in half of them, the managers' skills have been improved a lot.

In overall, managers' performance is assessed in average level. 5 companies evaluate that their managers have good decision-making skills, while 3 companies consider that it is lower than average. These 5 companies (50%) also highly appreciate the skills of the managers in developing new products and services and identifying goods and services that deliver real customer benefits in order to enhance competitiveness of the companies. However, 4 others assess that their managers do not have such of those skills. Related to HR management, 40% of the companies assess that their managers is good in organising and motivating the staffs, having the skills of supervising, leading and influencing the staffs, delegating works and having responsibility to others, having capabilities of organising resources and co-ordinating tasks. Other 40% evaluate the above contents at an average level, while 20% rated at poor level, which are the companies in construction and real-estate industries. In 2018, these 2 industries had a growth rate in 2018 of 8.02%, higher than the GDP growth rate of the country at 7.08%. 2019 is also a year of development of the 2 industries, when the demand for housing and office buildings has

increased 19%. However, worker and staff management in these sectors are more difficult, as human resource structure is complicated, the number of employees is large (both the 2 companies interviewed have more than 300 employees) and often fluctuate. In the digital age, using of technology in personnel management in other industries is much easier than in construction and real estate industries as the sites spread out in many locations. This constrain thus of course influences the management and motivation the employees of the companies' managers. The 60% of poor and average level of the enterprises interviewed in Hung Yen is much higher than the rates of only from 25% to 42% of Hertfordshire. Under the perception of their staffs, the managers of enterprises in Hertfordshire have better skills both in HR management and business management. This issue may affect to the productivity of Hung Yen companies. To fill in the skill gap of the managers, both the 10 companies interviewed in Hung Yen stated that they have training plans for managers, as well as budget prepared for the next coming year (2020).

4.2.4 Business constraints

National research still shows that SME's, in particular' cite the following as the principal business constraints on their business growth and productivity (ERC UK 2019): Competition in the marketplace (51% and rising); Regulations and red tape (46% and rising); Taxation (VAT, PAYE etc.) (41% and rising); UK's exit from the EU (27% and rising); Obtaining finance (18% and rising). Figure 6 shows the perception of Hertfordshire enterprises on factors influencing productivity, of which we can see many related to business environment constraints.

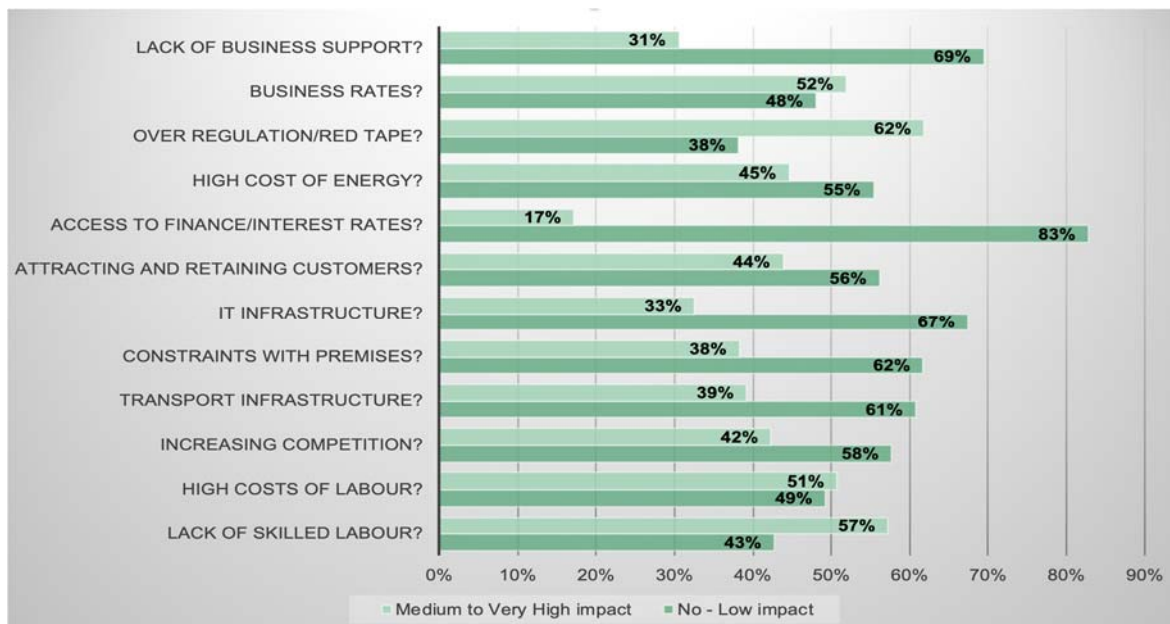


Fig. 6: Hertfordshire enterprise perception of factors impacting on productivity and growth

Local enterprises in Hertfordshire have a lot of problem relating to over regulated rate (medium to very high impact at 62%) and business rate (52%). For the other business constraints such as constraints with premises, IT or transport infrastructure, lack of business support or access to finance/ interest rate, the percentage of enterprises having significant impact is lower than 40% but still high (almost more than 30%, except access to finance/interest rate). Yet with all of these business constraints Hertfordshire enterprises are still predicting strong growth in the coming year, particularly in manufacturing & advanced engineering (56%), construction & the built environment (55%), information/communications & technology services (62%), and life sciences & the pharmaceutical (47%) sectors. In the services industries, arts/entertainment and recreation and high-end logistics & retail are also predicting strong growth (64% and 56%) respectively.

Nevertheless, in the digital age, when digital transformation is applied in all the areas of the economy including public service, in one European country, the high rate of enterprises claimed to be affected by these constraints among those surveyed is something need to be seriously considered.

Hung Yen is a province that have just a little progress in PCI ranking, and among 11 Red-river delta provinces, the province is in the lowest position (11th) and rank in 55th position in the total of 63 provinces. There are still many business constrains in Hung Yen, such as market entry costs, time costs, proactivity of provincial authorities, business support services, law and order. The marks of some sub-indices as transparency, unofficial fees, policy bias even increase but still low compared to other provinces and to the total average of the 63 provinces.

Table 4: PCI ranking and business constrain' factors of Hung Yen from 2015 to 2019

Unit: 10-point scale

Year	2015	2016	2017	2018	2019
Market entry costs	8.21	8.24	7.35	7.5	6.18
Transparency	4.88	5.68	5.62	5.5	5.98
Time costs	6.08	5.71	5.25	6.82	5.85
Unofficial fees	4.61	5.21	4.21	4.69	6.33
Policy bias	4.21	4.85	4.83	5.54	6.83
Proactivity of provincial authorities	4.2	5	4.5	6.19	5.95
Business support services	5.18	5.23	6.38	6.41	6.17
Law and order	5.87	5.58	5.37	6.29	6.08
PCI (100-point scale)	55.1	57.01	59.09	60.66	63.6
Ranking (in total 63 provinces)	56	50	56	58	55

Source: PCI 2019 report

PCI report 2019 has been done with the survey of thousands enterprises in the whole countries, and with the case of Hung Yen, this result reflect the reality of the local enterprises' difficulties. For the 10 companies interviewed in Hung Yen, 8 companies (80%) assess that there is an increase in competition among enterprises, however, the companies got from medium to very high impacts because of the administrative procedures are too many (90%), lack of business support from the government and local authorities (80%), difficult to access to finance resources and preferential interest rates (60%), and 90% have problems with high tax rate. It shows that almost the companies interviewed having issues with business constrains impacted to the productivity of their companies. Even 3 among them have stated that over regulations, administrative procedures and red-tape is

the factor the most affects company's productivity in the digital age, as it directly influences to company's daily activities.

4.3 Solutions to manage these constraints and improve the productivity of enterprise in capital nearby provinces in the digital era

The above findings consolidated the similarities and differences between Hung Yen and its forerunner, Hertfordshire, in terms of business productivity. Deriving from the above analysis, we suggested the solutions to drive longer-term productivity for enterprises in Hertfordshire and Hung Yen as follows:

Regarding the business side, enterprises should have **business strategy and plan to:**

- (i) improve their activities in driving up the introduction of new goods/services, on a regular basis, will prove their abilities to compete in both domestic and overseas markets;

- (ii) foster market research to understanding their continuously changing market and develop business strategies that increase the effectiveness of their new goods/service launches;
- (iii) push activities of export, e-commerce, and application of digital technologies;
- (iv) take part in business networks to learn best practices from their productive and scale-up enterprise neighbours;
- (v) pay attention to attract, train, and retain skilled labor (both of managers and staff) through improving compensation policy and working environment;
- (vi) collaborate with university, vocational school, and research institutions to strengthen their human resource and enhance R&D effectiveness.

Regarding the government side, national and regional governors can support firms through:

- (i) provide sufficient support and advice. In Hertfordshire and Hung Yen, employers that are young and growing search for information on employment, financial and other regulation-based needs, presumably to strengthen their business model and overall business sustainability. As these enterprises mature then they increasingly seek, and prioritise, on marketing and market research information needs, better to help fuel their sales pipelines. Figure 6 shows enterprises' information needs by business age. Table 5 shows the evaluation results of business support services of the provincial government in Hung Yen which fluctuated year by year and depict quite low level of governmental supportability.

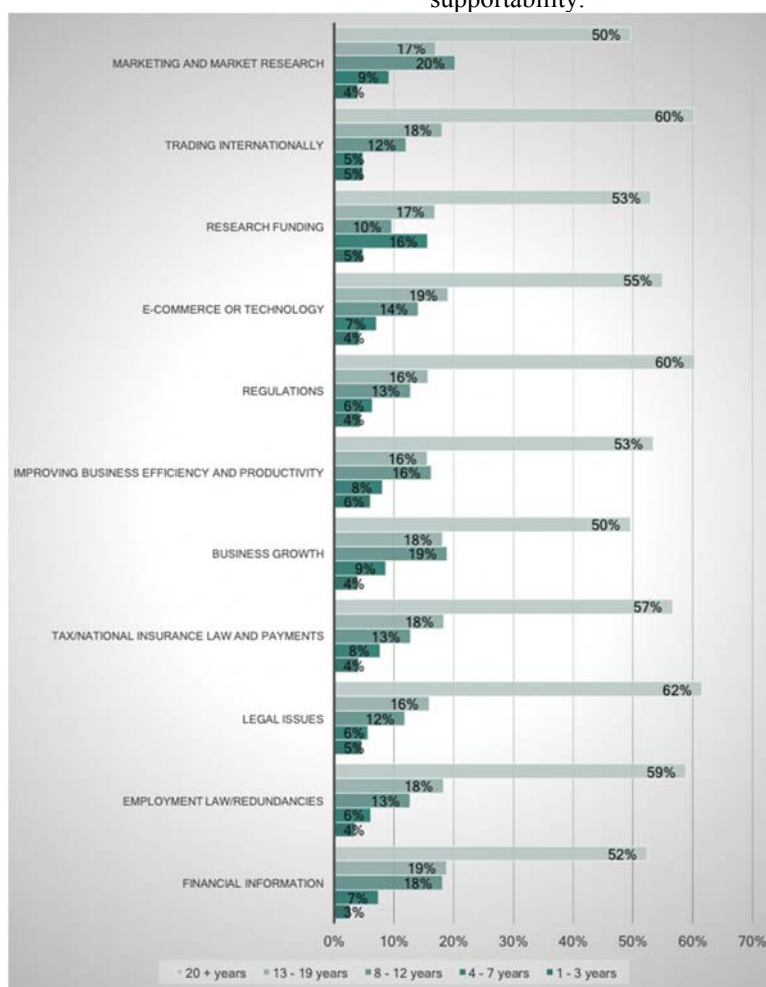


Fig. 7: Hertfordshire enterprises' information needs by business age

Table 5: Evaluation of business support services of provincial government in Hung Yen

Year	2013	2014	2015	2016	2017	2018	2019
Business support services	5.34	5.51	5.18	5.23	6.38	6.41	6.17

Source: PCI Vietnam, 2020

- (ii) improving quality of vocational training, while at the same disseminating industry promotion policies and providing rural businesses with consultancy in the fields of market development and brand building.
- (iii) simplifying administrative procedures and regulations and eliminating red-tape, bribery evils.

5. CONCLUSION

In every country, national and local government policy is to have an inter-connected strategy on strategic development, therefore the need to have a long-term outlook, integrate key factors that influence productivity, and then marry this to national strategies (Network 2019). What we present here is identifying the local SME community key factors influencing productivity, firstly Hertfordshire just outside London, and then Hung Yen, the business community outside Hanoi, Vietnam.

The Hertfordshire productivity study findings have revealed some interesting insights and perspectives of the Hertfordshire SME community, particularly around their activities in driving increased turnover, growth and improved productivity:

- Hertfordshire SMEs are experiencing steady growth, across the sector more than 56% have increased turnover by more 5% or more. In sector terms the strongest sectors are arts/entertainment and recreation (56%), manufacturing and advanced engineering (55%), and information/communications and technology (55%). The weaker sectors for growth in turnover in the past year were life sciences and the pharmaceuticals (35%), and professional/financial and technical services (35%);
- As a consequence of Hertfordshire enterprises' growth above, they are increasingly confident to increase employment levels, nearly 47% predicting recruiting new staff in the next year (2019-2020);
- Not surprisingly it is the micro- and small-enterprises who have fewer new goods/services being launched each year compared to medium-enterprises. The STEM skilled sectors (e.g. manufacturing and advanced engineering, life sciences and the pharmaceutical, etc.) have the highest incidence of goods/service launches per year. It is these STEM skilled sectors that more frequently launch new-to-the-world goods/services;
- Hertfordshire SMEs that deliver goods, relying on a high STEM skilled workforce, also recognize the high impact of internal R&D (47%), and the linked importance of external knowledge acquisition. As a contrast between manufacturing and advanced engineering and professional/financial and technical services, manufacturing are twice as likely to have internal R&D functions than other SMEs, they are also 50% less likely to use external knowledge to help their goods development;

- Hertfordshire micro- and small-enterprises identify the challenge of retaining staff (82%) as having a significant impact on both increasing turnover and on overall productivity, 10% reporting a continuing worsening of this situation;
- Hertfordshire SMEs reported a worsening of their leaders and managers (19 – 21%) ability to cope with introducing new technology, and the increased demand for new goods/services;
- Hertfordshire life sciences and the pharmaceuticals enterprises cite three highest impact constraints are being over-regulation/red tape (50%), attracting and retaining customer/clients (45%), and increasing competition (50%);

Hertfordshire SMEs' business plans are dominated by the focus on skills gaps and up-skilling their workforce. Key to their future success: turnover, growth and improved productivity; is the ability to recruit and hold on to the right workers. Hertfordshire SMEs' business plans identified the importance of increasing capital investment and investing in increasing the workforce's and leader/managers skills and its linkage to improved productivity. National studies suggest a degree of skepticism about enterprises level of commitment to improving productivity (Centre for Innovation and Productivity 2018), but our findings suggest differently.

With the case of Hung Yen province in Vietnam, although the companies interviewed having a turnover growth rate in 2019 of more than 5%, however, labor skills gap and business constraints are those which impacted the most to their total productivity in the digital age. Lack of high level staffs, high labor costs, over regulation and red tape that can cause wasting time, staff and losing opportunities for development make Hung Yen is one of the less developed provinces in the Red River region (GRDP of Hung Yen ranks at 7th among 11 provinces) and PCI score ranks the lowest. Simplifying administrative procedures, eliminating red tapes, improving vocational training activities to enhance labor skills are the necessary solutions for enterprises in Hung Yen to ameliorate the actual situation, promote the local development and adapt to the requirements of the digital era.

The research still has some limitations. The survey in Hertfordshire has done in 2019 for the performance of 2018, why we process another in-depth survey in Hung Yen after having the results of Hertfordshire, that means in 2020 for the year of 2019. When the number of samples surveyed in Hertfordshire was over 435 enterprises, due to time scales and the decision of choosing in-depth interview method, we only run our survey in 10 enterprises in Hung Yen. On the other side, the survey in Hertfordshire has covered SMEs, which account for the majority of the local enterprise community, while in Hung Yen, it can only be focused

on large enterprises and SMEs, when micro-enterprises accounts for large numbers in Hung Yen. This type of enterprises do not have much innovation activities, do not have many level of HR management in the organization and do not concentrate on training or improving skills for managers or staffs, opposite to the cases of large enterprises and SMEs. However, although Hertfordshire and Hung Yen have different growth level, but it can represent to the characteristics of one capital nearby province, where the number of enterprises is high compared to other regions of the country, and the productivity of the local enterprises play an important role to the development of the provinces in the digital age.

6. REFERENCES

- [1]. Amos S., Zanhoun K. A. D, Financial constraints, firm productivity and cross country income differences: Evidence from sub-Saharan Africa, *Borsa Istanbul Review*, 2019.
- [2]. Audretsch B.D., Belitski M., The role of R&D and knowledge spillovers in innovation and productivity, *European Economic Review*, 2020.
- [3]. Asia Perspective. (2019). Vietnam Key Economic Zones & Investment Guideline.
- [4]. Dat T. T, Thanh T. T et al., Annual Assessment of Vietnamese Economy, 2019 Report on "Improving labor productivity in the digital economy", NEU Publisher, 2019.
- [5]. Department for Business Energy & Industrial Strategy, 2019. "Longitudinal Small Business Survey: SME employers (businesses with 1 - 249) employees - UK, 2018." In. London, UK.: BEIS.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/803645/LSBS_2018_employers.pdf (accessed 5th September 2019).
- [6]. Department for Business Innovation & Skills, 2015. "Leadership and Management Skills in SMEs: Measuring Associations with Management Practices and Performance." In. London, UK.: BIS.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/418404/bis-15-204-leadership-and-management-skills-in-sme.pdf (accessed 1st December 2018).
- [7]. Department for Business Innovation and Skills. 2016. "Exploring the feasibility of a productivity based approach for evaluating business support interventions." In *BIS Research Paper*. London, UK.: BIS.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/534518/bis-16-311-evaluating-business-support-interventions-productivity-based-approach.pdf (accessed 1st December 2018).
- [8]. ERC UK, 2019. "State of Small Business Britain Report 2019." In. Warwick University: Enterprise Research Center.
https://www.enterpriseresearch.ac.uk/wp-content/uploads/2019/06/02114-State-of-Small-Business-Britain-Report_June-2019-Final.pdf (accessed 9th July 2019).
- [9]. GSO. (2020). Vietnamese Enterprise White Paper.
- [10]. Guzman V. E. et al., Characteristics and skills of leadership in the context of Industry 4.0, 2020.
- [11]. Hertfordshire LEP, 2019. "Hertfordshire Business Productivity Survey - Interim Report." In. Welwyn Garden City, Hertfordshire, UK.: Hertfordshire Local Enterprise Partnership.
<https://www.hertfordshirelep.com/> (accessed 31st May 2019).
- [12]. House of Commons, 2018. "Business Statistics." In. London UK.: House of Commons Library.
file:///Users/dockitbrown/Downloads/SN06152.pdf (accessed 26th June 2019).
- [13]. Hung Yen Provincial Youth Union. (2018). Project to support Hung Yen Youth startups (p. 14). Hung Yen Provincial Youth Union.
- [14]. Kuroda S., Yamamoto I., Good boss, bad boss, workers' mental health and productivity: Evidence from Japan, Japan and the World Economy, 2018.
- [15]. Love, James H., and Stephen Roper. 2013. "SME Innovation, Exporting and Growth: a review of existing evidence." In. Enterprise Research Centre and Warwick Business School: Enterprise Research Centre.
<http://enterpriseresearch.ac.uk/wp-content/uploads/2013/12/ERC-White-Paper-No-5-Innovation-final.pdf> (accessed 4th June 2019).
- [16]. Network, Productivity Insights. 2019. "Productivity Policy Review 2018." In. London UK.: Productivity Insights Network.
<https://productivityinsightsnetwork.co.uk/2019/01/productivity-policy-review/> (accessed 20th June 2019).
- [17]. Li C., Enhancing or inhibiting: the impact of investment in political ties on the link between firm innovation and productivity, *International Business Review*, 2020.

- [18]. Liyanage J. P., Hybrid Intelligence through business socialization and networking: managing complexities in the digital era, IGI Global Publisher, 2012.
- [19]. Mc Kinsey, The rise of Digital Challenges, 2018.
- [20]. Min A. S, Mansor N., Anvari R., Staff Organization Training: Designing, Stages and Methods, Procedia – Social and Behavioral Sciences, 2014.
- [21]. PCI Vietnam, 2020. PCI of Hung Yen. <https://pcivietnam.vn/ho-so-tinh/hung-yen>
- [22]. Sidoo V. et al., An exploratory study of digital workforce competency in Thailand, Heliyon, vol.5, 2019).
- [23]. UK Commission for Employment and Skills (UKCES), "Anchor institutions and small firms in the UK: A review of the literature on anchor institutions and their role in developing management and leadership skills in small firms." In. London UK.: UKCES, 2015 in https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/414390/Anchor_institutions_and_small_firms.pdf (accessed 15th June 2019).
- [24]. VGP News, 2019. Northern key economic zone must maintain leading economic engine status— Northern key economic zone must maintain leading economic engine status. Chinhphu.Vn. <http://news.chinhphu.vn/Home/Northern-key-economic-zone-must-maintain-leading-economic-engine-status/20196/36919.vgp>
- [25]. Vu Q., Tran T. Q., Government financial support and firm productivity in Vietnam, Finance Research Letters, 2020.
- [26]. Zhang D., Can export tax rebate alleviate financial constraint to increase firm productivity? Evidence from China, International Review of Economics & Finance, 2019.
- [27]. Windsor A., Ethical values and responsibilities of directors in the digital era, IGI Global Publisher, 2020.
- [28]. Wu A., The signal effect of government R&D subsidies in China: Does ownership matter, Technological Forecasting and Social Change, 2017.

AFRICA, THE EL DORADO OF THE TUNISIAN SMES?

Khaled Tamzini¹

¹LaREMFiq, IHECs, Sousse University, Sousse, Tunisia

*Corresponding author: tamzinik@gmail.com

Abstract

In this paper, the author seek to analyze the role of several determinants in the process of internationalization of Tunisian SMEs in Africa, and consequently their performance. Thanks to a quantitative study carried out among 46 companies analyzed under SPSS and Smart PLS, the results demonstrate the importance of the total mediating role of international entrepreneurial orientation (OEI) in the relationship between competitiveness and international performance. However, networking only generates a direct effect on international performance. Tunisian SMEs in the ICT industry are called upon to review their methods of management and inspection of the African market in order to guarantee optimal use of resources on the one hand and to avoid the loss of business opportunities on the other.

Keywords: SMEs, International Entrepreneurial Orientation (IEO), International Performance, ICT, Africa.

1. INTRODUCTION

Since 1986, when the structural adjustment plan of the international monetary fund was put in place, Tunisian companies have opened up to strategic partnerships, especially with the countries of the Mediterranean basin (Mansour et al., 2014). These partnerships have opened up prospects for great mobility of experts and consultants, by accelerating the transfer of European know-how to Tunisian managers (Mansour et al., 2014), more particularly, companies in the Information and Communication Technologies (ICT) industry which have experienced significant growth since their founders had lived, worked, studied abroad, and especially in Europe. The latter have acquired technological experience and knowledge, enabling them to play a fundamental role in identifying opportunities, especially at the international level (Mejri and Ramadan, 2016).

On the other hand, the liberalization of the Tunisian economy started gradually in the 90s by signing up to 50 agreements with neighboring countries (especially Europe and Africa), which justifies a foreign policy known for the diversification of export base and business partners. Since the 2000s, the Tunisian government has launched an Export Development Program (EDP) in partnership with the World Bank aimed mainly at facilitating the access of Tunisian SMEs to foreign markets (Tunisian Ministry of Commerce, 2017). Only the values of exports to Africa have been steadily increasing, particularly between 2014 and 2015, despite the economic difficulties experienced during this period. Overall, the Maghreb countries constitute the main target for Tunisian companies, but other countries such as Ghana, Senegal, Cameroon, and Ethiopia attract the latter because of their promising development, particularly in the ICT.

According to the National Statistics Institute (NSI, 2017), Africa and especially Europe are the main destinations for Tunisian exports.

Despite these data, several exporting companies considered new in the ICT industry, not always presenting clear objectives, and they try to adopt different structures for export operations (Khemakhem, 2010). Indeed, according to Mejri and Ramadan (2016), Tunisian exporting companies experience flexibility in adapting to the regulatory specificities of each country, and a certain aggressiveness in particular on the African market, as well as a complete knowledge of the targeted context.

Currently, Tunisia has not yet reached the objectives in terms of the values of exports targeted in Africa. However, knowing the characteristics of these markets (geographic proximity, growth, and rapid technological development), certain government actors (UTICA - Tunisian Union of Industry, Commerce and Crafts, chambers of commerce, export advisers) have set up a specific national program for Africa to help and to advise Tunisian companies, especially SMEs. These latter are seeking to export to these countries, and are faced with the challenge of accelerating operations towards this market attracting several players from around the world. Knowing, and especially with regulatory reforms, several African countries have opened their markets to international competition and private investment. Thus, Rwanda, Egypt, Kenya, South Africa, Seychelles, and Tunisia are considered the most ambitious countries in Africa in this industry (Essoungou, 2011). The Tunisian vision is the orientation towards external markets mainly Africa, given the considerable growth of these markets in recent decades. Thus, according to statistics from the Tunisian Ministry of Commerce (2017), Tunisia

exports mainly to Algeria, Libya, Morocco, Egypt, Ethiopia, but also to other African countries to a lesser extent. In addition, a study by the International Telecommunication Union (ITU) showed that Tunisia occupies the first position of African countries developed in ICT. This ranking was carried out according to indicators that assess the use and skills of ICT in each country (ITU Report, 2016). This gives it certain expertise that it can develop in foreign markets.

In addition, since 2011, Tunisia has drawn up a national strategic plan "Tunisie Digitale 2020" (2014-2020), which mainly aims to develop the various electronic services to make the knowledge industry competitive, especially at the international level (Report on ICT in Tunisia, DG Trésor, 2016). Indeed, the ICT industry employs nearly 9% of the workforce (+86,000 people) and represents 7.5% of the GDP. Tunisia is booming in this industry (nearly 1,600 companies were working in this industry in 2016), while in 2020, there are 2,120 SMEs, of which 632 are fully exporters. Thus, Tunisian SMEs will increasingly have to develop their export activities to African countries.

Knowing that the characteristics of Tunisian SMEs correspond to those observed in all developing countries [e.g. small size, lack of internal and external growth, low qualification of employees, failing financing structures and predominance of the informal sector (Tidjani, 2006; Galieue and Madjimbaye, 2007)], an essential question arises:

Given the promising development of the ICT industry in Africa, how Tunisian SMEs see their perspectives in this continent, especially after the massive adoption of ICTs (Dakouré, 2014), and investment opportunities to make big profits (Essoungou, 2011)? Is Africa considered a privileged destination, an El Dorado, for Tunisian SMEs?

Consequently, this research aims to study the main motivations for the internationalization of Tunisian SMEs in the ICT sector on the African market. In fact, the phenomenon of international entrepreneurial orientation can lead us to understand the process of discovering and exploiting opportunities outside the domestic markets allowing the development of competitive advantage (Zahra and George, 2002).

Thus, our research question is as follows: To what extent do the determinants of internationalization influence international performance through the international entrepreneurial orientation (IEO) of Tunisian SMEs operating in the African market?

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

Several studies have highlighted the important role that the IEO can play in improving a company's international performance. Likewise, the IEO can be influenced by both external and internal factors

(networking, market standardization, competitiveness, and environmental uncertainty). The author has chosen to stress the role of these factors in determining international performance as well as the mediating role of the IEO in the relationship between these determinants of internationalization and international performance. The study of mediation assumes a role in revealing the nature of the main effect (determinants of internationalization - international performance in this case) as well as the explanation of the reasons for this effect (Hair et al., 2017). Therefore, the first step involves testing the direct effects of the determinants on performance and then testing the indirect effects through the IEO.

2.1 The determinants of internationalization

Among the determinants of internationalization proposed by the literature, the author distinguishes networking, competitiveness, market standardization, and environmental uncertainty.

Networking

The network is defined as a channel of reciprocal transfer of resources and knowledge between companies. The extent of the benefits of networks depends on the firm's involvement with its partners (Roolaht, 2006).

In the "Uppsala" model of internationalization, the commitment to internationalization is the result of the application of the "networks approach" which is mainly based on quality relationships between companies. The SMEs engaged in the internationalization process try to have good relationships and large-quality networks to succeed in the internationalization operation (Lloyd-Reason and Mughan, 2002). Relationships and networks generate complementarity and competitiveness on an international scale (Ruzzier et al., 2006). The SMEs are becoming more and more capable to acquire new knowledge internationally relating to know-who (know-who) and know-how (Johannisson and Monsted, 1998). In addition, Rothaermel and Deeds (2006) suggest that effective management of networks at the firm level could encourage the entrepreneurial activity of firms, especially those working in the high technology field. These firms often have to rely on extensive inter-firm cooperation to discover, develop, and commercialize new products (Powell et al., 1996). Commonly, there are two types of networks. Personal networks (informal), and business networks (formal) (Jin and Jung, 2016).

International SMEs pay more attention to personal networks because they are usually characterized by strong, cohesive, informal, goodwill, and trust connections (Hite and Hesterly, 2001). A significant number of previous studies highlight the benefits of personal networks for SMEs. These reduce the costs in

terms of time and transaction, the risks, the uncertainty associated with entering the foreign market, and the strengthening of credibility and trust between partners. Personal networks facilitate intermediation (Jin and Jung, 2016).

Hence the following hypothesis:

H1a: there is a direct effect of networking on the international performance of Tunisian SMEs.

H1b: There is an indirect effect between networking and the international performance of Tunisian SMEs through the IEO.

Competitiveness

Twomey (2002) argues that competitiveness does not come primarily from the market. A firm is said to be competitive if it is able to adapt to its environment and to influence it using its human assets as well as their interactions, relationships, and roles in the application of knowledge. A competitive firm is one that has learning capacities and skills that develop innovation and allows learning and the transfer of knowledge.

The international competitiveness of a firm can be defined as the set of results of a firm (financial and non-financial) having activities in foreign markets hosting companies that offer the same products and services (Lopez and Garcia, 2005; Toppinen et al., 2007). The results can be expressed in terms of exports, foreign direct investment (FDI), new market shares, etc. (Peña-Vinces et al., 2012). These results come from the resources of firms that opt for internationalization and which are sources of international competitive advantages (Barney, 1996; Lopez and Garcia, 2005).

Thus, competitiveness in a very specific industry such as that of ICT can play a determining and favorable role in internationalization, and consequently, in international performance (Boter and Holmquist, 1996; Wheeler et al., 2008). Thus, the feeling of confidence of certain Tunisian SMEs working in the ICT industry due to the fact that they have the conceptual and execution capacities necessary to be competitive, as well as the good reputation they have, constitute an asset for them to approve their competitiveness in the market (African Manager, 2018). Hence the second hypothesis:

H2a: There is a direct effect of competitiveness on the international performance of Tunisian SMEs.

H2b: There is an indirect effect between the competitiveness and the international performance of Tunisian SMEs through the IEO.

Market standardization

According to Nkongolo-Bakenda et al. (2010), the standardization of international markets appearing in niches or groups of countries, allows several firms to

achieve economies of scale, and consequently to internationalize towards markets which represent the same characteristics (same needs customers, same purchasing, sales, partnerships, same products marketed, etc.). The characteristics of the target market seem to be the most important factor for standardization decisions (Erdogmus et al., 2010). Market segments that share the same demographic and socio-cultural characteristics, and the same homogeneous needs and behavioral habits of customers in target markets, are considered to be an important factor for standardization practices of brands and products (Samiee and Roth, 1992; Craig and Douglas, 2000; Ozomer and Simonin, 2004). The higher the convergence of customer behavior in target markets, the higher the level of standardization, and the greater the incentive to seek opportunities. On the other hand, the greater the intensity of competition in the target markets, the greater the level of standardization (Erdogmus et al., 2010). Therefore, the third hypothesis is as follows:

H3a: there is a direct effect of market standardization on the international performance of Tunisian SMEs.

H3b: There is an indirect effect between market standardization and the international performance of Tunisian SMEs through the IEO.

Environment uncertainty

The entrepreneurial spirit at the international level benefits from the business environment (Mtigwe, 2005). Indeed, when SME managers travel and quickly discover new foreign markets, they are more inclined to internationalize, because they perceive the business environment as less risky than managers who have never traveled (Manolova et al. al., 2002). In this regard, several studies confirm the positive relationship between the stable environment and the internationalization strategies of SMEs. In addition, technological development can also be a support for the operation of internationalization (Sedoglavich, 2012).

Usually, companies view a target market as uncertain when they do not have sufficient information, or when there is a great geographic or psychic distance (Johanson and Vahlne, 2009). However, the reality of the relations of certain companies with the African market is not the same, given the geographical and psychological proximity between Tunisia and African countries (technical cooperation agreements, exchanges of skills, visits by political leaders, conferences of partnerships, existing commercial exchanges, etc.). This has led to the establishment between these markets, what Johanson and Vahlne, (2009) call business relationships of emotional and affective aspects that generate social dynamics of trust, mutuality, dependence, and power between the different markets, especially those that are close. Moreover, the environment plays an important role in

the internationalization of firms, especially those operating in a transition economy. Thus, access to technology, interaction with institutions, reduction of corruption, and insecurity are all factors that can reduce uncertainty in the market and subsequently the incentive to adopt entrepreneurial behavior (Lamotte and Calovic, 2015). When the environment is certain, risk aversion decreases, which positively affects performance (Kraus et al., 2012). To this end, the fourth hypothesis is proposed:

H4a: There is a direct effect of the uncertainty of the environment on the international performance of Tunisian SMEs.

H4b: There is an indirect effect between the uncertainty of the environment and the international performance of Tunisian SMEs through the IEO.

2.2 The mediating role of international entrepreneurial orientation (IEO)

Over the past two decades, many companies have shown a great interest in locating abroad to seek new opportunities. A combination of multiple factors explains the internationalization of the latter. Thus, factors linked to available ICTs, managerial skills, innovation capabilities, and others have greatly affected exports in all industries (Lecerf, 2012). The competitiveness of the target market, its standardization, and its stable environment has prompted managers to make strategic decisions relating to internationalization. "The relative importance of the various traditional determinants of internationalization remains imperfectly understood" (Lecerf, 2012). This variety of determinants that push any company to internationalize is embodied in a gradual process. Through this process, companies become more and more capable of learning and seizing external market opportunities, develop necessary talents, adapt quickly to needs, and be able to innovate and maintain high quality and competitive products (Johanson and Vahlne, 1977; Kim et al., 1993; Harrison et al., 2000; Olmos and Díez-Vial, 2015).

Thus, driven by opportunities, resources, and international performance objectives, SME managers seem to be forced to adopt entrepreneurial behavior to directly influence global and international performance (Lumpkin and Dess, 1996; Knight, 2000, 2001; Rauch et al., 2009). The IEO (international entrepreneurial orientation) can be defined as being a preliminary and essential phase to internationalization (O'Cass and Weerawardena, 2009) and positively affects the international performance of SMEs (Jantunen et al., 2005; Knight, 2001; Moreno and Casillas, 2008; Ripollés-Meliá et al., 2007; Wang, 2008; Slevin and Terjesen, 2011). The International Entrepreneurial Orientation (IEO), known for its strategic aspect in the entrepreneurship literature (Knight, 2001; Wales et al., 2013), refers to the seizing of opportunities on the

international market with a behavior innovative, proactive, and risk-taking (Jantunen et al., 2005; Wang, 2008; Glavas and Mathews, 2014). Innovative behavior mainly refers to the creation of new products or processes. According to Lumpkin and Dess (2001), innovation can be defined as creativity or experimentation when a firm wants to introduce new products or technologies to apply research and development of new processes. As for risk-taking, this mainly refers to the strategic decision-making of entrepreneurs who build a vision towards the future with more optimism and confidence (Wolff et al., 2015). Venkatraman (1989) defined proactivity as the introduction of new products or brands before competitors, while Covin and Slevin (1989) associated proactivity with aggressive action towards competitors when they try to win or retain a competitive advantage.

This international entrepreneurial behavior depends on the internal characteristics of SMEs (profiles of leaders and managers, resources and skills, organizational structure) (Oviatt and McDougall, 1994; Nummela et al., 2004; Mostafa et al., 2005; Weerawardena and al., 2007; Covin and Miller, 2014; Brouther et al., 2014), but also external factors (Business networks, environmental characteristics, etc.) (Miller, 1983; Covin and Slevin, 1991; Zahra, 1993; Zahra and Covin, 1995; Dess et al., 1997; Wiklund and Shepherd, 2005; Mathews and Zander, 2007). Indeed, an SME with an international entrepreneurial orientation will succeed better in turbulent contexts, will internationalize quickly and widely, and will subsequently achieve its international performance (Zahra and George, 2002).

From a general point of view, entrepreneurial orientation is considered as a facilitator of firm performance and growth (Chow, 2006; Carree and Thurik, 2000; Rauch et al., 2009). Several studies indicate that company performance is positively influenced by entrepreneurial behavior (Covin and Slevin, 1989; Lumpkin and Dess, 1996). In addition, the effect of entrepreneurial orientation varies according to the context, the type of industry, the market situation, the size, etc. Hence, the non-obviousness of the results and the relative importance of the effect of a context justifies the choice of the Tunisian context, which represents the example of an economy in transition (Grande et al., 2011).

According to Filser and Eggers (2014), it is evident that performance indicators (financial and non-financial) measure the outcome of the internationalization experience. That said, the mediating role of the IEO between the determinants and the performance is explained by the fact that the latter is constantly generated by the determinants of internationalization and pushes companies to adapt more easily to changes, and to proactively shape the environment while fostering their growth and performance potential. In addition, IEO could bring competitive advantages and

thus have a positive influence on performance (Hult et al., 2004; Wiklund and Shepherd, 2005). Thus, entrepreneurial orientation leads companies to the development of new opportunities (Lumpkin and Dess, 2001). It includes innovation, risk-taking, and proactivity. They lead companies towards export experiences and therefore towards proactive orientation (Okpara, 2009). Indeed, these companies seek new opportunities in foreign markets and allocate significant resources for information research. They are preparing to accept short-term losses to gain long-term market shares. They seek the information necessary for the development and therefore the achievement of performance. For example, testing the product and carrying out market research in foreign markets, as well as gathering information directly from distributors and suppliers who are important sources of information. Hence, the following hypothesis:

H5: The International Entrepreneurial Orientation (IEO) has a direct positive effect on the international performance of Tunisian SMEs.

H6: There is a mediating effect of the International Entrepreneurial Orientation (IEO) in the relationship between the determinants of internationalization and the international performance of Tunisian SMEs.

2.3 The conceptual model

From the above development, the conceptual model (see Fig. 1) proposes a causal relationship between the different determinants that influence the company's international strategic decisions (Porter, 1980). Thus, the competitive advantage acquired by companies in the market, the standardization of consumer needs, the low uncertainty, the ease of forecasting, the unstable environment, and the networking, push companies to widely expand their business activities internationally (Ruzzier et al., 2006; Nkongolo-Bakenda et al., 2010; Bianchi et al., 2017). The determinants studied in this research allow, on the one hand, to see how Tunisian SMEs perceive the African market, and on the other hand, to define the most important determinants that affect the international entrepreneurial orientation of the SME.

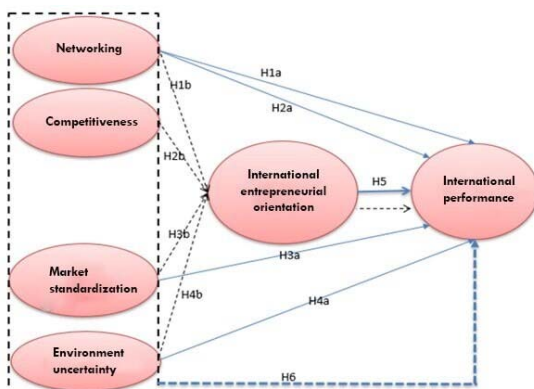


Fig. 1: Conceptual model

3. METHODOLOGY

The development of the ICT industry in African countries and the interest of Tunisian companies in these countries have prompted the author to choose this industry as a field of investigation for this research.

The choice of the sample was based on two criteria: being in the ICT industry, and exporting to African countries, which constitutes 6.7% of total exporters in Tunisia. Thus, the author targeted 733 companies to which he sent the questionnaire by email to the founders (or CEO), he was only able to validate 46 responses (see table 1 for characteristics). The rate of respondents is low due to the fact that the study was conducted in the midst of the COVID-19 crisis. The government decreed the containment.

The questionnaire is made up of three parts. The first part deals with the motivations for internationalization, as well as the modes of entry into the African market. The second part proposes questions relating to the determinants of internationalization (networking, competitiveness, environmental uncertainty, and market standardization). The third part concerns the mediating variable between the determinants of internationalization and performance, which is the international entrepreneurial orientation. The questions are in the form of a Likert scale ranging from 1 to 5.

The data were analyzed first using SPSS software, and then using SmartPLS. Indeed, the PLS-SEM method makes it possible to analyze data proposing a limited number of respondents and to solve the problems of non-normality of the data (Hair et al., 2012).

Table 1: Characteristics of the study sample

N valid 46	Mean/ Percentage	SD	Skewness	Kurtosis
N employees	38.39	31.54	0.472	0.688
N years since the creation	11.65	7.82	1.393	2.810
N years since the first exportation	6.39	3.19	-0.100	-1.483
Method of market penetration:	43.5%	-	0.412	-1.252
- Direct	34.8%			
- Via agents / distributors	21.7%			
- Subsidiaries				
Export phase	17.4%	-	-0.698	-0.934
- Nearby markets	30.4%			
- Confirmed exporter	52.2%			
- More distant markets				

4. RESULTS

In what follows, the measurement of variables, descriptive analysis, and finally the analysis of structural links will be presented.

4.1 Measures

The model variables were measured using items already developed and validated in previous studies (Belso-Marti'Nez, 2006; Blesa and Ripolles, 2008; Kenny and Fahy, 2011; Bianchi et al., 2017). Three items were proposed for the first variable of the determinants of internationalization "Networking" (2 are retained with $\alpha = 0.877$ and Composite Reliability = 0.939). For the variable "competitiveness of Tunisian SMEs", and out of 5 items, 4 were retained with $\alpha = 0.730$ and Composite Reliability = 0.828. For the variable "market standardization", 4 items were developed but only 2 variables were retained with $\alpha = 0.514$ and Composite Reliability = 0.790. Finally, 4 items for the variable "Environmental uncertainty" were developed and only 3 were retained with $\alpha = 0.853$ and Composite Reliability = 0.899. Regarding the variables to be explained in particular the mediating variable "International Entrepreneurial Orientation",

and the dependent variable "international performance", the results showed very good measures of reliability since all the items used are retained (with respectively $\alpha = 0.892$ and Composite Reliability = 0.922 and $\alpha = 0.796$ and Composite Reliability = 0.806). These results prove the consistency of the measurements of the constructs since the values of these indicators for all the variables have an average between 0.7 and 0.9 (or even 0.95, which is considered satisfactory).

However, regarding the validity (convergent and discriminant), which is an indication of the ability of an item to represent its construct, the values of the extracted means (AVE) and Fornell-Lacker confirm good results, since the AVEs are greater than 0.5, and the Fornell-Lacker values are all greater than the highest value of the correlation between the items of each construct (Carricano and Poujol, 2008; Hair et al., 2012). All the items retained for this analysis contribute adequately to their constructs since the values of the loadings of each item are generally considered to be satisfactory (Henseler et al., 2009; Hair et al., 2012; Henseler et al., 2012) (see table 2).

Table 2: Validity and reliability results according to the selected items

Variables	Items	Outer Loadings	Reliability		Validity	
			Internal consistency reliability		Convergent validity	Discriminant validity
			Cronbach's alpha	Composite reliability	Average Variance Extracted (AVE)	Fornell-Larcker Criterion
Networking	Net2	0.912	0.877	0.939	0.885	0.941
	Net3	0.969				
Competitiveness	Comp2	0.655	0.730	0.828	0.548	0.741
	Comp3	0.716				
	Comp4	0.721				
	Comp5	0.855				
Market standardization	Stand1	0.686	0.514	0.790	0.658	0.811
	Stand3	0.920				
Environment uncertainty	Env2	0.861	0.853	0.899	0.750	0.866
	Env3	0.940				
	Env4	0.791				
IEO	IEO1	0.779	0.892	0.922	0.707	0.841
	IEO2	0.929				
	IEO3	0.910				
	IEO4	0.668				
	IEO5	0.889				
International performance	IP1	0.943	0.796	0.806	0.525	0.725
	IP2	0.793				
	IP3	0.491				
	IP4	0.584				

4.2 Descriptive analysis

According to this actual study (see table 1), the majority of responding SMEs are rather young (12 years of existence), with an average experience of 7 years in the African market, and an average number of employees of 39 individuals. Thus, the majority of these SMEs (more than 50%) are in an advanced phase of internationalization in Africa, a phase during which the latter seeks to develop export activities towards African countries (psychologically more distant) (Johanson and Wiedersheim-Paul, 1975; Bilkey and Tesar, 1977).

Table 3 shows that the SMEs in the sample consider the African business environment to be uncertain (2.88), with a fairly weak network of contacts (2.69). The market is considered to be moderately standard, although these companies consider themselves quite competitive. in the African market. Moreover, and although these companies have a high entrepreneurial orientation in the African market, their international performance has not reached a high enough threshold. All the distributions of the descriptive results can be considered as normal given the values of "Skewness" and "Kurtosis" lying between -2 and 2 (Carricano and Pujol, 2008).

Table 3: Descriptive statistics

	Means	SD	Skewness	Kurtosis
Competitiveness	3.41	0.568	0.024	-0.812
Market standardization	3.04	0.656	0.233	0.300
Environment uncertainty	2.88	0.839	0.350	0.908
Networking	2.69	0.931	-0.183	-0.721
IEO	4.24	0.768	-0.661	-0.872
International performance	3.13	-0.996	-0.338	-0.437

From these descriptive results, one can see that the strength of Tunisian SMEs is their competitiveness compared to other competitors existing in the African market, although the expected performance does not seem to be achieved. Indeed, despite the intention to develop resources to invest internationally, and the desire to give more importance to the development of the SME in foreign markets to seize new opportunities, the results achieved are not satisfactory. On the other hand, one can see that the IEO is rather important for Tunisian SMEs (4.24). This means that they have invested in innovation, in discovering new markets, and they are willing to take risks to reach those markets.

4.3 Analysis of structural links

The validation of the structural model consists of testing the structural links. The lower the statistical significance level (which is the probability of error), the better the result. Research generally uses thresholds of 1%, 5%, or even 10%. However, it should be noted that managerial research and more specifically data collected in companies, a threshold of 10% is generally accepted because the number of observations in the sample is close to the number of the population studied. In this study, the results will be validated according to the thresholds of 1%, 5%, and 10% (Thietart et al., 2003, p. 205).

The tests of structural links show that there are significant links between certain determinants of internationalization and international performance with

a significance level of less than 10% and 5%. Thus, networking directly influences performance (p-value $0.040 < 0.05$), however, only competitiveness has an indirect impact on international performance, and this through the IEO (p-value $0.088 < 0.10$). The indirect links are tested through the validation of the effects of the determinants of internationalization on the IEO, and between the IEO and international performance. These indirect links will also be used to test the mediating role of the IEO in the relationship between the determinants of internationalization and international performance. On the other hand, the links, which trace the effects of market standardization and the uncertainty of the environment, are not significant. Thus, these two variables did not play any role in this modeling since their effects on the IEO and international performance were not significant (p-values > 0.05 and 0.10). This means that these variables do not explain the international performance, and they do not contribute to the mediation of the IEO in the explanation of the international performance.

The values (f^2) indicate how well an exogenous variable explains an endogenous variable. A value between 0.02 and 0.15 indicates a weak effect, while a value between 0.15 and 0.35 indicates a moderate effect. A value of f^2 greater than 0.35 represents a significant effect (Cohen, 1988; Hair et al., 2016). The results presented in Table 4 show a priori that despite the significant direct effect of networking on international performance, the explanation is considered weak. On the other hand, international

entrepreneurial orientation moderately explains international performance.

To test the mediating effect of international entrepreneurial orientation between the determinants of internationalization and international performance according to the approach of Zhao et al. (2010), the test of the significance of the indirect effects of the determinants of internationalization on international performance through international entrepreneurial orientation is required. As mentioned before, the results affirm only one significant indirect link (between competitiveness and international performance). Therefore, one can state that international entrepreneurial orientation can play a mediating role in the relationship between competitiveness and international performance.

There is therefore a complete mediating effect of international entrepreneurial orientation at the level of the relationship between competitiveness and international performance since the direct effect of competitiveness on international performance is not significant. Therefore, this competitiveness variable affects international performance only through the IEO. This means that competitiveness develops the spirit of entrepreneurship, innovation, and initiative to achieve good profitability, increased sales, etc. in the African market. These results confirm previous research which considers that entrepreneurial orientation is a facilitator that leads to the performance and growth of companies (Chow, 2006; Carree and Thurik, 2000; Rauch et al, 2009) and that the latter is positively influenced by entrepreneurial behavior (Covin and Slevin, 1989; Lumpkin and Dess, 1996; Becherer and Maurer, 1997; Wiklund, 1999).

Table 4: Results of structural links

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	f^2
Networking → International performance	0.300	0.146	2.053	0.040	0.120
Networking → IEO → International performance	0.033	0.083	0.395	0.693	-
Competitiveness → International performance	0.290	0.181	1.598	0.110	0.079
Competitiveness → IEO → International performance	0.211	0.124	1.704	0.088	-
Market standardization → International performance	0.223	0.199	1.121	0.263	0.045
Market standardization → IEO → International performance	0.103	0.105	0.985	0.325	-
Environment uncertainty → International performance	0.059	0.353	0.167	0.868	0.002
Environment uncertainty → IEO → International performance	0.117	0.102	1.144	0.253	-
IEO → International performance	0.384	0.197	1.947	0.049	0.173

5. DISCUSSION

From the results of this research, it appears that the two determining variables relating to the context of the African market and its characteristics (standard market and environmental uncertainty) do not lead Tunisian SMEs to perform well. This means that Tunisian SMEs in the ICT industry see the African market as a difficult market to penetrate and predict, although they benefit from a very competitive image in this market, which

also offers them several business opportunities. Indeed, according to Tunisian leaders, the African environment is turbulent, uncertain, and does not have standard operations. In contrast, the other two determining variables of international performance (networking and competitiveness) influence the latter in different ways. Thus, networking directly influences international performance, while competitiveness affects international performance indirectly, through the IEO. This leads to proposing that the leaders of Tunisian

SMEs working in Africa adopt two different but complementary management approaches. The first approach is based on informal (Personal networks). That is to say, the relationship with the outside to develop business relationships and consequently increase profitability and performance on the African market. The second approach is based on the formal (Business networks). That is to say, on the effective management of skills that guarantee competitiveness vis-à-vis competitors who are in the same market. In this regard, an important question arises: is the non-effect of uncontrollable variables on performance really due to the African market, and its features or is it due to the failure of these Tunisian SMEs to perform their market prospection process? Tunisian SME managers must allow great importance to this question knowing that the time factor matters a lot in this emerging market. Otherwise, there is a risk of losing opportunities, which may even have repercussions on their survival.

Moreover, the two determining and controllable variables (networking and competitiveness) play their roles appropriately in determining international performance. Thus, a new question arises in this regard. What relationship development program do these companies undertake? In other words, what about to guarantee these relationships and how to develop them? Tunisian SMEs must attach great importance to these elements because the African market is attracting more and more new competitors, especially from Asian countries such as China. Moreover, the competitiveness of Tunisian SMEs and their capabilities in the market has generated an entrepreneurial and innovative spirit, and consequently performance. It must be said that Tunisian leaders benefit from high-level training, as well as an open experience on all continents. According to recent statistics, Tunisia sees around 1000 engineers specializing in ICT per year leaving for Europe (Marrakchi, 2017). The latter return to Tunisia after this experience to launch a new project, or work in a subsidiary of an international firm. In addition, Tunisia is a country that attaches great importance to intellectual capital and which continuously strives to establish a knowledge economy, and catch up with developed countries in this area (El Harbi et al., 2011). It remains to be seen what new skills these companies need to make the best use of resources.

Another finding from these results is that the IEO quite significantly affects international performance. This confirms the ideas of several academics and

professionals who claim that several emerging countries are today a world showcase in the field of ICT. Tunisian SMEs are therefore called upon not only to penetrate these emerging African markets but also to seek to conserve them. In addition, they are called upon to review their internationalization approach, especially since the results have shown that 50% of the SMEs in this sample is in an advanced phase in their international development despite their rather short experience (6 years on average).

These results show a certain ambiguity among Tunisian leaders. On the one hand, they consider that the African market is not stable, turbulent, and difficult, and on the other hand, they persevere to develop resources and seek new opportunities. Indeed, these companies try to benefit from the positive image of their competitiveness, as well as their good brand image in these markets. This can be explained by the fact that several African countries are currently undergoing total economic restructuring, which is pushing Tunisian SMEs to prepare for a new phase full of opportunities, even if the current situation is not satisfactory. On the other hand, Tunisia's current difficult economic situation is pushing these SMEs to seek alternative opportunities especially after the 2011 revolution and the global health crisis, COVID-19. Since that date, more than 90,000 executives have left the country (Espace Manager, 2018).

Finally, instilling an entrepreneurial spirit in a company regardless of its activity or field of action remains a key factor in achieving its performance. However, the author assumes that the managerial approach needs to be reviewed to guarantee optimal use of resources and therefore ideal and adequate functioning. The determinants of internationalization do not automatically guarantee the achievement of international performance. Analyzes show that there is a fully mediating role embodied in proactive behavior, risk-taking, and development of the necessary resources, to explore new business opportunities which is the international entrepreneurial orientation (Hult et al., 2004; Wiklund and Shepherd, 2005; Filser and Eggers, 2014). Entrepreneurial behavior then becomes a primordial dimension in the economies of the various countries of the world, something that is justified by the occupation of the place of entrepreneurship in the various economic strategies of these countries.

Thus, thanks to this research, 4 hypotheses were validated (see table 5).

Table 5: Results of validation of research hypotheses

Hypotheses	Results
H1a: there is a direct effect of networking on the international performance of Tunisian SMEs	Confirmed
H1b: There is an indirect effect between networking and the international performance of Tunisian SMEs through the IEO	Infirmid
H2a: There is a direct effect of competitiveness on the international performance of Tunisian SMEs	Infirmid
H2b: There is an indirect effect between the competitiveness and the international performance of Tunisian SMEs through the IEO	Confirmed
H3a: There is a direct effect of market standardization on the international performance of Tunisian SMEs	Infirmid
H3b: There is an indirect effect between market standardization and the international performance of Tunisian SMEs through the IEO	Infirmid
H4a: There is a direct effect of the uncertainty of the environment on the international performance of Tunisian SMEs	Infirmid
H4b: There is an indirect effect between the uncertainty of the environment and the international performance of Tunisian SMEs through the IEO	Infirmid
H5: The International Entrepreneurial Orientation (IEO) has a direct positive effect on the international performance of Tunisian SMEs	Confirmed
H6: There is a mediating effect of the International Entrepreneurial Orientation (IEO) in the relationship between the determinants of internationalization and the international performance of Tunisian SMEs	Confirmed (Complete mediation, only between competitiveness and performance)

6. CONCLUSION

The author concludes that the identification of international opportunities, especially with African markets, becomes an important priority for Tunisian SMEs specializing in ICT. This work attempted to answer the following problem: To what extent do the determinants of internationalization influence international performance through the international entrepreneurial orientation (IEO) of Tunisian SMEs operating on the African market?

In addition, the author has chosen the variable "international entrepreneurial orientation" because it allows tracing the progressive path of internationalization. It affects the decision-making style, strategic orientation, managerial processes, prospecting for opportunities, developing the necessary resources, etc., while ensuring business behavior of innovation, proactivity, and risk-taking (Covin and Slevin, 1989; Wiklund, 1999; Lumpkin and Dess, 1996; Wiklund and Shepherd, 2003). On the other hand, international entrepreneurial orientation in its various forms (Zahra and Covin, 1995; Wiklund and Shepherd, 2005) plays an important mediating role in the process of internationalization, mainly between the determinants and the results of performance. Indeed, this research confirms the fact that IEO quite significantly affects international performance.

On the other hand, according to this research, the weight of the competitive advantage of Tunisian SMEs allows them to adopt an entrepreneurial behavior characterized by innovation, proactivity, and risk-taking in this market (Wolf et al. al., 2015). This pushes them to adopt a permanent design and adaptation of the different methods of value creation, innovation, and localization of opportunities. This entrepreneurial behavior pushes companies to better structure their management (Magretta, 2002; Wirtz et al., 2016), develop skills of intuition and anticipation in the market, risk-taking, initiative, and consequently the achievement of performance, and sustainability (Cromie, 2000; Thompson, 2004; Apospori et al., 2005).

Thus, the initial research question was partially answered by the author. Only 4 hypotheses have been validated.

H1a: there is a direct effect of networking on the international performance of Tunisian SMEs.

H2b: There is an indirect effect between the competitiveness and the international performance of Tunisian SMEs through the IEO.

H5: The International Entrepreneurial Orientation (IEO) has a direct positive effect on the international performance of Tunisian SMEs.

H6: There is a mediating effect of the International Entrepreneurial Orientation (IEO) in the relationship between the determinants of internationalization and the international performance of Tunisian SMEs.

Despite these encouraging results, this research remains limited by the number of companies studied. Consequently, the data cannot be generalized, much less juxtapose with other developing countries.

That said, thanks to this research, two important questions could be asked which will serve as research perspectives: 1) are there other mediating factors between the determinants and the results of internationalization?; 2) What type of result is considered by Tunisian ICT SMEs to be the most important? Is it the operating result (results, profit, profitability), or the results with a strategic deadline (survival and continuity in Africa)?

7. REFERENCES

- [1] African Manager (2018), "Tunisie : Ils font en Afrique, avec brio, ce qu'ils ne peuvent pas faire ici!" <https://africanmanager.com/tunisie-ils-ont-en-afrique-avec-brio-ce-qu'ils-ne-peuvent-pas-faire-ici/>.
- [2] Apospori, E., Papalexandris, N. and Galanaki, E. (2005), "Entrepreneurial and professional CEOs". *Leadership & Organization Development Journal*, **26**, (2), 141-162.
- [3] Barney, J. (1996), "The resource-based theory of the firm", *Organization Science*, **7**, (5), 469.
- [4] Becherer, R. and Maurer, J. (1997), "The moderating effect of environmental variables on the entrepreneurial and marketing orientation of entrepreneur-led firms", *Entrepreneurship Theory and Practice*, **22**, (1), 47-58.
- [5] Belso-Marti'Nez, J. A. (2006), "Why are some Spanish manufacturing firms internationalizing rapidly? The role of business and institutional international networks", *Entrepreneurship and Regional Development*, **18**, (3), 207-226.
- [6] Bianchi, C., Glavas, C. and Mathews, S. (2017), "SME international performance in Latin America: The role of entrepreneurial and technological capabilities", *Journal of Small Business and Enterprise Development*, **24**, (1), 176-195.
- [7] Bilkey, W. and Tesar, G. (1977), "The Export Behavior of Smaller-Sized Wisconsin Manufacturing Firms" *Journal of International Business Studies*, **8**, 93-98.
- [8] Blesa, A. and Ripolles, M. (2008), "The influence of marketing capabilities on economic international performance", *International Marketing Review*, **25**, (6), 651-673.
- [9] Boter, H.; Holmquist, C. (1996), "Industry characteristics and internationalization processes in small firms", *Journal of Business Venturing*, **11**, (6), 471-487.
- [10] Brouthers, K. D., Nakos, G. and Dimitratos, P. (2014), "SME entrepreneurial orientation, international performance and the moderating role of strategic alliances", *Entrepreneurship Theory and Practice*, first published online 12 march.
- [11] Carree, M. A. and Thurik, R. A. (2000). *The impact of entrepreneurship on economic growth*. In Audretsch, D.B. & Acs, Z.J. (eds.). *Handbook of entrepreneurship*. Boston.
- [12] Carricano, M. and Poujol, F. (2008). *Analyse de données avec SPSS [Data analysis with SPSS]*. Paris, France: Pearson Education.
- [13] Chow, I. H. (2006), "The relationship between entrepreneurial orientation and firm performance in China", *SAM Advanced Management Journal*, **71**, (3): 11-20.
- [14] Covin, J. G. and Miller, D. (2014), "International entrepreneurial orientation: conceptual considerations, research themes, measurement issues, and future research directions", *Entrepreneurship Theory and Practice*, **38**, (1), 11-44.
- [15] Covin, J. G. and Slevin, D.P., (1991), "A conceptual model of entrepreneurship as firm behavior", *Entrepreneurship Theory and Practice*, 7-25.
- [16] Covin, J. G. and Dennis P. S. (1989), "Strategic Management of Small Firms in Hostile and Benign Environments", *Strategic Management Journal*, **10**, (1), 75-87.
- [17] Covin, J. G. and Slevin, D. P. (1989), "Strategic management of small firms in hostile and benign environments", *Strategic Management Journal*, **10**, (1), 75-87.
- [18] Craig, S. C., Douglas, S. (2000), "Building global brands in the 21st century", *Japan and the World Economy*, **12**, 273-83.
- [19] Cromie, S. (2000), "Assessing entrepreneurial inclinations", *European Journal of Work and Organizational Psychology*, **9**, (1), 7-30.
- [20] Dakouré, E. (2014), "TIC et développement en Afrique : approche critique d'initiatives et enjeux", *Revue Française des sciences de l'information et de la communication*, **4**.
- [21] Dess, G. G., Lumpkin, G. T. and Covin, J. G., (1997), "Entrepreneurial strategy making and firm performance: Tests of contingency and configurational models", *Strategic Management Journal*, **18**, 677-695.

- [22] El Harbi, S., Anderson, A. R. and Amamou, M. (2011), "Knowledge sharing processes in Tunisian small ICT firms", *Library Review*, **60**, (1), 24-36.
- [23] Erdogmus, İ E., Bodur, M. and Yilmaz, C. (2010), "International strategies of emerging market firms: Standardization in brand management revisited", *European Journal of Marketing*, **44**, (9/10), 1410-1436.
- [24] Essoungou, A. M. (2011). "Dans de nombreux pays africains, le secteur des nouvelles technologies n'est plus marginal", *Afrique Renouveau*, United Nation. www.un.org
- [25] Filser, M. and Eggers, F. (2014), "Entrepreneurial orientation and firm performance: A comparative study of Austria, Liechtenstein and Switzerland", *South African Journal of Business Management*, **45**, (1), 55-65.
- [26] Galieue X. and Madjimbaye N. (2007), "Le management africain, entre contraintes économiques et contingences culturelles : résultats d'une enquête à N'djamena Tchad", *Gestion 2000*, (1), 143-163.
- [27] Glavas, C. and Mathews, S. (2014), "How international entrepreneurial characteristics influence internet capabilities for the international business processes of the firm", *International Business Review*, **23**, (1), 228-245.
- [28] Grande, J., Madsen, E. L. and Borch, O. J. (2011), "The relationship between resources, entrepreneurial orientation and performance in farm-based ventures", *Entrepreneurship & Regional Development*, **23**, (3-4), 89-111.
- [29] Hair, J. F., Sarstedt, M., Ringle, C. M. and Mena, J. M. (2012), "An Assessment of the Use of Partial Least Squares Structural Equation Modeling in Marketing Research", *Journal of Marketing Science*, **40**, (3), 414-433.
- [30] Hair, J. F., Hult, G. T. M., Ringle, Ch. M. and Sarstedt, M. (2017), *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 2nd edition, Thousand Oaks, CA: Sage.
- [31] Harrison, A. L., Dalkiran, E. and Elsey, E. (2000), "International Business: Global Competition from a European Perspective", Oxford University Press, Oxford.
- [32] Henseler, J., Ringle, Ch. M. and Sarstedt, M. (2012), "Using Partial Least Squares Path Modeling in International Advertising Research: Basic Concepts and Recent Issues", *Handbook of Research on International Advertising* Publisher: Edward Elgar Publishing Editors: Shintaro Okazaki.
- [33] Henseler, J., Ringle, Ch. M. and Sinkovics, R. (2009), "The Use of Partial Least Squares in International Marketing", *Advances in International Marketing*, **20**, 277-320.
- [34] Hite, J. M. and Hesterly, W. S. (2001), "The evolution of firm networks: from emergence to early growth of the firm", *Strategic Management Journal*, **22**, (3), 275-286.
- [35] Hult, G. T. M., Hurley, R. F. and Knight, G. A. (2004), "Innovativeness: Its antecedents and impact on business performance", *Industrial Marketing Management*, **33**, (5), 429-438.
- [36] Jantunen, A., Puumalainen, K., Saarenketo, S. and Kyläheiko, K. (2005), "Entrepreneurial Orientation, Dynamic Capabilities and International Performance", *Journal of International Entrepreneurship*, **3**, 223-243.
- [37] Jin, B. and Jung, S. (2016), "Toward a deeper understanding of the roles of personal and business networks and market knowledge in SMEs' international performance", *Journal of Small Business and Enterprise Development*, **23**, (3).
- [38] Johanson, J. and Vahlne, J-E. (1977), "The internationalization process of the firm- A model of knowledge development and increasing foreign market commitments", *Journal of International Business Studies*, **8**, (1), 23-32.
- [39] Johanson, J. and Wiedersheim-Paul, F. (1975), "The internationalization of the firm: Four Swedish cases", *Journal of Management Studies*, 305-322.
- [40] Johanson, J. and Vahlne, J-E. (2009), "The Uppsala internationalization process model revisited: from liability of foreignness to liability of outsidership", *Journal of International Business Studies*, **40**, (9), 1411-1431.
- [41] Johansson, B. and Monsted, M. (1998), "Contextualizing entrepreneurial networking: the case of Scandinavia", *International Studies of Management and Organisation*, **27**, (3), 109-36.
- [42] Kenny, B. and Fahy, J. (2011), "Network resources and international performance of high tech SMEs", *Journal of Small Business and Enterprise Development*, **18**, (3), 529-555.
- [43] Khemakhem, R. (2010), "Explaining the entry mode choice among Tunisian exporting firms: Development and test of an integrated model", *European Journal of Marketing*, **44**, (1/2), 223-244.

- [44] Kim, W. C., Hwang, P. B, and Willem. P. (1993), "Multinationals' diversification and the risk-return trade-off", *Strategic Management Journal*, **14**, (4), 275-286.
- [45] Knight, G., (2000), "Entrepreneurship and marketing strategy: The SME under globalization", *Journal of International Marketing*, **8**, (2), 12-32.
- [46] Knight, G.A., (2001), "Entrepreneurship and strategy in the international SME", *Journal of International Management*, **7**, (3), 155-171.
- [47] Kraus, S., Rigtering, J. P. C., Hughes, M. and Hosman, V. (2012), "Entrepreneurial orientation and the business performance of SMEs: a quantitative study from the Netherlands", *Review of Managerial Science*, **6**, 161-182.
- [48] Lamotte, O. and Colovic, A. (2015), "Early Internationalization of New Ventures From Emerging Countries: The Case of Transition Economies", *Management*, **18**, (1), 8-30.
- [49] Lecerf, M-A (2012), "Déterminants de l'internationalisation des PME françaises: Les leviers du développement international des PME françaises: proposition et test d'une hiérarchisation", *Revue internationale P.M.E.*, **25**, (1).
- [50] Lloyd-Reason, L. and Mughan, T. (2002), "Strategies for internationalisation within SMEs: the key role of the owner-manager", *Journal of Small Business and Enterprise Development*, **9**, (2), 120-129.
- [51] Lopez, J. and Garcia, R. (2005), "Technology and export behavior: a resource-based view approach", *International Business Review*, **14**, (5), 539-57.
- [52] Lumpkin G. T. and Dess G. G. (1996), "Clarifying the Entrepreneurial Orientation Construct and Linking it to Performance", *Academy of Management Review*, **21**, (1), 135-172.
- [53] Lumpkin G. T. and Dess G. G. (2001), "Linking two dimensions of entrepreneurial orientation to firm performance: the moderating role of environment and industry life cycle", *Journal of Business Venturing*, **16**, 429-451.
- [54] Magretta, J. (2002), "Why Business Models Matter", *Harvard Business Review*, **80**, (5), 86-92.
- [55] Mansour, N., Gara, E. and Gaha, C. (2014), "Getting inside the black box: HR practices and firm performance within the Tunisian financial services industry", *Personnel Review*, **43**, (4), 490-514.
- [56] Manolova, T. S., Brush, C. G., Edelman, L. F., and Greene, P. G. (2002), "Internationalization of Small Firms", *International Small Business Journal*, **20**, (1) 9-31.
- [57] Marrakchi C., F. (2017), "Le secteur des TICs et ALECA: Etat des lieux vs attentes du secteur", *Solidar Tunisie*. <http://www.aleca.tn>
- [58] Mathews, J.A. and Zander, I., (2007), "The international entrepreneurial dynamics of accelerated internationalization", *Journal of International Business Studies*, **38**, (3), 387-403.
- [59] Mejri, I. and Ramadan, M. (2016), "Capital social, connaissances et identification d'opportunités entrepreneuriales dans un processus d'internationalisation: cas de la Tunisie", *Revue Marché et Organisation*, **26**, 189-218.
- [60] Miller, D. (1983), "The correlates of entrepreneurship in three types of firms", *Management Science*, **29**, (7), 770-791.
- [61] Moreno, A. M. and Casillas, J. C. (2008), "Entrepreneurial orientation and growth of SMEs: a causal model", *Entrepreneurship: Theory and Practice*, **32**, (3), 507-528.
- [62] Mostafa, R. H., Wheeler, C. and Jones, M.V., (2005), "Entrepreneurial orientation, commitment to the Internet and export performance in small and medium sized exporting firms", *Journal of International Entrepreneurship*, **3**, (4), 291-302.
- [63] Mtigwe, B. (2005), "The entrepreneurial firm internationalization process in the Southern African context: A comparative approach", *International Journal of Entrepreneurial Behavior & Research*, **11**, (5), 358-377.
- [64] Nkongolo-B., Jean-Marie, Anderson, R., Ito, J. and Garven, G. (2010), "Structural and competitive determinants of globally oriented small- and medium-sized enterprises: An empirical analysis", *Journal of International Entrepreneurship*, **8**, 55-86.
- [65] Nummela, N., Saarenketo, S. and Puimalainen, K., (2004), "A global mindset: a prerequisite for successful internationalization?", *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, **21**, (1), 51-64.
- [66] O'Casey, A. and Weerawardena, J. (2009), "Examining the role of international entrepreneurship, innovation and international market performance in SME internationalization", *European Journal of Marketing*, **43**, (11/12), 1325-1348.

- [67] Olmos, M., Fernandez and Diez-Vial, I. I. (2015), "Internationalization pathways and the performance of SMEs", *European Journal of Marketing*, **49**, (3/4), 420-443.
- [68] Okpara, J. (2009), "Entrepreneurial Orientation and Export Performance: Evidence from an Emerging Economy", *Review of Business Research Papers*, **5**, (6), 195-211.
- [69] Ozmer, A. and Simonin, B. L. (2004), "Marketing program standardization: a cross-country exploration", *International Journal of Research in Marketing*, **21**, (4), 397-419.
- [70] Oviatt, B. M. and McDougall, P. P., (1994), "Towards a Theory of International New Ventures", *Journal of International Business Studies*, **25**, (1), 44-64.
- [71] Peña-Vinces, J. C., Cepeda-Carrión, G. and Chin, W. W. (2012), "Effect of ITC on the international competitiveness of firms", *Management Decision*, **50**, (6), 1045-1061.
- [72] Porter, M. E. (1980). "Competitive strategy: techniques for analyzing industries and competition". *Free Press*, New York.
- [73] Powell, W. W., Koput, K. W. and Smith-Doerr, L. (1996), "Inter-organizational collaboration and the locus of innovation: networks of learning in biotechnology", *Administrative Science Quarterly*, **41**, (1), 116-45.
- [74] Rauch, A., Wiklund, J., Lumpkin, G. T. and Frese, M., (2009), "Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future", *Entrepreneurship Theory and Practice*, **33**, (3): 761-787.
- [75] Ripollés-Meliá, M., Menguzzato-Boulard, M. and Sánchez-Peinado, L. (2007), "Entrepreneurial orientation and international commitment", *Journal of International Entrepreneurship*, **5**, (3/4), 65-83.
- [76] Roolah, T. (2006), "The company's involvement in international networks as an entrepreneurial decision", *Baltic Journal of Management*, **1**, (1), 102-115.
- [77] Rothaermel, F. T. and Deeds, D. L. (2006), "Alliance type, alliance experience and alliance management in high- technology ventures", *Journal of Business Venturing*, **21**, (4), 429-60.
- [78] Ruzzier, M.; H., Robert. D. and Antoncic, B. (2006), "SME internationalization research: past, present, and future", *Journal of Small Business and Enterprise Development*, **13**, (4), 476-497.
- [79] Samiee, S. and Roth, K. (1992), "The influence of global marketing standardization on performance", *Journal of Marketing*, **56**, (2), 1-17.
- [80] Sedoglavich, V. (2012), "Technological imperatives in the internationalization process: Results from a qualitative investigation of high-tech SMEs", *Management Research Review*, **35**, 5, 441-459.
- [81] Slevin, D. P. and Terjesen, S. A. (2011), "Entrepreneurial orientation: reviewing three papers and implications for further theoretical and methodological development", *Entrepreneurship: Theory & Practice*, **35**, (5), 973-987.
- [82] Thompson, J. L. (2004), "The facets of the entrepreneur: identifying entrepreneurial potential", *Management Decision*, **42**, (2), 243-258.
- [83] Tidjani, B. (2006), "La gestion des ressources humaines dans le secteur informel en Afrique", *Encyclopédie des ressources humaines*, Edition Vuibert, 1227-1237.
- [84] Toppinen, A., Toivonen, R., Mutanen, A., Goltsev, V. and Tatti, N. (2007), "Sources of competitive advantage in woodworking firms of Northwest Russia", *International Journal of Emerging Markets*, **2**, (4), 383-94.
- [85] Twomey, Daniel F. (2002), "Organizational Competitiveness: Building Performance And Learning", *Competitiveness Review: An International Business Journal*, **12**, (2), 1-12.
- [86] Venkatraman, N. V. (1989), "The concept of fit in strategy research: toward verbal and statistical correspondence", *Academy of Management Review*, **14**, (3), 423-444.
- [87] Wales, W., Wikland J. and Mckelvie A., (2013). "What about new entry? Examining the theorized role of new entry in the entrepreneurial orientation-performance relationship", *International Small Business Journal*, **33**, (4), 351-373.
- [88] Wang, C. L. (2008), "Entrepreneurial orientation, learning orientation, and firm performance", *Entrepreneurship: Theory and Practice*, **32**, (4), 635-657.
- [89] Weerawardena, J., Mort, G. S., Liesch, P.W. and Knight, G., (2007), "Conceptualizing accelerated internationalization in the born global firm: A dynamic capabilities perspective", *Journal of World Business*, **42**, (3), 294-306.

- [90] Wheeler, C. Ibeh K. and Dimitratos, P. (2008), "UK export performance research: review and implications", *International of Small Business Journal*, **26**, (2), 1-31.
- [91] Wiklund, J., and Shepherd, D. (2005), "Entrepreneurial orientation and small business performance. A configurational approach", *Journal of Business Venturing*, **20**, 71-91.
- [92] Wiklund, J. (1999), "The Sustainability of the Entrepreneurial Orientation-Performance Relationship", *Entrepreneurship Theory and Practice*, **24**, (1), 37-48.
- [93] Wiklund, J. and Shepherd, D. (2003), "Knowledge-Based Resources, Entrepreneurial Orientation, and the Performance of Small and Medium-Sized Businesses", *Strategic Management Journal*, **24**, (13), 1307-1314.
- [94] Wirtz, B. W., Pistoia, A., Ullrich, S. and Geottel, V. (2016), "Business Models: Origin, Development and Future Research Perspectives", *Long Range Planning*, **49**, 36-54.
- [95] Wolff, J. A., Pett, T. L. and Ring, J. K. (2015), "Small firm growth as a function of both learning orientation and entrepreneurial orientation: An empirical analysis", *International Journal of Entrepreneurial Behavior & Research*, **21**, (5), 709-730.
- [96] Zahra, S. A., (1993), "A Conceptual Model of Entrepreneurship as Firm Behavior: A Critique and Extension", *Entrepreneurship: Theory & Practice*, **17**, 5-21.
- [97] Zahra, S. A. and Covin, J. G. (1995), "Contextual Influences on the Corporate Entrepreneurship-Performance Relationship: A Longitudinal Analysis", *Journal of Business Venturing* **10**, (1), 43-58.
- [98] Zahra, S.A. and George, G., (2002). *International Entrepreneurship: The current status of the field and future research agenda*, In Hitt, Ireland, Sexton & Camp (eds), *Strategic Entrepreneurship: Creating an Integrated Mindset*, Oxford: Blackwell Publishers, 255-88.
- [99] Zhao, X., Lynch, John. G. and Chen, Q. (2010), "Reconsidering Baron and Kenny: Myths and Truths about mediation analysis", *Journal of Consumer Research*, **37**, 197-206.

8. APPENDIX: QUESTIONNAIRE ITEMS

Networking:

- 1- Public institutions are present on the African market to help businesses and facilitate operations.
- 2- Contacts of African clients are available.
- 3- Contacts of African suppliers are available.

Competitiveness of Tunisian SMEs:

- 1- There are not many existing competitors in key African ICT markets.
- 2- Competition in the African ICT market is not intense.
- 3- Our activities on the African market allow us to achieve economies of scale.
- 4- The cost of factors on the African market (wages, equipment, capital, etc.) are lower compared to the local market.
- 5- Our prices are very competitive compared to our competitors in the African market.

Market standardization:

- 1- The needs of customers in the African market are very similar to those of Tunisia.
- 2- Purchasing practices among African customers resemble those of Tunisians.
- 3- The technologies used on the African market are similar to those existing on the Tunisian market.
- 4- Existing competitors on the African market market standard products.

Environmental uncertainty:

- 1- Rarely do we change our marketing practices in the African market.
- 2- The rate of obsolescence is high for certain products / services on the African market.
- 3- The actions of competitors are easy to predict in the African market.
- 4- The tastes and preferences of customers are easy to predict in the African market.

International Entrepreneurial Orientation:

- 1- Our firm considers Africa as the real market of opportunities.
- 2- The culture of our company is to explore and pursue new business opportunities in the African market.
- 3- Our general management constantly communicates its intention to succeed in the African market.
- 4- Our general management develops resources to achieve the objectives on the African market.
- 5- Our general management attaches great importance to entering the African market.

International performance:

- 1- There is a remarkable growth in sales on the African market during the last three years.
- 2- Our market share in Africa has improved over the past three years.
- 3- International profitability has improved due to our entry into the African market.
- 4- We are satisfied with our work on the African market.

THE POWER SYSTEM TOWARDS THE CIRCULAR ECONOMY: CASE OF LAO'S PDR

Vatthana Vansyli¹, Nguyen Hoang Lan²

^{1,2}Department of Industrial Management, School of Economics and Management,
Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: vansyliyvatthana@gmail.com

Abstract

The wealth in natural resources of Lao PDR, in particular, its abundant water resources and mountainous conditions make it possible for the development of hydropower. The project for development of a power source in the Lao PDR has started since 1970, until now Laos has 63 existing projects, and among projects under construction, 25 projects are expected to complete construction before 2020, 68 projects are expected to complete construction before 2025, 73 projects are expected to complete construction before 2030 and 282 projects are going on feasibility study report. This study will assist Lao PDR in analysing the information by analyzing, finding the solutions to ensure electricity supply is sufficient during dry seasons in the future.

Keyword: power sector, sustainable development, planning, Lao PDR.

1. INTRODUCTION

Lao People's Democratic Republic (Lao PDR) is a landlocked country located in the center of the Indochina Peninsula, bordering China, Vietnam, Myanmar, Thailand and Cambodia. Its area is 236.800 km², and its total population is approximately 7 million people (2018). Lao PDR has achieved remarkably high economic growth. Its average Gross Domestic Product (GDP) growth rate was 7.79% during the period 2000-2016 and 6.29% in 2018, the highest growth rate among the Association of Southeast Asian Nations (ASEAN) member states during the same period. In 2018, its real GDP per capita was US\$ 2,585, in which GDP share by sector (2018) was: agricultural 15.71%, industry 31.53%, services 41.61% and taxes on products and import duties, net 11.15%.



Fig. 1-1: Country map of Lao PDR

Lao PDR has administration zone with 16 provinces and 2 special cities, which is divided into 4 regions for electricity operation. Each region is defined in

accordance with geographic location and comprises of the provinces and special cities as below.

- (1) North region: 9 provinces and 1 special city
 - Phongsaly
 - Luang Namtha
 - Oudomxay
 - Bokeo
 - Huaphan
 - Luang Prabang
 - Xayabouly
 - Xieng Khuang
 - Vientiane
 - Xaysomboun (special city)
- (2) Central I region: 1 special city
 - Vientiane city (directly under the central government)
- (3) Central II region: 3 provinces
 - Borikhamxay
 - Khammuane
 - Savannakhet
- (4) South region: 4 provinces
 - Saravan
 - Sekong
 - Champasak
 - Attapeu

Lao PDR is a small country with high potential for hydropower development. In 2018, installed capacity was 7,240.84 MW, in which 2,772.24 MW was supplied in its domestic system with a maximum power

demand be 1,000 MW. The development of hydro power plants in Laos is significant. The Government of Lao PDR aims to establish a "System to System" scheme (inter-connections between Lao system and neighbouring countries) to expand power trades with neighbouring countries and to enhance electric power exports. Laos expects that hydropower resources will be a primary source of income in the future by selling electricity to Thailand and other neighbours. The foreign exchange earned from sale of hydropower will in turn stimulate other economic and social development in the Lao PDR, while the electric network will be a key infrastructure for that development.

Currently power sector of Laos is overseen by a state-owned company and a government agency i.e. Electricity du Laos (EDL) and Department of Energy Policy and Planning (DEPP). The main functions of EDL are generation, transmission and distribution of electricity services throughout the country, while the functions of DEPP are to oversee power sector development resting from EDL and to give policies and strategies for Independent Power Plan (IPP) development.

The purpose of this research is to analyse current power system in Laos to find out the solution for developing power system in the balance of electricity supply and demand.

This paper includes: section 2 describes the methodology used for analysis, section 3 analyses the current situation of Laos' power system, section 4 is conclusion and recommendation.

2. METHODOLOGY

Methodology used to conduct the study on power system for Lao PDR up to the year 2030 with base year of 2018 is data aggregation. The information that used for the analysis, assessment and compare comes from secondary data. The information needed in the model includes load curve of region, energy supply system, and energy demand forecast. All the information is collected from Department of Energy Policy and Planning, Ministry of Energy and Mines and Electricity du Laos.

Forecast electricity demand is important to power system planning. In this study, we use LEAP model (the Long-Range Energy Alternative Planning System) to forecast. Data such as population growth, GDP growth, number of household customers are the main data inputs of model.

Electricity demand forecast is calculated for each year and each sector (residential, industry, business and public). Electricity demand is calculated as a product of total activity and electrical intensity.

$$ED_{b,s,t} = TA_{b,s,t} \cdot EI_{b,s,t} \tag{1}$$

Where ED is electricity demand, TA is total activity, EI is electricity intensity, b is sector, s is scenario and t is time (year). In the final electricity demand analysis, energy intensity can be calculated from electricity consumption and the number of customers. It can also be energy intensity defined as the total amount of energy consumption per unit of gross domestic product (GDP). The number of customer and GDP is referred to as total activity.

$$EI_{b,t} = \frac{EC_{b,t}}{TC_{b,t}} \tag{2}$$

or

$$EI_{b,t} = \frac{EC_{b,t}}{GDP_{b,t}} \tag{3}$$

Where EI is electricity intensity, EC is electricity consumption, TC is total customer number, GDP is gross domestic product, b is sector and t is time (year).

3. ANALYSIS OF CURRENT POWER SYSTEM SITUATION

EDL has divided power system operation into four areas: Northern region, Central 1 region, Central 2 region and Southern region.

a. Electricity generation

Lao PDR is rich in natural resources; notably the abundant water resources and the mountainous conditions that make development of hydropower possible. The development of a power source project in the Lao PDR has started since 1970, until now Laos has 63 existing projects, among under construction projects, 25 are expected to complete construction before 2020, 68 projects are expected to complete construction before 2025, 73 projects are expected to complete construction before 2030 and 282 projects are going on feasibility study report (MOU signed state) as show in the table below:

Table 3-1: Hydropower Development Projects in Lao PDR

No.	Item	Project amount	Installed capacity (MW)	Energy Generation (GWh/year)
1	Existing projects	63	7,240.84	37,449.19
2	Under construction projects, expected to complete construction before 2020	25	2,758.80	15,288.79
3	Under construction projects, expected to complete construction before 2025	68	4,986.55	21,673.78

4	Expected to complete construction before 2030 (Planning projects)	73	6,947.50	32,539.87
5	MOU signed	282	13,256.13	52,003.02
	Total	512	35,189.82	158,954.65

Source: DEPP (2018). The 10th Report on Hydropower Development Projects in Lao PDR

❖ **Installed capacity share by ownership**

Based on natural resources, Laos has established a policy to develop the energy sector and attracted foreign investment. The investment on energy sector in Laos consists of three major parts as follow: EDL and EDL-Generation Public Company (EDL-Gen), Independent Power Producer domestic (IPPd) and Independent Power Producer export (IPPe), in which EDL and EDL-Gen accounted for 12.71%, IPP(d) accounted for 21.94%, and IPP(e) accounted for 65.35% of the total installed capacity.

Table 3-2: Installed capacity share by ownership in Lao PDR

Ownership	Installed capacity (MW)			Number of stations
	Total	Domestic	Export	
EDL	269.50	269.50	-	6
EDL-Gen	651.00	651.00	-	15
IPP (d)	1,588.34	1,588.34	-	34
IPP (e)	4,732.00	263.40	4,468.60	8
Total	7,240.84	2,772.24	4,468.60	63

Source: DEPP (2018). The 10th Report on Hydropower Development Projects in Lao PDR

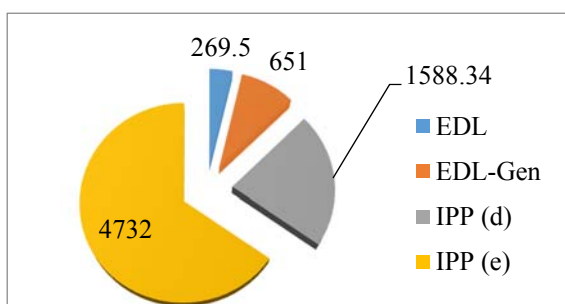


Fig. 3-1: Installed capacity share by ownership.

❖ **Installed capacity share by type**

Laos’s power generation consists of four types, hydro power plant (HPP), thermal power plant, solar PV, and biomass power plant. The share of hydro power PP is 73.28%, while that of thermal PP is 25.94%, solar PV is 0.44% and biomass PP is 0.35%.

Table 3-3: Installed capacity share by type in Lao PDR

Type	Installed capacity (MW)			Number of plants
	Total	Domestic	Export	
Hydro	5,305.84	2,640.24	2,665.60	55
Thermal	1,878.00	75.00	1,803.00	1
Solar PV	32.00	32.00	-	5
Biomass	25.00	25.00	-	2
Total	7,240.84	2,772.24	4,468.60	63

Source: DEPP (2018). The 10th Report on Hydropower Development Projects in Lao PDR

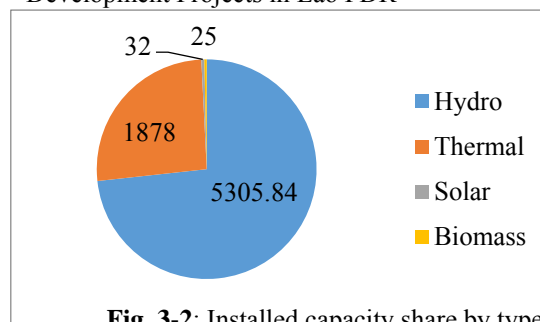


Fig. 3-2: Installed capacity share by type

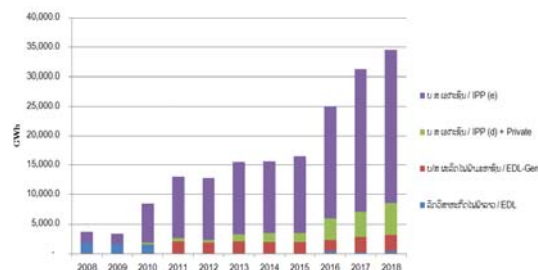


Fig. 3-3: Electricity generation of IPP and EDL (2008-2018)

Since Laos expects that hydropower resources will be a primary source of income in the future by selling electricity to Thailand and other neighbours, in 2008 Laos has signed MOU with Thailand government to export 5,000 MW and with Viet Nam government to export 3,000 MW before the year 2020. Laos’s government has established strategies, policy and law for support foreigner and domestic investors to invest in energy sector. As show in Figure 3-3 above, after the year 2010, IPP (d) and IPP (e) had growth rapidly.

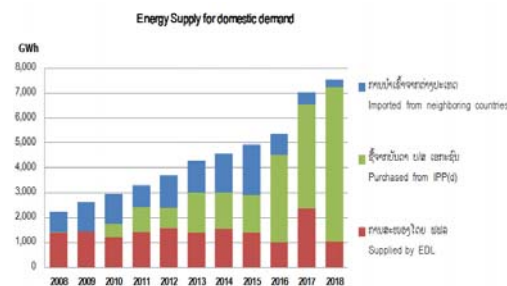


Fig. 3-4: Electricity supply for domestic demand (2008-2018)

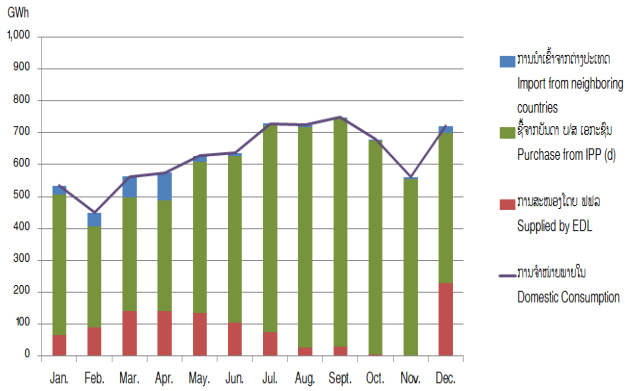


Fig. 3-5: Monthly electricity supply/consumption (2018)

Because the main power supply in the system is come from hydropower plants, which are mostly run-off-river types or small reservoir types, Lao still needs to import electricity in the dry season (especially in Central I and Central II regions) due to the fact that the hydro power plants are not able to operate at full capacity.

In 2018, imported electricity from neighboring countries is about 3.98% of energy consumption, especially in Dry1 season (January to May).

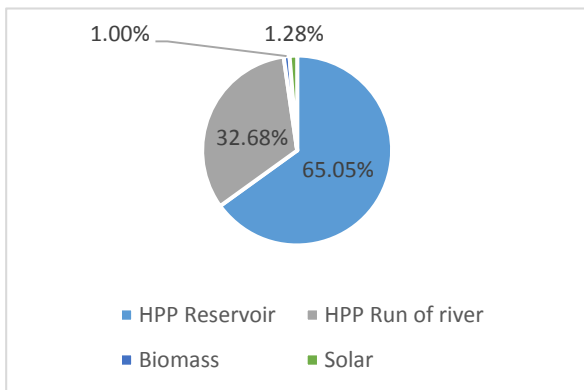


Fig. 3-6: Electricity supply/consumption share by plants

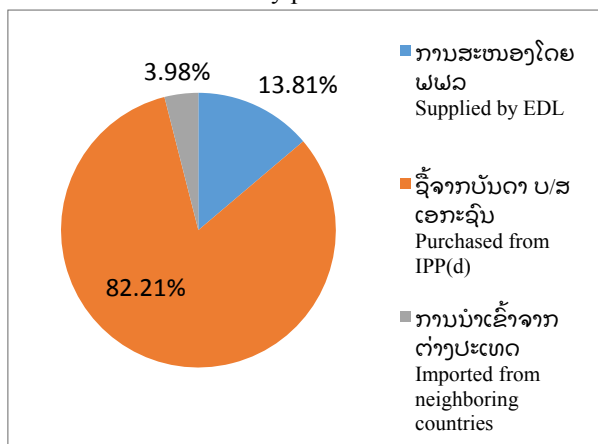


Fig. 3-7: Electricity supply share by producer

b. Electricity demand

The country's electricity demand has grown at an average rate of 13.5 to 14% per year from 2000 to 2017. In 2018, the demand is 5,416 GWh, having increased 9.1% compared to 2017.

From 2000 to 2012, residential sector accounts for a large proportion of the demand, while from 2013 to 2018, industrial sector grows faster.

In 2005, the portion of households that has access to electricity is only 48.3%. During the first six months of 2019, the portion of households with access increase to 93.4%, accounting for 92.86% of villages, and 100% of districts.

In 2018, the National peak load is 951.2 MW in April 2018, and the growth is 4% increase compared to 2017.

❖ **Historical Load Characteristic**

(1) Monthly Load Characteristic

In Laos, monthly electricity consumption does not vary. This is reflected in the past record of the year 2018; the lowest and highest of load characteristic are within the narrow interval of 0.84-1.00 per unit as shown in Table 3-4 and Figure 3-8.

Table 3-4: Monthly Load Characteristic of Laos in 2018

Month	Jan	Feb	Mar	Apr	May	Jun
Load (MW)	824	802	861	951	850	850
Month	Jul	Aug	Sep	Oct	Nov	Dec
Load (MW)	904	863	919	890	908	870

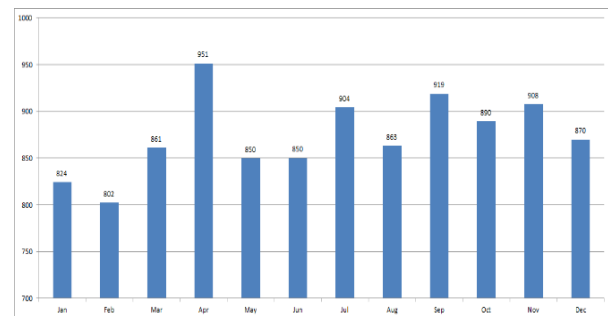


Fig. 3-8: Monthly Load Curve of the Year 2018

(2) Daily Load Characteristic

Laos has divided the load of each region into 3 parts. First is Dry1 season from January to May, second is Wet season from June to October, and the last one is Dry2 season from November to December.

- Dry1 Season

Generally peak load in Dry1 season occurs three times a day, which are at 11:00, 15:00 and during 19:00-

21:00. A typical daily load characteristic in Dry1 season of the year 2018 is presented in Table 3-5 and Figure 3-9. It is seen that the minimum load factor for a day occurring at 5:00 AM is 0.65, while the maximum occurring at 20:00 PM is 1.00. The average daily load factor is 0.815.

Table 3-5: Typical Daily Load Factor (L.F) of Dry1 season in 2018

Time	Hourly Load (MW)	Load Factor Per-units	Time	Hourly Load (MW)	Load Factor Per-units
01:00	685.85	0.72	13:00	822.57	0.86
02:00	663.98	0.70	14:00	862.30	0.91
03:00	637.41	0.67	15:00	935.36	0.98
04:00	632.31	0.66	16:00	819.98	0.86
05:00	614.74	0.65	17:00	779.56	0.82
06:00	627.48	0.66	18:00	810.20	0.85
07:00	680.01	0.71	19:00	932.21	0.98
08:00	698.91	0.73	20:00	951.25	1.00
09:00	780.08	0.82	21:00	938.09	0.99
10:00	819.10	0.86	22:00	827.38	0.87
11:00	821.08	0.86	23:00	767.33	0.81
12:00	809.93	0.85	24:00	696.90	0.73
Average daily load factor is 0.815					

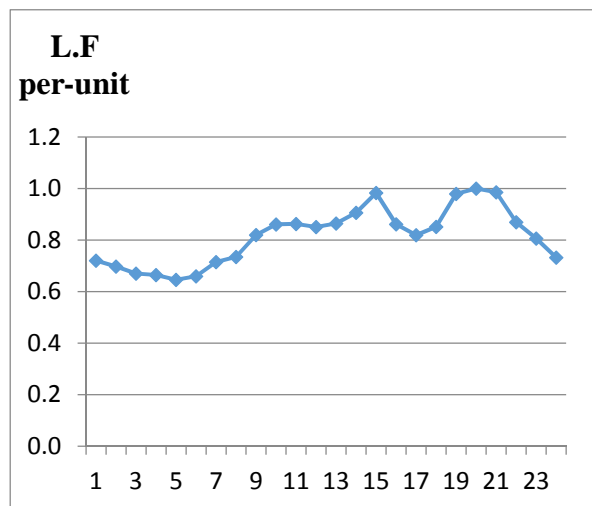


Fig. 3-9: Typical Daily Load Curve of Dry1 season

• Wet Season

Power peak demand in Wet season occurs three times in a day, similar to the Dry1 season, at around 11:00, 15:00 and during 19:00-21:00. A typical daily load characteristic in Dry1 season of the year 2018 is

presented in Table 3-6 and Figure 3-10. It is seen that the minimum load factor for a day occurring at 5:00 AM is 0.65, while the maximum occurring at 20:00 PM is 1.00. The average daily load factor is 0.817.

Table 3-6: Typical Daily Load Factor (L.F) of Wet season in 2018

Time	Hourly Load (MW)	Load Factor Per-units	Time	Hourly Load (MW)	Load Factor Per-units
01:00	666.47	0.73	13:00	771.27	0.84
02:00	638.88	0.70	14:00	811.60	0.88
03:00	619.81	0.67	15:00	880.00	0.96
04:00	606.01	0.66	16:00	777.91	0.85
05:00	600.82	0.65	17:00	736.73	0.80
06:00	634.08	0.69	18:00	811.32	0.88
07:00	695.71	0.76	19:00	916.66	1.00
08:00	680.70	0.74	20:00	918.79	1.00
09:00	755.75	0.82	21:00	910.02	0.99
10:00	784.60	0.85	22:00	808.74	0.88
11:00	793.13	0.86	23:00	744.96	0.81
12:00	756.81	0.82	24:00	692.24	0.75
Average daily load factor is 0.817					

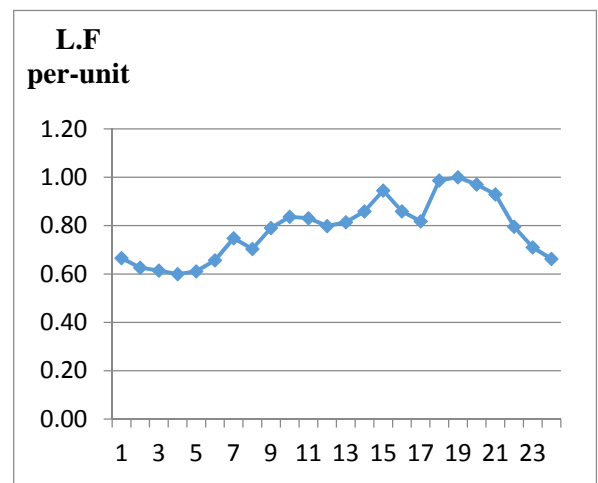


Fig. 3-10: Typical Daily Load Curve of Wet season

• Dry2 Season

Power peak demand in Dry2 season occurs three times a day, a little bit different from other seasons, at around 10:00, 15:00 and during 18:00-20:00. A typical daily load characteristic in Dry1 season of the year 2018 is presented in Table 3-7 and Figure 3-11. It is seen that the minimum load factor for a day occurring at 5:00 AM is 0.61, while the maximum occurring at 19:00 PM is 1.00. The average daily load factor is 0.785.

Table 3-7: Typical Daily Load Factor (L.F) of Dry2 season in 2018

Time	Hourly Load	Load Factor Per-units	Time	Hourly Load	Load Factor Per-units
01:00	604.61	0.67	13:00	738.88	0.81
02:00	568.42	0.63	14:00	780.19	0.86
03:00	557.47	0.61	15:00	858.28	0.95
04:00	544.34	0.60	16:00	780.13	0.86
05:00	554.96	0.61	17:00	742.39	0.82
06:00	596.36	0.66	18:00	896.11	0.99
07:00	679.10	0.75	19:00	907.72	1.00
08:00	638.95	0.70	20:00	880.84	0.97
09:00	717.53	0.79	21:00	843.86	0.93
10:00	759.40	0.84	22:00	722.09	0.80
11:00	754.21	0.83	23:00	644.91	0.71
12:00	724.36	0.80	24:00	601.46	0.66

Average daily load factor is 0.785

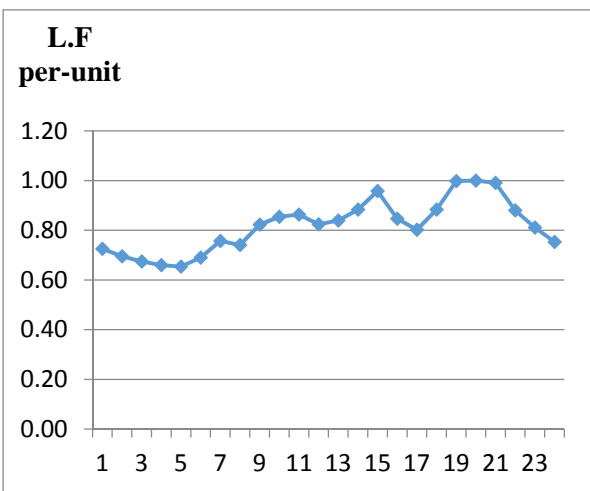


Fig.3-11: Typical Daily Load Curve of Dry2 season

❖ **Power Demand Forecast**

The statistic peak load of each region during 2015-2018 period and forecasted peak load for 2019-2030 are shown in Figure 3-12. It is obviously seen that among 4 regions, the highest power demand is Central I while the demand in South region is lowest.

The demand increases with high rate for every region after 2020. The growth rate during 2019-2030 period is around 11.10% for the North region, 5.00% for the Central I region, 7.00% for the Central II region, and 10.50% for the South region. Regarding to North

region, the demand increase rate is high because of mining industries such as copper, cement factory and iron and special zone economic demands in the province Luang Namtha, Oudomxay and Phongsaly.

Electricity consumption by regions and provinces during 2015-2018 and forecasted demand in 2019-2030 period are shown in Figure 3-13. The highest amount in the electricity consumption is in the Central I region and the lowest amount is in the South region. Electricity consumption with high growth rate will be seen during 2019-2030 period.

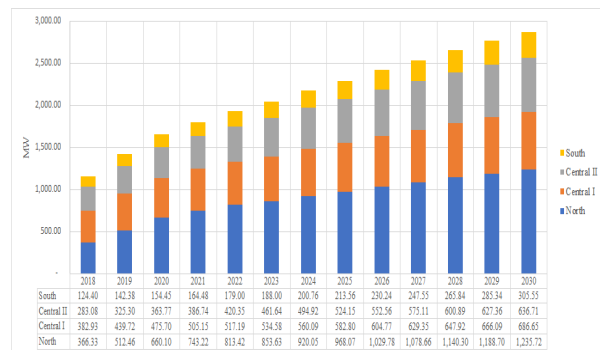


Fig. 3-12: Load Forecast for 2019-2030 period

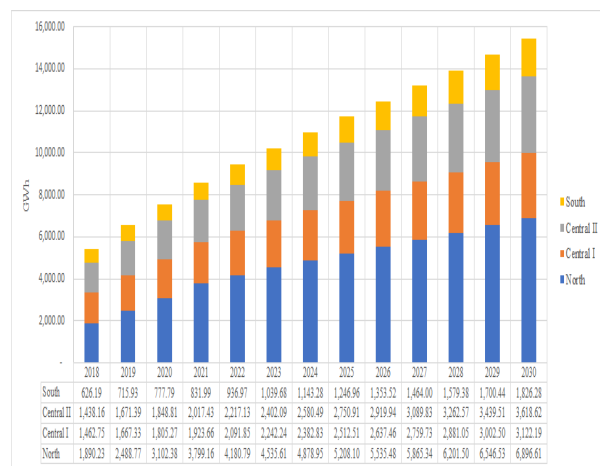


Fig. 3-13: Energy Consumption for 2019-2030 period

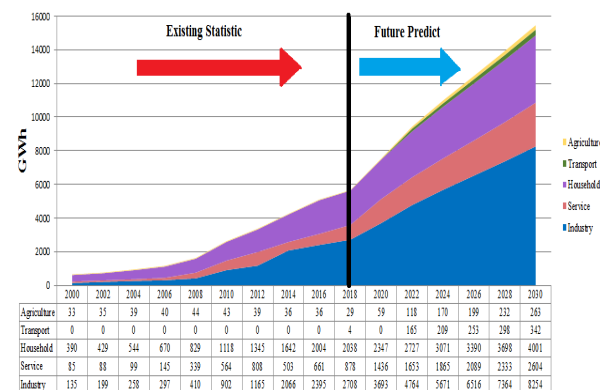


Fig. 3-14: Electricity Forecast by Sector for 2019-2030 period

c. Transmission and Distribution System

The power system of Laos has been divided into power system for Export-dedicated transmission lines and domestic power system. The Export-dedicated transmission lines are directly connected to the power systems of neighbouring countries from dedicated power plants by 230 kV and 500 kV voltage level to Thailand and 220 kV voltage level to Viet Nam. The domestic power supply system is synchronized with the electric power system of Thailand via 115 kV transmission lines in five places. Through those lines, electric power was imported from Thailand during the dry season and exported during the rainy season from 2010 to 2015. In most part of the northern region, there is a 115 kV interconnection with China, and power has been supplied from China to some regions at times when power shortages are expected.

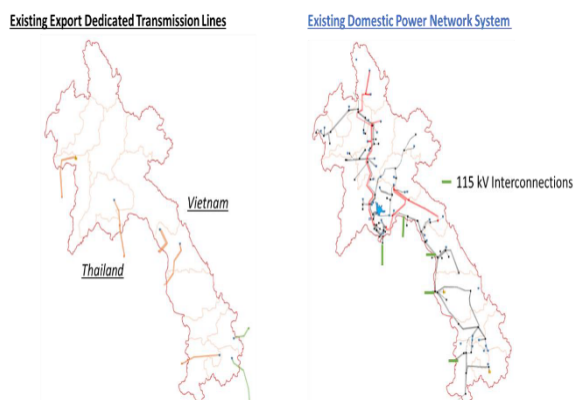


Fig. 3-15: Export-Dedicated Transmission Lines and Domestic Power Supply System

At the beginning, there were plans to make all the export power plants to be developed connected to the domestic power system, and then export from them with the power plants developed in the domestic system, in order to expand flexibility through System to System. However, the study plans to continue to separate the export-dedicated transmission lines from the domestic power supply system until 2030. This is due to insufficiencies in system operation functions such as securing supply-demand balance within the power system for domestic supply in Laos, control of generators, and the maintenance of domestic power system facilities, and for the time being, difficulty in building a reliable power transmission system in combination with the power plants of power generation companies dedicated to export.

The loss in transmission and distribution is 15%.

Table 3-8: Existing transmission line and distribution in Lao PDR

Transmission and Distribution Lives	Length (Km)
Length of 500 kV lines	464
Length of 230 kV lines	2,225
Length of 115 kV lines	6,968
Length of 35 kV Lines	331
Length of 34.5 kV Lines	332
Length of 22 kV Lines	30,847
Length of 12.7 kV Lines	310
length of 0.4 kV Lines + Swer	20,136

Source: Power System Planning Division, DEPP

❖ Domestic power system planning

Domestic transmission lines and substations, including the interconnections from the domestic power system to neighbouring countries, are planned based on the domestic power demand forecast and power supply plans. The main plans are as follows:

- **North:**
 - New 500 kV transmission lines in the northern part of Laos for expansion of imports and exports with Thailand.
 - New 230 kV transmission lines near Myanmar border (export to Myanmar, supply of northern industrial park).
- **Central:**
 - New 230 kV transmission lines surrounding Vientiane (measures to increase demand in Vientiane City).
 - New 230 kV transmission lines from East Vientiane to Thailand by interconnection (expansion of imports and exports with Thailand with a back-to-back converter station).
- **South:**
 - New 230 kV transmission lines KM20 – Mahaxai (measures to increase the power flow to the Central area).
 - New 230 kV transmission lines Pakxong – Nathone (Houay Ho domestic return acceptance).

4. RECOMMENDATIONS AND CONCLUSION

Lao PDR has abundant natural resources and high potential for development of power plants, and until now Laos has 63 existing projects with total installed capacity 7,240,84 MW. 25 projects are under constructions, expected to complete construction before 2020 and more than 400 projects are signed MOU.

Based on the potential for power plants, many hydropower plants are constructed in the Northern, but main load appears in the Central I and Central II. In 2018, the installed capacity in North, Central I, Central II and South are approximately 2,294 MW, 32 MW, 187 MW and 259 MW respectively, but the peak load in each region are 366 MW, 383 MW, 283.08 MW and 124 MW respectively. The imbalance between supply and demand in the Central I and Central II causes the need for importing electricity from other regions. By the year 2020, some hydropower plants will be constructed with total installed capacity be 3,184 MW, and the reserve rate be 10%. If the power plants run at full capacity, the power supply is enough for 2,865 MW demand until 2030. However, the difference in hydro energy between different seasons (eg. Dry and rainy season) causes the lack and surplus of electricity supply. For the year 2025-2030 period, based on hydropower plants in Laos specifically in rainy season, the electricity supply will be sufficient from generation output of existing hydropower plants, but in dry season this may not enough, so some electricity supply has to be imported from neighbouring country (Thailand) or Laos has to plan for new power plants.

Recently, the 115 kV transmission line from the independent Northern area to the Southern area has taken place and started operation in 2016. Currently it is difficult to transmit electricity from hydroelectric power plants in the Northern to Central I with existing transmission lines, therefore, the system needs to construct new 230 kV transmission lines for transmitting electricity from Northern to Central I and Central II before the year 2020.

Base on the existing transmission line, it unable to transmit energy from generation source to load center. The main power supply in the domestic system is come from hydropower plants, so energy supply will be lack or surplus depend on the seasons (eg. Dry and rainy season). To solve the problems above, Laos needs

accurate planning by using tools to help with assessment, analysis and optimization of energy supply in each period. In which MESSAGE model will be solve these advantages. MESSAGE (Model for Energy Supply Strategy Alternatives and their General Environmental Impacts) is software designed for setting up models of energy systems (i.e. energy supplies and utilization) for optimizing energy supply to ensure energy demand for Laos. MESSAGE was originally developed by International Atomic Energy Agency (IAEA).

5. ACKNOWLEDGEMENT

The authors gratefully acknowledge the contribution of Department of Energy Policy and Planning, Ministry of Energy and Mines and Electricity du Laos in providing information and data of Lao's power system.

6. REFERENCES

- [1] DEPP (2018). The 10th Report on Hydropower Development Projects in Lao PDR.
- [2] Department of Energy Policy and Planning, Electricity Statistics (2018).
- [3] Japan International Cooperation Agency (JICA), National Power Development Plan for Lao PDR (2020).
- [4] Laos Statistics Bureau.
- [5] laoenergy.com.la
- [6] Lao PDR Energy Statistics (2018).
- [7] Policy on Sustainable Hydropower Development in Lao PDR (2015).
- [8] Stockholm Environment Institute (SEI), LEAP user guide (2004).
- [9] The Study on Power Network System Master Plan in Lao PDR.

PROJECT OF ELECTRICITY GENERATION FROM SOLID WASTE - A CASE STUDY TO DEVELOP CIRCULAR ECONOMY

Pham Thi Thu Ha

School of Economics and Management, HUST

Nguyen Ngoc Anh

Institute of Strategy and Public Policy, Ministry of Industry and Trade

Abstract

This paper provides a detail case of researching opportunities about electricity generation from solid waste to develop the circular economy. By this approaching, we not only solve the problem of landfilled waste, but also create clean energy from waste, and that is the way leads to develop the circular economy. Obviously, we have had ideas, but there are a lot of challenges forward request us find out answers for questions that are how we should solve problems? How we should do at this stage? What difficult things we should eliminate on the path to a circular economy? On the other words, those are content that will be provided through this paper.

Keywords: Waste to Electricity (WTE), Circular Economy (CE); Effective of Social Economics (ESE); Effective of Finance (EF); Effective of Environment (EE)

1. WHAT IS THE CIRCULAR ECONOMY?

The circular economy (CE) is the model of economics in which the activities of design, production, and service will be supported for keeping the life-long of goods, and eliminating negative affections to environment. All the circular processes will be applied the process of reuse through sharing, repairing, refurbishment, remanufacturing, and recycling to create close-loops for using resources in the economy that minimizes quantities of using in-put resources as well as wastes and the level of polluted air and environment. The goal of circular economy is to keep the life-long of goods, facilities and infrastructure that will lead to increase performance of themselves. All of the waste in a production process should be concentrated as resources for other production process. This approach contrasts to the linear economy that is popular in global currently. Regarding to the linear economy, almost of resources are using as just one-line, that is from deploying resources, producing goods, to trash after

consuming, and these activities lead to waste recourses as well as huge garbage.

The waste to energy is process to transform organic waste to energy which is electricity and/or heat power by method of incineration, and this is one of recycling technology for creating energy. It is a specific illustration of circular economy, that helps us to deal with multiple goals such as social – economics goal, and the most important goal is environment aspect.

2. THE GLOBAL EXPERIENCES

The method of waste burned incineration is existed in Europe from 1930s in the 20th century to reduce the quantity as well as the volume of garbage. Currently, these modern waste incinerators can reduce the volume of waste by 90 percentage, and it means that the time of using landfill will be longer 10 times. In other words, the inorganic waste is not created pollution such as smell and leachate that are resources lead to pathogenic bacteria as normal waste.

Table 1: The status of waste incinerator in some countries around the world

No.	Countries	Population (Million People)	Quantity of waste (Million ton/year)	Number of incinerators	Percentage of incinerated waste
1	Japan	123	32	1893	72
2	Denmark	5	1.7	36	65
3	Sweden	9	1.8	23	55
4	France	56	7.6	170	42
5	Netherlands	15	2.8	12	40
6	Germany	61	9.2	47	30
7	Italy	58	2.7	94	18
8	The USA	248	28.6	168	16
9	The UK	57	2.5	30	7
10	Spain	38	0.7	22	7

Sources: [10]

There are so many types of incinerations with different kinds of incinerating such as the open manual incinerator, single-level incinerator, multi-level incinerator, rotary barrel, fluidized bed incinerator, multi-storey incinerator, pyrolysis incinerator, gasification incinerator.

Collecting and sorting waste are important problems that are needed to solve in the process of dealing with waste effectively. The common characteristics of waste is the diversity of metal, ceramic, organic waste from foods, paper, nylon and other rubber things, plastic, and eventually soil or stone. With regard to many kinds of waste, the collecting garbage will be faced to some problems as below:

- If there are too little burnable components or the garbage is too moist, the burned incineration is not possible. This problem is often happened for organic waste areas.
- If there are too much nylon or composite plastic, foods, rubber, batteries; even there are many more burnable components, however they will create toxic waste to environment.
- If the waste contains many large and hard things, bulky lumps that will lead to difficulties in transporting, sorting and removing.
- Collecting waste will create polluted smell that affects directly to workers and people who live around the waste areas as well as waste plants, therefore there will be risen strongly objections.

Basing on the diverse characters of waste, the processing of garbage to fuel contains following stages:

- Sorting wastes to the burnable components which are papers, nylon, rubber etc...; organic components which will be used to produce compost such as vegetables waste, leftover foods, other unburnable components like stones, ceramics, building materials etc.
- The burnable components will be collected separately to drain and dry, then grinded and processed to fuel pellets or burned immediately that depends on the type of incinerated technology.
- The organic components will be buried or soaked to produce CH₄ biogas and then burn them in incinerator.
- The inorganic waste could be buried.

The ideas of generating electricity from waste incineration was created long time ago, however there are so many reasons that lead to failure of electricity waste project.

- Firstly, it is the lacking of finance. This is new complex technology, so the cost rate is relatively high.
- Secondly, decisions as well as paper documents of Government are slowly. There is not any successful

WTE projects, if it is not supported by Government and relative stakeholders.

- Thirdly, it is the objection of citizen. As we know, waste impacts a lot to environment, especially it impacts directly to people who live around areas where waste is collected and processed. These WTE projects could not be successful if there is not the consensus of the citizen.

- On the other hand, it is choosing wrong or bad quality of technology. So, there are a lot of lessons learn from these kinds of failures in around the world and in Vietnam as well.

- In addition, it is the lacking of knowledge and research about the waste in present and in the future. Therefore, it leads to choose unsuitable technology.

- Furthermore, the estimation and forecast the quantity as well as quality of waste and in-put fuel are not precise. When this information is not correct, it will affect to quantity of waste negatively and lead to rise cost that relates to process in-put fuel.

- One more reason is the too confident mindset in creating more living income. Obviously, there are two ways to create income from WTE projects, that are selling electricity and the finance for processing waste instead of burying them. And, when we estimate the income too high, it will lead to fake profit and real loss.

- Besides, it is the situation of updating changes about documents as well as circulars of environment. In reality, requirements of environment are higher and higher, that provide challenges for processing in-put fuel; therefore, it is the reason to rise cost of WTE projects.

- Moreover, there is not long-term commitment by the agreements of supplying waste as well as selling electricity. Almost of WTE projects, the investment is high, long payback period, high risk; and if there is not long-term agreement, it will not impress investors.

- The lacking of experienced human resources to operate WTE project is one of important reasons lead to successful. With regard to new and expensive technology, there will be a lot of problems that are needed to be solved, and the good human resource is often urgent requirement.

- Regarding to management problem, it is the core factor for new technology projects; because of so many things might be happened in each case during these projects are running that we have not had experiences so far.

- And finally, we do not have any plans for closing WTE projects.

According to reality of waste processing in around the world and some experiences from unsuccessful

projects, we have got some lessons learn to solve with WTE projects as below:

- First of all, ensuring the system of collecting waste and landfills are managed in effective way.
- Secondly, there is long-term agreement of buying electricity/water vapor between stakeholders.
- Thirdly, ensuring the long-term of safety environmental standards.
- Fourthly, ensuring experienced human resource who are suitable to apply for present requirements as well as for developing requirements in the future.
- Finally, ensuring the supporting from citizen for solid waste burned projects.

3. THE STATUS OF PROCESSING WASTE IN VIETNAM

3.1. The huge of resources

With more than 94 million people, the quantity of waste in Vietnam each year is quite high, in average, there are nearly 35000 tons of urban solid waste and 34000 tons of rural living waste on each day. In big cities such as Hanoi and Hochiminh, it is estimated about 7 to 8000 tons of waste.

Currently, in Vietnam, there is 85% of waste that is processed by burying method, and it requires the large areas. In which, there is 80% of landfills where are not safety and they are resources of polluted environment, and they are not used effectively as huge fuel.

For encouraging to process solid waste effectively to produce energy, the government has issued many circulars such as the Feed in tariff of buying electricity (FIT) at USD10,05 cents/kWh for electricity generator from solid waste projects that used burned technology directly according to the Decisions No. 31/2014/QD-TTg and Circular No. 32/2015/TT-BCT of Ministry of Industry and Trade (MOIT) about developing projects and model agreement of selling and buying electricity.

As the strategy of developing recycling energy that has been accepted in late 2015, the percentage of processing urban solid waste for energy goal will be increased from insignificant to 30% in 2020, and it is approximately 70% in 2030; and almost of urban solid waste will be used for producing energy in 2050.

Producing energy from waste is the effective solution in around the world, and in Vietnam recently it is to solve challenges about environment and the demand of using land in urbans; and it also supports for producing sustainable energy for Vietnam.

According to the Report of developing social – economics 2010 – 2020 for Mountain provinces in the Northern of Vietnam, the quantity of domestic waste was based on the geography (or geography for developing social – economics). The quality of living standard is better that creates more demand and consumption, therefore, the quantity of domestic was increased more than before. The estimation average of urban CTR in Vietnam 2015, 2020, and 2030 is relatively to 1.2; 1.4; 1.6 kg/person/day, the rural CTR is 0.8; 1.0; 1.2 kg/person/day.

3.2. The opportunity of producing electricity from landfill gas (LG)

The landfill gas is biogas contains 40 to 60% of methane (CH₄) and 30 to 35% dioxide carbon (CO₂), and the percentage of them is sustainable by the time of burying or anaerobic incubation waste. The volume of landfill gas depends on so many factors. And the character of bio-waste is suitable for collecting landfill gas to generate electricity.

The direct burned waste technology is as same as other bio-fuel technology, however the moist of bio-waste is quite high (60 – 70%), so it is needed to drain and it leads to increase the cost investment. The opportunity of producing electricity from direct burned waste is shown in the table 2, as below:

Table 2: The opportunity as theory of domestic waste and hospital waste by areas

Criteria	Units	2013	2014	2015	2020	2025	2030
Average quantity of bio-waste per year	Ton/year	2,787,401	3,037,120	3,782,825	6,541,764	26,913,915	41,402,427
Quantity of buried bio-waste	Ton/year	1,393,701	1,518,560	1,891,412	3,270,882	13,456,957	20,701,213
Quantity of direct burned bio-waste	Ton/year	278,740	303,712	378,282	654,176	2,691,391	4,140,243
Buried waste solutions							
Quantity of landfill gas in 15 years	10 ³ m ³ /15 year	83,622	91,114	113,485	196,253	807,417	1,242,073

Criteria	Units	2013	2014	2015	2020	2025	2030
The capacity of installing increases by year	MW	1	2	2	4	19	29
The capacity of generator	MW	2	4	6	21	62	184
The quantity of electricity in 15 years	MWh/15 years	133,795	145,782	181,576	314,005	1,291,868	1,987,316
The average quantity of electricity per year	MWh/year	17,106	26,825	38,930	120,162	310,591	872,339
The direct burned waste solutions							
The capacity of generator	MW	20	21	24	34	126	191
The average quantity of electricity per year	MWh/year	78,047	6,992	27,872	105,122	675,542	1,081,221

Source: [4] [6]

Table 3: The status of domestic waste in Vietnam

No.	Methodology of processing	Percentage (%)	Quantity of domestic waste (Million ton/year)	Affects
1	Domestic waste was not processed	24.5	7.57	Polluted, uncontrolled
2	Buried landfill. It is not sanitary	50	15.44	Polluted, used a lot of landfills
3	Sanitary buried landfill	24	6.18	Reduced pollution, used a lot of landfills
4	Waste burned incineration to generate electricity	0.5	0.15	Controlling pollution. Creating energy. Saving lands
5	Only waste burned incineration		0.31	Polluted

Source: [2]

The burned waste incineration leads to effective results and it is significantly in processing garbage, reducing environmental pollution with opportunity to solve problem of large waste thoroughly.

The sorting waste will lead to separate elements, materials, that could be reused or recycled.

Burning garbage in vapor incinerators to produce water vapor over temperature. Therefore, burning garbage should be processed in waste burned incinerators which are safety with right standards of technology about solid domestic waste incinerators QCVN61-MT: 2016/BTNMT or other individual standards for industrial or hospital waste.

From 2004, the concepts and WTE projects (projects of transforming waste to energy) has been appeared in Vietnam. Until now, there are some investors has contacted to locals to provide their proposal for doing

projects of waste burned incineration to generate electricity, such as:

The project of solid waste burned incineration combined with generating electricity that is owned by Waste to Energy Pte. Ltd. (Singapore). The project of solid waste burned incineration combined with generating electricity in Hochiminh City, Ba Ria – Vung Tau, Fluid Tech (Australia) in Dung Quat Industrial Zone. The project of processing waste by pyrolysis (Venturing between Dai Lam Company and Entropic Energy Co., The USA).

Currently, there are some projects has been received investment, such as: Waste to Electricity Son Tay (Hanoi), Waste to Electricity Phu Tho, Waste to Electricity VIETSTAR, Waste to Electricity Thanh Hoa, Waste to Electricity Thai Binh, Waste to Electricity Hai Phong, The processing industrial and hospital waste manufacture Thai Nguyen.

Table 4: The quantity of waste by groups in Vietnam

Groups	Units	Years			Average by period (%)
		2015	2020	2025	
Urban population	Million people	35	44	52	4.04%
Percentage	%	38	45	50	
Solid waste (rural waste)	Million ton/year	19	20	30	4.67%
Solid waste urban waste	Million ton/year	12.8	19	26	7.34%
Percentage	%	67.37	95.00	86.67	

Sources: [2]

Looking at primary processing model of waste burned incineration to generate electricity, we know the first difficult step that Vietnam has to face with is sorting waste.

In Vietnam, the last 10 years, the story of sorting garbage has been concerned through the project of sorting waste at sources which was financed by Japan International Cooperation Agency (JICA), incorporated with Urban Environment Limited Company (URENCO) was piloted at four wards in Hanoi, they were Phan Chu Trinh, Nguyen Du, Thanh Cong, and Lang Ha. However, this project has been unsuccessful because of both subjective as well as objective factors.

The unsuccessful of this project has led us to so many lessons learn about the system of operating, designing, equipping collected tools and landfill in the scientific and closed lines, that minimized polluted smell around areas as well as on the way of transforming garbage. In addition, we have learned that, if the sorting garbage step was not done thoroughly, the project could not be

successful. And this is a difficult problem for investors who are concerning on waste burned incineration to generate electricity. Basing on the theory, we understand that the garbage disposal process will be required the completed system from collecting waste, separating garbage at sources, processing fuel for burning technology to generate electricity then run smoothly and effectively.

3.3. Analyzing the efficiency of waste burned incineration to generate electricity project

To understanding clearly about the efficiency of waste burned incineration to generate electricity project WTE, these factors impact to the results, the difficult problems will be arisen in running this project and ensuring the efficiency of this special project, we will research a specific case, that is project of waste to electricity Seraphin at the waste disposal Xuan Son, Son Tay, Hanoi; and then we will withdraw specific solution to develop this kind of waste to electricity manufacture.

Table 5: The initial parameters of Waste to Electricity Seraphin Manufacture

Total investment	3,809,701.07	Million VND	Income from disposing waste	529000
Borrow	75%		Self-Used	37%
Owner's equity	25%		Electricity price	2311.5
Price of electricity	10.05	US Cent/kWh	Discount rate	10%
Time of borrowing	10	Year	Price of waste disposal	529000
Capacity	37	MW	Processing ash	420900
Hours of using capacity per year	7200	Hour	Consuming waste by day	1500
	300	24	Consuming waste per year	450000
Cost of processing ash	420900		O&M	5%

Sources: [1] and Author's analysis

Table 6: The financial efficiency of Waste to Electricity Seraphin plant

NPV Owner's Equity	828,361.40	Million VND
IRR Owner's Equity	17.38%	
PBP	11	Years
	3.6	Months

Source: Author's analysis

Table 7: Analyzing the fluctuation of NPV by total investment

NPV	0%	5%	10%	15%	20%	25%	e
828,361.40	828,361.40	612,521.97	396,250.99	179,980.02	(36,290.96)	(252,561.94)	-5.21

Source: Author's analysis

Table 8: Analyzing the fluctuation of NPV by the hours of using capacity

NPV	0%	5%	10%	15%	20%	25%	e
828,361.40	828,361.40	563,041.57	297,290.18	31,538.80	(234,212.59)	(499,963.97)	6.41

Source: Author's analysis

Table 9. Analyzing the fluctuation of NPV by the cost of O&M

NPV	0%	5%	10%	15%	20%	25%	e
828,361.40	828,361.40	747,926.85	667,060.75	586,194.65	505,328.55	424,462.45	-1.94

Source: Author's analysis

Table 10: Analyzing the fluctuation of NPV by capacity

NPV	0%	5%	10%	15%	20%	25%	e
828,361.40	828,361.40	499,407.62	170,022.28	5,329.61	(159,363.05)	(324,055.72)	3.97

Source: Author's analysis

The table shows that the total of investment impacts sharply high to the efficiency of project, and this is negative impactation (-5.21). There are so many factors that impact to the efficiency of project, and one of them is the technology that was used in this model was high technology, expensive, and Vietnam was not able to enough capacity to be owner. The average return of investment for waste burned incineration to generate electricity manufacture is about USD 4 million/MW. It should be noted that the return of investment for solar electricity and wind electricity manufactures is only around USD 2 million/MW. Therefore, to invest into waste to electricity manufacture with modern and high technology will require the large investment.

As other electricity manufactures, the hours of using equipment impacts significantly and this is positive impactation (6.41). Regarding to waste to electricity manufactures, the new technology with complexed problems in sorting waste, to ensure some certain hours

of using equipment is the big challenge. This problem will lead to require more about collecting and disposing garbage.

From the primary option, the cost of O&M is too high (5%) to compare with the total investment. And this cost might be fluctuated sharply because the problem of waste disposal as in-put fuel for producing electricity, especially when the garbage is not sorted at sources. And this is negative impactation (-1.94). Therefore, we understand that it will be needed to sort garbage at source thoroughly to prevent failures as before.

Moreover, the quality of waste in incinerator also impacts to the efficiency of this project, and the detail information will be provided in the table 10.

The technology of waste disposal to producing electricity is new and complexed technology, therefore the capacity is not high, and according to some

researches the capacity is about 30%. Meanwhile, the capacity of thermal power plant has been reached around 40%. This capacity will be changed a lot by the quality of in-put garbage. As the primary option, we estimate the capacity is 30%. This is positive impact and it also means that the less capacity reduces, the less NPV decreases as well. Once again, this factor shows the important role of separating waste at source and disposing waste before putting them into incinerator.

The technology of waste disposal to producing electricity is new and complexed technology, garbage will be needed to remove carefully before putting into

the incinerator, then transform through some complexed steps, and this is one of factor that leads to high self-used. We have assumed that the self-used quite high is 37% in the primary option. The table 11 shows that this is largely negative impact (-2.32). And the more self-used increases, the less efficiency decreases.

To combine two significant factors that impact to total investment and the hours of using equipment, we will know the panoramas picture of investing to waste to electricity manufactures with some inefficiency areas.

Table 11. Analyzing the fluctuation of NPV by self-used

NPV	0%	5%	10%	15%	20%	25%	e
828,361.40	828,361.40	732,068.68	635,344.42	538,620.16	441,895.89	345,171.63	-2.32

Source: Author's analysis

Table 12. Analyzing the fluctuation of NPV as two impact factors

		NPV by total investment (million VND)					
NPV	828,361.40	0%	5%	10%	15%	20%	25%
NP by T max	0%	828,361.40	612,521.97	396,250.99	179,980.02	(36,290.96)	(252,561.94)
	5%	563,041.57	346,770.59	130,499.61	(85,771.37)	(302,042.35)	(518,313.32)
	10%	297,290.18	81,019.20	(135,251.77)	(351,522.75)	(567,793.73)	(784,064.71)
	15%	31,538.80	(184,732.18)	(401,003.16)	(617,274.14)	(833,545.11)	(1,049,816.09)
	20%	(234,212.59)	(450,483.56)	(666,754.54)	(883,025.52)	(1,099,296.50)	(1,315,567.48)
	25%	(499,963.97)	(716,234.95)	(932,505.93)	(1,148,776.90)	(1,365,047.88)	(1,581,318.86)

Source: Author's analysis

The efficiency of social – economics and environment of project.

The most important impact of this project is to develop social – economics for locals (creating jobs, tax, export, and transferring technology).

Firstly, this project helps to solve the urgent problem that is waste disposal in Hanoi, reduce garbage, pollution, and minimize the landfill to bury waste as normal, then the living environment will be improved and changed the urban atmosphere as well. The quantity of consuming garbage per day around 1500 tons, it is estimated around 450000 tons per year.

Besides, this project will create more new jobs in the environment aspect for labor force in the city, and it also creates more opportunities for local young labors approach to high technology. Solving the waste problem, we will keep Hanoi avoid to pollution. In addition, currently, there is more than 70% of waste has been buried. The buried garbage (is occupied 76% of quantity); decomposes naturally (compost), recycle (14.7%) and burned (9.3%). The landfill Nam Son, Soc Son, Hanoi has been received about 5000/6.500 tons of

garbage in Hanoi, and landfill Xuan Son has been received 1300 tons of garbage, and the rest will be transferred to another small landfill. Therefore, if we reduce burned garbage, we will keep long time for landfill.

Regarding to economic benefits: changing landfills to resources for producing electricity and recycling useful goods for life. The improving quality of environment in urban will lead to impress investment for Hanoi, promote traveling as well as other sectors. This project brings indirect benefits. The quantity of electricity per year is about 266 million kWh. The profit from electricity is VND 387 million/year, and profit from waste disposal is VND 238 million/year.

Social benefits: this project will use the local human resource firstly, especially, they will prioritize to recruit people who are affected by project. In addition, they will have specific plan to train domestic experts who has experiences to control technology and operate project. Besides, this project will create more jobs for local workers. As results, this project will supply and support for national energy safety program. Moreover, it reduces risks for community's health which is negative impacted from landfill. It also decreases

negative impact by conflicting people who live around landfills. And especially, the project will bring opportunities to approach new technology in around the world for labor force, and train the human resources for transferring technology in future.

Environment benefits: after this project, it could be improved the quality of environment, reduced and reused urban solid waste quickly. Even ash will be buried, save capacity of landfill, and keep long time for using landfill.

A good illustration is landfill Xuan Son, in 2020, if we only buried waste, there is not any space for burned garbage at the first stage.

3.4. The difficulties in processing waste

The benefits of waste to electricity project is clearly, however, there is existed so many difficult problems that lead to almost these projects still are ideas; and the difficulties are briefed as below:

Firstly, it is the difficult in collecting and sorting garbage at sources. We have done so many experiments and we also have unsuccessfulness.

Secondly, for each technology models, we have to have enough ability to monitor system strictly, especially to monitor threats of polluted environment, and monitor compliance with standard regulations.

Thirdly, it is the huge investment. The time to build project is long, and the payback time is also long. And it is not enough impression for investor.

The project of waste to electricity in Vietnam is not only some numbers that has been provided above. Currently, there are a lot of paper projects because of so many reasons, and one of them is there is not agreement about cost of waste disposal and the price of electricity. Because of different materials, so if it is not separated at sources thoroughly, and there is mixed organic waste from foods, which is low characters of fuel, and it will cost more for burning waste. Therefore, until we solve the problem of separating garbage and the policy about cost of waste disposal as well as the price of selling electricity, we will impress investment to deal with polluted environment in big cities.

According to the Decision No. 31/2014/QĐ - TTg on 05/5/2014 that was issued by Prime Minister about policy of supporting to develop projects of generating electricity from solid waste in Vietnam, there is circular about support for price of buying electricity but waste disposal projects must to follow the plan of power sector; therefore, they have to face with the difficult of waiting for plan of power sector. Besides, there is not any specific guidance to apply the Law of planning, so adding more projects into plan of developing power sector will take time and slow.

Moreover, the price of electricity is just applied for projects of generating electricity from direct solid waste burned incineration and from collecting gas at landfill buried waste. It is needed to review before applying new technology in waste to electricity; or it is not clearly, adequate, so it leads to long time to complete documents as well as procedure, and it makes difficult for investor. And, when enterprises want to invest into waste disposal in Vietnam have to face with complicated procedure, and it also takes time. With regard to invest into solid waste disposal process is type of investment in the form of public private partnerships (PPP), the investment procedure is needed to choose investor and it takes from 1 to 2 years; and after that, it is procedure for construction investment such as design appraisal, fire prevention and fighting appraisal, report on environmental impact assessment, procedures for completing environmental protection. The problem of balancing between cost and profit for investment always is difficult aspect, because this is high technology, expensive and modern technology, and Vietnam still not research in complex to control this technology.

4. RECOMENDATIONS OF DEVELOPING WASTE DISPOSAL FOR GENERATING ELECTRICITY

From researching the case study of electricity generation from solid waste, we provide some recommendations to solve difficult problems on the path to circular economy as below:

First of all, the Government should review and change the documents, systems, and procedures, that are obstacles for managing investment in domestic waste sector (the legal about PPP, the Decisions to develop waste to electricity, and the planning jobs). It is also needed to provide specific policies for prioritizing investment.

Secondly, simplified procedure to create conditions for enterprises invest into solid waste disposal to build up the industrial environment sector in Vietnam.

We should ensure the collecting waste system has been controlled in good way.

With regard to long-term agreement of buying electricity/water vapor between stakeholders, it should be ensured benefits of them and the most important thing is the benefit for community. These agreements must to ensure certain stability as well as changes in master plan for developing social economics of local and nation. In order to do this, the Ministry of Industry and Trade must to consider and appraise soon the report on supplementing the national electricity development period 2011 – 2020 with the vision to 2030 (Power Planning VII adjusted) and submit to Prime Minister to approve for waste to electricity projects in general and the Seraphin manufacture at

solid waste disposal in Xuan Son, Son Tay in particularly into the revised power planning VII to create legal for implementing this project on schedule.

Ensuring long-term of safety environmental standards, it is not only sustainable, but also updates with increasing strictly environmental requirements.

Ensuring the skilled staff who meets current requirements and future growth requirements. These staff should be trained before project runs to ensure that they are proactive in operating new and complicated technology.

Ensuring the consent of citizen for solid waste burned incineration projects.

In conclusion, there are a lot of problems we have to deal with project of waste to electricity. And, it is necessary to aware threats and opportunities of the development path to have suitable solutions for solving all difficulties to implement effectively projects of waste to electricity, and beyond is to develop the circular economy.

5. REFERENCES

- [1] Bao Nga; Thuy Ngan (2016). Separating garbage at sources: 10 years back to zero. <http://hanoimoi.com.vn/Tin-tuc/Xa-hoi/835416/phan-loai-rac-thai-tu-nguon-10-nam-lai-tro-ve-con-so-0>
- [2] Enterprises News (2020). <https://enternews.vn/truc-tiep-toa-dam-o-nhiem-rac-thai-va-cac-giai-phap-phet-trien-cong-nghe-dien-rac-tai-viet-nam-174239.html>
- [3] Haoran Zhao, Huiru Zhao, Sen hua. Evaluating the comprehensive benefit of eco-industrial parks by employing multi-criteria decision making approach for circular economy (2016). Journal of cleaner production. Volume 142, Part 4, 20 January 2017, 2262-2276.
- [4] Ministry of Industry and Trade 2012. Decision No. 8217/QĐ-BCT on 28/12/2012 approved: Proposal of planning to develop recycle energy in the Delta and Mountain in the Northern of Vietnam to 2020, the vision to 2030. <https://thuvienphapluat.vn/van-ban/tai-nguyen-moi-truong/Quy-dinh-8217-QĐ-BCT-2012-phet-trien-nang-luong-tai-tao-vung-dong-bang-trung-du-Bac-Bo-430566.aspx>
- [5] Ministry of Industry and Trade (2015). Circular No. 32/2015/TT-BCT about developing projects and model agreement of selling and buying electricity will be applied for domestic waste to electricity <https://thuvienphapluat.vn/van-ban/thuong-mai/Thong-tu-32-2015-TT-BCT-Hop-dong-mua-ban-dien-mau-du-an-phet-dien-su-dung-chat-thai-ran-292666.aspx>.
- [6] Modul 4: The conditions and problems of waste to electricity. <http://gizenergy.org.vn/media/app/media/bai%20rinh%20bay/6- Amrehn Module 4-VIE.pdf>
- [7] Nguyen Hanh (2017). The polluted smell from waste disposal Phu Quoc manufacture, citizen has stopped waste transportation. <https://dantri.com.vn/xa-hoi/nha-may-xu-ly-rac-phu-quoc-boc-mui-dan-chan-xe-rac-20171021070704234.htm>.
- [8] Nguyen Xuan Quang (2017). Burning waste to generate electricity, the opportunity and threat for Vietnam. <https://tiasang.com.vn/khoa-hoc-cong-nghe/Dot-rac-phet-dien-tiem-nang-va-hien-thuc-cho-Viet-Nam-11006>
- [9] Nguyen Thi Kim Nga (2005), Environmental and Resources Economics Lessons. Vietnam National University Press.
- [10] Prime Minister 2014. The Decision No. 31/2014/QĐ - TTg about policy of supporting to develop projects of generating electricity from solid waste in Vietnam. <https://thuvienphapluat.vn/van-ban/tai-nguyen-moi-truong/Quy-dinh-31-2014-QĐ-TTg-ho-tro-phet-trien-du-an-phet-dien-su-dung-chat-thai-ran-228427.aspx>
- [11] Proposal of master planning to develop recycle energy in the Delta and Mountain in the Northern of Vietnam to 2020, the vision to 2030 <http://www.ievn.com.vn/tin-tuc/Quy-hoach-phet-trien-Nang-luong-tai-tao-vung-dong-bang-trung-du-Bac-Bo-den-nam-2020-tam-nhin-den-nam-2030-5-1027.aspx>.
- [12] The Report of waste to electricity Serahpin manufacture at waste disposal landfill Xuan Son, Son Tay, Hanoi.

THE IMPACT OF CRUDE OIL PRICE ON SOME MACROECONOMICS INDICATORS OF VIETNAM IN THE PERIOD OF 2015-2019

Pham Canh Huy^{1,*}, Pham Thanh Vinh¹, Pham Ngoc Duy¹

¹ School of Economics and Management, Hanoi University of Science and Technology

*Corresponding author: huy.phamcanh@hust.edu.vn

Abstract

Oil is considered as one of the most important inputs in most economic activities; therefore, any fluctuations or shocks in oil price have significant impact on global economy as well as on any country. Hence, oil price has become one of the main indicators in economic analysis. The article will shed lights on the impact of oil price on some macroeconomics indicators of Vietnam, specifically the Consumer Price Index (CPI) and the Index of Industrial Production (IIP). The research will employ the Vector Autoregression (VAR) model, the samples include oil price, which is the Consumer Price Index (CPI) and Index of Industrial Production (IIP) recorded monthly in the period from January 2015 to December 2019. Results have shown the impact oil price has on macroeconomic indicators in Vietnam.

Keywords: Oil Price, Index of Industrial Production, Consumer Price Index of Vietnam.

1. INTRODUCTION

Oil is one of the most crucial fuels of the modern society. Oil fuels the production of electricity, industrial production, and vehicles. Oil also serves several non-energy purposes in petrochemical industry such as production of fertilizer and plastics. Nowadays, oil also goes by “black gold”, contributing largely to the development of all nations around the world.

Oil is an energy source and a valuable resource in many economic activities. Fluctuations in oil price will have multi-dimensional influences on oil-mining enterprises and manufacturing enterprises that use oil as input resource. The increase in oil price will benefit oil enterprises while damaging the enterprises that consume oil or use materials derived from oil.

We understand that IIP and CPI are important macroeconomic indicators. The increase or decrease in oil price would affect CPI as gasoline price contributes significantly to the CPI basket of goods. A decline in oil price will have a positive impact on households' consumption and business activities as households could save on some expenses and thus increase spending on other services, contributing to improving total retail sales in goods and services.

Vietnam is a crude oil exporter but also an importer of oil products. Oil prices have two-sided effects on the economy, an increase in oil price will be beneficial for the state budget; the operational efficiency of enterprises in the oil and gas industry, especially businesses in the upstream phase, will grow, with the costs of rising input expenditure in several sectors of

the economy, affecting production efficiency, as well as increasing inflation. On the other hand, a decline in oil prices will lead to decreasing energy and fuel input costs, thereby stimulating consumption and improving operational efficiency of companies and industries that consume oil or use materials derived from oil. However, the operations of enterprises in the oil and gas industry will be affected due to declining revenues, indirectly deferring the explorations and deployments of new rigs, affecting mining output for the upcoming years. Therefore, the impact of oil prices on the Index of Industrial Production (IIP) in this period requires specific empirical research.

Previous studies have shown the impact of oil prices on the macroeconomic indicators of countries such as the US, Canada or some Southeast Asian countries including Malaysia and Thailand. However, due to the relationship of oil prices and macroeconomic variables from time to time, there are certain differences in each country.

2. LITERATURE REVIEW

To find out the correlations between oil prices and the economy, prior research has been conducted to study the impact of oil prices on macroeconomic indicators and it has been clarified that oil price fluctuations have some impact on the macroeconomic indicators in specific countries. Some studies use a qualitative approach while others apply a quantitative approach through the use of econometric models.

One of the first studies on the impact of oil prices on the macroeconomy was Hamilton (1983), who concluded the impact of oil prices on the post-World-

War-II macroeconomy of the United States, this prompted other researchers to look at this issue in more detail. Next, Ferderer (1996) analyzed US data from 1970 to 1990 to examine the relationship between oil price volatility and macroeconomic indicators. In this study, an vector autoregression model (VAR) was used to analyze the effects of both oil price shocks and oil price movements on macroeconomic variables.

The study of George & Ioannis (2014) shed lights on the impact of oil prices and empirical research was conducted in oil exporting and importing countries using VAR model. The results indicate that inflation levels in both oil net-exporters and net-importers are significantly affected by oil prices.

There are less studies about the relationship between oil prices and Industrial Production Index. Cunado and Perez (2003) studied the impact of oil prices on Industrial Production Indexes in many European countries using quarterly data for the period 1960-1999. Results indicate that oil prices have an impact on inflation and in the short term but an asymmetric effect IIP. Furthermore, the responses in each country to these shocks differ considerably.

For Southeast Asian region, dweller of developed countries with economic potential and development conditions similar to those in Vietnam, there have been studies to evaluate the relationship between oil prices and macroeconomic variables. Shuddhasawtta & Ruhul (2009) studied the effect of oil prices on macroeconomy in Thailand, using the VAR model, the study showed that there is a causal relationship

between fluctuations in oil prices and investment rate, unemployment rate, interest rates and trade balance over the entire data period of the study.

Al-hajj et al (2018) explored how oil price shocks have affected Malaysia's stock market. The research concluded that the oil price shock, either up or down, has a negative impact on the stock market, implying that the Malaysian stock market is very sensitive to oil price fluctuations.

In Vietnam, the study using the VAR model with the input series of macro data from 1995 to 2009 by Le & Nguyen also confirmed a long-term relationship between oil prices, inflation, and the exchange rate.

3. THE FLUCTUATION OF GLOBAL CRUDE OIL PRICES AND SOME MACROECONOMIC INDICATORS OF VIETNAM IN THE PERIOD 2015-2019

3.1 The fluctuation of global crude oil prices in the period 2015-2019

Since the establishment of market, global oil prices have gone through many volatile periods. Specifically, in the period from 2015 to 2019, the global crude oil market also experienced significant fluctuations. Due to Singapore being the main importer of Vietnam's petroleum, the market was not affected much by oil prices in the US. The price of imported petroleum in Vietnam is based on the Brent Crude Oil Price, so the research is also using Brent Crude Oil Price during the period from 2015 to 2019, calculated in USD.

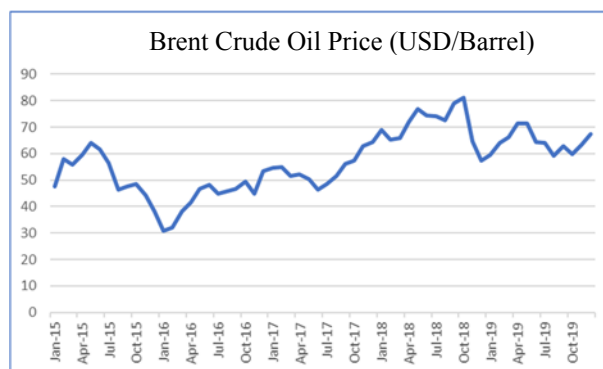


Fig. 1: Brent Crude Oil price in the period 2015-2019

It can be seen from Figure 1 that the period from mid-2015 to early 2016 witnessed a rapid decline in global crude oil price. Under such circumstances, OPEC and many countries have made efforts to promote the rebalancing process such as OPEC's agreement to cut 1.2 million barrels a day between the end of 2016 and early 2017. After a period of negotiation, OPEC members have managed to build an output ceiling, thereby pulling oil prices to a relatively stable level around 50-55 USD/barrel from December 2016 to mid-2017.

Oil price in 2018 was in constant reversal. The oil market in 2018 was in volatility as OPEC's lost its monopoly status on supply and the rights to fix world oil prices. In 2019, crude oil production in OPEC member countries fell by 2.2 million barrels per day to an average of 29.8 million barrels a day (compared to 32.0 million barrels in 2018). Although many tensions in 2019 have affected the oil market such as US sanctions, tensions in the Gulf, assaults on oil facilities in Saudi Arabia, the OPEC + deal, the price of crude oil did not see any significant movements.

3.2. Macro-economic indicators of Vietnam for the period 2015-2019

a. Index of industrial production IIP

Index of Industrial Production (IIP) of Vietnam for the period 2015 - 2019 was as follows:

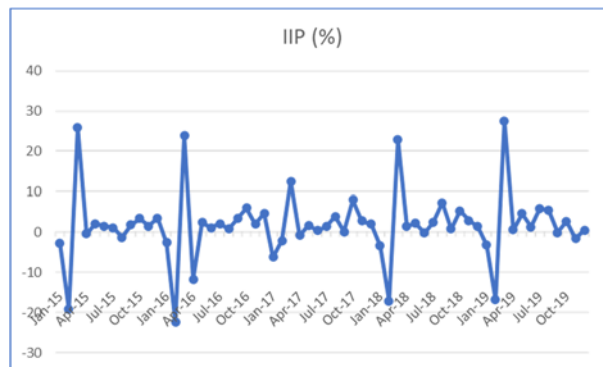


Fig. 2: Index of Industrial Production (IIP) of Vietnam for the period 2015 - 2019

IIP in 2016 rose by 7.5% compared to 2015. Processing and manufacturing sectors increased by 11.2%; electricity production and distribution increased by 11.5%; water supply and waste treatment, wastewater increased by 7.2%; the mining industry plunged by 5.9%.

In 2017, the IIP soared by 9.4% compared to 2016, much higher than the growth rate of 7.5% in 2016. Processing and manufacturing sectors increased by 14.5%, highest in the past 6 years; electricity production and distribution rose by 9.4%; water supply and waste and wastewater treatment rose by 8.7%; the mining industry decreased by 7.1%.

For the whole year 2018, IIP was increased by 10.2% over the previous year. Processing and manufacturing sectors continued to play a key role, promoting the overall growth of the whole industry with an increase of 12.3%; the electricity production and distribution

sector ensures to provide enough electricity for production and consumption of the population with an increase of 10%; water supply and waste and wastewater treatment sectors rose by 6.3%; the mining industry continued the decline but with a lower rate of 02% (mainly due to the decrease of 11.3% in crude oil mining). IIP in 2019 saw an increase of 8.86% compared to that of the previous year.

It can be said that the IIP index of Vietnam in the period 2015-2019 had a promising growth. Monthly grows were positive, with high growth usually happening around March. Negative growth was seen in January and February every year, as this is the Tet holiday period.

b. Consumer Price Index

Consumer Price Index for the period of 2015 to 2019 was as follows:

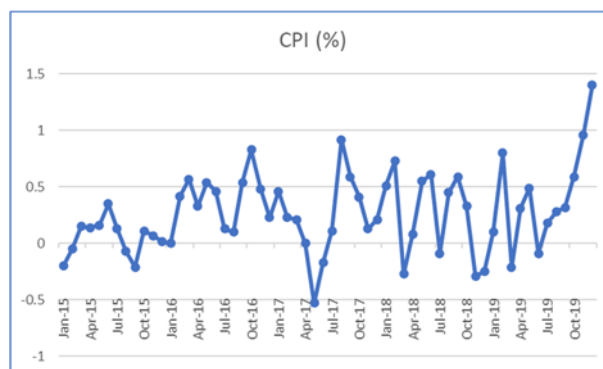


Fig. 3: Consumer price index for the period 2015-2019

According to the General Statistics Office, CPI in December 2015 increased by 0.6% compared to the same period in 2014 and 2015 CPI increased by 0.63% compared to that in 2014. The growth rate between 2014 and 2015 was the lowest in the past 14 years and much lower than the target CPI of 5%.

Consumer price index in December 2016 increased by 0.11% over the previous month and by 1.87% compared to the same period last year. Average inflation rate in 2016 increased by 1.83% compared to that in 2015. The Consumer Price Index in the following period had certain fluctuations but was lower than the target set by the National Assembly.

According to statistics, Vietnam's CPI in December 2019 increased by 1.4% compared to the previous month, the highest increase in the last 9 years. In particular, restaurant and catering services saw the highest rise of 3.42%, mainly due to the increase of 4.41% of the food sector (making the overall CPI increase by 1%); staple food increased by 0.45%; out-of-home dining increased by 2.44% due to the influence of the food group (increasing the overall CPI by 0.22%). The traffic group increased by 0.61% due to the influence from the increase in gasoline and oil prices on November 30, 2019, causing the price of gasoline and oil to increase by 1.27% (resulting in a CPI increase of 0.05%). Housing and construction materials sector rose by 0.43% due to the increase of 1.03% in domestic gas price and 0.37% in house repair services; garment, hats and footwear by 0.33%; beverage and tobacco rose by 0.25%; household equipment and housewares rose by 0.14%; entertainment, cultural services and tourism rose by 0.09%; education and educational service both increased by 0.01%; commodity and other services rose by 0.24%. The only sector experiencing a decline was postal and telecommunications, at the rate of 0.09% over the previous month. Although the average CPI in 2019 increased by 2.79% compared to the average in 2018, it was below the target set by the National Assembly.

4. MODELS AND DESCRIPTIVE DATA

4.1. Introduction to the VAR model

Based on prior research with many different models, the study uses the autoregression vector econometric model (VAR) to test the impact of oil prices on IIP and CPI. The study also calculates impulse response functions to measure the variation of the variables and

analyze the variance decomposition to measure the effects of the research variables.

A vector autoregression (VAR) model is a multivariate time series model containing a system of n equations of n distinct, stationary response variables as linear functions of lagged responses and other terms. VAR models are also characterized by their degree p ; each equation in a VAR(p) model contains p lags of all variables in the system.

For a set of n time series variables, a VAR model of order p (VAR(p)) can be written as:

$$(1) \quad y_t = A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_{t-p} + u_t$$

where the A_i 's are $(n \times n)$ coefficient matrices and u_t is an unobservable i.i.d. zero mean error term.

The condition for a VAR model to be valid is that the variables over time must be stationary which means the variance and covariance at the same lag are constant over time. If the variable is not stationary, it will cause artificial regression, making OLS in regression analysis not applicable.

4.2. Descriptive data

The study uses data sample of monthly average Brent Crude oil prices from 2015 to 2019 and some selected macroeconomic variables, including the IIP and the CPI. The main objective of the study is to evaluate the impact of oil prices on the mentioned macroeconomic indicators. Data on the IIP and CPI in the considered period are obtained from the General Statistics Office of Vietnam.

Below is a statistics table describing the data: oil prices (denoted by OP) are measured in units of USD, the IIP and CPI are shown by percentage.

Table 1: Descriptive statistics of the variables

	OP	CPI	IIP
Mean	57.11367	0.264333	1.721667
Median	57.43500	0.220000	1.500000
Maximum	81.03000	1.400000	27.60000
Minimum	30.70000	-0.530000	-22.30000
Std. Dev.	11.47058	0.354340	8.804142
Skewness	-0.066729	0.466849	0.347255
Kurtosis	2.500458	3.612231	5.862458
Jarque-Bera	0.668385	3.116545	21.69003
Probability	0.715916	0.210499	0.000020
Sum	3426.820	15.86000	103.3000
Sum Sq. Dev.	7762.883	7.407873	4573.262
Observations	60	60	60

A statistical table describing 60 samples was analyzed by Eviews. Results showed the average value of CPI data series in 60 months is 0.26%, ranging from -0.53% to 1.4%. The standard deviation of the CPI is 0.35% indicating that the CPI data series over the past 60 months has signified some certain fluctuations.

For the IIP data, the average value over the last 60 months is 1.72%, ranging from -22.3% to 27.6%. The standard deviation of 8.8% indicates that the IPP chain has had large fluctuations over the period studied.

Lastly, for the OP data series, research found that the average value for this variable over the period is 57.11 USD, ranging from 57.43 USD to 81.03 USD. The standard deviation of \$11.47 implies that oil prices have also experienced relative volatility (around 20%) between 2015 and 2019.

5. RESEARCH RESULTS

5.1. Verify the stationarity of variables

Nelson and Plosser (1982) argue that most time series are non-stationary at order I (0); so, before analysis, it is necessary to test whether the time series is stationary

or not. The stationarity of the intentional time series has been employed. If the time series is non-stationary then the assumption of the OLS (Ordinary Least Square) method is not satisfactory. Accordingly, the t-tests or F-tests are not valid (Chrish, 2008).

Here, we will use the Unit root test, specifically the ADF test, and after adding data to the Eviews software we get the results of the stationarity of the data series. D (OP, 1), CPI, IIP.

5.2. Determine the optimal lag length

In estimating the VAR model, the determination of the lag length is very thorough. If the lag length is too great for parameters to be overestimated, then a large enough sample size is required.

So when building VAR models, there is a need to determine the optimal lag length. Optimal lag length is often selected based on the Akaike information standard (AIC). The delay that causes the above statistics to accept the smallest value is considered the optimal delay of the model.

Table 2: Optimal lag length selected by the criterion

VAR Lag Order Selection Criteria
 Endogenous variables: IIP CPI D(OP)
 Exogenous variables: C
 Date: 09/22/20 Time: 16:10
 Sample: 1 60
 Included observations: 58

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-389.6670	NA	152.4171	13.54024	13.64682	13.58176
1	-370.7325	35.25729*	108.2779*	13.19767*	13.62397*	13.36373*

* indicates lag order selected by the criterion
 LR: sequential modified LR test statistic (each test at 5% level)
 FPE: Final prediction error
 AIC: Akaike information criterion
 SC: Schwarz information criterion
 HQ: Hannan-Quinn information criterion

From table 2, it is clearly seen that the optimal lag length order of the model equals 1.

5.3. Test the stability of the model

Inverse Roots of AR Characteristic Polynomial

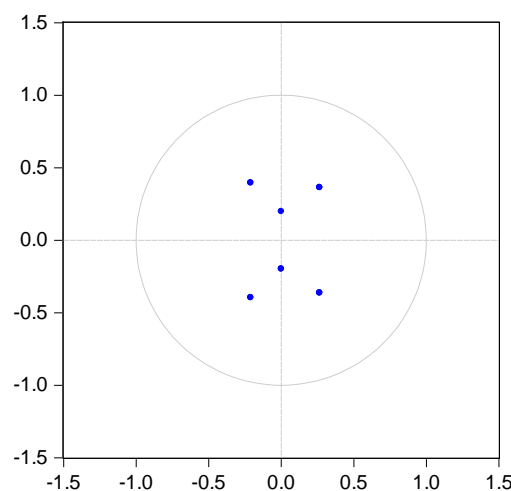


Fig. 4: Testing the stability of the model

From Figure 4, it can be observed that all dots are inside the circle; therefore, the model holds.

5.4. Results and meaning of the model

a. Estimated results of VAR model

VAR Model - Substituted Coefficients:

$$IIP = -0.447193834205 * IIP(-1) + 0.327623129345 * CPI(-1) + 0.18313032102 * D(OP(-1)) + 2.84284134299$$

$$CPI = 0.00278675932479 * IIP(-1) + 0.303314199623 * CPI(-1) + 0.0215828081729 * D(OP(-1)) + 0.19051054101$$

$$D(OP) = 0.0491821428126 * IIP(-1) + 1.3828438285 * CPI(-1) + 0.134317515079 * D(OP(-1)) - 0.316534263645$$

If we just stop at estimating the VAR model, we cannot see the whole meaning of the model for the study. Therefore, the explanation will be easier when done through the reaction Impulse Response Functions and Variance Decomposition of the VAR model to be able to see more clearly the relationship of the variables.

b. Impulse Response Functions IRF

The Impulse Response Functions describes the effects of a shock at a time on present and future endogenous variables. So here we need to consider the IRF push response function to be able to see more clearly the relationship between the variables.

To evaluate the impact of oil price variable OP on two variables CPI and IIP, we focus on observing two Impulse Response Functions charts describing the impact of the variable OP on the variable CPI and the impact of the variable OP on the variable IIP.



Fig. 5: Response of IPP to crude oil prices

As a result of the push reaction, we can see that when the price of crude oil starts to fluctuate, it also has an impact on the IIP index, which has a positive impact

towards the end of the 2nd period but then a negative but very small impact at Period 3. From Period 4 onwards, the effects are not clear.

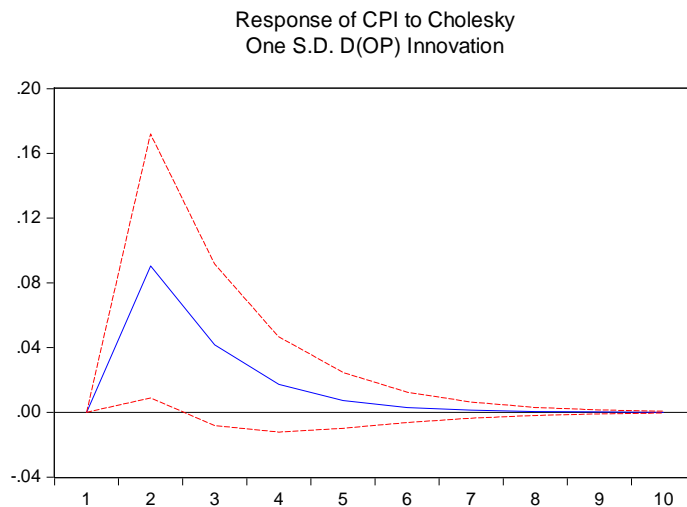


Fig. 6: Response of CPI to crude oil prices

Observing the response function of CPI to oil price fluctuations, we can see from the first period and the strongest in Period 2, then its effect decreases gradually and is almost insignificant from Period 5.

c. Variance decomposition of VAR model

After the push response function, we perform analysis of variance decomposition. Variance decomposition (Variance decomposition) is used to predict the percentage effect of the exogenous variables on

endogenous variables in the system of equations of the VAR model.

From period 2, we can see the effect of oil prices on the IIP. This volatility is stable from period 3. The impact of oil prices on the IIP is quite small.

Even in period 1 we have seen the effect of oil prices on the CPI. This volatility has been mostly stable since period 5. Oil price variable explains 21% of the CPI volatility.

Table 3: Variance Decomposition of VAR model

Variance Decomposition of CPI:				
Peri...	S.E.	IIP	CPI	D(OP)
1	7.580535	14.35803	85.64197	0.000000
2	8.362437	11.55939	82.10274	6.337868
3	8.509714	11.18296	81.42106	7.395981
4	8.542834	11.11406	81.31760	7.568342
5	8.549496	11.10321	81.29716	7.599629
6	8.550993	11.10111	81.29406	7.604829
7	8.551298	11.10078	81.29343	7.605788
8	8.551366	11.10072	81.29333	7.605946
9	8.551380	11.10071	81.29331	7.605975
10	8.551383	11.10071	81.29331	7.605980

Variance Decomposition of IIP:				
Peri...	S.E.	IIP	CPI	D(OP)
1	0.320283	100.0000	0.000000	0.000000
2	0.359239	98.83405	0.323883	0.842070
3	0.366224	98.81036	0.315299	0.874342
4	0.367397	98.77627	0.324732	0.899003
5	0.367609	98.77487	0.324436	0.900696
6	0.367645	98.77348	0.324792	0.901725
7	0.367651	98.77340	0.324783	0.901813
8	0.367652	98.77335	0.324797	0.901857
9	0.367653	98.77334	0.324797	0.901861
10	0.367653	98.77334	0.324797	0.901863

Variance Decomposition of D(OP):				
Peri...	S.E.	IIP	CPI	D(OP)
1	4.673916	0.036920	19.58614	80.37694
2	4.762597	0.243285	20.94861	78.80811
3	4.780706	0.350296	21.18882	78.46088
4	4.782996	0.358110	21.22861	78.41329
5	4.783585	0.362659	21.23569	78.40166
6	4.783657	0.363065	21.23685	78.40009
7	4.783677	0.363260	21.23705	78.39969
8	4.783679	0.363281	21.23709	78.39963
9	4.783680	0.363289	21.23709	78.39962
10	4.783680	0.363290	21.23709	78.39962

Cholesky Ordering: IIP CPI D(OP)

6. DISCUSSIONS OF FINDINGS

After proposing the VAR model and estimating the model, we have assessed the impact of oil prices on two macroeconomic indicators in Vietnam, the IIP index and the CPI in the period of 2015-2019. The results have shown specifically that when oil prices

fluctuate, it will have a stronger impact on our country's CPI than its impact on the IIP.

From the results obtained, we can conclude that oil prices play an important role in stabilizing inflation in Vietnam and partly to the index of industrial production. It can be explained by the fact that Vietnam is the country which both exports and imports oil and oil products. With the constant fluctuation of oil prices

in the international market, the domestic market for petroleum products is also significantly affected, although the Government has taken some measures and tools to regulate gasoline prices to minimize the negative effects from oil price volatility in international markets.

The issue of the influence of oil prices on economic indicators of the macro economy is an important issue, this is not only a scientific issue but also of high practical value. Doing quantitative research on the relationship of oil prices and macroeconomic variables can help policy-making bodies in the review and decision-making of their policies.

7. REFERENCES

References should be numbered in the paper body in order of appearance using name of the author(s) and year of publication enclosed in round brackets (Author, 2019). They should also be listed at the end of the manuscript (in this section) in Times New Roman 10pt. References should be complete in style as shown in the examples below:

- [1] Al-hajj, E., Al-Mulali, U. and Sakiru, A. S. (2018), "Oil price shocks and stock returns nexus for Malaysia: Fresh evidence from nonlinear ARDL test", *Elsevier Ltd*.
- [2] Charles, N. and Charles, P. (1982), "Trends and random walks in macroeconomic time series: Some evidence and implications", *Journal of Monetary Economics*, **10** (1982), 139-162.
- [3] Cunado, D. and Perez, G. (2003), "Do oil price shocks matter? Evidence for some European countries".
- [4] Farrdous, A. (2015), "An Investigation into the Crude Oil Price Pass Through to the Macroeconomic Activities of Malaysia", *Energy Procedia*.
- [5] Ferderer, J. P (1996), "Oil Price Volatility and the Macroeconomy: A Solution to the Asymmetry Puzzle", *Journal of Macroeconomics*, **18**.
- [6] George, F. and Ioannis, C. (2014), "Financial and monetary policy responses to oil price shocks: Evidence from oil-importing and oil-exporting countries", *Review of Quantitative Finance and Accounting*.
- [7] Hamilton, J. D. (1983), "Oil and the Macroeconomy since World War II", *Journal of Political Economy*.
- [8] Hamilton, J. D. (2003). "What is an oil shock?", *Journal of Econometrics*.
- [9] Hamilton, J. D. (2005), "Oil and the Macroeconomy".
- [10] Hookers, M. A. (2002), "Are Oil Shocks Inflationary? Asymmetric and Nonlinear Specifications versus Changes in Regime", *Journal of Money, Credit and Banking*.
- [11] James, D. H. (1983), "Oil and the Macroeconomy since World War II. The Journal of Political Economy", *The University of Chicago Press*, **9** (2), 228-248.
- [12] Korhan, G., Vahid, A. and Nigar, T. (2015), "The relationship between Industrial Production, GDP, Inflation and Oil Price: The case of Turkey", *Procedia Economics and Finance*.
- [13] Lardic & Mignon (2006), "Oil Prices and Economic Activity: An Asymmetric Cointegration Approach".
- [14] Le, V. T. and Nguyen, T. T. V. (2011), "The impact of oil prices, real effective exchange rate and inflation on economic activity: Novel evidence from Vietnam", *Petrovietnam Journal*, 67 - 79.
- [15] Nguyen, Q. D. and Nguyen, T. M. (2013), "Econometrics", *National Economics University Publishing*.
- [16] Rafiq, S., Salim, R., & Bloch, H. (2009), "Impact of crude oil price volatility on economic activities: An empirical investigation in the Thai economy", *Resources Policy, Elsevier*, **34** (3), 121-132.
- [17] Rebeca, J-R. (2005), "Oil price shocks and real GDP growth: empirical evidence for some OECD countries".
- [18] Ronald, A.R and Joaquin, L. V. (2015), "Oil prices and global factor macroeconomics". *Energy Economics*.
- [19] Shuddhasawtta, R., Ruhul, S. and Harry, B. (2008), "Impact of crude oil price volatility on economics activities: An empirical investigation in Thai economy", *Resources Policy*.
- [20] Vu, K. D and Nguyen, V. C. (2016), "Economics", *National Economics University Publishing*.

FOOD SECURITY FOR POVERTY REDUCTION VIA IMPACTS OF MACRO FACTORS ON RICE PRICE IN AN ECONOMETRIC MODEL - A STUDY CASE IN VIETNAM

Pham Minh Dat, PhD

Thuongmai University, Hanoi, Vietnam

minhdat@tmu.edu.vn

Hoang Thanh Hanh, PhD

Academy of Finance, Vietnam

hoangthanhanh@hvtc.edu.vn

Dinh Tran Ngoc Huy, MBA

Banking University HCMC, Ho Chi Minh city, Vietnam - International University of Japan, Japan

dtanhuy2010@gmail.com

Bui Thi Thu Hang, Master

TayNguyen University, Daklak, Vietnam

btthang@ttn.edu.vn

Bui Dan Thanh, PhD

Banking University HCMC, Ho Chi Minh city, Vietnam

thnhbd@buh.edu.vn

Pham Thi Hong Nhung, PhD

TNU - University of Economics and Business Administration (TUEBA), Thai Nguyen, Vietnam

Thuthuytn1211@gmail.com

Ly Thy Hue, PhD

National University of Public Administration

lythyhue@gmail.com

Tran Quoc Tuan, PhD

Banking University HCMC, Ho Chi Minh city Vietnam

tuancnck@gmail.com

Abstract

Aim: The research aimed to evaluate impacts of macro socio-economic factors including population, GDP growth, inflation and interest rates on the dependant variable "rice price" in Vietnam. We will concentrate on Vietnam case and just use Thailand data as references to compare to Vietnam.

Research Design/Methodology: The research used quantitative design with econometric model with 4 macro economic factors affecting rice price to reflex food security. The sample size comprised of a Southeast Asian country (Vietnam) and the time-frame for the study was 2010 to 2019. The main techniques of analysis were Bayes and regression with stata software. We use time series data during 10 years, regularly, so not using panel data.

Findings: It was found that interest rate in Vietnam has negative correlation with rice price in the country; then, inflation in Vietnam has positive correlation with rice price in the nation. On the contrary, comparing to Thailand case, inflation has negative correlation with rice price, I.e, Thailand rice price will reduce if inflation is little higher.

Limitations/Implications: The research was limited to the case of Vietnam; hence, we can expand research to other Asian countries or European, US, Middle East and Africa.

Keywords: food security, macro economic factors, poverty reduction rice price, inflation, population, Vietnam.

JEL: E01, E4, E6

1. INTRODUCTION

With the advancement of technology and rapid globalization, rice crops can be developed more with higher quality and quantity and hence, beneficial for the economy. However, after period of financial crisis, we need to measure impacts of macro factors on rice price to see certain impacts on producing, consuming, ex-import, and hence, food security and poverty reduction.

Economic development is associated with the process of agriculture development, and esp rice price and crops quality. Rice price and crop are affected by macro socio-economic factors such as inflation and interest rates, etc.

In general terms, Poverty reduction can be done via a mechanism in which the nation can control investment, GDP growth and inflation, as well as interest rate as they have certain impacts on rice price and therefore, food security, as presented in below section.

Hence, the research aims to identify the relation ship among macro factors and rice price in a Southeast Asian country (Vietnam) and examine whether proper policies need to be implemented for food security and poverty reduction.

As we can see from the below Fig. 1: Population in Vietnam is higher than that in Thailand and they move in the same trend. While inflation in Vietnam is also higher, but not in the same trend.

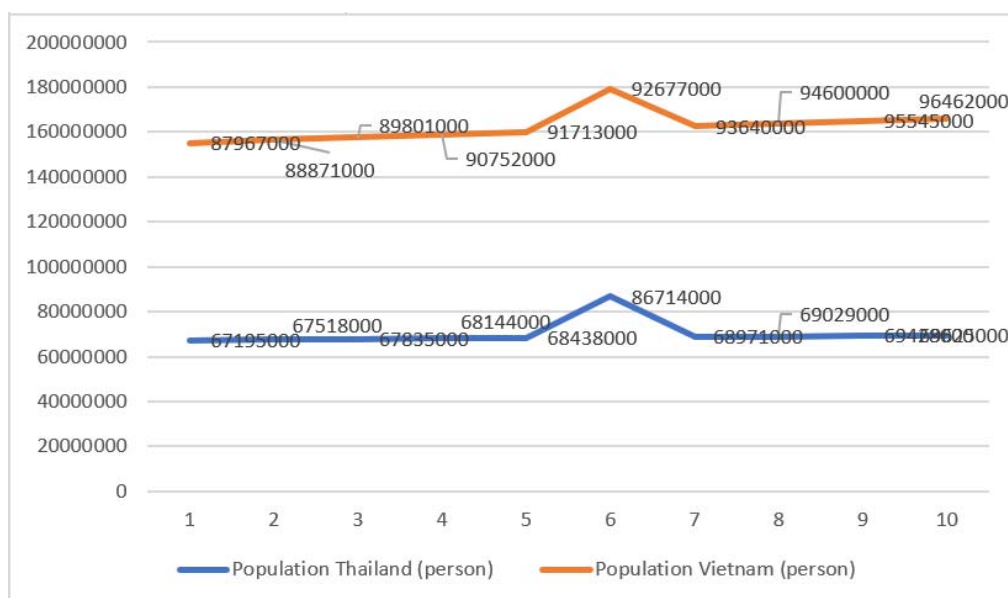


Fig. 1: Compare population in 2 countries

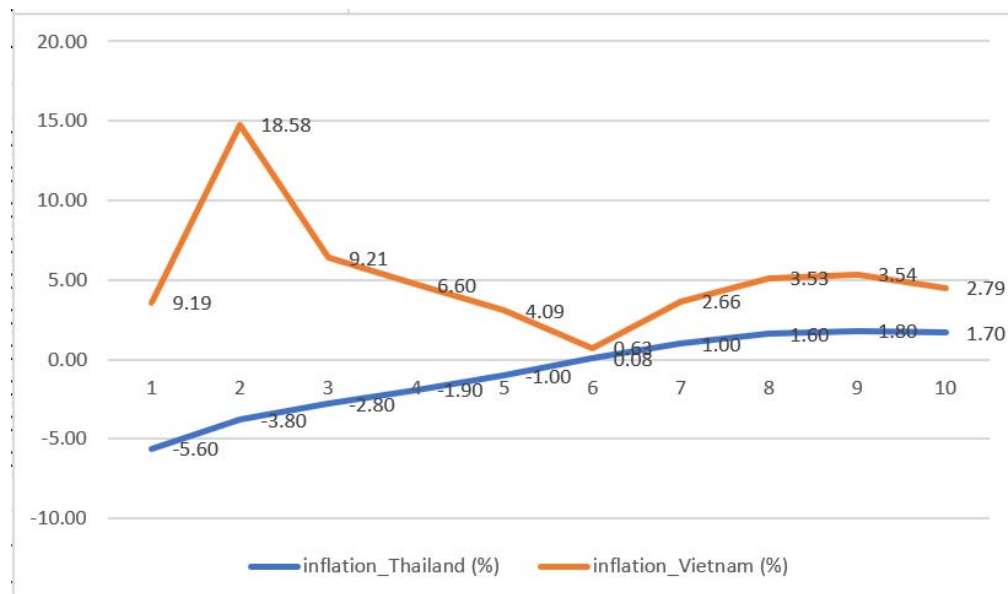


Fig. 2: Compare Inflation in 2 countries

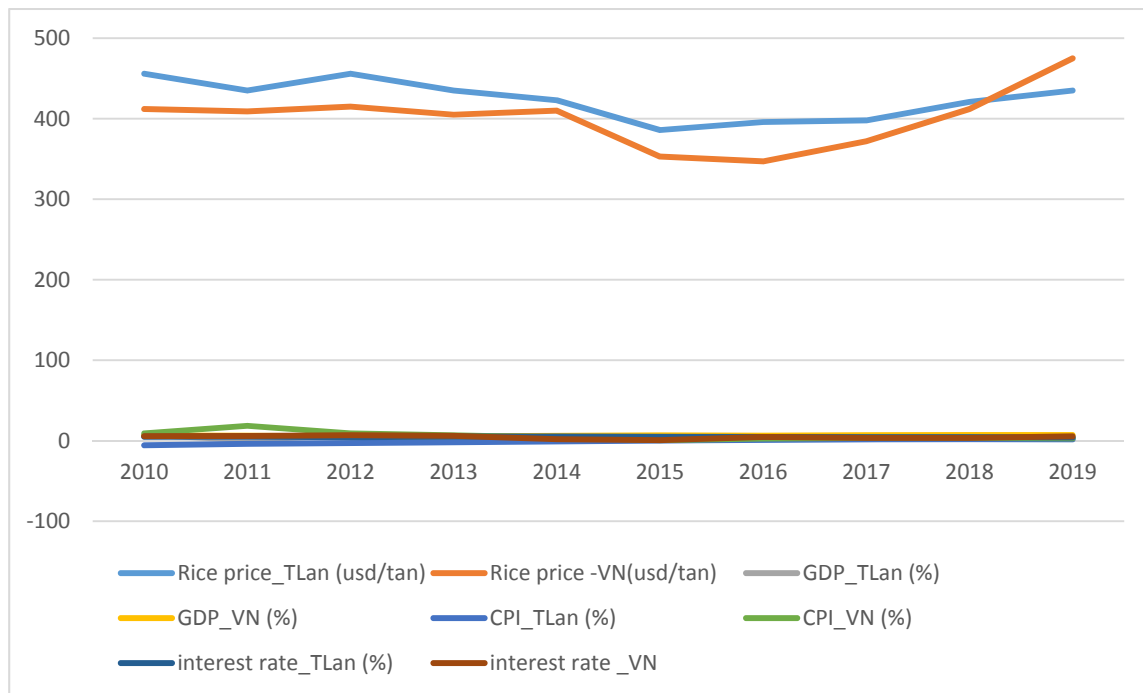


Fig. 3: Compare Rice price, Inflation, GDP growth and interest rates in 2 countries

Based on the above charts, we recognize rice price in Vietnam is lower than (<) rice price in Thailand until 2019, it is higher than rice price in Thailand. Also, we can see that CPI in Vietnam is higher than CPI in Thailand.

2. LITERATURE REVIEW

The most significant determinant of decline in price competitiveness of rice during 1989-1995 is large appreciation in real exchange rate, for which macroeconomic policies were chiefly responsible (Romeo, 1999). Ronald et al. (2011) revealed that most of the long-term trends in agricultural production and consumption that contributed to the 2002-2006 price increases and the 2007-2008 price spike also contributed to the recent price surge, including global growth in population and per capita incomes, increasing world per capita consumption of animal products, rising energy prices and growing global biofuel production, depreciation of the U.S. dollar, and slower growth in agricultural productivity. Next, John and Allen (2013) examines the relative contribution of various sector and macroeconomic drivers to price changes of five food commodities (maize, wheat, rice, soybeans, and palm oil) by applying a reduced-form econometric model on 1960-2012 annual data. The drivers include stock-to-use ratios, crude oil and manufacturing prices, the United States dollar exchange rate, interest rate, and income. Based on long-run elasticity estimates (approximately -0.25 for the stock-to-use ratios, 0.25 for the oil price, -1.25 for the exchange rate, and much less for others), the paper estimates the contribution of these drivers to food price increases from 1997-2004 to 2005-2012. It concludes

that most of the price increases are accounted for by crude oil prices (more than 50 percent), followed by stock-to-use ratios and exchange rate movements, which are estimated at about 15 percent each. Crude oil prices mattered most during the recent boom period because they experienced the largest increase. Then, Diem Loan (2016) mentioned that the main reason for the continuous decline in rice prices over the past year was due to abundant supply, especially in the world's leading rice exporters, while the import demand was low, the contract was small; Traditional customers have tried their best to pursue the policy of self-sufficiency and restrict rice import.

We can make recommendations such as appropriate tax collection measures on producers should be implemented so as to curtail farmers from exploiting the masses by making excessive gains. Since the decrease in export results in an increase in price, the government should keep a balance between import and export to maintain the price of rice at a reasonable level. The price of rice can be reduced by the government when they implement measures to control the inflation rate in the economy (Opeyemi et al, 2016). Beside, studies decompose each commodity price series into a global (or common) component, block-specific components and a purely idiosyncratic shock. Researchers found that the bulk of the fluctuations in commodity prices is well summarised by a single global factor. This global factor is closely related to fluctuations in global economic activity and its importance in explaining commodity price variations has increased since the 2000s, especially for oil prices. (Simona et al., 2017). In the past, there have been many

researches that have talked about the topic but the compounding impacts of population, interest rates, GDP growth and CPI are the main concern in this regard.

Luqman and Okewale (2017) profess that cost of sales has an insignificant positive effect on pricing policy, while company's objective and consumer perception has a significant positive relationship on pricing policy. On the other hand, market demand and availability of close substitute has a significant negative pricing policy while macroeconomic trend and market segment has an insignificant negative effect on pricing policy.

It has been stated by Sayeed and Yunus (2018) that historically, the rice sector used to dominate Bangladesh agriculture and the economy as a whole, determining GDP growth rates, inflation, wages,

employment, food security and poverty with the rice price being a very sensitive economic and political economy variable. Furthermore, Ceylan et al. (2018) opine that the food price causes Turkish Lira (TRY) to appreciate and inflation to increase contemporaneously. institutions, commonly the commercial banks (Yang, 2019).

3. CONCEPTUAL THEORIES RELATING TO RICE PRICE, FOOD SECURITY AND MACRO FACTORS

Rice price is just one of major components of food price indices, as we can see from the picture below; hence, for food security, rice price and rice price volatility need to be measured and controlled to have a price indices stability:



Rice price, therefore, will depend on many factors, but not limited to, such as demand and supply fluctuation in producing and consuming, and changes in trade (loosening or tightening), or governmental stock and purchases.

Beside, Baharudin et al. (2013) stated that macro factors, for instance, biodiesel production, exchange rate, GDP growth and government spending on rural development will have highest shock on food security in specific time or years.

Moreover, **Monetary policy** can affect the availability of credit to finance both the production of food and the purchase and storage of the annual harvest. A tight monetary policy can severely limit access to credit in the agricultural sector. However, if monetary policy is so lax that it fuels high levels of inflation, the longer-term impact on domestic food supply could also be detrimental, insofar as it could discourage investment in productivity - enhancing capital, while encouraging speculation in land. (source: www.fao.org).

4. METHOD

The main focus of the study is to examine the association between the rice price with other macro factors in a Southeast Asian country (Vietnam) where the study attempts to provide proof regarding correlation between rice price and macroeconomic variables such as: interest rate, inflation, GDP growth, population. Thus, the research uses the time-series data annually from 2010-2019. The source from which it is collected is from Bureaues of Statistics in Vietnam which has been accessed for obtaining the data. In order to answer this research questions, Bayesian analysis is applied. Bayesian inference is based on a

single rule of probability, which is applied to all parametric models. This makes the Bayesian approach universal and greatly facilitates its application and interpretation. The previous information can be used in bayes to mitigate the effect of a small sample size and show the model inference exactly and straightforwardly. Bayes inference is more comprehensive and flexible than traditional because it uses the knowledge of the entire distribution after the model parameters. It also satisfy the likelihood principle. Especially, Bayesian estimation precision is not limited by the sample size. The posterior probability distribution is the heart of Bayesian statistics and a fundamental tool for Bayesian parameter estimation. Gibbs helps to solve problems that may not be feasible using other sampling methods. The model can show one distribution using samples generated from another distribution. Gibbs in Bayesian support to answer the research question effectively.

4.1 Model and formula showing variables relation

The basic equation for conducting the study is following:

Y (rice price) = $f(x_1, x_2, x_3, x_4)$ where: x_1 : interest rate, x_2 : inflation, x_3 : GDP growth, x_4 : population.

The highest impacts, then will be shown by coefficients after performing regression model.

5. RESULTS

5.1 Autocorrelation Testing

The following section of the study pertains to the analysis of the trace, cusum plots and autocorrelation between 2 variables: rice price in a Southeast Asian country (Vietnam) and GDP growth in in Vietnam. Results in below Fig.4 depicts autocorrelation: it is OK.

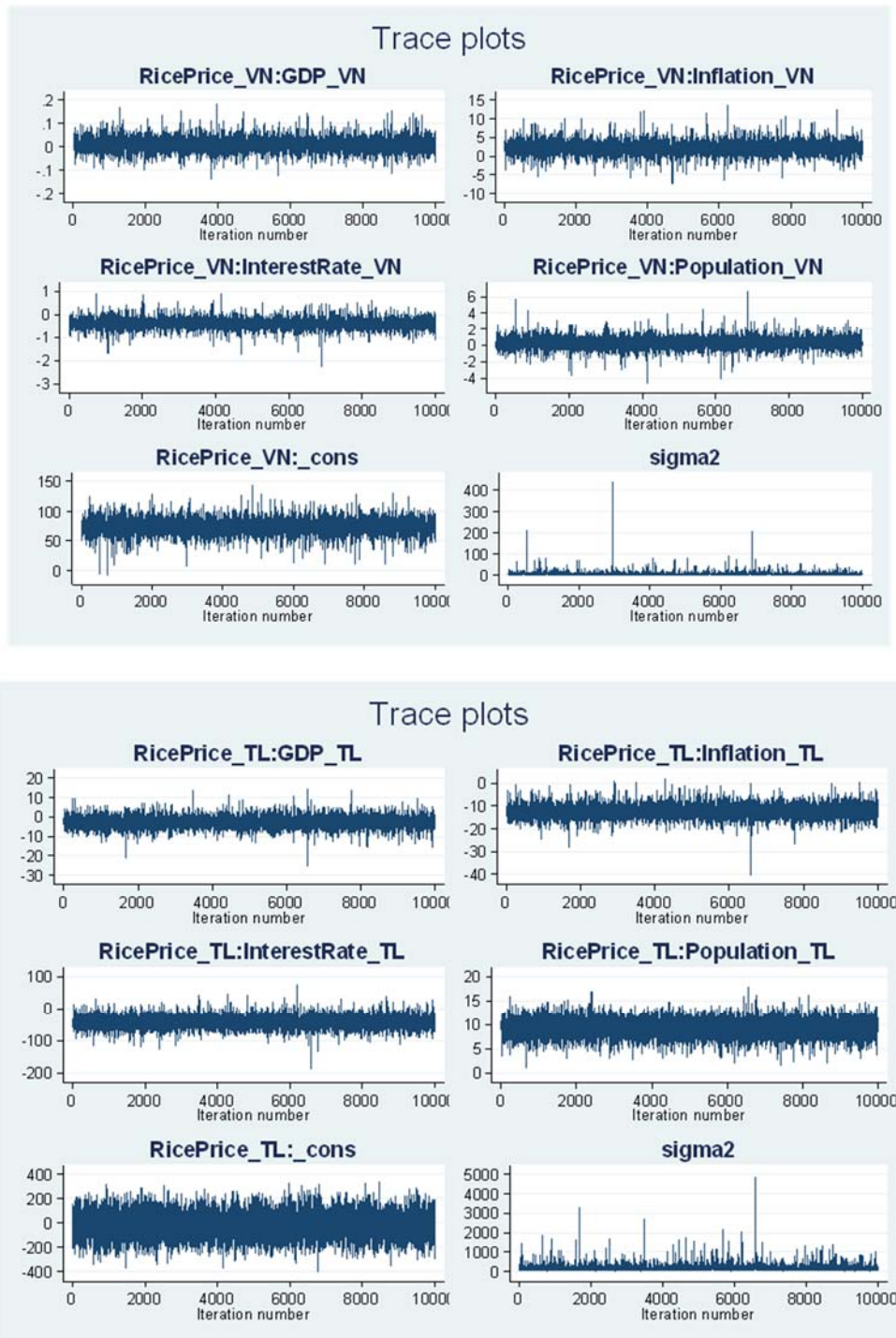


Fig. 4: Comparing trace plots between Vietnam (VN) and Thailand (TL) case

Then we compare autocorrelation between Vietnam and Thailand cases:

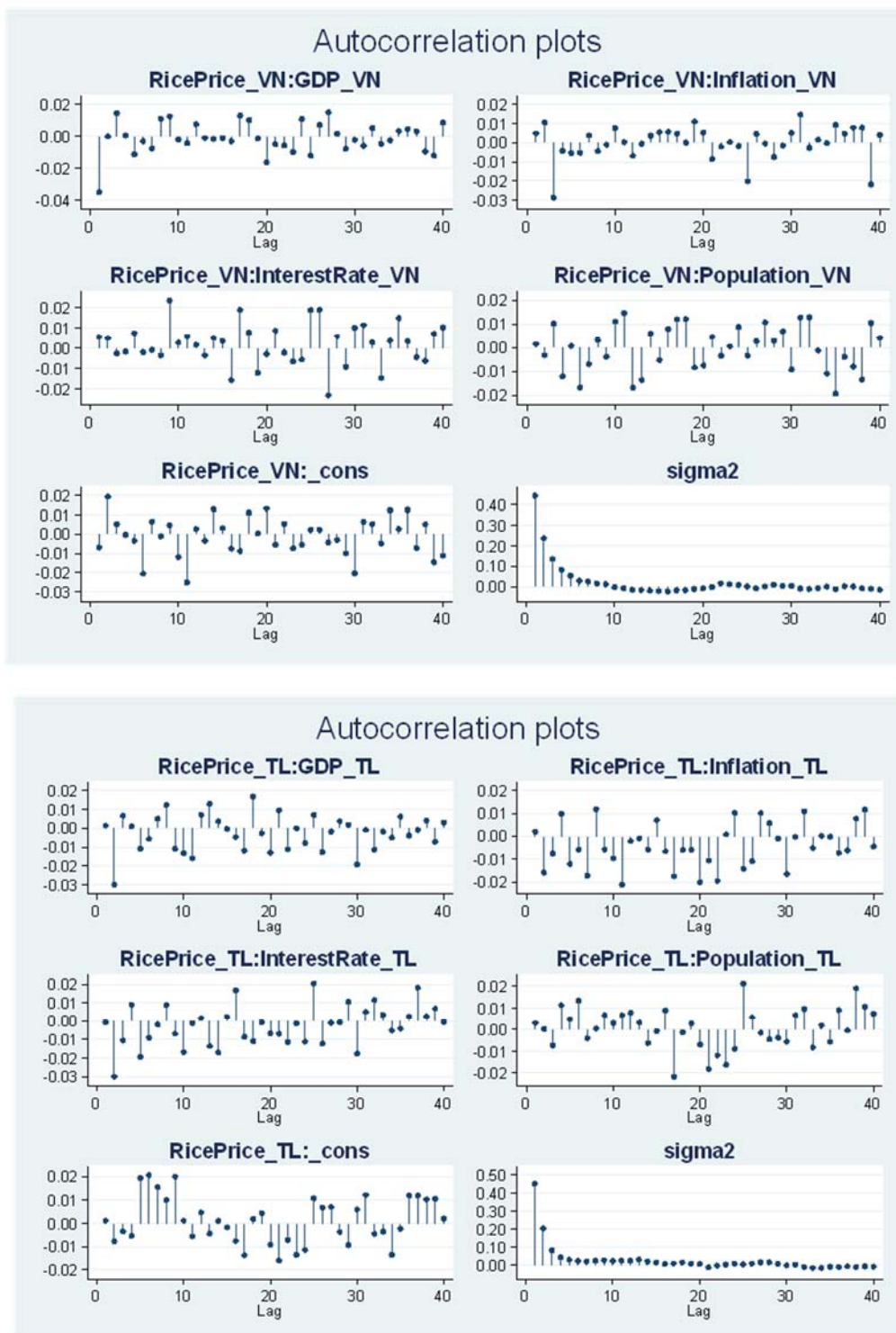


Fig. 5

Next, we can compare cusum plots for 2 countries:

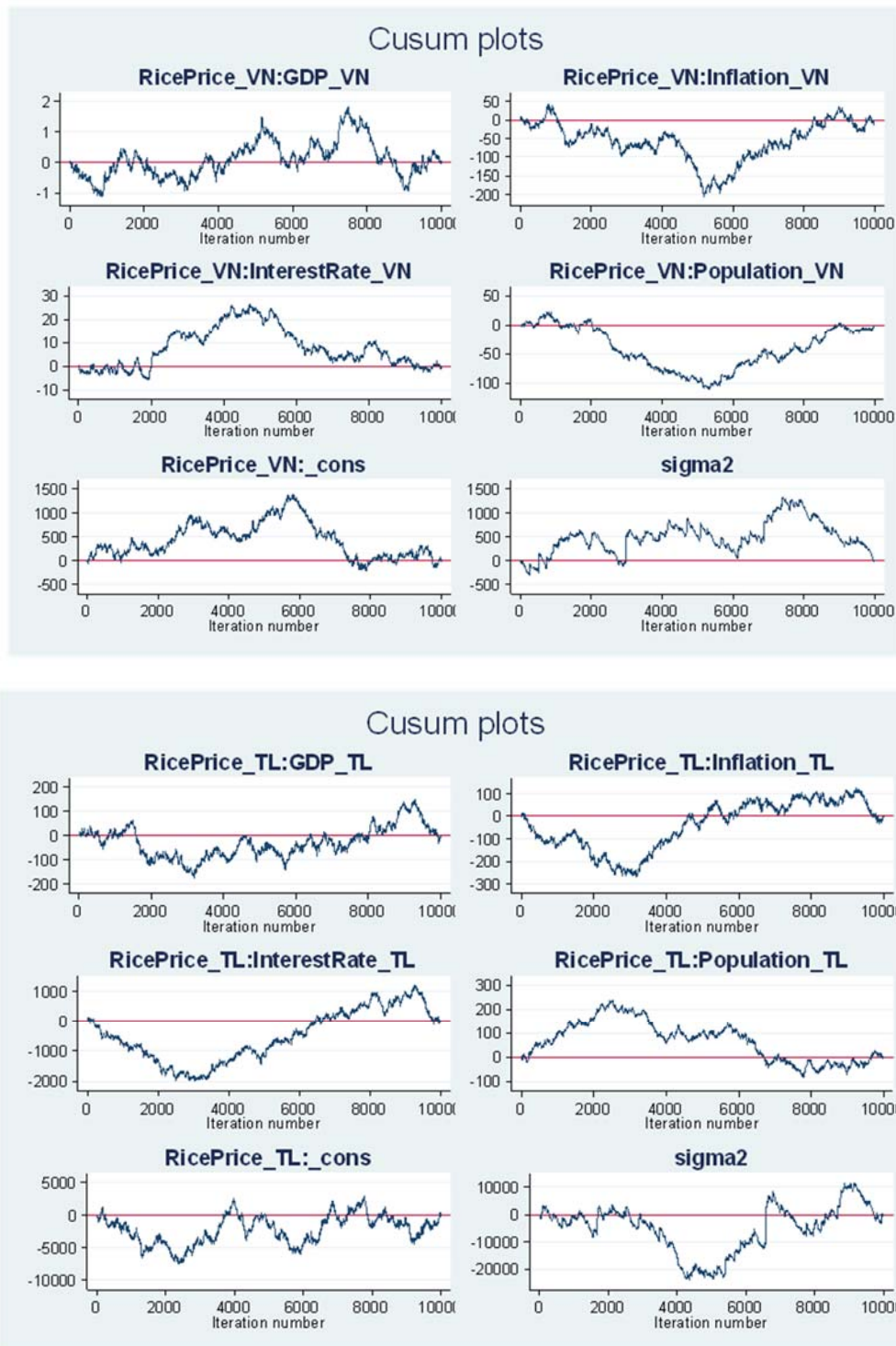


Fig. 6

5.2 Bayesmh analysis - Vietnam case

5.2.1 Using stata

Bayes (with Gibbs) result for case of Vietnam (variables: GDP_VN, inflation_VN, interest rate_VN, Population_VN) as below:

. bayes, gibbs: regress RicePrice_VN GDP_VN Inflation_VN InterestRate_VN Population_VN

Model summary

Likelihood:

RicePrice_VN ~ normal(xb_RicePrice_VN, {sigma2})

Priors:

{RicePrice_VN:GDP_VN} ~ normal(0,10000) (1)
 {RicePrice_VN:Inflation_VN} ~ normal(0,10000) (1)
 {RicePrice_VN:InterestRate_VN} ~ normal(0,10000) (1)
 {RicePrice_VN:Population_VN} ~ normal(0,10000) (1)
 {RicePrice_VN:_cons} ~ normal(0,10000) (1)
 {sigma2} ~ igamma(.01,.01)

(1) Parameters are elements of the linear form xb_RicePrice_VN.

Bayesian linear regression MCMC iterations = 12,500
 Gibbs sampling Burn-in = 2,500
 MCMC sample size = 10,000
 Number of obs = 10
 Acceptance rate = 1
 Efficiency: min = .3253
 avg = .8876
 Log marginal likelihood = -48.905951 max = 1

	Mean	Std. Dev.	MCSE	Median	Equal-tailed [95% Cred. Interval]	
RicePrice_VN						
GDP_VN	.0101207	.026766	.000258	.0096543	-.0423487	.0661101
Inflation_VN	2.26948	1.574347	.015743	2.252233	-.8484513	5.480487
InterestRate_VN	-.3864557	.2063555	.002064	-.3883801	-.8016946	.0289743
Population_VN	.3023902	.6335648	.006336	.3045842	-.9589164	1.5629
_cons	74.82838	11.94057	.119406	75.1136	50.51975	98.23189
sigma2	6.316917	8.369752	.146743	4.314544	1.472703	23.29646

Note: Default priors are used for model parameters.

Fig. 7

From the above Bayes result we see that:

Efficiency (min) = 0.32 larger (>) than 0.01: result is fine. Higher efficiency mean smaller Monte Carlo standard errors (MCSEs) and thus more precise posterior mean estimates.

Log marginal likelihood = -48.9.

5.2.2 Bayes analysis for Vietnam case (cont.)

. bayesstats ess _all

Efficiency summaries MCMC sample size = 10,000

```

-----
|      ESS  Corr. time  Efficiency
-----+-----
RicePrice_VN |
  GDP_VN | 10000.00      1.00      1.0000
  Inflation_VN | 10000.00      1.00      1.0000
InterestRate_VN | 10000.00      1.00      1.0000
  Population_VN | 10000.00      1.00      1.0000
    _cons | 10000.00      1.00      1.0000
-----+-----
  sigma2 | 3253.18      3.07      0.3253
-----

```

Fig. 8

From the above Bayes result we see that:

Efficiency around 1

Corr. Time around 1: It is acceptable.

Next, we run stata:

```
. bayes, gibbs prior({RicePrice_VN:}, normal(-1,10000)): regress RicePrice_VN GDP_VN Inflation_VN
InterestRate_VN Population_VN
```

Model summary

Likelihood:

RicePrice_VN ~ normal(xb_RicePrice_VN, {sigma2})

Priors:

{RicePrice_VN:GDP_VN} ~ normal(-1,10000) (1)

{RicePrice_VN:Inflation_VN} ~ normal(-1,10000) (1)

{RicePrice_VN:InterestRate_VN} ~ normal(-1,10000) (1)

$$\begin{aligned} \{\text{RicePrice_VN:Population_VN}\} &\sim \text{normal}(-1,10000) & (1) \\ \{\text{RicePrice_VN:}_cons\} &\sim \text{normal}(-1,10000) & (1) \\ \{\text{sigma2}\} &\sim \text{igamma}(.01,.01) \end{aligned}$$

(1) Parameters are elements of the linear form $xb_RicePrice_VN$.

Bayesian linear regression MCMC iterations = 12,500
 Gibbs sampling Burn-in = 2,500
 MCMC sample size = 10,000
 Number of obs = 10
 Acceptance rate = 1
 Efficiency: min = .2237
 avg = .8706
 Log marginal likelihood = -48.996496 max = 1

	Equal-tailed					
	Mean	Std. Dev.	MCSE	Median	[95% Cred. Interval]	
RicePrice_VN						
GDP_VN	.0104259	.0267181	.000264	.0100091	-.0416094	.0643379
Inflation_VN	2.248744	1.550209	.015502	2.228015	-.8218997	5.322105
InterestRate_VN	-.3866373	.2034389	.00189	-.3853874	-.7868109	.0159345
Population_VN	.2946826	.6202646	.006203	.3024244	-.9291532	1.516456
_cons	74.86329	12.02018	.119665	75.00411	50.08567	98.31136
sigma2	6.076053	7.336584	.155132	4.272939	1.459851	21.90525

Note: Default priors are used for some model parameters.

Fig. 9

From the above Bayes result we see that:

Efficiency (min) = 0.223 larger (>) than 0.01: result is fine. Higher efficiency mean smaller Monte Carlo standard errors (MCSEs) and thus more precise posterior mean estimates

Log marginal likelihood = -48.9

5.2.3 Bayes analysis for Vietnam case (cont.)

. bayes, gibbs prior({RicePrice_VN:}, normal(-0.8,10000)): regress RicePrice_VN GDP_VN Inflation_VN InterestRate_VN Population_VN

Model summary

Likelihood:

$$\text{RicePrice_VN} \sim \text{normal}(\text{xb_RicePrice_VN}, \{\text{sigma2}\})$$

Priors:

$$\{\text{RicePrice_VN:GDP_VN}\} \sim \text{normal}(-0.8, 10000) \quad (1)$$

$$\{\text{RicePrice_VN:Inflation_VN}\} \sim \text{normal}(-0.8, 10000) \quad (1)$$

$$\{\text{RicePrice_VN:InterestRate_VN}\} \sim \text{normal}(-0.8, 10000) \quad (1)$$

$$\{\text{RicePrice_VN:Population_VN}\} \sim \text{normal}(-0.8, 10000) \quad (1)$$

$$\{\text{RicePrice_VN:}_\text{cons}\} \sim \text{normal}(-0.8, 10000) \quad (1)$$

$$\{\text{sigma2}\} \sim \text{igamma}(.01, .01)$$

(1) Parameters are elements of the linear form xb_RicePrice_VN .

Bayesian linear regression	MCMC iterations =	12,500
Gibbs sampling	Burn-in =	2,500
	MCMC sample size =	10,000
	Number of obs =	10
	Acceptance rate =	1
	Efficiency: min =	.2256
	avg =	.8672
Log marginal likelihood =	-48.850265	max = 1

	Mean	Std. Dev.	MCSE	Median	[95% Cred. Interval]
RicePrice_VN					
GDP_VN	.0097264	.0270715	.000274	.0091804	-.0428302 .0646902
Inflation_VN	2.276382	1.581487	.015815	2.255607	-.8563468 5.494019
InterestRate_VN	-.3853197	.1998191	.001954	-.3868008	-.7869306 .0121723
Population_VN	.3077957	.6179229	.006179	.3130269	-.9144874 1.528773
_cons	74.92268	12.18017	.121802	75.07939	49.51872 97.96871
sigma2	6.287975	7.739106	.162951	4.325065	1.466164 23.86671

Note: Default priors are used for some model parameters.

Fig. 10

From the above Bayes result we see that:

Efficiency (min) = 0.223 larger (>) than 0.01: result is fine. Higher efficiency mean smaller Monte Carlo standard errors (MCSEs) and thus more precise posterior mean estimates.

Log marginal likelihood = -48.9.

5.2.4 Bayes analysis for Vietnam case (cont.)

. bayes, gibbs prior({RicePrice_VN:}, normal(-0.6,10000)): regress RicePrice_VN GDP_VN Inflation_VN InterestRate_VN Population_VN

Model summary

Likelihood:

RicePrice_VN ~ normal(xb_RicePrice_VN, {sigma2})

Priors:

- {RicePrice_VN:GDP_VN} ~ normal(-0.6,10000) (1)
- {RicePrice_VN:Inflation_VN} ~ normal(-0.6,10000) (1)
- {RicePrice_VN:InterestRate_VN} ~ normal(-0.6,10000) (1)
- {RicePrice_VN:Population_VN} ~ normal(-0.6,10000) (1)
- {RicePrice_VN:_cons} ~ normal(-0.6,10000) (1)
- {sigma2} ~ igamma(.01,.01)

(1) Parameters are elements of the linear form xb_RicePrice_VN.

Bayesian linear regression MCMC iterations = 12,500
 Gibbs sampling Burn-in = 2,500
 MCMC sample size = 10,000
 Number of obs = 10
 Acceptance rate = 1
 Efficiency: min = .2235
 avg = .8706
 Log marginal likelihood = -48.579935 max = 1

	Equal-tailed					
	Mean	Std. Dev.	MCSE	Median	[95% Cred. Interval]	
RicePrice_VN						
GDP_VN	.0096646	.026527	.000265	.0093198	-.0434976	.0624804
Inflation_VN	2.276678	1.621429	.016214	2.259453	-.7802582	5.383768
InterestRate_VN	-.3849684	.2002916	.002003	-.3863326	-.774724	.0109168
Population_VN	.2994806	.6188202	.006188	.2984942	-.9135332	1.556902
_cons	74.98316	12.41117	.124112	75.19057	50.10781	98.05778
sigma2	6.329548	10.63255	.224905	4.201902	1.428409	23.62735

Note: Default priors are used for some model parameters.

Fig. 11

From the above Bayes result we see that:

Efficiency = 0.22 slightly larger (>) than 0.01: result is fine.

Log marginal likelihood = -48.5.

5.2.5 Bayes analysis for Vietnam case (cont.)

. bayes, gibbs prior({RicePrice_VN:}, normal(-0.4,10000)): regress RicePrice_VN GDP_VN Inflation_VN InterestRate_VN Population_VN

Model summary

Likelihood:

RicePrice_VN ~ normal(xb_RicePrice_VN,{sigma2})

Priors:

- {RicePrice_VN:GDP_VN} ~ normal(-0.4,10000) (1)
- {RicePrice_VN:Inflation_VN} ~ normal(-0.4,10000) (1)
- {RicePrice_VN:InterestRate_VN} ~ normal(-0.4,10000) (1)
- {RicePrice_VN:Population_VN} ~ normal(-0.4,10000) (1)
- {RicePrice_VN:_cons} ~ normal(-0.4,10000) (1)
- {sigma2} ~ igamma(.01,.01)

(1) Parameters are elements of the linear form xb_RicePrice_VN.

```
Bayesian linear regression      MCMC iterations = 12,500
Gibbs sampling                 Burn-in      = 2,500
                               MCMC sample size = 10,000
                               Number of obs  = 10
                               Acceptance rate = 1
                               Efficiency: min = .2347
                               avg = .8434
```

```
Log marginal likelihood = -48.468964      max = 1
```

	Equal-tailed					
	Mean	Std. Dev.	MCSE	Median	[95% Cred. Interval]	
RicePrice_VN						
GDP_VN	.0098914	.0274629	.000275	.0094513	-.043118	.0663081
Inflation_VN	2.277722	1.616276	.016163	2.237033	-.7746776	5.637646
InterestRate_VN	-.3849917	.210754	.002108	-.385039	-.7936854	.0206225
Population_VN	.3063388	.6515541	.006516	.3020116	-.9580748	1.588721

_cons | 74.83905 12.41912 .13665 75.28523 48.83676 97.67284

sigma2 | 6.553917 10.70869 .22105 4.320131 1.466355 24.06915

Note: Default priors are used for some model parameters.

Fig. 12

From the above Bayes result we see that:

Efficiency = 0.23 higher than (>) than 0.01: result is fine. Higher efficiency mean smaller Monte Carlo standard errors (MCSEs) and thus more precise posterior mean estimates.

Log marginal likelihood = -48.4.

Probability of mean (RicePrice_VN; GDP_VN growth variable) within range (-0.04; 0.06) is 95%, and that of (RicePrice_VN; Inflation_VN) within range (-0.7; 5.6) is 95%, and that of (RicePrice_VN; InterestRate_VN) within range (-0.7; 0.02) is 95%, and that of (RicePrice_VN; Population_VN) within range (-0.9; 1.5) is 95%.

Then we continue to run stata for other cases and we summarize data and get the below overall figure to see the statistic robustness for Vietnam case in the below table:

Table 1

Variables	Statistics	Mean of normal						
		-1	-0.8	-0.4	0	0.4	0.8	1
GDP_VN	Mean	0.0104	0.0097	0.0098	0.0098	0.0103	0.0101	0.0096
	Std.Dev.	0.0267	0.0270	0.0274	0.0262	0.0258	0.0263	0.0264
	MCSE	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
	Equal-tailed [95% Cred. Interval]	-0.0416	-0.0428	-0.0431	-0.0418	-0.0400	-0.0407	-0.0424
		0.0643	0.0646	0.0663	0.0630	0.0625	0.0626	0.0632
Inflation_VN	Mean	2.2487	2.2763	2.2777	2.2901	2.2963	2.2477	2.2701
	Std.Dev.	1.5502	1.5814	1.6162	1.5375	1.5196	1.5244	1.5563
	MCSE	0.0155	0.0158	0.0161	0.0153	0.0154	0.0149	0.0155
	Equal-tailed [95% Cred. Interval]	-0.8218	-0.8563	-0.7746	-0.7694	-0.6532	-0.7740	-0.8587
		5.3221	5.4940	5.6376	5.4091	5.4619	5.3905	5.4441
InterestRate_VN	Mean	-0.3866	-0.3853	-0.3849	-0.3854	-0.3850	-0.3825	-0.3883
	Std.Dev.	0.20343	0.1998	0.2107	0.1998	0.1972	0.1950	0.1977
	MCSE	0.0018	0.0019	0.0021	0.0020	0.0020	0.0019	0.0020
	[95% Cred. Interval]	-0.7868	-0.3868	-0.7936	-0.7807	-0.7787	-0.7702	-0.7744
		0.01593	-0.7869	0.0206	0.0223	0.0203	0.0077	0.0062
Population_VN	Mean	0.2946	0.3077	0.3063	0.3089	0.3019	0.2907	0.3049
	Std.Dev.	0.6202	0.6179	0.6515	0.6096	0.6008	0.6005	0.6089
	MCSE	0.0062	0.0061	0.0065	0.0060	0.0061	0.0060	0.0059
	[95% Cred. Interval]	-0.9291	-0.9144	-0.9580	-0.9003	-0.9214	-0.9093	-0.9051
		1.5164	1.5287	1.5887	1.5435	1.4978	1.5113	1.5233

5.3 Regression model for Vietnam

First, we run regression with Stata for Vietnam:

```
. regress RicePrice_VN GDP_VN Inflation_VN InterestRate_VN Population_VN
```

Source	SS	df	MS	Number of obs	=	10
Model	55.9606367	4	13.9901592	F(4, 5)	=	3.77
Residual	18.5436869	5	3.70873737	Prob > F	=	0.0889
				R-squared	=	0.7511
				Adj R-squared	=	0.5520
Total	74.5043236	9	8.27825818	Root MSE	=	1.9258

RicePrice_VN	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
GDP_VN	.0087718	.0207012	0.42	0.689	-.0444424 .0619859
Inflation_VN	2.187217	1.218408	1.80	0.133	-.9448 5.319233
InterestRate_VN	-.386824	.1558731	-2.48	0.056	-.7875086 .0138606
Population_VN	.2978568	.4782405	0.62	0.561	-.9314995 1.527213
_cons	75.92032	9.429441	8.05	0.000	51.68117 100.1595

Fig. 13

From the above regression, we find out that interest rate and inflation have higher impacts on Rice price in Vietnam (coefficient -0.3 and 2.18), the 2nd factor is population in Vietnam and lastly, GDP in Vietnam.

Regression with Stata for Thailand:

Using stata giving us result:

```
. regress RicePrice_TL GDP_TL Inflation_TL InterestRate_TL Population_TL
```

Source	SS	df	MS	Number of obs	=	10
Model	4642.49009	4	1160.62252	F(4, 5)	=	8.50
Residual	682.409909	5	136.481982	Prob > F	=	0.0187
				R-squared	=	0.8718
				Adj R-squared	=	0.7693
Total	5324.9	9	591.655556	Root MSE	=	11.683

RicePrice_TL	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
GDP_TL	-1.913261	2.843801	-0.67	0.531	-9.223484 5.396963
Inflation_TL	-12.83111	2.45324	-5.23	0.003	-19.13736 -6.524857
InterestRate_TL	-35.46474	20.60375	-1.72	0.146	-88.42837 17.4989
Population_TL	13.21467	6.825267	1.94	0.111	-4.330243 30.75957
_cons	-315.8635	529.2532	-0.60	0.577	-1676.352 1044.625

Fig. 14

From the above regression, we find out that interest rate and population have higher impacts, negative and positive correspondingly, on Rice price in Thailand (coefficient -35.4 and 13.2), the 2nd factor is inflation in Thailand and lastly, GDP growth in Thailand.

Beside, we can compare Thailand and Vietnam cases:

. bayestest model Model_VN Model_TL

Bayesian model tests

	log(ML)	P(M)	P(M y)
Model_VN	-49.0073	0.5000	0.9987
Model_TL	-55.6571	0.5000	0.0013

Note: Marginal likelihood (ML) is computed using

Laplace-Metropolis approximation.

It shows that model VN has statistics (log and probability better).

6. DISCUSSION

Firstly, from the above regression in 2 countries, we find out that interest rate and inflation have higher impacts on Rice price in Vietnam (coefficient -0.3 and 2.18), the 2nd factor is population in Vietnam. Hence, we compare in both countries, interest have higher impact on rice price and GDP growth has less impact on rice price in both nations, Vietnam and Thailand.

Secondly, we recognize that interest rate has negative correlation with rice price in Thailand and Vietnam, while population has positive correlation with rice price in Vietnam and Thailand.

Different from Thailand case where inflation and rice price has negative correlation, when inflation in Vietnam is higher, then rice price will increase. Therefore government and agencies need to control inflation well (and population as well).

Next, we can add more factors onto the above regression model including, but not limited to: exchange rate, price of fertilizer, average wage, world oil price, ex-import balance, quality of land, income per capita, etc. in order to enhance the width of this research.

7. CONCLUSION

In this study, we find out impacts of macro factors on Vietnam rice price over many years with time series analysis. Esp. We recognize when inflation and population in Veitnam increase, the rice price will go up; hence, we need to control inflation and population in a proper range to keep rice price at acceptable level.

Conclusively, regarding Asian countries, esp. in 2 countries above, there is positive correlation and negative correlation in cases of Thailand and Vietnam. Therefore, it has been implied that we need to control interest rate (not increasing too much), and inflation factors in Vietnam and Thailand (i.e not increasing too much in Vietnam and declining too much in Thailand) to control rational rice price in Vietnam. On the

contrary, Thailand need to control interest rate and inflation (i.e not decreasing too much) to control rice price there.

Consequently, more investment in Vietnam, but at a rational and selective ratio, is recommended considering the potential impact on rice price.

8. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The research was limited to the case of Asian countries, therefore, in future, the evaluation of European countries can be conducted or African region can also be undertaken into consideration. For financial development, limited indicators have been considered, therefore, other metrics, for instance, average wages and unemployment ratio can be considered in future researches. In furtherance, limited sample of years has been considered in this study due to limited availability of the data on publicly available sources. Therefore, the enhancement in future studies can be conducted by incorporating data of more years or changing the frequency of the data to quarterly or monthly. Hence, this research can be improved moderately

9. REFERENCES

- [1] Ahmed, A. A., 2018. Bank-Based Financial Development and Economic Growth: Time-Varying Causality Analysis for Egypt. *International Journal of Economics and Finance*, 10(4), pp.123-135.
- [2] Ceylan, M. B., Liang, X., and Ayhan, K. (2018). Macroeconomic impacts of global food price shocks on the economy of Turkey. *Agric. Econ. – Czech*, 64, pp. 517-525.
- [3] John, B., and Allen, D. (2013). Long-Term Drivers of Food Prices. *Policy Research Working Paper 6455*.
- [4] Komal, R. and Abbas, F., 2015. Linking financial development, economic growth and energy consumption in Pakistan. *Renewable and Sustainable Energy Reviews*, 44, pp. 211-220.

- [5] Loan, L. T. D. (2016). Tác động từ thị trường đến giá gạo xuất khẩu của Việt Nam. *Tạp chí Tài chính*, kỳ 2(6).
- [6] Luqman, O., and Okewale, J. (2017). Factors Influencing Pricing Decision: Evidence from Non-Financial Firms in Nigeria. *Acta Universitatis Danubius. Economica*, 13(1).
- [7] Opeyemi, E.A., Aina, V.I., Ayinde, K., and Lukman, A.F. (2016). Drivers of Rice Price Variation in Nigeria: A Two-Stage Iterative Ridge Regression Approach. *Journal of Agricultural Sciences*, 61(1): 79-92.
- [8] Romeo, M. B. (1999). The Price Competitiveness of Rice Production in Vietnam – Effects of Domestic Policies and External Factors. *Asean Economic Bulletin*, 16(1).
- [9] Ronald, T., Daniel, M., Stacey, R., and Paul, W. (2011). Why Have Food Commodity Prices Risen Again?. *WRS-1103 Economic Research Service/USDA*.
- [10] Sayeed, K. A., and Yunus, M. M. (2018). Rice prices and growth, and poverty reduction in Bangladesh. *Background paper to the UNCTAD-FAO Commodities and Development Report*.
- [11] Shahbaz, M., Van Hoang, T. H., Mahalik, M. K. and Roubaud, D., 2017. Energy consumption, financial development and economic growth in India: New evidence from a nonlinear and asymmetric analysis. *Energy Economics*, 63, pp. 199-212.
- [12] Simona, D. C., Laurent, F., and Domenico, G. (2017). Common factors of commodity prices. ECB Working Paper Series No 2112.
- [13] Valickova, P., Havranek, T. and Horvath, R., 2015. Financial development and economic growth: A meta-analysis. *Journal of Economic Surveys*, 29(3), pp. 506-526.
- [14] Yang, F., 2019. The impact of financial development on economic growth in middle-income countries. *Journal of International Financial Markets, Institutions and Money*, 59, pp. 74-89.

APPLYING GM (1,1) MODEL IN FORECASTING EXPORT AND IMPORT TURNOVER OF VIETNAM

Nguyen Thi Kim Lien^{1,2*}

¹ Department of Economics – Business Administration, Thanh Dong University, Hai Duong, Vietnam

² Scientific Research – International cooperation, Thanh Dong University, Hai Duong, Vietnam

*Corresponding author: lienntk@thanhdong.edu.vn

Abstract

The growth in global economy and trade is enhancing the import and export operations, which not only contributes to making the foundation for economic development but also brings the turnover to a nation. The purpose of this study is to find out the export and import turnover of Vietnam in the future time when Vietnam joins as a part in the transactions of exchanging goods with other countries all over the world. The valuation of transporting products in the future from 2020 to 2023 will be predicted by grey forecasting method with the GM (1,1) model which bases on the historical time series during the period of 2012 to 2019. The empirical prediction results are reasonable because the mean absolute percentage errors (MAPE) of forecasting values are re-tested less than 5.39069% and the average MAPE indicator of import turnover and export turnover is 2.2346425% and 1.8250675%, respectively. An approach of GM (1,1) model figures out a picture of the status of export and import turnover, in addition, it proposes a plan for the development orientation of Vietnam. Moreover, the result of grey forecast indicates that the exporting and importing goods will expand and grow continuously. The export ratio will be always higher than the import ratio, thus the balance of trade will increase sharply in the future time.

Keywords: Import and export turnover, grey forecast, GM (1,1), mean absolute percentage error (MAPE).

1. INTRODUCTION

Global trade is expanding and pushing up export and import process of a nation, which supports the economic growth [1]. Balance of trade achieves a profit when the export turnover of goods is higher than the import turnover of materials and products. The export growth plays an important role in enhancing the economic development [2]. According to the statistics of The World Bank [3], Vietnam's gross domestic product (GDP) increased 7% in 2019. In the current international economic integration, Vietnam is unavoidably affected directly by the Coronavirus disease (COVID-19) in the importing and exporting process. However, the disease has been controlled well in Vietnam, and the world also sees many positive signs in the fight against COVID-19 as well. Vietnam has speeded up many big economy projects & attracted many potential sources of investment to increase the economy in the future. Along with the economic development, the export and import of raw materials, products, etc will increase. This research uses GM (1,1) model in predicting the import and export turnover in Vietnam in the future time, thus having a foreseen importing and exporting operation progress in the future.

Grey theory was set up by Deng in the 1980s [4] and the grey model can deal with using four data points or more than [5], these points are a serial number of historical data and in consecutive order to compute the accuracy value. The ability of the forecast can assist personal and enterprises in changing operation policy, especially in financial aspect. Many researches of various fields applied grey theory into predicting the future time. For instance, the future turn of the cargo throughput in the port of Kaohsiung estimated to make development plans and construction [6]. The traffic trip generation volume was forecasted [7]. The optimal quantity of spare parts was predicted to determine the required quantity [8]. An application showed the demand of using liquid crystal display television (LCD TV) [9]. The coal consumption was performed [10]. A prediction gave the incidence trend of typhoid and paratyphoid fevers in Wuhan city, China [11]. An application of GM (1,1) was utilized to forecast the apparel export volume in the next three years based on the historical time series from 1999 to 2008 [12]. The amount of import and export commodities in Taiwan for the next five years were predicted based on the original dataset of six historical years from 2007 to 2013 [13]. Moreover, the grey theory offers courses to PhD level, master level students and all undergraduate students in different majors in many universities such

as Huazhong University of Science and Technology, Wuhan University of Technology, Fuzhou University, Bogazici University and so on [14]. Therefore, the grey approached and applied in various areas, the common purpose is to forecast future values.

In the research, the grey method is applied into reckoning the future import and export turnover in Vietnam. In particularly, GM (1,1) model in grey theory supports to find out future valuations, perform a future picture and orient growth for exporting and importing operation progress in Vietnam. From the empirical result of import and export ratios, some international trade policies and development directions can be discussed to promote the international exchange of goods.

Besides, the study uses GM (1,1) model for predicting the import and export turnover because it can deal with minimum time series within four data points. In addition, it gives an exact result when the accuracy level of the final values are retested by mean absolute percent error (MAPE) index, all unappreciated values will be deleted. As a result, GM (1,1) model has a high reliability, which utilizes to forecast in future term.

Step 1: Setting up the initial data from the observed data:

$$B^0 = (B^0(1), B^0(2), \dots, B^0(n)) \quad n \geq 8 \quad (1)$$

Where

$$B^0 = \begin{pmatrix} B^0(1), B^0(2), B^0(3), B^0(4), B^0(5), \\ B^0(6), B^0(7), B^0(8) \end{pmatrix}$$

Step 2: Computing time-series B^1 bases on $B^0(1)$ as below:

$$B^1 = (B^1(1), B^1(2), \dots, B^1(n)) \quad n \geq 8 \quad (2)$$

Where $B^1(h)$ is calculated as following:

$$B^1(h) = \sum_i^h B^0(1) \\ (h = 0, 1, \dots, n)$$

With the particular parameters:

$$B^1(1) = B^0(1) \text{ when } h = 0$$

$$B^1(2) = B^0(1) + B^0(2) \text{ when } h = 1$$

$$B^1(3) = B^0(1) + B^0(2) + B^0(3) \text{ when } h = 2$$

$$B^1(4) = B^0(1) + B^0(2) + B^0(3) + B^0(4) \text{ when } h = 3$$

$$B^1(5) = B^0(1) + B^0(2) + B^0(3) + B^0(4) + B^0(5) \text{ when } h = 4$$

$$B^1(6) = B^0(1) + B^0(2) + B^0(3) + B^0(4) + B^0(5) + B^0(6) \text{ when } h = 5$$

$$B^1(7) = B^0(1) + B^0(2) + B^0(3) + B^0(4) + B^0(5) + B^0(6) + B^0(7) \text{ when } h = 6$$

$$B^1(8) = B^0(1) + B^0(2) + B^0(3) + B^0(4) + B^0(5) + B^0(6) + B^0(8) \text{ when } h = 7$$

Step 3: Computing the mean value Z^1 , based on B^1 :

2. METHODOLOGY

2.1 Data source

The aim of this study is to predict the export and import turnover of Vietnam during the period of 2020 to 2023. Thus, the researcher applies GM (1,1) model based on the historical time-series, the initial data from 2012 to 2019 is derived from the source of customs.gov.vn [15].

Export turnover: All goods exported out of Vietnam without freight, insurance attributable to the transport of goods.

Import turnover: All goods and materials imported from others countries.

2.2 Grey forecasting model

GM (1,1) model calculates the predicted values which bases on the time series in the historical data. GM (1,1) model only computes the forecasting values when the initial data is a positive value. In the research, GM (1,1) model is used for computing the predicted values of Vietnam's export and import turnover which depends on the eight historical and current points and is performed with the specific steps as the following:

$$Z^1(h) = Z^1(1), Z^1(2), Z^1(3), \dots, Z^1(h) \quad (3)$$

$$(h = 1, 2, \dots, n)$$

$$Z^1(h) = \frac{1}{2}(B^1(h) + B^1(h-1))$$

$$(h = 1, 2, \dots, n)$$

Subject to

$$Z^1(1) = \frac{1}{2}(B^1(1) + B^1(2)) \text{ if } h = 1$$

$$Z^1(2) = \frac{1}{2}(B^1(2) + B^1(3)) \text{ if } h = 2$$

$$Z^1(3) = \frac{1}{2}(B^1(3) + B^1(4)) \text{ if } h = 3$$

$$Z^1(4) = \frac{1}{2}(B^1(4) + B^1(5)) \text{ if } h = 4$$

$$Z^1(5) = \frac{1}{2}(B^1(5) + B^1(6)) \text{ if } h = 5$$

$$Z^1(6) = \frac{1}{2}(B^1(6) + B^1(7)) \text{ if } h = 6$$

$$Z^1(7) = \frac{1}{2}(B^1(7) + B^1(8)) \text{ if } h = 7$$

Step 4: Defining the value a and b when basing on the equation (1) and (3):

$$B^0(h) + a \times Z^1(h) = b / (h = 1, 2, 3, \dots, n) \quad (4)$$

Subject to

$$B^0(2) + a \times Z^1(1) = b$$

$$B^0(3) + a \times Z^1(2) = b$$

$$B^0(4) + a \times Z^1(3) = b$$

$$B^0(5) + a \times Z^1(4) = b$$

$$B^0(6) + a \times Z^1(5) = b$$

$$B^0(7) + a \times Z^1(6) = b$$

$$B^0(8) + a \times Z^1(7) = b$$

Step 5: Calculating the different equation of sequence B^1 as below:

$$\frac{dB^1(h)}{dh} + aB^1(h) = b \quad (5)$$

$$(h = 2, 3, 4)$$

Utilizing the matrix to change the linear equation:

$$Y_N = \begin{bmatrix} B^0(2) \\ B^0(3) \\ \dots \\ B^0(n) \end{bmatrix}$$

$$E = \begin{bmatrix} -Z^1(1) & 1 \\ -Z^1(2) & 1 \\ \dots & \dots \\ -Z^1(n) & 1 \end{bmatrix}$$

$$\hat{E}T = \begin{bmatrix} -Z^1(1) & -Z^1(2) & \dots & -Z^1(n) \\ 1 & 1 & \dots & 1 \end{bmatrix}$$

And

$$\hat{\delta} = \begin{bmatrix} a \\ b \end{bmatrix} = (E^T E)^{-1} E^T Y_N$$

Step 6: Counting the prediction value:

$$\hat{B}^0 = \hat{B}^0(1), \hat{B}^0(2); \hat{B}^0(3); \dots \hat{B}^0(n) \tag{6}$$

Here

$$\begin{aligned} \hat{B}^0(1) &= B^0(1) \\ \hat{B}^0(h + 1) &= \left[B^0(1) - \frac{b}{a} \right] e^{-ab} (1 - e^a) \\ &(h = 1, 2, 3) \end{aligned}$$

Step 7: Checking estimated values via the via the MAPE indicator to define the qualification.

$$\begin{aligned} MAPE &= \frac{100}{n} \sum_{t=1}^n \left| \frac{B^0(h) - \hat{B}^0(h)}{B^0(h)} \right| \\ &(h = 1, 2, 3) \end{aligned} \tag{7}$$

The MAPE has four parameter levels as Table 1.

Table 1: The classification of MAPE

Value	Qualification
MAPE < 10%	Excellent
10% < MAPE < 20%	Good
20% < MAPE < 50%	Resonable
> 50%	Poor

Therefore, the forecasting value will get an acceptant result when the MAPE is under 50%. The predicted value will be deleted if the MAPE is higher than 50% [16], in this case, the unappreciated data must be re-tested by another method.

3. RESULTS AND DISCUSSION

3.1 Data analysis

The international trade enhances the exchanging goods process of a country with global. The export and import action of Vietnam in the previous term increased continuously as shown in Table 2. During the period

2012-2019, the export turnover raised from 114.5 billion to 264.19 billion and the import turnover also increased from 113.8 billion to 253.07 billion. As a result, the export and import operation occurred and developed continuously.

Based on the principle of the grey forecast, all values in the historical time series which are used for counting the future period are positive values. The data is shown in Table 2, it is positive and original data, thus, can be applied into GM (1,1) model to find out the export and import turnover during the period of 2020-2023.

Table 2: The actual data of export and import turnover (Billion USD)

Year	Export	Import
2012	114.50	113.80
2013	132.00	132.00
2014	150.20	147.90
2015	162.00	165.60
2016	176.60	174.80
2017	215.10	213.00
2018	243.70	236.90
2019	264.19	253.07

Source: Customs [15]

3.2 Forecasting value

Prediction values of export turnover and import turnover are determined by using the history data in Table 2. The primary data is set up in order to create

the first foundation of time series. The forecasting results are calculated through implementing equations systematically as Section 2.1. The export turnover is used for illustration.

The actual values from 2012 to 2019 are ranged as follows:

$$B^0 = (114.5; 132; 150.2; 162; 176.6; 215.1; 243.7; 264.19)$$

Calculating B^1 based on the accumulated generating operation method.

$$\begin{aligned} B^1(1) &= 114.5 & B^1(2) &= 246.5 \\ B^1(3) &= 396.7 & B^1(4) &= 558.7 \\ B^1(5) &= 735.3 & B^1(6) &= 950.4 \\ B^1(7) &= 1,194.1 & B^1(8) &= 1,458.29 \end{aligned}$$

Counting the mean value Z^1 :

$$\begin{aligned} Z^1(1) &= \frac{1}{2}(114.50 + 246.50) = 180.5 \\ Z^1(2) &= \frac{1}{2}(246.5 + 396.7) = 321.6 \\ Z^1(3) &= \frac{1}{2}(396.7 + 558.7) = 477.7 \\ Z^1(4) &= \frac{1}{2}(558.7 + 735.3) = 647 \\ Z^1(5) &= \frac{1}{2}(735.3 + 950.4) = 842.85 \\ Z^1(6) &= \frac{1}{2}(950.4 + 1,194.1) = 1,072.25 \\ Z^1(7) &= \frac{1}{2}(1,194.10 + 1,458.29) = 1326.195 \end{aligned}$$

Finding out a and b:

$$\begin{aligned} 132 + a \times 180.5 &= b \\ 150.2 + a \times 321.6 &= b \\ 162 + a \times 477.7 &= b \\ 176.6 + a \times 647 &= b \\ 215.1 + a \times 842.85 &= b \\ 243.7 + a \times 1,072.25 &= b \\ 264.19 + a \times 1326.195 &= b \end{aligned}$$

Converting the matrix.

$$E = \begin{bmatrix} -180.5 & 1 \\ -321.6 & 1 \\ -477.7 & 1 \\ -647 & 1 \\ -842.85 & 1 \\ -1072.25 & 1 \\ -1326.195 & 1 \end{bmatrix}, Y_N = \begin{bmatrix} 132 \\ 150.2 \\ 162 \\ 176.6 \\ 215.1 \\ 243.7 \\ 264.19 \end{bmatrix}$$

Using the least-square method for calculating a and b.

$$\hat{\delta} = \begin{bmatrix} a \\ b \end{bmatrix} = (E^T E)^{-1} E^T Y_N = \frac{-0.1202679}{108.33063}$$

Computing the whitening equation of the differential equation.

$$\frac{dB^1}{dh} - 0.1202679 \times B^1 = 108.33063$$

Finally, the predicted valuation is conducted as follows:

$$\hat{B}^0(h + 1) = \left[114.5 - \frac{108.33063}{-0.1202679} \right] e^{-ab}(1 - e^a)$$

Each of the value of h is defined as follows:

$$\begin{aligned} h = 0, B^1(1) &= 114.5 \\ h = 1, B^1(2) &= 244.247 \\ h = 2, B^1(3) &= 390.575 \\ h = 3, B^1(4) &= 555.605 \\ h = 4, B^1(5) &= 741.725 \\ h = 5, B^1(6) &= 951.631 \\ h = 6, B^1(7) &= 1188.362 \\ h = 7, B^1(8) &= 1455.348 \\ h = 8, B^1(9) &= 1756.454 \\ h = 9, B^1(10) &= 2096.041 \\ h = 10, B^1(11) &= 2479.027 \\ h = 11, B^1(12) &= 2910.959 \end{aligned}$$

The final prediction results are been computed:

$$\begin{aligned} \hat{B}^0(1) &= 114.5 & \hat{B}^0(7) &= 236.731 \\ \hat{B}^0(2) &= 129.747 & \hat{B}^0(8) &= 266.985 \\ \hat{B}^0(3) &= 146.328 & \hat{B}^0(9) &= 301.106 \\ \hat{B}^0(4) &= 165.029 & \hat{B}^0(10) &= 339.587 \\ \hat{B}^0(5) &= 186.119 & \hat{B}^0(11) &= 382.986 \\ \hat{B}^0(6) &= 209.905 & \hat{B}^0(12) &= 431.931 \end{aligned}$$

With the rule of grey forecast, the accuracy of prediction results must be checked by the MAPE indicator, the examination of forecast precision is to base on actual value and forecast values. From the

equation (7), the MAPEs of export turnover and import turnover are computed particularly. The forecasted values and MAPEs of import and export turnover are determined as shown in Table 3 and Table 4.

Table 3: Forecasting values of export turnover

((Billion USD) except MAPE (%))

Year	Export turnover	Predicted value	Error	MAPE (%)
2012	114.5	114.5	0	0
2013	132	129.747	2.25	1.7067
2014	150.2	146.329	3.87	2.57742
2015	162	165.029	-3.03	1.86998
2016	176.6	186.12	-9.52	5.39068
2017	215.1	209.906	5.19	2.41475
2018	243.7	236.732	6.97	2.8594
2019	264.2	266.986	-2.8	1.05821
2020		301.106		
2021		339.587		
2022		382.986		
2023		431.931		

Table 3 and Table 4 present the estimated values, error value and MAPE index. In the first term (2012), this year was chosen to be the beginning prediction period so that the error is zero to both import and export turnover. The other years had a small difference. For instance, Table 3 denoted that the error of the export turnover over the period of 2012-2019 was ranged from -9.52 to 6.97. Table 4 indicated that the error of import turnover during the time period of 2012-2019 was from -9.33 to 7.046. As a result, the errors were too low. In addition, each MAPE indicator of import and export turnover, their MAPEs are under 5.34002% and the average MAPE of import turnover and export turnover is 2.2346425% and 1.8250675%, respectively. In consequence, the average relative errors between primary data and the predictive data are very low, the predicted values obtain a high exact level based on the principle of MAPE index as seen in Table 1. Therefore,

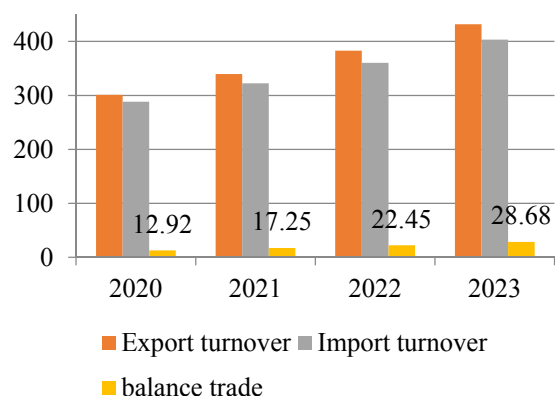
Table 4: Forecasting values of import turnover

((Billion USD) except MAPE (%))

Year	Import turnover	Predicted value	Error	MAPE (%)
2012	113.8	113.8	0	0
2013	132	131.593	0.407	0.30864
2014	147.9	147.186	0.714	0.4829
2015	165.6	164.627	0.973	0.58772
2016	174.8	184.134	-9.33	5.34002
2017	213	205.954	7.046	3.30819
2018	236.9	230.358	6.542	2.76141
2019	253.1	257.655	-4.58	1.81166
2020		288.186		
2021		322.335		
2022		360.53		
2023		403.252		

the GM (1,1) model is a feasible tool to predict the future displacement in this study. The prediction values of export turnover and import turnover of Vietnam during the period 2020 to 2023, being calculated and shown in Table 3 and Table 4 have the high accuracy.

The forecasting values in Table 3 and Table 4 derived from escalating the history time series within eight years as shown in Table 2. The forecasted data shows that the export and import turnover in the future time is expected to increase smoothly. From 2020 to 2023, the export turnover is expected to achieve 301.106; 339.587; 382.986 and 431.931 billion USD particularly. The import turnover is expected to achieve 288.186; 322.335; 360.53 and 403.252 billion USD, respectively. Thus, the balance of trade will reach to the positive valuation in the future as shown in Figure 1.

**Fig. 1:** Balance of trade between export and import turnover

Observing Figure 1, the balance of trade will extend smoothly in the future time. In particular, the balance of trade will achieve 28.68 billion USD in 2023, and that will increase approximately three times in comparison with the year 2020. The exporting goods will rise in the future term and be at a high level. According to the forecasted result, Vietnam's government will have strategies to expand and boost operations of exchanging goods with other countries, whereas, the export of products is a key element in increasing balance of trade. It needs to make a sustainable base, promote and extend the economic growth rate. Vietnamese import turnover and export turnover in the future term will increase continually that will open many big opportunities for investors. In recent years, Vietnam has been attracting more international enterprises coming to invest and build up factories. By the way, the raw materials, products and semi-finished products will be exchanged more, the revenue from importing and exporting operations will extend sharply.

4. CONCLUSION

Turnover from export and turnover from import of Vietnam has increased smoothly in the previous time and will enlarge sharply in the future term. To define the status of future term, the study utilizes GM (1,1) model to forecast and make an evidence of the development process. The forecasting results figure out the development plan for exporting and importing products. In addition, GM (1,1) model estimates the future value based on the historical time series including four continuous past and current points. The forecasting result gets a high accuracy when the MAPE index is less than 5.34002%. However, the research only utilizes GM (1,1) model to predict values, the further study needs to apply more models such as Holt Winter, ARMA, Box-jenkins model to have the comparison and choice for the best empirical valuation.

5. ACKNOWLEDGMENTS

This research was supported by Thanh Dong University in Hai Duong Province, Vietnam.

6. REFERENCES

- [1] Absolute Percentage Error," *Journal of Physics : Conference series*, **930**, 1-6.
- [2] Bakari, M and Mabrouki, M. (2017), "Impact of exports and imports on economic growth : new evidence from Panama," *Journal of smart economic growth*, **1**, (2), 1-13.
- [3] Chiou, H. K.; Tzeng, G. H. and Cheng, C. K., (2004), "Grey prediction GM (1,1) model for forecasting demand of planned spare parts in Navy of Taiwan," *Proceedings world automation congress*, **17**, 315-320.
- [4] Deng, J. L. (1982), "Control problems of grey systems," *Systems and control letters*, **5**, 288-294.
- [5] Khair, U.; Fahmi, H. and etc. (2017), "Forecasting Error Calculation with Mean Absolute Deviation and Mean
- [6] Li, X. ; Liu, Y.C. and etc. (2011), "Applying GM (1,1) model in China's apparel export Forecasting," *2011 Fourth International Symposium on Computational Intelligence and Design*, **2**, 28-30.
- [7] Liu, S. F. ; Forrest, J. and Yang, Y. J. (2012), "A brief introduction to grey systems theory," *Grey systems : Theory and application*, **2**, (2), 89-104.
- [8] Lu, H. Y., (2013), "Application of GM (1,1) prediction model in coal consumption market," *Advanced Materials Research*, vol. 869-870, *Trans Tech Publications*, **869-870**, 554-558.
- [9] Masoud, A. M and Suleiman, N. (2016), "The Relationship among export, import, capital formation and economic growth in Malaysia," *Journal of global economics*, **4**, (2), 1-6.
- [10] Tong cuc Hai quan, Available online: <https://www.customs.gov.vn/> (Accessed on 15 June 2020).
- [11] Tran, T. T. (2019), "Applying grey system theory to forecast the total value of imports and exports of top traded commodities in Taiwan," *International Journal of Analysis and Application*, **17**, (2), 282-302.
- [12] Tsaor, R. C. and Liao, Y. C., (2007), "Forecasting LCD TV demand using the fuzzy grey model GM (1,1)," *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, **15**, (6), 753-767.
- [13] Wang, C. N. and Phan, V. T. (2014), "An improvement the accuracy of grey forecasting model for cargo throughput in international commercial ports of Kaohsiung," *International journal of business and economics research*, **3**, (1), 1-5.
- [14] Worldbank, Tổng quan về Việt Nam, Available online : <https://www.worldbank.org> (Accessed on 18 September 2020).
- [15] Yi, L. and Sifeng, L. (2004), "a historical introduction to grey system theory," *IEEE international conference on system, Man and Cybernetics*, **3**, 2403-2408.
- [16] Yang, X. B. ; Zou, J. J. and etc. (2018), "The analysis of GM (1,1) grey model to predict the incidence trend of typhoid and paratyphoid fevers in Wuhan city, China," *Medicine*, **97**, (34), 1-5.
- [17] Zhao, M. Y. ; Zhao, D. X. and etc. (2015), "The gray prediction GM (1,1) model in traffic forecast application," *Mathematical modelling of engineering problems*, **2**, (1), 17-22.

STUDY ON THE BARRIERS TO SOCIAL ENTERPRISE GROWTH IN VIETNAM

Doan Thu Trang^{1*}, Nguyen Thi Ha¹ and Nguyen Thuy Trang¹

¹ International School, Vietnam National University Hanoi, Vietnam

*Corresponding author: trangdt@isvnu.vn

Abstract

Social enterprises have been growing very fast in recent years in Vietnam. With its distinctive characteristics, social enterprises have become a promising model to support Vietnam in dealing with social issues, such as unemployment, inequalities or environmental problems and so on. However, social enterprises in Vietnam are also facing many obstacles which challenge them to expand. In this research, we conduct a multi-case study with six social enterprises in Vietnam, to explore the main impediments to their growth in the market. Findings from the case study reveal many obstacles related to both external environment and internal resources of social enterprises.

Keywords: social enterprise, Vietnam, barrier to growth.

1. INTRODUCTION

For the last twenty years, the renovation and new market policies in Vietnam have created essential conditions for the development of all businesses in both the economic and social sectors. Vietnam's business landscape has absorbed the existence of an organizational structure named "social enterprise" which is defined as an entrepreneurial organization that focuses on achieving wider social, environmental, or community objectives. Since 2014, the term "social enterprise" has been officially recognized as a distinct type of organization in Vietnam Enterprise Law (British Council, 2019). The majority of Vietnamese social enterprises have been developed in response to social needs and led by charismatic and persistent social entrepreneurs. According to the Survey Report on Social Enterprise in Vietnam (2011), there are four main areas from which social enterprise emerged: non-government organizations (NGOs), traditional firms, voluntary associations/clubs, and co-operatives.

With its mixed goals to maximize the social impact alongside the economic gains, an increasing number of Vietnam social enterprises have participated in the gigantic and diverse market, and are actively supported by a large number of prestigious organizations including the British Council, The Centre for Social Initiatives Promotion (CSIP), The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and so on. Resources from the social sector are highly important for Vietnam to resolve the critical social issues. These issues include low quality of education and health care and environmental issues such as climate change, natural disasters, and so on. In addition, social enterprises also help to bridge the gaps between men and women, between urban areas and

rural, remote, mountainous areas, and between ethnic majority and ethnic minorities.

However, the social sector in Vietnam only accounts for a small portion with only eighty social enterprises officially registered with the government. Compared to commercial ventures that pursue commercial success alone, social enterprises are explicitly motivated by the dual mission to achieve economic and societal value creation. This implies that they will encounter a more complex array of barriers to growth than other commercial companies (Davies, Haugh and Chambers, 2018). Shortage of staff or volunteers, lack of business skills and cash flow and the like are suggested to be the main challenges faced by most social enterprises (British Council, 2019). However, existing research has not touched the deep root of barriers to growth or outcomes are merely stated from survey without further investigation. With the new wave of start-up social enterprises, it is more urgent to determine these barriers to form a healthy ecosystem for social enterprises to thrive.

Considering the call for more research on barriers to growth of social enterprises, we dedicate this study to answer two questions as follows:

- (1) What are the barriers that impede the social enterprise growth in Vietnam?
- (2) How can social enterprises in Vietnam overcome these barriers?

We choose to investigate these two questions in the context of the Vietnamese market. Vietnam's economy has transformed extensively while confronted with significant social challenges. This leads to the vibrant and diverse growth of the social enterprise sector in Vietnam while a huge number of enterprises have been run since 2015, mainly led by young founders (British

Council, 2019). Pham (2016) explored three driving factors on the emergence and growth of the social enterprise sector, namely entrepreneurs, professional intermediaries and markets. While the state did not have further introduction of social enterprises, it is advocated to establish supporting policies for this sector (Pham, 2016). As setting up for tackling social challenges, the objectives of social enterprise vary from social to environmental issues, but mostly on the mission of creating employment opportunities, improving a particular community and supporting vulnerable people (British Council, 2019). Studies by British Council suggested unique characteristics of Vietnamese social enterprises such as most are profitable, take different legal forms rather than social enterprise, and are optimistic to have a plan to grow. On the other hand, they also mentioned that social enterprises do meet significant challenges to grow their businesses. Nevertheless, the number of research on the social enterprise in Vietnam is generally limited, most of which were conducted by British Council, The Centre for Social Initiatives Promotion (CSIP) and The Center for Social Innovation and Enterprise (CSIE) and mainly about social enterprise overview. Meanwhile, the literature on social enterprises' challenges are carried much more in foreign countries, where social enterprise models firstly form and become popular. Although the findings from these papers somewhat can be applied in the early stage of social enterprise, these suggestions are still far from being able to fit this fledgling business sector in Vietnam.

On that basis, this study is conducted to give a closer look at issues encountered by social enterprises in Vietnam. In this paper, we first offer a literature review on barriers to growth of small and medium enterprises (SMEs) in Vietnam. This section also provides a theoretical background for the study as social enterprises are considered as a type of SMEs. Then, we discuss the concept of social enterprises in Vietnam and review their barriers to growth in three main categories, which are institutional-based barriers, business model, and values-based barriers. Next, we explain our methodology and data collection processes. This section is followed by major results presentation. The last section discusses on our findings, recommendations to social enterprises in Vietnam and concludes.

2. THEORETICAL BACKGROUND

2.1. Barriers to Growth of SMEs in Vietnam

Since the Vietnamese government launched the "Doi Moi" (Renovation) policy (1986), joined ASEAN (1995) and the World Trade Organization (2007), small and medium-sized enterprises (SMEs) in Vietnam have experienced remarkable growth. SMEs play a major role in Vietnam's economy and account for 98 percent of all enterprises with approximately 40 percent of

GDP. As social enterprises in Vietnam fall into the SMEs sector in the eyes of government policies (British Council, 2019), it is crucial to revise the SMEs context to get the general picture of Vietnamese business environment. While the government has made a number of reforms, SMEs in Vietnam continue to face constraints to the development that come from both internal and external factors.

Main internal barriers include limited management and technological capability (Pham et al., 2017). First, the dynamic management capabilities are the core elements to gain congruence between organization's competencies and the change in its environmental conditions (Kor and Mesko, 2013). These capabilities include three main attributes which are managerial human capital, managerial social capital and managerial cognition (Adner and Helfat, 2003). The importance of management capability to SMEs is no longer doubted with various empirical evidence. According to Tran (2015), the knowledge of business and management has significant and positive impact on the success of SMEs, but it should be noted that 55.6 percent of Vietnamese SME managers have insufficient knowledge, namely business and corporate governance and business law (JETRO, 2017). Obviously, the managers in such cases cannot build a long-term strategic business plan and mostly operate based on their limited experience (Pham et al., 2017).

Second, regarding technological capability, domestic firms have to focus on digitization and innovation if they want to compete with foreign firms as the global economy moves towards the Fourth Industrial Revolution (Das, 2017). However, among three technology developing stages: adopting, mastering and creating, Vietnam is still on the first stage (Tran et al., 2008). Research and development (R&D) in Vietnam is mostly set in large firms, which limits the capability to create new technology to further promote technology developing stage in Vietnam. Notably, the private sector has virtually no investment in R&D, according to Dinh and Vu (2004). The reasons include inefficient and theoretical education system (Tran et al., 2008) as well as limited commercialization of technology products. It seems that difficulties in access to resources like capital, production premises and government insufficient and ineffective policies are the cause for this late adoption (Pham et al., 2017).

In terms of external factors, access to finance/credit, access to land, physical infrastructure, labor force, as well as the practices of competitors in informal sectors are considered as the main obstacles (Pham et al., 2017). In South and East Asia and the Pacific, approximately nine million of all formal SMEs do not have sufficient access to finance (IFC, 2013). Credit access is a major concern for the Vietnamese SMEs (Das, 2017). In 2008, because of tightened monetary policy, access to finance became difficult for all

enterprises including SMEs (Vo et al., 2011). “Credit gap” is the difference between formal credit provided to SMEs and total estimated potential need for formal credit based on McKinsey & Co. estimates (ADB Institute., 2016). SMEs in Vietnam encountered a huge credit gap with approximately US\$ 42 thousand per enterprise in 2011 (IFC, 2011). Credit accessibility of SMEs shares some common characteristics that differentiate from large firms (Nguyen et al, 2015), in which firm size determines firms’ ability to obtain credit (Bigsten et al, 2003; Drakos and Giannakopoulou, 2011; Hainz and Nabokin, 2013; Le, 2012; Nguyen et al, 2015). Another determinant is small firm age (Reynolds, 1987; Nguyen et al., 2015; Pham, 2017) with some obstacles to access finance including informational disparities (Hernández-Cánovas & Martínez-Solano, 2010; Kira & He, 2012), more difficulties to monitor (Byiers, Rand, Tarp, & Bentzen, 2010) and inexperience (Akoten et al., 2006). Due to the challenges in access to finance from banks and financial institutions, Vietnam SMEs seek investments from internal sources rather than external sources (Yoshino and Wignaraja, 2015) such as relatives, and friends with interest rate three to six times higher than that of bank (Hoang Hai, 2004), non-bank sources rather than banks (Wignaraja and Jinjarak, 2015).

Regarding difficulties to access to external bank loans, there are some major constraints such as high transaction costs, asymmetric information (Beck, 2007; Hernández-Cánovas & Martínez-Solano, 2010), and high interest rates (Vo et al., 2011; Nguyen et al., 2015; Brandt K. et al., 2016). Difficult application process (Brandt, K. et al., 2016; Vo et al., 2011) also makes SMEs credit constrained. With regards to bank loans, higher default risks, lack of financial transparency, and lack of assets for a mortgage (Das, 2017; Pham et al., 2017; Shinozaki, 2012; Vo et al., 2011) are the reasons that make banks hesitate to provide loans to SMEs.

In addition to the impediment in financial accessibility, Tran Tien Cuong and colleagues (2008) indicate the “bottlenecks” to SMEs development-underdeveloped infrastructure, poor quality, and insufficient human resource. First, the poor quality of infrastructure links to the SMEs’ problem in access to land for business purposes. Second, limitation of the labor force with skill shortages cause the low absorptive capability of the domestic firms and hinders technology development (Pham et al., 2017; Tran et al., 2008; Vo et al., 2011). Moreover, increasing competition puts pressure on the growth of SMEs as they are still discriminated while state-owned enterprises receive continued subsidy and preferences in different forms in conjunction with unfair competition from foreign-invested enterprises (Das, 2017; Brandt K. et al., 2016; Tran et al., 2008; Vo et al., 2011).

In short, the barriers to growth of Vietnam SMEs reviewed above can be summarized in two main

groups: internal and external base. Regarding internal barriers, prior literature states that limited management skills and technology capability are the key leads to poor operating decisions. In terms of external factors, access to finance/credit, underdeveloped infrastructure, limitation of the labor force, increasing competition are considered as major obstacles.

2.2. Social Enterprises in Vietnam and Their Barriers to Growth

Emerging as a new business model in Vietnam, not only social enterprises suffer from the same barriers as commercial business, they also have their own impediments due to their nature. Social enterprises were recognised by Vietnam’s Enterprise Law officially in 2014 and defined as “an enterprise that is registered and operates to resolve a number of social and environmental issues for a social purpose; and reinvests at least 51 percent of total profits to resolve the registered social and environmental issues” (Article 10, Enterprise Law).

With this interpretation, there are more obstacles to social enterprise growth. Scaling up a social enterprise does not simply mean improving commercial performance only, because its growth is achieved from various perspectives which are primarily underpinned by the mission of perceived social value (Hynes, 2009). In addition, the development of social enterprises may take different forms, often in non-financial areas in the early stage, then to employment, revenue (profit) and product/service growth in the latter stage (Hynes, 2009).

The concept of social enterprise has become more and more prominent across continents and gets assisted by significantly encouraging policies and active cooperation from the government to achieve social missions. However, in Vietnam this concept is still in the early stage, making social enterprises to face even tougher barriers to survive and thrive. According to Truong (2018), there are no specific criteria to define social enterprises in Vietnam. The diversified definitions of social enterprise themselves impinge on enterprise creation and growth (Davies, Haugh and Chambers, 2018). Recognized as “hybrid” models between non-governmental, non-profit organizations and businesses, social enterprises can adopt and apply many types of organizations with different legal statuses, such as NGOs, limited company, shared company, Cooperatives, Funds, Association, Clubs (Nguyen et al., 2012). In addition, there is no legally authoritative organization to manage the social enterprise sector (Nguyen, 2013). This complicated variation of organizational forms tends to create confusion for the public. Furthermore, it might limit the opportunity seizing of social enterprise due to the regulatory and cultural expectations of specific organizational forms (Robinson, 2006). It is worth

noting that until present, there are only 88 social enterprises that have legally registered among 19125 enterprises estimated in Vietnam (British Council, 2019).

According to Davies and colleagues (2018), the obstacles for social enterprises' growth can be categorized into three major groups: Institutional, Business Model and Values-based.

First, regarding institutional-based barriers, Truong (2018) provides various policy burdens to Social Enterprise, such as few preferential policies on facilities and taxes, more obligations than benefits on registering as a social enterprise, and no legal framework for this model. Moreover, the author states that the administrative procedure is a constraint, not only for social enterprises but for all businesses in Vietnam, or they even receive no support in public processes (Wildmannova, 2018). Second, Davies (2018) further lists consumer behaviors and traditional business norms as the main institutional factors. In addition, customer inertia and low awareness of social enterprises are the main concerns to social enterprises' communication messages while they have to balance between benefit-to-customer and benefit-to-distant-other ones. The problem also comes up with asymmetry of social cost and perceived customer value to gain an effective cost structure, which Hynes (2009) advances the situation as it is difficult to ask limited income customers to pay a certain price. Third, barriers to growth that are identified with traditional business norms arise from conservative lending policies and low-interest of investors make social enterprises struggling with sustaining the capital more than other businesses.

Second, in terms of business model based barriers, carrying dual missions slows down the development of social enterprises in some ways. In addition to maintaining the social mission, social enterprises must undertake business operations and compete fairly and equally with traditional businesses in the same field (Nguyen et al., 2012). Nguyen and colleagues indicate that this "social innovation" business solution is a challenge of social enterprises as they need to provide good quality and reasonable price products and services to the market. In addition, Wildmannova (2018) proposes that the lack of social innovation capacity, especially insufficient innovation offer, is a barrier to the activities of social enterprises. Not only having difficulty in achieving social mission, social enterprises also encounter financial related difficulties including the lack of capital, adequate different types of financial report (Nguyen, 2013), and falling into a vicious cycle of solving short-term financial difficulty and long-term investment (Nguyen et al., 2012). Social enterprises in Vietnam are quite young, thus lacking the capability of human resources management. The challenges in access to human resources of social enterprises

regularly come from communication barriers with diverse stakeholder groups, lack of personnel with commercial acumen and a narrow initial motivation for starting the enterprise (Dey and Teasdale, 2015; European Commission, 2015; Germak and Robinson, 2013). Moreover, Davies, Haugh and Chambers (2018) specify the network-based recruitment and constraints on employee remuneration (limited pools of human capital and low rewards for achievement) are the factors hindering the growth of the enterprises. Following the barrier to growth list are the weakness in the marketing, branding and social impact measurement (Truong et al., 2018) and the scarcity of viable business models that successfully combine dual mission achievement (Camenzuli and McKague, 2015; European Commission, 2015).

Last, regarding the value-based barriers, Davies, and colleagues (2018) suggest three major challenges to social enterprises, namely Ethical value difference, Growth philosophy and Ethical principle. "Ethical value difference" is defined as the level of conflict with stakeholders such as suppliers and distributors. With different values, or even on the two sides of the coin, the informants will purposely reject all resources from other stakeholders, namely finance, raw material or outlet and so on. Next, "growth philosophy" is presented as the perspective of managers toward the growth process, with commercial imperative and preservation of social mission. Hynes (2009) found that various commercial objectives were adopted by enterprises with the aim of securing external funds to perceive their missions. The social and commercial objectives can be parallel processing (Hynes, 2009), but should be restricted to not compromise social mission to accelerate commercial one (Davies et al., 2018). Last but not least, 'ethical principle' explains how difficult the balance between commercial and social impact can be achieved in all business functions. Note that social fairness and environment fairness, referring to the acknowledgment of social and environmental externalities, are the active factors on the manager's decision concerning suppliers and distributors.

In a nutshell, most of literature reviewed above were conducted in international markets. In order to get a more thorough understanding about the constraints to Vietnam social enterprise growth, we conduct our multi-case study on social enterprises in Vietnam. In the next section, we explain our methodology and data collection.

3. METHODOLOGY

3.1 Methodology

Our research applies a qualitative methodology with multiple case studies approach in order to look deeper into perceptions of different social enterprises. As a typical exploratory research design, two stages were

involved in the data gathering process. Firstly, we adopted in-depth interviews with founders and representatives of social enterprise to get into Vietnamese context. To get narrative data, interview questions were given in two main topics: the motivation of setting up a social enterprise and the obstacles that restrain its growth to achieve social mission. During the interview, questions such as: “Can you please tell me more about the achievements of your enterprise...” were stated to encourage the entrepreneur to reflect their operating procedure and experiences to gain success. All of the information from the interview was recorded and then transcribed. Lastly, the data were analyzed and conceptualized into categories of different main bases according to the theories.

3.2 Case selection

Our exploratory research involves six case studies of six social enterprises in Vietnam (Alpha, Beta, Gamma, Delta, Zeta, Kappa). With the aim of having an overview of the barriers to growth of Vietnam social enterprises, our decision to case selection was not limited to any specific business sector, firm size or age except for the institutional context is Vietnam. These six cases are very active in Vietnam’s social enterprises ecosystems. Some of them are even considered the pioneering cases in applying social enterprises model in Vietnam business context. The core social missions of each case are diverse and supported by different business activities. The subjects of the social mission mainly focus on the vulnerable such as the disabled, children in remote areas, domestic abuse victims. Detailed information on each of the six cases are presented in Table 1.

Table 1: Sample and Case Description

Firm	Founded	Product/Service Offered
Alpha	2006	Clothes, accessories, homewares, and toys
Beta	2017	Clothes, accessories, artwork
Gamma	2016	Snookball, footbowl and footgolf
Delta	2018	Food
Zeta	2016	Public playgrounds
Kappa	2001	Restaurant

3.3 Data analysis

The transcript was stored in word files and double-checked by team members. As all interviews were conducted in Vietnamese, we translated the script into English and had it corrected by a translator partner. The data were then extracted to key information related to business barriers and the same information of each case was categorized into discrete topics. We used two

initial cases to develop the template of barriers based on these topics with definition and empirical data for each to make sure the barriers are supported with relevant information. For the later cases, we revised all the available barriers to put it in suitable barriers or create a new category. With the barriers raised by various data, we compared the characteristics of data one by one to choose the most compatible evidence. When we gathered enough data, the template was filled with the evidence from the transcript and changed its name to fit with the temporary information. To have the highest result, every adjusting step was repeatedly cross-checked when finished inserting data from a new case. Finally, we theorized the main bases from the categories of barriers and labeled them with relevant aspects.

4. RESULTS AND DISCUSSION

As our process included within-case and cross-case analysis, we identified a wide range of barriers which are specific for Vietnamese context. We present our findings in the following sections.

4.1 Institutional-Based Barriers

Our data reveal that institutional barriers, including administrative procedures barriers, consumer behavior barriers and traditional business norms barriers, are the most common obstacles faced by social enterprises. Below is the detailed explanation regarding each barrier.

Policy. Before suffering from any barriers from the market, social enterprises experience the difficulties coming from business policies. The first constraint is the *lack of instruction from the government*, which is explicit by its name, making social enterprises fall into the sea of turbulence. For example, although the registration process is clear and straightforward for commercial firms, for social enterprise, it is much burdensome to be legally recognized. A founder stated that:

We already have registered as Social Enterprise, but in the early stage, almost nobody knew about this model, even in the Planning and Investment Department, the accountant had to ask a number of people to find somebody who could help us (Zeta).

In relation to this constraint, five of our enterprises mentioned that the *available business law is not supporting their model*. Moreover, there is *no specific legal framework for social enterprises*, which makes their development suffer even more. Noticeably, because the legal framework for social enterprise is not drawing up, the social enterprises prefer to work under other business forms to avoid uncertainty that emerge in the unclear business model, as suggested by a CEO:

For the social enterprise model, the Vietnamese policy framework is still vague. And while the policy is unclear, it is the barrier for us to do business. That's why I registered my business as a collective economy model (Beta).

Administrative procedure. The "administrative procedure" concept refers to all practices that are required by the government to manage organizations such as registration, transferring business models, paying taxes and so on. Despite the reduction and renewal in administrative procedures in recent years, enterprises in Vietnam still find it too complicated when dealing with administration processes. Together with unsupportive policies, administration processes in Vietnam really created significant challenges to all social enterprises that we interviewed, as stated by a CEO.

I had to visit Vietnam many times just to register myself and my company as a social enterprise. This cost me lots of time and money (Delta).

Consumer behavior. Building relationships between social enterprise and customers is another key objective for enterprises to achieve economic goals. The concept of attaching some particular social values to the business has emerged for quite a long time in developed countries but Vietnamese consumers seem to barely acknowledge it, they even doubt and criticize it. The low awareness of social enterprises of Vietnamese people is a constraint for social enterprises to reach the "action" stage of the AIDA model (awareness, interest, desire, action) for consumer behavior. This is clearly revealed in the sharing of a founder:

The highest barrier for us is the social mindset, not the policy framework or any financial problem because it is carved in people's minds that social enterprises are the weak, vulnerable class that always have to wait for the money from non-government organizations. With this prejudice, it is very hard for us to grow as a business (Gamma).

Traditional Business Norms. Not only normal people but the authorities are also not completely aware of the social business model. Some still misunderstand social enterprises with the corporate social responsibility of a conventional venture. This leads to lack of support from the authorities while social enterprises are struggling to develop.

For the local authority, they see us as traditional enterprises, then when working together, they prefer to have some discounts. Although our projects are for the sake of society and not for profit, the

authority still demands an exemption as they keep the thought of us as a profitable business (Zeta).

4.2 Resource-Based Barriers

At the organizational level, we focus more on internal resources to explore the barriers related to business models, business experiences, funding and infrastructure and the like.

Managerial skills and experiences of founders. Key factors to the success of every company include the skills and experiences of the founder. It is crucial to a new business model like social enterprise to thrive in the early stage. From the data we collected, four out of six social enterprises are reported to be founded by founders with no or very limited experience in management or business. Their backgrounds are varied from diverse sectors, such as art, journalism rather than management related. Therefore, within the boundary of their business knowledge, it is difficult to evaluate at least the avoidable risks.

I am an architect and my co-founder is a journalist. In the beginning, we suffered from many problems as we did not have background knowledge of business management, all of our actions are based on what we can learn ourselves (Zeta).

It should be noted that, in our cases, even if the founders are former managers of traditional businesses, they still struggle with creating and sustaining their own social enterprises. The fact that operating social enterprises are different from traditional business is only drawn out after a long time of getting lost. One of the CEOs suggested that:

Based on my observation, the lack of business skills is the center of all problems that Vietnamese social enterprises experienced. People often focus too much on solving social challenges while the business management receives no attention. All three founders of our enterprise do not have business related background. Although two of them have experience in operating their media company, it is totally different when creating Alpha... At that time, everything was unplanned, we designed our product in line with our preferences and ignored the customer insights and cost, which led to financial losses in many years (Alpha).

The ultimate goal of a social enterprise is to solve a social problem and to educate the customer of purchasing products that create social impact. Therefore, the selling process, especially marketing, is an essential step to effectively spread the message of each product. In our case study, most social enterprises

merely advertise their products through fanpages on social networks and through personal networks. As network-based marketing is still working, entrepreneurs put less effort to promote their business, resulting in *weak marketing and branding measurement*.

I have not spent any money on marketing as the project is still supported by the media and the network of parents or schools. I already have a poor-quality website as no one takes care of it, also I created a page on Facebook where I just post the story of this project (Gamma).

Furthermore, without an appropriate marketing strategy, our social enterprises face another difficulty of customer *misinterpretation of social objectives*. Since the organizations adopt dual missions for economy and society, the uncertainty in marketing can easily drive such enterprises on the verge of commercializing entire businesses. This brings out the skepticism and inquiry of customers on whether the enterprise focuses on dealing with social challenges or makes profit from it.

We should be careful to market our product to avoid commercializing "what cannot be commercialized". Therefore, we have to separate the marketing plans for each product, so that our product can fairly compete in the market. Then people will buy it not because of donation, but because it is good and useful, and even want more because of the story behind our product (Alpha).

Human resource. Human resource management is always a challenge for any business. But taking the social enterprise perspective, it raises more barriers due to the unique business characteristics. In the first place, we realized *the low level of commitment* in social enterprise's employees. Two founders in our cases have the same opinion that employees of social enterprises mostly engage because of their interest in this business model, not only for the salary. Besides, the compensation in social enterprises is relatively low in comparison to traditional business. All of these issues result in: (1) hard to recruit good candidates, (2) having mostly young employees who enthusiast with their jobs but lack of experience (because experienced people often have their own families then they demand for higher income) and (3) after a while, employees will seek for another job elsewhere if they have financial issues.

The compensation or salary policy at Alpha is only adequate compared to the average level in the job market. Therefore, applicants to Alpha are primarily young people who are really interested in social enterprises and focus on self development rather than income (Alpha).

On the other hand, in some social enterprises, their special workers cannot promise long term cooperation because of their own condition.

Although we hire people with disabilities, there are quite many issues that we need to consider. For example, there is no guarantee that they will stay with us for a long time (Beta).

Training employees is another human resource issue that many social enterprises have. As a large number of employees in our cases are vulnerable and disadvantaged people, the founders shared that they had to be very patient when helping their staff to work in a professional way.

I found it challenging to deal with these women themselves because they are extremely vulnerable. They were already in their 30s or 40s, have different backgrounds and perceptions from different countryside, so it is not easy for them to change their mindset.

..... Also, it is hard to train because these (vulnerable) women's skills are not so high (Delta).

Unbalanced business model. Social enterprises have to carry dual missions and this leads to the difficulty in not compromising the economic mission and social impact of the products and services. Most of the products from the social enterprises we interviewed are handmade, hence, their prices are relatively higher than those of mass-produced products. The disadvantage in price hinders social enterprises from competing directly with the majority of for-profit enterprises in the market.

We continually review market feedback to evaluate trends for product improvement, but the difficulty is how to balance the interests of customers so that the product price is not too high or else we stop to develop more market-driven products (Alpha).

Access to Fundings. All of the six cases interviewed stated that the founders all fund social business with their own money, such as their savings or salaries from other jobs. Without a stable job, social enterprise founders would *lack the capital* to fuel their passion for achieving social missions.

I still have an outside job to pay for my employees and the house rent (Delta).

In addition to using personal savings, some founders also shared that they received financial support from friends and relatives. However, those funds are trivial and scaling up a business requires more funds from established organizations. Non-government funds are the destinations for social enterprises to go to when

they need funds. The *lack of financial support for social enterprises* emerges as a primary barrier to growth. Let alone that the number of funds for social enterprises is small, the resource in each fund is also limited and has to be distributed to many other enterprises in need.

I think it is quite difficult to raise funds from impact funds and impact investors because Vietnam has few available funds for social enterprises like other countries. There is a trend in impact investing but these investors only focus on particular industries such as agriculture or technology, not for domestic violence (Delta).

When we mentioned the funding source from bank loans, all of the six social enterprises said they never thought of it or they find it *difficult to access bank loans*. Borrowing money from banks is different from other sources. Banks often require quite a lot of procedures and social enterprises find it difficult and time-consuming to meet those requirements. Moreover, banks do not have any desirable policy for social enterprises to get a loan.

Actually a bank loan is eventually a type of loan and it is hard for social enterprise to handle (Kappa).

Both the collective economy model (cooperative) and social enterprise have to mortgage assets when borrowing money from banks. The problem is people with disabilities like us often never have their own property, it belongs to their family. Therefore mortgaging assets need family approval which rarely occurs (Beta).

In relation to the impediments of funding, we find some other factors associated with financial challenges that social enterprises in Vietnam encounter. Running a business is never easy, especially when the business has to share its resources. Social enterprises face the challenge of *resource allocation* since they have to use 51% of profit to accomplish their social mission and the 49% seems to limit their profit optimization capacity.

Competing in the market and making profit already make traditional enterprises struggle but social enterprises have to face more challenges because SEs only spend 49% of their profit on reinvestment and 51% on addressing social issues. This challenge of sharing resources fundamentally slows down the growth speed of social enterprises compared to conventional enterprises (Alpha).

Insufficient cash flow. After stating all problems related to accessing funds, what is left is the instability in receiving external finance. While the business has not recorded any surplus, social enterprise must seek for loans to continue operating. As discussed earlier, the traditional sources are too complex to approach, social enterprises rely more on social funds as the alternative. But there is another problem because these funds are not always available and cannot be transferred as fast as getting loans from other sources:

...there are always times when your fund is delayed, then you cannot pay the bills and your supplier will cut your material so you cannot run your business... Some firms have plans to fund certain organizations, but they often choose one organization for each year, then if this year they finance our enterprise, the next year we have to find another sponsor (Kappa).

Infrastructure. In our sample, all social enterprises do not have their own offices. While traditional companies rent a place and gradually make profit to have an official one, the social enterprises cannot do the same as their mission block the flow of revenue into saving. This obstacle puts social enterprises at a disadvantaged position as they have to find a long term location to operate, which is often scarce. Moreover, associated with the barrier of cash flow, the lack of infrastructure makes it difficult to approach any funds.

When the landlord found that my business works and we built our community at their place, they kicked us out right away. Then we have to move from place to place with a very short house rental contract. I do not think I have enough money to rent a place in 5 to 7 years or more (Delta).

5. CONCLUSION

While the interest in social enterprises is growing with the awareness of acting for the well-being of society, our social enterprise research serves as a supportive work to get into this new business model. In this study, we adopted a qualitative approach and clarify our results with empirical evidence. Using within-case and cross-case analysis, we were able to identify a wide range of barriers to social enterprise growth in the Vietnamese context. Not only underpinning challenges in Vietnam suggested by previous studies, we also prove that some barriers to foreign social enterprise growth weigh down Vietnamese social enterprises. Most importantly, we extend theoretical barriers with the impediments of the social enterprise founders' lack of managerial experience and human resources management. Understanding the difficulties faced by Vietnamese social enterprise and recognizing the potential internal values of this business, we propose transcending vagueness strategy to minimize the

uncertainty in legal framework, consolidating strategy to promote the interest of stakeholders and empowering social mission strategy to lever up the business.

5.1. Theoretical contribution

Up to date, research on barriers of social enterprises' growth in Vietnam is still limited, both in quality and quantity. The literature to date has identified institutional barriers to social enterprise growth in Vietnam. Our findings confirm that social enterprises struggle with the lack of the legal framework (Nguyen et al., 2012), supporting policy from the government and the complicated administrative procedures that social enterprises find it hard to accommodate (Truong et al., 2018). Our study contributes by analyzing how the ambiguous definition and the inappropriate marketing strategy of the social enterprise model lead to the misunderstanding and prejudice of the consumers and investors about the way social enterprises work.

The knowledge and experience limitation of managers (Pham et al., 2017) are stated as one of the internal impediments to SMEs' growth in Vietnam. With reference to the Vietnam social enterprise case, existing literature on this type of barrier has not specified the role of founders in the development of the enterprises. We found that founders of social enterprises vary in different fields such as art or journalism, and seek for social innovation related to those backgrounds or to help their community where they reside. They are not equipped with sufficient skills on how to effectively operate a business enterprise while concentrating on achieving social missions. We also extend the Vietnam social enterprise literature by providing the cause impeding the development that most social entrepreneurs make light of in the marketing and branding process.

Previous research concludes that the barrier to social enterprise growth comes from the low quality of human resources (Nguyen et al., 2012) with insufficient skills (Davies et al., 2018). In our study, most social enterprises found it hard to provide competitive benefits for their employees and they also needed special techniques to work with the vulnerable. We thus expanded the theoretical barrier in Vietnam with a low level of commitment of employees under special work conditions as major impediments in human resource management.

A series of research conducted in both Vietnam and foreign contexts conclude that access to fundings is the main financial barrier with a lack of financial support for social enterprises (Nguyen et al., 2012; Wildmannova, 2018). In this research, we reinforce the empirical evidence in which Vietnam social enterprises finance their business with their own money from personal savings or from friends other than seeking funds from established organizations due to the small

number of social funds. In addition to seeking funds from internal sources, the limitation of profit optimization with only 49% of profit reinvested makes social entrepreneurs continuously raise funds to fuel their business growth. These barriers slow down the development of social enterprises.

5.2. Recommendations

All barriers considered, we would like to propose some strategies for social enterprises to overcome the challenges. With the combination of theoretical literature and novel insight from face-to-face interviews, we develop three strategies to match with Vietnamese situation while still balancing the social-commercial missions.

(1) Transcending Vagueness

Previous sections point out that vague social enterprise regulations and lack of supportive policies are primary impediments for social enterprise at the entry mode. It is critical to grasp all social enterprise legal benefits in available business law while there is still a long way to go until the specific framework of social enterprise is implemented. Instead of being susceptible to the unclear business code, we would like to suggest outsourcing the legal function by which social enterprises can take their rights and simultaneously focus more on business management. Two cases in our sample reported that they did not suffer from policy-related constraints due to the fact that they all have law agencies to take care of those. It would be challenging for some social enterprises when they still struggle with operating costs, then the suggestion might broaden the network of founders in the same industry to have advice on legal framework from the formers.

(2) Consolidating

At the market entry-level, social enterprises fall under the prejudice of customers and the skepticism of investors. For any business, this is the verge of loss unless they find the way to climb up. It should be noted that, although being legally recognized in 2014 and even appearing in Vietnam far earlier, social enterprise is still a new concept to Vietnamese people while the number of this model is modest and the legal portion is much limited. This humble scale of social enterprises reflects the low awareness which accounts for the misunderstanding and prejudices from both investors and customers. With this in mind, we would like to propose the consolidating strategy – which leverages the awareness of Vietnamese people on this new type of business. Referring to the similar strategy suggested by Davies, Haugh and Chambers (2018), we inherit and adjust for Vietnamese social enterprise to effectively apply. In the customer segment, we suggest active communication in various forms to further educate people on the concept and impact of this business

model. In particular, as we noticed a successful case in our sample gaining positive response in local community to their model, we recommend local anchoring to raise awareness and interest in the neighborhood then later widen the encouraging effect to larger markets. In the investor segment, we suggest promoting the connection between social entrepreneurs and professional intermediaries to foster the awareness of potential investors as well as to approach the funding with the same objective. Moreover, the annual fairs and innovation competitions are the proper places to better deliver the social impact to future investors.

(3) Empowering social mission to build a strong ecosystem

Most social enterprises in Vietnam started off to perform social missions rather than generate profit from running a business. Informants of our research acknowledged that passion in addressing social issues was not enough for them to maintain the social enterprise model. Truong (2018) mentions that social impact entrepreneurs have “a warm heart” when pursuing social missions but not “a cold head” with a clear business mindset. Four out of six cases we interviewed have faced challenges originating from the lack of managerial skills and experience. Empowering social mission by enhancing the capabilities of social enterprises’ founders is essential to advance their social innovation to expand the scale of social impact. We suggest that social initiatives call in for professional mentoring and coaching network from social enterprises support centers such as CISP (Centre for Social Initiatives Promotion) and CSIE (Center for Social Innovation and Entrepreneurship) or incubators like sYs, TFI, WeCreate in Ha Noi, DNE in Da Nang, SIHUB in Ho Chi Minh City to access their sufficient training courses about leadership and business skills.

Regarding the impediments in human resource management, our informants mentioned that their employees lack commitment and decide to engage in working for social enterprises and accept low remuneration because they are interested in the social sector. Therefore, the social mission of the enterprises could be leveraged to increase the level of employee engagement as the value of the organization and employees is aligned with each other.

Since social mission is at the heart of the relationship between social enterprises and investors, it enables this business to seek financial support from conventional ventures which have the same social objectives. Taking this insight into consideration, we encourage social enterprises to leverage their social missions. This step serves two purposes: to reduce any possible conflict of values and principles between funders and social entrepreneurs and to boost the impact of these businesses. Also, we recommend social enterprises to expand their funding sources, from traditional bank

loans to modern impact investors. In our analysis, the case of Alpha is evidence to prove that one funding source cannot be efficient to operate business annually. Associated with constraints of lacking financial support and difficulty of accessing bank loans, we see the opportunities to approach some potential funding sources such as embassies, innovation centers and competitions, financial support programs... In the first place, diversified funds facilitate the flexibility of entrepreneurs in allocating resources for operating. For another, it will broaden the founders’ network which scales up the influence of social enterprises as well as supports business more than financial function. It should be noted that pitching skill is the key condition to successfully get the fund. With moving stories and significant business impact, the entrepreneur can have higher chances to be funded.

5.3. Practical implication

So far, the literature on barriers to social enterprises’ growth in Vietnam identified both internal and external impediments with recommendations given for professional intermediaries and actions proposed to the government. The scarce measurements suggested for social enterprises to maximize their utility limits these researches to be further applied by the main object of the studies. More importantly, the strategies are often given in form of discrete steps for each business function. As found in our data, we recognized the valuable internal resource of each social enterprise can be the fuel to foster their growth. Therefore, we propose the empowering social mission strategy based on the enterprises’ potential resources and capabilities. Focusing on the value of each individual, we design every step to be aligned with the social mission that can be tailored to fit with industrial characteristics. With its flexibility, the empowering social mission strategy can be used as a basis to deal with barriers to the growth of social enterprises. For remaining strategies, we develop Transcending Vagueness and Consolidating by analyzing management literature and those successful cases in our sample. We noticed the difficulties in balancing social – commercial mission, of lacking business skills and of limited resources, thus to lessen the strain on managers’ shoulders, having legal agencies to deal with lawful problems would be a practical option. This implication is often seen in commercial business and we find it can be applied in social enterprises as a typical business. Building on the strategic literature, we modify Consolidating to go with Vietnamese context as well as attach steps that are effectively applied in our cases. With small to medium scale and simple models, we believe that the strategies recommended can be adopted by social enterprises of any business size. For larger businesses, the result would be more impressive by advancing these strategies with skillful managers.

Limitation and suggestions for future research

Our study is limited to the boundary of the sample. We conduct an ad-hoc analysis with six cases – which cannot represent all social enterprises in Vietnam to fully explore the barriers. Secondly, the sample case includes enterprises from different sectors, but not all industries in Vietnam, then it hinders us to theorize specific barriers for each sector. Thus, the barriers provided include both general barriers applied to all social enterprises and distinct ones which only are suffered by certain social enterprises. Finally, we choose social enterprises from the suggestion of maps of social enterprises in Vietnam without filtering with particular criteria. This random selection may affect the result of the study.

Our research mainly investigates Vietnam social enterprises regardless of their industries, business models or social enterprise forms. However, we acknowledge that social enterprises in different industries might encounter different constraints on development that require distinct solutions. Therefore, our study paves the way for further research on the impediments regarding each business sector to respond better with the barriers. With this study, future research will be provided with key insights and theoretical challenges that would be the foundation for further finding.

6. REFERENCES

- [1] British Council. (2019). *Social Enterprise In Vietnam*. [online] Available at: <<https://www.britishcouncil.vn/sites/default/files/social-enterprise-in-vietnam.pdf>> [Accessed 18 March 2020].
- [2] Davies, I., Haugh, H. and Chambers, L., 2018. Barriers to Social Enterprise Growth. *Journal of Small Business Management*, **57**(4), pp.1616-1636.
- [3] Pham, H. (2016). Determinants of New Small and Medium Enterprises (SMEs) Access to Bank Credit: Case Study in the Phu Tho Province, Vietnam. *International Journal of Business and Management*, **12**(7), 83.
- [4] Pham Thi Tuyet Trinh & Nguyen Duc Thanh (2017), Development characteristics of SME sector in Viet Nam: Evidence from the Viet Nam Enterprise Census 2006-2015, VEPR, Ha Noi, Viet Nam.
- [5] Kor, Y. & Mesko, A. (2012). Dynamic managerial capabilities: Configuration and orchestration of top executives' capabilities and the firm's dominant logic. *Strategic Management Journal*, **34**(2).
- [6] Adner, R. & Helfat, C. (2003). Corporate effects and dynamic managerial capabilities. *Strategic Management Journal*, **24**(10), 1011-1025.
- [7] Tran, T. (2015). Key Success Factors of SME Entrepreneurs: Empirical Study in Vietnam. *International Journal of Business and Management*, **11**(1), 142.
- [8] Japan External Trade Organization (JETRO). (2017). Policies Supporting SMEs – Experience from Japan. In Workshop on Policies Supporting SMEs – Experience from Japan, Hanoi, Vietnam.
- [9] Das, K. (2017). Facilitating SME Growth in Vietnam – Vietnam Briefing News. [online] *Vietnam Briefing News*. Available at: <https://www.vietnam-briefing.com/news/facilitating-sme-growth-vietnam.html/> [Accessed 19 Feb. 2H020].
- [10] Tran, Tien Cuong, Le, Xuan Sang, & Nguyen, Kim Anh (2008). Vietnam's small and medium-sized enterprises development: Characteristics, constraints and policy recommendations. *SME in Asia and Globalization, ERIA Research Project Report*, **5**, 323-364. Available at http://www.vnep.org.vn/Upload/Vietnam%E2%80%99s%20Small%20and%20Medium%20Sized%20Enterprises%20Development%20Characteristics,%20Constraints%20and%20Policy%20Recommendations_Sang_KimAnh.PDF [Accessed 10 March 2020].
- [11] International Finance Corporation (IFC). (2013). Closing The Credit Gap For Formal And Informal Micro, Small, And Medium Enterprises.
- [12] Vo, T. T., T.C. Tran, V. D. Bui & D. C. Trinh (2011), Small and Medium Enterprises Access to Finance in Vietnam, in Harvie, C., S. Oum, and D. Narjoko (eds.), Small and Medium Enterprises (SMEs) Access to Finance in Selected East Asian Economies. *ERIA Research Project Report 2010-2014*, Jakarta: ERIA. 151-192.
- [13] ADB Institute. (2016). Financial system stability, regulation, and financial inclusion. [Place of publication not identified]: SPRINGER Verlag, JAPAN.
- [14] International Finance Corporation (IFC). (2011). Enterprise Finance Gap Database.
- [15] Nguyen, Thi Nhung and Gan, Christopher & Hu, Baiding (2015): An empirical analysis of credit accessibility of small and medium sized enterprises in Vietnam. *Banks and Bank Systems*, Vol. 10, No. 1, 2015 (2015): 34-46.

- [16] Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J. W., Zeufack, A. (2003). Credit Constraints in Manufacturing Enterprises in Africa. *Journal of African Economies*, **12**(1), 104-125. doi: <http://dx.doi.org/10.1093/jae/12.1.104>
- [17] Drakos, K., & Giannakopoulos, N. (2011). On the determinants of credit rationing: Firm-level evidence from transition countries. *Journal of International Money and Finance*, **30**(8), 1773-1790. doi: <http://dx.doi.org/10.1016/j.jimonfin.2011.09.004>
- [18] Hainz, C. & Nabokin, T. (2013). Measurement and Determinants of Access to Loans, *CESifo Working Paper Series* 4190, CESifo Group Munich.
- [19] Le. (2012). What Determines the Access to Credit by SMEs? A Case Study in Vietnam. *Journal of Management Research*, **4**(4), 90-115. doi: <http://dx.doi.org/10.5296/jmr.v4i4.1838>
- [20] Reynolds. (1987). New firms: Societal contribution versus survival potential. *Journal of Business Venturing*, **2**(3), 231-246. [https://doi.org/10.1016/0883-9026\(87\)90011-5](https://doi.org/10.1016/0883-9026(87)90011-5)
- [21] Hernández-Cánovas, G., & Martínez-Solano, P. (2010). Relationship lending and SME financing in the continental European bank-based system. *Small Business Economics*, **34**(4), 465-482. doi: <http://dx.doi.org/10.1007/s11187-008-9129-7>
- [22] Kira, A. R., & He, Z. (2012). The Impact of Firm Characteristics in Access of Financing by Small and Medium-sized Enterprises in Tanzania. *International Journal of Business and Management*, **7**(24), 108. doi: <http://dx.doi.org/10.5539/ijbm.v7n24p108>
- [23] Byiers, B., Rand, J., Tarp, F., & Bentzen, J. (2010). Credit demand in Mozambican manufacturing. *Journal of International Development*, **22**(1), 37-55. doi: <http://dx.doi.org/10.1002/jid.1558>
- [24] Akoten, J. E., Sawada, Y., & Otsuka, K. (2006). The determinants of credit access and its impacts on micro and small enterprises: The case of garment producers in Kenya. *Economic development and cultural change*, **54**(4), 927-944. doi: <http://dx.doi.org/10.1086/503585>
- [25] Yoshino, Naoyuki, & Ganeshan Wignaraja (2015). SMEs Internationalization and Finance in Asia. In *Frontier and Developing Asia: Supporting Rapid and Inclusive Growth* IMF-JICA Conference Tokyo.
- [26] Hoang Hai (2004), Some issues of the development of foreign invested sector. *Comunist review*, no. **706**(7).
- [27] Wignaraja, Ganeshan, & Yothin Jinjarak (2015). Why Do SMEs Not Borrow from Banks? Evidence from People's Republic of China and Southeast Asia. *ADB Working Paper*, No. 509. Tokyo: Asian Development Bank Institute.
- [28] Beck, T. (2007). Financing Constraints of SMEs in Developing Countries: Evidence, Determinants and Solutions. KDI 36th Anniversary International Conference.
- [29] Brandt, K. et al. (2016) Characteristics of the Vietnamese business environment: Evidence from a SME survey in 2015. Helsinki: UNU-WIDER.
- [30] Shinozaki, S. (2012). A New Regime of SME Finance in Emerging Asia: Empowering Growth-Oriented SMEs to Build Resilient National Economies: Asian Development Bank.
- [31] Hynes, B. (2009), Growing the social enterprise – issues and challenges, *Social Enterprise Journal*, Vol. 5 No. 2, 114-125. <https://doi.org/10.1108/17508610910981707>
- [32] Truong, T., (2018). Fostering the Growth of the Social Impact Business Sector in Viet Nam.
- [33] Nguyen, Dinh Cung & Luu, Minh Duc & Pham, Kieu Oanh & Tran, Thi Hong Gam (2012). SOCIAL ENTERPRISE IN VIETNAM CONCEPT, CONTEXT AND POLICIES. [online] Britishcouncil.vn. Available at: <<https://www.britishcouncil.vn/sites/default/files/social-enterprise-in-vietnam-concept-context-policies.pdf>> [Accessed 10 March 2020].
- [34] Nguyen, T. T. (2013). Improving the development of social enterprise in Vietnam, Case: Center for Promotion Initiatives Center (CSIP). B. A. Thesis. Lahti University of Applied Sciences. Available at: <https://www.theseus.fi/bitstream/handle/10024/69700/Trang+Nguyen+Thuy.pdf;jsessionid=04FCCB4B3F73898731401087AB5CA557?sequence=2> [Accessed: 18 March 2020].
- [35] Robinson, J. (2006). Navigating Social and Institutional Barriers to Markets: How Social Entrepreneurs Identify and Evaluate Opportunities, *Social Entrepreneurship*. Eds. K. Hockerts, J. Mair, & J. Robinson. Basingstoke, UK: Palgrave Macmillan, 95-120.

- [36] Wildmannova, M., (2018). Barriers and Opportunities for the Development of Social Entrepreneurship: Case Study of Czech Republic. *Journal of Economic and Social Development (JESD)*, **5**(1).
- [37] Dey, P. & Teasdale, S., (2015). The tactical mimicry of social enterprise strategies: Acting “as if” in the everyday life of third sector organizations. *Organization*, **23**(4), 485-504.
- [38] European Commission (2015). *A Map of Social Enterprises and Their Eco-Systems in Europe*. Brussels, Belgium: Directorate General for Employment, Social Affairs and Inclusion.
- [39] Germak, A. & Robinson, J., (2013). Exploring the Motivation of Nascent Social Entrepreneurs. *Journal of Social Entrepreneurship*, **5**(1), 5-21.
- [40] Camenzuli, A., & K. McKague (2015). Team Microfranchising as a Response to the Entrepreneurial Capacity Problem in LowIncome Markets, *Social Enterprise Journal* **11**(1), 69-88.

VIETTEL ENTERPRISE CULTURE WITH CHALLENGES OF THE MULTI-CULTURAL ENVIRONMENT

Quach Thi Ngoc Ha

VNU University of Economics & Business

Email: ngochoa.ueb@gmail.com

Mobile: (+84)979363085

Abstract

The article studies the theoretical basis of corporate culture, applied in assessing the current status of corporate culture in Viettel after investing abroad. From the Viettel's practices of developing corporate culture in a multicultural environment, the article proposes effective solutions to develop corporate culture as well as contributing to Vietnamese enterprises' sustainable development goals in the international arena.

Keywords: Viettel enterprise culture, the changes, international intergration process, multi-cultural environment.

1. INTRODUCTION

Today, in the context of international integration, Vietnam has participated and is a member of many major economic forums and organizations such as: ASEAN (Association of Southeast Asian Nations), ASEM (Asia-Europe Meeting), APEC (Asia-Pacific Economic Cooperation), WTO (World Trade Organization), signed bilateral and multilateral trade agreements with the United States, EU, ASEAN... and most recently the Vietnam-EU Free Trade Agreement (EVFTA) is a new generation FTA between Vietnam and the 28 EU member states. EVFTA, together with the Trans-Pacific Partnership Agreement (TPP), are the two FTAs with a broad range of commitments and the highest level of commitments of Vietnam ever.

Under such integration conditions, Vietnam will become an open market for businesses from intra-bloc countries as well as global investors. Therefore, enterprises must face great pressure to compete with other countries in tax rates, business environment, especially anti-dumping measures from developed countries. They must face and adapt to the fierce competition in global business environments, multicultural environments. That (multicultural business environment) is an environment with many subjects from many ethnic cultures, many different countries, participating in business, communication, cooperation and competition with each other. Therefore, inside the organization and the enterprise's human resources there are many people with different religions, cultures and psychology, so the internal corporate governance also raises many new problems. Enterprises need to learn about psychology, culture, laws, institutions... in foreign business environments. Thereby, organizational culture and business administration of Vietnamese enterprises can overcome

barriers, conflicts, cultural conflicts and institutional differences to promote their own business brand name and country reputation, as well as contributing to the strength of the ethnic community and the national economy of Vietnam.

Among Vietnamese enterprises investing abroad, the Military Industry – Telecommunication Group (Viettel) is considered one of the first but most successful enterprises. After more than 10 years, Viettel has had its own brands in 10 countries. In the first 6 months of 2020, despite the heavy impact of the Covid epidemic and the downward trend of consumption of telecommunications and information technology in the world, revenue growth from overseas markets has significantly contributed to business results of Viettel, helping to ensure the planned targets. Good business results in foreign markets made cash flow to Vietnam exceed the plan, reaching nearly 140 million USD, up 4.7% over the same period. However, investment and business activities in all three continents, Asia, America and Africa, also pose great challenges to the Group's human resource management. Because "Viettel people" now include citizens of many countries around the world; inevitably encounter difficulties in language, culture, law... This fact raises the question: how does the multicultural environment affect Viettel's cultural culture? Is it possible to exist a culture of Viettel or that culture will have to continue and change differently in each market?

Therefore, it is necessary to consider and evaluate the current situation of Viettel business culture system and the changing trend of this organizational culture system in the new business environment within the challenge of the multicultural environment. In this article, the author will evaluate the change of corporate culture in Viettel in the international integration process, the author takes the benchmark of comparison between the

period before and after doing business abroad, concretize by two phase (2000-2006 and 2007-2019) in the questionnaire table.

2. RESEARCH OBJECTS AND METHODOLOGY

2.1. Research objects

The object of research is the Viettel corporate culture's core values and the movement of Viettel corporate culture before and after doing business abroad.

2.2. Scope of research

- Location: Head office, subsidiaries, nationwide and some overseas branches of Viettel.

- Time:

+ Time of research: from January 2018 to December 2019.

+ Timeline in the survey: Focusing on the period when Viettel Group invested in business abroad (in 2006).

2.3. Research model

Research model is based on the theory of 3 levels of organizational culture by Schein (1992). Specifically, according to Schein, there are 3 levels of organizational culture in each enterprise, including: (1) The tangible cultural structure (Artifacts) includes phenomena and things that a person can see, hear and felt when first contacting the business; (2) Espoused Values include common values, strategies, and philosophies that are agreed upon among the majority of employees and business leaders and (3) Basic (Basic Underlying Assumptions) includes shared perceptions, beliefs, thoughts, and feelings that are deeply rooted in the subconsciousness and psychology of business members and become recognized.

With the purpose of answering the question posed by the research is: Does the evaluation of the organizational culture levels of Viettel change and how does it change between the two periods before and after Viettel does business abroad?

2.4. Designing survey questionnaires

To evaluate the changes in corporate culture at Viettel in a multicultural environment, the author takes the benchmark between the period before and after doing business abroad, concretizing the questionnaire into two phases (2000-2006 and 2007-2019). That selecting these two phases is primarily based on when Viettel started doing business overseas (Cambodia) in June 2006, and also on the notion that cultural assessment cannot be counted at a single point in time. That need to be evaluated over a period of time.

The questionnaire is designed with 02 main parts in addition to the introduction and the final thank you part, including:

(1) Part A is general information about the candidate, including information about gender, age, education level, working time,.... ;

(2) Part B includes questions to evaluate the levels of organizational culture according to Schein's (1992) three-level culture model for two different periods (before and after doing business abroad). The scale to evaluate part B is the 5-point Likert scale.

2.5. Sample size and sample selection

- Sample size: 500 samples.

Description of sample selection:

+ Overall research process: Viettel officers and employees in Viettel branches nationwide and abroad.

+ Sampling method: Using non-probability random sampling method.

+ Sample size: Estimated number of samples for this study is 500 samples.

+ Sample standard: Viettel officers and employees are randomly selected in departments and divisions until the sample size reaches 500.

- Subjects surveyed: Officers, employees at Viettel Telecom Group.

- Scope of survey: Head office, Viettel branches nationwide and abroad.

- Method of survey: is done through distributing and receiving questionnaires directly or by email to officers and employees.

2.6. Data analysis

Research data were analyzed with the help of SPSS 20 software for pre-defined research purposes. Includes analytical techniques as follows:

Analysis by mean and standard deviation: The mean value indicates the average rating of employees about Viettel's different cultural levels. Standard deviation indicates the degree of difference between the particular observed values and the sample mean.

Paired Sample T-test: To evaluate the difference in the average score of the indicators measuring the levels of organization culture. Verification of a pair sample will reveal whether there is a real difference between the two periods in the group of employees who have experience both before and after the overseas business. Test standards were customary at 5% significance level.

T-test: To determine the difference in the evaluation level of organization culture levels for groups of variables with two attributes. Inspection standards were customarily taken at the 5% significance level.

Analysis of variance (ANOVA): For categorical variables there are more than two categorical attributes.

The Post Hoc Test will be used if discrepancies occur between the comparison groups.

3. SOME RESEARCH RESULTS

After sending out 500 questionnaires directly or by email (email) to officers and employees of Viettel Telecom Group, 454 valid questionnaires were collected. There are some questionnaires filled with

information missing in some questions, but the rate of missing filling is very low, so it is still kept for analysis.

3.1. The results of general assessment of the levels of organizational culture in Viettel

Table 1: Results of general evaluation of survey factors

No.	Evaluation criteria	General evaluation
I	General assessment of the practical role of corporate culture Viettel	
1	The role of corporate culture for the operation and development of the unit	4.18
2	Positive effects of corporate culture on work and personal development of each employee	4.01
3	Apply corporate culture in real work	3.32
II	Evaluation of the tangible structure of Viettel corporate culture	
1	Office architecture, interior and exterior	3.64
2	Logo	4.12
3	Uniform	3.84
4	Rituals, festivals, cultural programs	3.91
5	E-Publications	3.76
6	Stories, anecdotes	3.98
7	Education and training system	3.21
8	Social activities	4.17
III	Evaluation of Viettel's declared values	
1	Mission and vision	4.19
2	Business philosophy	4.15
3	Core values	3.83
4	The standard system in doing the job	3.91
5	Action motto	4.11
6	The East-West combining culture makes a difference	4.16
7	The East-West combining culture needs to be preserved	4.19
8	The East-West combining culture is effective in foreign countries	4.13
IV	Evaluation of fundamental implications and common concepts	
1	Proud of tradition	3.99
2	Job loving	3.96
3	Perform proper manners	3.85
4	Promote business philosophy	4.16
5	Exemplary leaders and managers	4.18
6	Viettel lifestyle	3.97
7	Unifying conception	4.12

- With the first level of the tangible cultural structure of Viettel corporate culture

Factors of tangible cultural value are assessed quite equally and at a high score. Among them, the score for Logo and Social Activity is the highest. These are two prominent and recognizable factors that are commensurate with the investment and dedication of Viettel when building a new market outside of Vietnam. Unlike other multinational telecommunications corporations when investing

abroad, they often use the brand name of the parent Group,... Viettel has a completely different way of building brands in international markets. With its own philosophy, Viettel wants each company invested by the Group to represent the brand of that country, is the company of the host, is the pride of each nation that Viettel sets foot in. Choosing separate brands for each market not only arouses the national pride of each employee, but also encourages them to strive for their

own future, their own country. This is a unique feature that other Corporations do not have.

The elements of Office architecture, interior and exterior, and Education and training system are not appreciated. In which the lowest is the Education and Training System with 3.19 points. This partly reflects the fact that when investing abroad, in the first stage to quickly respond to office work, Viettel will often rent

or buy existing houses for office work, so it may not be able to respond to desired architecture. In addition, the education and training for indigenous people has not been properly organized, due to job progress pressure in foreign markets, most of the training is usually directly on the job. This is a weakness that needs to be overcome.

Table 2: Evaluation results of the tangible cultural structure of Viettel between the two periods before and after doing business abroad

Evaluation criteria	Before doing business in a foreign country		After doing business in a foreign country		Difference	
	Mean	SD	Mean	SD	Mean	SD
Q1. Unified brand identity system	3.75	0.82	4.33	0.57	0.57	0.92
1.1. Logo, slogan, icon, color	3.98	0.81	4.39	0.63	0.40	0.96
1.2. Costumes, business cards, name plates...	3.48	1.13	4.38	0.81	0.69	1.04
1.3 Office decoration	3.86	0.95	4.28	0.63	0.51	1.05
1.4 Types of stationery: printing paper, notebook, pen...	3.79	1.01	4.25	0.77	0.52	1.04
Q2. Programs, ceremonies, events organized by the corporation, its branches contribute to enhancing the pride of the unit and the spirit of solidarity among members	3.96	1.12	4.35	0.71	0.49	1.22
Q3. The corporation, its affiliates build stories, anecdotes about their operations (growth phase, period of overcoming terror), stories about people who make important contributions to development Viettel's stories and these stories and anecdotes are widely disseminated among officials and employees	3.71	0.97	3.93	0.88	0.52	1.03
Q4. There is a system of clear and specific regulations, processes on the following contents and is strictly implemented	3.93	0.74	4.25	0.77	0.18	0.88
4.1. Regulations on employee behavior towards customers and partners	3.91	0.88	4.25	0.87	0.24	1.15
4.2. Regulations on internal working practices (working hours, communication with leaders, meeting mode,...)	3.98	0.80	4.30	0.78	0.16	0.87
4.3. The process of how to handle the work (to whom to report, how to report, who is allowed to make decisions about what...)	3.91	0.75	4.19	0.84	0.24	0.96
4.4. Provisions on reward and punishment	3.85	0.92	4.11	0.91	0.24	0.87
Q5. Having a clear, coherent hierarchy chart system, and clearly understood by employees	4.02	0.84	4.10	0.82	- 0.13	1.00

Source: Author's calculation and SPSS software results

The tangible cultural structure is assessed from 5 factors including:

- Unified brand identity system.
- Programs, ceremonies and events.
- The system of stories and anecdotes about the organization.
- System of rules, processes, regulations.
- Organizational structure system.

The analysis results show that all aspects of tangible cultural structure at Viettel in “the after doing business abroad period” are more highly appreciated by employees than the previous period. In which, the highest rating belongs to the Unified Brand Identity System (Q1) with an average score of 4.33 (SD = 0.57) after doing business abroad compared with the average score of 3.75. (SD = 0.82) pre-business period abroad. The lowest rating belongs to the aspect of the construction of stories and anecdotes (Q3), with an average score of 3.93 (SD = 0.88) post-business overseas compared to the 3.71 average (SD = 0.97) pre-business period in a foreign country.

To assess the difference in the degree of change in cultural structure before and after doing business abroad, the author assessed through the staff working in both phases.

Results by pair test in in-group comparison between employees who experience both periods showed that 4 out of 5 indicators have a change between two periods: (1) Unified brand identity system (Q1), (2) Viettel's ceremonies, events, and programs (Q2), (3) Stories, anecdotes about the development process and the contributions of special characters (Q3) and (4) The system of regulations, processes and regulations is strictly implemented (Q4) (p-value < 0.05). The trend shows that the post-business overseas period scores of the tangible cultural structure are higher than the pre-business period abroad. The results also show that the aspect of “clearly coherent organizational hierarchy, hierarchy” average score slightly decreased, but the test shows no basis to suggest that there is a difference between the two periods for this indicator (p-value = 0.21 greater than 0.05).

Table 3: Results of testing the change in the tangible cultural structure of Viettel between the two periods before and after doing business abroad

Comparing changes between two periods	Differences in pairs		t	df	p-value
	Mean	SD			
Q1. Unified brand identity system	.58	.92	6.48	116	.00
1.1. Logo, slogan, icon, color	.42	.97	4.59	116	.00
1.2 Costumes, business cards, name plates...	.72	1.11	7.52	116	.00
1.3. Office decoration	.53	1.12	5.65	116	.00
1.4. Types of stationery: printing paper, notebook, pen...	.57	1.10	5.87	116	.00
Q2. Programs, ceremonies, events organized by the corporation, its branches contribute to enhancing the pride of the unit and the spirit of solidarity among members	.48	1.23	4.40	116	.00
Q3. The corporation, its affiliates build stories, anecdotes about their operations (growth phase, period of overcoming terror), stories about people who make important contributions to development Viettel's stories and these stories and anecdotes are widely disseminated among officials and employees	.52	1.06	5.17	116	.00
Q4. There is a system of clear and specific regulations, processes on the following contents and is strictly implemented	.25	.81	2.68	117	.01
4.1. Regulations on employee behavior towards customers and partners	.25	1.16	2.42	117	.02

Comparing changes between two periods	Differences in pairs		t	df	p-value
	Mean	SD			
4.2. Regulations on internal working practices (working hours, communication with leaders, meeting mode,...)	.18	.84	2.14	117	.03
4.3. The process of how to handle the work (to whom to report, how to report, who is allowed to make decisions about what...)	.28	.95	2.68	117	.01
4.4. Provisions on reward and punishment	.20	.90	2.32	116	.02
Q5. Having a clear, coherent hierarchy chart system, and clearly understood by employees	-1.11	1.00	-1.19	116	.21

Source: Author's calculation and SPSS software results

• **Level 2 on assessing the declared values of Viettel**, with the variables surveyed by the author, it can be seen that the declared values of Viettel are all appreciated, even higher than structural factors. material. This assessment shows the strength of the Group's business philosophy, core values, strategy, vision... Factors belonging to the declared value such as: mission, vision; Business philosophy; The core values are assessed at a high level. This shows that the officers and employees have understood the intangible

cultural values that the company has. In particular, the highest scores of this cultural level are the factors that clearly show its identity, Viettel's distinction is the strength for the Group's growth when investing abroad.

The analysis results show that all aspects of the second cultural level (shared values) at Viettel are highly appreciated by employees in the post-business period in a foreign country compared with pre-business period in a foreign country.

Table 4: Assessment results of general values agreed by Viettel in the period before and after doing business abroad

Evaluation criteria	Before doing business in a foreign country		After doing business in a foreign country		Difference	
	Mean	SD	Mean	SD	Mean	SD
Q6. Staff easily adapt to changes in the business environment or changes in internal structure	4.01	0.91	4.06	0.86	0.07	1.14
Q7. New ideas are always welcome	4.04	0.95	4.12	0.85	0.08	1.15
Q8. Building a system of business philosophy, mission and core values; these contents are disseminated throughout Viettel Group and are fully aware of its staff	3.86	1.10	4.16	0.82	0.32	0.72

Source: Author's calculation and SPSS software results

The system of common values agreed in Viettel is evaluated by officials and employees through (1) The ability to easily adapt to changes in the business environment and internal structure (Q6); (2) The ability to be ready to welcome new ideas (Q7) and (3) Build a system of business philosophy, mission and core values (Q8).

Using a pair sample test for in-group change between employees who experience both pre- and post-business overseas shows that there is only a change in the

employee's assessment in terms of "building system, business philosophy, mission and core values which are disseminated, fully recognized by employees" (Q8) (p-value = 0.00 less than 0.05). The trend shows that, after doing business overseas, employees' perception of this aspect is higher than that of not doing business abroad. Other aspects such as "employees easily adapt to changes in the business environment or internal structure" (Q6) and "open to new ideas" (Q7) do not show any difference between two periods (p-value > 0.05).

Table 5: Results of testing changes in the system of common values agreed upon at Viettel before and after doing business abroad

Comparing changes between two periods	Differences in pairs		t	df	p-value
	Mean	SD			
Q6. Staff easily adapt to changes in the business environment or changes in internal structure	.07	1.12	.58	117	0.56
Q7. New ideas are always welcome	.09	1.14	.73	117	0.48
Q8. Building a system of business philosophy, mission and core values; these contents are disseminated throughout Viettel Group and are fully aware of its staff	.34	.71	4.84	118	0.00

• **Level 3 on assessing the underlying implications and general conceptions in Viettel corporate culture**, the survey results of the author through the manifestation factors show that they are evaluated at a high level. Target “Exemplary leaders and managers” score the highest with 4.18 points. That shows the strength of Viettel's corporate culture in foreign countries, it has created a valuable foundation, the way of thinking and acting ready to sacrifice, accept any difficulties, always strive first. First, the Vietnamese must always set an example for the local people to respect and follow, leaders must always be an example for their subordinates to follow. That has brought the success of Viettel Group when abroad.

At the third cultural level, the basic implications recognized among Viettel members are assessed through (1) The implications that Viettel has a different style of working from other telecom companies (Q9); (2) The implications on belief in Viettel's development (Q10); (3) The implications of the role of organization culture (Q11) and (4) The implications of the role of mass organizations in the building of organization culture.

Analysis results show that, the assessment of employees about aspects of the third cultural level (basic implications) at Viettel has uneven fluctuations between the two periods before and after doing business abroad. Some aspects tend to increase (Q10, Q11, Q12) but also aspects tend to decrease (Q9).

Table 6: Assessment results on basic implications of Viettel members before and after doing business abroad

Evaluation criteria	Before doing business in a foreign country		After doing business in a foreign country		Difference	
	Mean	SD	Mean	SD	Mean	SD
Q9. Viettel has its own working style, different from other telecom companies and you perceives and feels that working style	4.12	0.74	4.11	0.76	-0.21	0.96
Q10. A large number of officers and employees have confidence in Viettel's development	4.25	0.78	4.32	0.78	-0.25	1.01
Q11. Many employees are aware that corporate culture plays an important role in the overall development of Viettel	3.86	1.03	4.38	0.81	0.26	0.68
Q12. The following mass organizations have made positive contributions to participating in building corporate culture, creating a solidarity and coordination working environment at Viettel	4.13	0.75	4.29	0.77	-0.12	0.86
Q12.1. Union	4.18	0.79	4.29	0.78	-0.23	1.08
Q12.2. Youth Union	4.13	0.80	4.30	0.79	0.03	0.70

Source: Author's calculation and SPSS software results

The results of pair sample testing for employees with experience in both periods showed a difference in 3 out of 4 evaluation aspects including (1) Viettel has a different working style from the other information telecom company (Q9); (2) employees have confidence in the development of the corporation (Q10); (3) employees are aware of the role of corporate culture with Viettel's development (Q11) (p-value < 0.05). In which, the two aspects of "distinct working style" and "employee's belief in Viettel's development" tend to decrease between the post-business period in a foreign country compared to the pre-business period, overseas.

The perceived aspect of "the role of corporate culture in Viettel's development" shows a tendency to be appreciated by employees. There is no clear difference between the two periods (p-value > 0.05) in terms of the role of the unions to build corporate culture.

3.2. Results of assessing the current situation and changing trend of core values of Viettel business

3.2.1. Results of the first level of culture assessment (tangible cultural structure)

Table 7: Results of testing the changes in basic implications in Viettel between the two periods before and after doing business abroad

Comparing changes between two periods	Differences in pairs		T	df	p-value
	Mean	SD			
Q9. Viettel has its own working style, different from other telecom companies and you perceives and feels that working style	-.21	.98	-2.19	114	.04
Q10. A large number of officers and employees have confidence in Viettel's development	-.25	1.02	-2.81	117	.01
Q11. Many employees are aware that corporate culture plays an important role in the overall development of Viettel	.32	.68	4.72	116	.00
Q12. The following mass organizations have made positive contributions to participating in building corporate culture, creating a solidarity and coordination working environment at Viettel	-.12	.85	-1.33	117	.17
Q12.1. Union	-.26	1.09	-2.32	118	.03
Q12.2. Youth Union	.02	.71	.43	117	.71

Source: Author's calculation and SPSS software results

Table 8: Results of the first cultural level assessment

Evaluation criteria	Before doing business in a foreign country		After doing business in a foreign country		Difference	
	Mean	SD	Mean	SD	Mean	SD
Q1. Unified brand identity system	3.59	0.75	4.25	0.63	0.72	0.61
1.1. Logo, slogan, icon, color	3.58	0.78	4.19	0.68	0.61	0.88
1.2. Costumes, business cards, name plates...	3.41	0.91	4.25	0.80	0.74	0.92
1.3. Office decoration	3.59	0.87	4.28	0.75	0.89	1.05
1.4. Types of stationery: printing paper, notebook, pen...	3.78	0.89	4.11	0.84	0.60	0.89
Q2. Programs, ceremonies, events organized by the corporation, its branches contribute to enhancing the pride of the unit and the spirit of solidarity among members	3.91	0.88	4.27	0.71	0.49	0.91

Evaluation criteria	Before doing business in a foreign country		After doing business in a foreign country		Difference	
	Mean	SD	Mean	SD	Mean	SD
Q3. The corporation, its affiliates build stories, anecdotes about their operations (growth phase, period of overcoming terror), stories about people who make important contributions to development Viettel's stories and these stories and anecdotes are widely disseminated among officials and employees	3.55	0.78	3.76	0.83	0.43	0.88
Q4. There is a system of clear and specific regulations, processes on the following contents and is strictly implemented	3.89	0.68	4.22	0.72	0.48	0.72
4.1. Regulations on employee behavior towards customers and partners	3.88	0.78	4.34	0.78	0.53	0.91
4.2. Regulations on internal working practices (working hours, communication with leaders, meeting mode,...)	3.92	0.72	4.38	0.76	0.48	0.84
4.3. The process of how to handle the work (to whom to report, how to report, who is allowed to make decisions about what...)	3.86	0.68	4.24	0.79	0.47	0.86
4.4. Provisions on reward and punishment	3.92	0.84	4.16	0.85	0.43	0.79
Q5. Having a clear, coherent hierarchy chart system, and clearly understood by employees	4.01	0.68	4.10	0.80	0.25	0.92

To evaluate the difference in the degree of change in Viettel's tangible cultural structure, the author used pair tests for 318 people to experience both periods (Paire samples test). The analysis results show that there is really a difference in the tangible cultural structure of Viettel between the two periods (p-value is statistically significant = 0.00) in all evaluation criteria. Trends show that assessment scores of tangible cultural structures during the post-business period abroad have

a higher mean score than the pre-business period abroad in all respects. In which the biggest difference in the factor "brand identity system" (Q1), the average of change is 0.75 (SD = 0.72), the least change belongs to the factor "hierarchy coherent and clear organizational system" (Q5), the mean of change is 0.25 (SD = 0.92).

3.2.2. Results of second cultural level assessment (agreed common values)

Table 9: Results of the evaluation of agreed common values

Evaluation criteria	Before doing business in a foreign country		After doing business in a foreign country		Difference	
	Mean	SD	Mean	SD	Mean	SD
Q6. Staff easily adapt to changes in the business environment or changes in internal structure	3.96	0.79	3.93	0.79	0.12	0.83
Q7. New ideas are always welcome	3.91	0.81	3.95	0.86	0.17	0.85
Q8. Building a system of business philosophy, mission and core values; these contents are disseminated throughout Viettel Group and are fully aware of its staff	3.88	0.88	4.13	0.85	0.29	0.72

The results of pair sample testing between members who have been experiencing both before and after the overseas business show that there is a difference in all the common value system evaluation indicators between the two periods (p-value are statistically significant less than 0.05). Trends show that the rating of a common value system agreed among employees in the post-business period is higher than the pre-business

period abroad. In which the biggest change in Viettel's business philosophy, mission, vision, core values (Q8) with an average score of 0.29 points and the lowest increase in the aspect of adaptability to changes environment and internal structure (Q6) with an average score of 0.10 points.

3.3.3 Results of the third cultural level assessment (basic implications)

Table 10. Assessment results of basic assumptions at Viettel between two periods before and after doing business abroad

Evaluation criteria	Before doing business in a foreign country		After doing business in a foreign country		Difference	
	Mean	SD	Mean	SD	Mean	SD
Q9. Viettel has its own working style, different from other telecom companies and you perceives and feels that working style	3.96	0.75	3.92	0.81	0.05	0.77
Q10. A large number of officers and employees have confidence in Viettel's development	4.35	0.76	4.24	0.83	-0.08	0.73
Q11. Many employees are aware that corporate culture plays an important role in the overall development of Viettel	4.07	0.94	4.27	0.83	0.27	0.65
Q12. The following mass organizations have made positive contributions to participating in building corporate culture, creating a solidarity and coordination working environment at Viettel	4.21	0.65	4.32	0.73	0.12	0.64
Q12.1. Union	4.30	0.77	4.30	0.76	0.00	0.81
Q12.2. Youth Union	4.02	0.69	4.34	0.78	0.26	0.62

The pair sample test results for members to experience both pre- and post-business overseas show that differences occur in (1) perceptions about the role of corporate culture to Viettel's development (Q11) and (2) the contribution of mass organizations in building corporate culture (Q12), in which the difference only occurs in terms of the role of Youth Union (Q12.2). Trends also show that the assessment score of the underlying implications of the post-business period abroad is higher than the pre-business period abroad. The biggest change occurs in the perception of the role of corporate culture to Viettel's development, the average change is 0.26 (SD = 0.62), the less change belongs to the role factor of The mass organization average score of change was 0.12 (SD = 0.64).

By comparing the evaluation results of Viettel's corporate culture levels between the two periods before and after doing business in a foreign country, we can see some prominent similarities and differences as follows:

- Regarding the similarity: The evaluation score of corporate culture in most aspects of the first cultural level (tangible cultural structure) and the second cultural level (shared values) is rather high and tends to increase after doing business abroad. In which, the

strongest increase was the brand identity system (level 1), business philosophy system, mission and core value (level 2) and the least increase was the Hierarchical Systems, Processes, Rules (Level 1) and Adaptation to Change in Business Environment and Internal Structure (Level 2).

- Regarding the difference: the assessment of elements of the third cultural level (basic assumptions) between the two periods before and after doing business abroad is quite different. Only the Perception of the role of corporate culture tends to increase, while other factors have different increases and decreases. This also reflects the true nature of the third cultural level, expressing the implications of the identity of each unit, so it is difficult to have unity, even in the tendency of changes in corporate culture factor of the third cultural level which is tested.

4. SUMMARY OF RESEARCH RESULTS AND COMMENTS

4.1. The first level of culture is the tangible cultural structure

Overall, the staff highly appreciated. The average rating of these evaluation aspects is quite large in most evaluation aspects such as brand identity system, ritual

system, anecdotes, unified process system and the apparatus structure which is coherently and clearly organized. This shows that entering the period of a competitive market, the group has focused more on the process of building corporate culture, especially the standardization of brand identity system and tangible attributes. This is also the first and easy-to-build element of an enterprise culture system.

Viettel's tangible cultural structure has shown a major shift since doing business abroad. The general trend in this study shows that the assessment score at the post-business overseas stage is much larger than the pre-business overseas period. This is also a signal showing the increasing interest in investing in branding through corporate culture at all levels of leadership.

4.2. For the second level of culture – a system of agreed and shared values.

The results of this study show that, in general, the employee's rating is quite high. Average score is approximately 4 points and small standard deviation on Likert 5 point scale. This shows signs of effectiveness in implemented corporate culture programs. Ability to adapt to the external environment and organizational structure, the ability to accept new ideas, to have a system of philosophy, missions, goals and core values shaped. This is also a signal that Viettel has made a transformation in corporate culture after doing business abroad. Under the competitive pressure of the larger market, higher customer requirements, more service required.

However, we can find that the evaluation score of elements of the agreed common value system is evaluated lower than the tangible cultural structure. The research results show that the change between the two periods before and after doing business abroad in the system of common values is also lower than the change in the tangible cultural structure. Among the aspects of the agreed common value system, the biggest change in the assessment score between the two periods before and after the overseas business was in the “Viettel's business philosophy system, mission, vision and core values”. This shows that the system of common values mentioned above has been more refined by Viettel leaders, studied more thoroughly and especially communicated more effectively to the employees.

4.3. On the third cultural level – the basic implications

The study aims to determine are there the basic implications of corporate culture in Viettel or not, and at the same time give some basic implications related to the building of corporate culture to prepare the basis of proposing solutions to build corporate culture.

The survey results show that implications in corporate culture at Viettel do exist, specifically about the different working style among employees, perceptions

and beliefs about the company's future development, the role of corporate culture in the development of companies and the role of unions in building corporate culture. This shows that programs on building corporate culture have achieved good results, because one of the manifestations of a strong corporate culture is that staff members have agreed basic implications, from that directs their actions. The results also show a positive change between the two periods before doing business overseas.

Differences between tables 2, 3, 4 and tables 8, 9, 10:

Assessing the structures and testing the structural change between 2 periods: Before doing business abroad and after doing business abroad.

5. REFERENCES

- [1] Do Minh Cuong (2001), *Văn hóa kinh doanh và triết lý kinh doanh*, National Political Publishing House, Hanoi.
- [2] Do Minh Cuong (2015), *Quản trị văn hoá doanh nghiệp và sự phát triển bền vững*, printed in the Proceedings of the National Workshop "Building corporate culture in the spirit of the 9th Party Central Conference, Session XI" organized by the Ministry of Industry and Trade in Hanoi on April 22, 2015.
- [3] David H. Maister (2005), *Bản sắc văn hóa doanh nghiệp*, Vietnamese version, Statistical Publishing House, Hanoi.
- [4] Nguyen Van Dan (2006), *Văn hóa và Phát triển trong bối cảnh toàn cầu hóa*, Social Science Publishing House, Hanoi.
- [5] Egar H. Schein (2012): *Văn hoá doanh nghiệp và sự lãnh đạo*, Vietnamese version, Thoi Dai Publishing House, Hanoi.
- [6] Francois Jullien (2010), *Tinh khá tri của văn hóa*, Vietnamese version, Labor Publishing House, Hanoi.
- [7] Duong Thi Lieu (Editor, 2011), *Giáo trình văn hóa kinh doanh*, National Economics University Publishing House, Hanoi.
- [8] Dao Duy Quat (Editor, 2007), *Văn hoá Doanh nghiệp, văn hoá doanh nhân trong quá trình hội nhập*, National Political Publishing House, Hanoi.
- [9] Allan Williams, Paul Dobson, Mike Walters (1989), *Changing Culture: New Organizational Approaches*, Institute of Personnel Management, London.
- [10] David J. Ketchen – Duane Ireland – Charles C. Snow (2007), *Strategic Entrepreneurship, Collaborative Innovation, and Wealth Creation*, Published online in Wiley InterScience.

- [11] Edgar H. Schein (1992), *Organizationalculture and Leadership: ADynamic View*, San Francisco, CA: Jossey-Bass, pp.9.
- [12] Fred C.Lunneburg (2011), *Understanding Organizational Cultute: A Key Leadership Asset*, Sam Houston State University, America.
- [13] Joann Keyton (2010), *Communication and Organizational Cuture – A Key to Understanding Work Experiences*, SAGE Publications, Inc.
- [14] John Mooij (2004), *Corporate Cultute of Central Banks: Lessons from the Past*, EABH Workshop.
- [15] John R. Schermerhorn, Jr. Sames G. Hunt, Richard N. Osborn (2003), *Organizational Behavior*, Capstone publisher.
- [16] John Fraedrich, O. C. Ferrell (2014), *Business Ethics: Ethical Decision Making and Cases*, South- Western College Publishing, English.
- [17] Kenneth E. Goodpaster (2007), *Conscience and Corporate Culture*, Blackwell Publishing.
- [18] Kim S. Cameron, Robert E. Quinn, Jeff DeGaff, Anjan V. Thakor (2006), *Competing Values Leadership: Creating Values in Organizations*, New Horizons in Management, Edward Elgar Publishing Limited.
- [19] Kuroiwa, Seichi (2006), *The effects of culture on banking strategy: A study of three banks in three countries*, Sloan School of Management, Massachusetts Institute of Technology.
- [20] Mary G. Trefry (2006), *A Double-Edged Sword: Organizational Culture in Multicultural Organizations*, Jack Welch College of Business, WCOB Faculty Publications.
- [21] S. Camaron, E. Quinn (2011), *Diagnosing and Chaging Organizational Cultute: Based on Competing values Framework*, Third Edition, Jossey Bass.
- [22] Schein, F. *Corporate Culture and Leadership*, Jossey Bass Publisher, 2004.

APPLICATION OF AI TECHNOLOGY TO SUPPORT BUSINESS DECISION-MAKING AND SOME ISSUES FOR VIETNAMESE BUSINESSES

Nguyen Thi Thanh Dan

School of Economics and Management, Hanoi University of Science and Technology

Email: dan.nguyenthithanh@hust.edu.vn

Abstract

To succeed in business today, companies need information systems that can support the diverse information and decision-making needs of their managers and business professionals. In this paper, the research will explore in details how this is accomplished by decision support. Besides the study will concentrate on how AI technology has significantly strengthened the role that information systems play in supporting the decision-making activities of every manager and worker in business. Finally, the research analyzes the advantages and challenges of applying AI technology to support management decision making in Vietnamese business.

Keyword: AI, decision-making, Decision support systems, Vietnam.

1. INTRODUCTION

After a half-decade of quiet breakthroughs in artificial intelligence, 2015 has been a landmark year. Computers are smarter and learning faster than ever (Jack Clark, 2015). The world is witnessing an exponential growth in the application of Artificial intelligence (AI) to all areas of life (S. Ransbotham, et al., 2017). AI is likely to become the most breakthrough technology in the next 10 years based on advances in computing power; leaps in volume, speed, and variety of data (A. S. Rao, G. Verweij, 2017). AI is focused as a companion, a virtual assistant to enhance creativity and efficiency. AI not only supports people in audio recognition of data languages, supports manual tasks but also have become a great tool capable of processing information for decision-making, which is often inconsistent and uncertain, and that within a non-classical logic (Alessandro et al., 2018, S. Russell, P. Norvig, 2016). AI technologies are being used in a variety of ways to improve the decision support provided to managers and business professionals in many companies (Jame & George, 2008). The intelligence of AI technologies is expanding rapidly, and they are acting as semiautonomous decision makers in complex, increasingly diverse contexts (Davenport & Kirby, 2016). By applying breakthroughs in AI technology, the business will be able to automate and improve the decision making flows and help reduce foreseeable business risks, which will allow managers to make better informed business decisions.

AI-enable applications play a pivotal role in information distribution and retrieval, database mining, product design, manufacturing, inspection, training, user support, surgical planning, resource scheduling, and complex resource management. Indeed, for anyone

who schedules, plans, allocates resources, designs new products, uses the Internet, develops software, is responsible for product quality, is an investment professional, heads up IT, uses IT, or operates in any of a score of other capacities and areas, AI technologies already may be in place and providing competitive advantage (Winston, Patrick, 1997). Though AI is more effective in overcoming complexity in decision making than humans, humans retain the comparative advantage when addressing uncertainty and equivocality in decision making as they can leverage their superior intuition, imagination, and creativity (Marwala, 2015; Captain, 2017; Guszczka et al., 2017; Brynjolfsson & McAfee, 2012; Mohammad Hossein Jarrahi, 2018).

Within the scope of this study, the paper will explore how AI technology support administrators to make management decisions, and how the executive information systems, enterprise information portals and knowledge management systems can support the information needs of executives, managers and business professionals; identify how neural networks, fuzzy logic, genetic algorithms, virtual reality, intelligent agents can be used in business and analyzes the advantages and challenges of applying AI technology to support management decision making in Vietnamese enterprises.

2. DECISION SUPPORT IN BUSINESS

2.1 Information, decisions and management

Nowadays, the environment is extremely competitive and globalized, and technologies are evolving constantly, the type of information required by decision makers in a company is directly related to the level of management decision making and amount of structure in the decision situations they face (José Antonio Pérez

et al., 2015; N. Urbach, B. Müller, 2012; Al-Omiri and Drury, 2007; Gupta and Gunasekaran, 2005). Level of management decision making still exists, but their size, shape, and participants continue to change as today's fluid organizational structures evolve. Thus, the levels of managerial decision – making that should be supported by information technology in a successful organization are:

- Strategic Management: The CEO and top executives develop overall organization goals, strategies, policies, and objectives as a part of a strategic planning process. They also monitor the strategic performance of the organization and its overall direction in the political, economic, and competitive business environment.
- Tactical Management: Increasingly, business professionals in self-directed teams as well as business unit managers develop short – and medium-range plans, schedules, and budgets and specify the policies, procedures, and business objects for their subunits of the company. They also allocate resources and monitor the performance of their organizational subunits, including departments, divisions, process teams, project teams, and other workgroups.
- Operational management. The members of self-directed teams or operating managers develop short-range plans as weekly production schedules. They direct the use of resources and the performance of tasks according to procedures and within budgets

and schedules they establish for the teams and other work groups of the organization.

People need information of high quality, that is, information products whose characteristics, attributes, or qualities make the information more valuable to them. Information has three dimensions of time, content, and form as following:

- Time dimension: Timeliness, Currency, Frequency, Time period.
- Content dimension: Accuracy, Relevance, Completeness, Conciseness, Scope, Performance.
- Form Dimension: Clarity, detail, order, presentation, media.

Information systems must be designed to produce a variety of information products to meet the changing needs of decision makers throughout an organization. For example, decision makers at the strategic management level may select decision support systems to provide them with more summarized, ad hoc, unscheduled reports, forecasts, and external intelligence to support their more unstructured planning and policy making responsibilities. Decision makers at the operational management level, on the other hand, may depend on management information systems to supply more pre-specified internal reports emphasizing detailed current and historical data comparisons that support their more structured responsibilities in day to day operations. Table 1 compares the information and decision support capabilities of management information systems and decision support systems.

Table 1: Comparing the major differences in the information and decision support capabilities of management information systems and decision support systems

	Management information systems	Decision support systems
Decision support provided	Provide information about the performance of the organization	Provide information and decision support techniques to analyze specific problems or opportunities
Information form and frequency	Periodic, exception, demand, and push reports and response	Interactive inquires and responses
Information format	Pre-specified, fixed format	Ad hoc, flexible, and adaptable format
Information processing methodology	Information produced by extraction and manipulation of business data	Information produced by analytical modeling of business data

Source: James A. O'brien & George M. Marakas. "Management information systems", Eighth edition

2.2 Decision support systems

Decision support systems (DSS) are computer-based information systems that provide interactive information support to managers and business professionals during the decision making process. DSS uses (1) analytical models, (2) specialized databases, (3) a decision maker's own insights and judgments, and

(4) an interactive, computer-based modeling process to support the making of semi-structured business decisions (Jame & George, 2008).

Management information systems support analysis – they allow users to run queries and generate reports and also use analysis models to provide users with recommendations. The systems therefore support

decision-making by providing information and intelligence which is useful for understanding the results of operations, determining patterns, determining the cause(s) of some phenomenon, and other useful information (Basu, Archer, & Basudeb, 2012). They are used in various industries and by different types of organizations (private as well as public organizations).

Unlike management information systems, DSS rely on model bases as well as databases as vital system resources. A DSS model base is a software component that consists of models used in computational and analytical routines that mathematically express relationships among variables. DSS are becoming increasingly more critical to the daily operation of organizations. Using information systems to support business decision-making has been one of the primary thrusts of business use of information technology (Jame & George, 2008). The fast pace of new information technologies like PC hardware, and software suites, client/server networks, and networked PC version of DSS software made decision support available to lower

levels of management, as well as to non-managerial individuals and self-directed teams of business professionals (Gantz & John, 1999; Ouellette & Tim, 1999; Turban et al., 1998). This trend has accelerated with the dramatic growth of the Internet and of intranets and extranets that internetwork companies and their stakeholders. The e-business and e-commerce initiatives that are being implemented by many companies are also expanding the information and decision support uses and the expectations of a company’s employees, managers, customers, suppliers, and other business partners. A business must meet the information and data analysis requirements of its stakeholders with more personalized and proactive Web-based decision support (Kalakota et al., 2001).

Using a decision support system that includes an interactive analytical modeling process consists of the following four basic types of analytical modeling activities: (1) what if analysis, (2) sensitivity analysis, (3) goal – seeking analysis, and (4) optimization analysis. See table 2.

Table 2: Activities and examples of the major types of analytical modeling

Type of Analytical Modeling	Activities and Examples
What-if analysis	Observing how changes to selected variables affect other variables. Example: <i>What will be the market share if the advertising budget increases by 5%?</i>
Sensitive analysis	Observing how repeated changes to a single variable affect other variables. Example: <i>Let’s cut advertising by \$100 repeatedly so we can see its relationship to sales.</i>
Goal-seeking analysis	Making repeated changes to selected variables until a chosen variable reaches a target value. Example: <i>What annual R&D budget is needed for annual growth rate of 15% by 2021?</i>
Optimization analysis	Finding an optimum value for selected variables, given certain constraints. Example: <i>What is the best amount of advertising to have given our budget and choice of media?</i>

Source: James A. O’Brien & George M. Marakas. “Management information systems”, Eighth edition

DSSs include many types of systems such as group decision support systems, clinical decision support systems (applicable to healthcare), and intelligent decision support systems. They range from “simple software systems to complex knowledge-based and artificial intelligence systems” (Basu, Archer, & Basudeb, 2012). Group decision support systems support decisions by groups of individuals – by supporting collaborative work activities. Collaborations may be face-to-face or among groups in other locations. Intelligent decision support systems use intelligent behavior such as learning and reasoning to assist with decision- making. Such systems may involve rule-based expert systems or other artificial intelligence systems. Employees at different levels of the organization use DSSs. Top-level management or

senior-level executives use DSSs for strategic decisions; middle management use DSSs for tactical decision-making; and lower-level managers (first line managers) use DSSs for day-to-day operational decisions (Nowduri, 2011). However, DSSs are viewed as systems primarily for middle and lower-level managers. EISs (Executive Information Systems) are supposed to be information systems that support the decision-making needs of senior-level executives (Gantz, John, 1999; Belcher, et al, 1993; Turban et al., 1998; Vandenbosh et al., 1997; Watson et al, 1994).

3. ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN BUSINESS

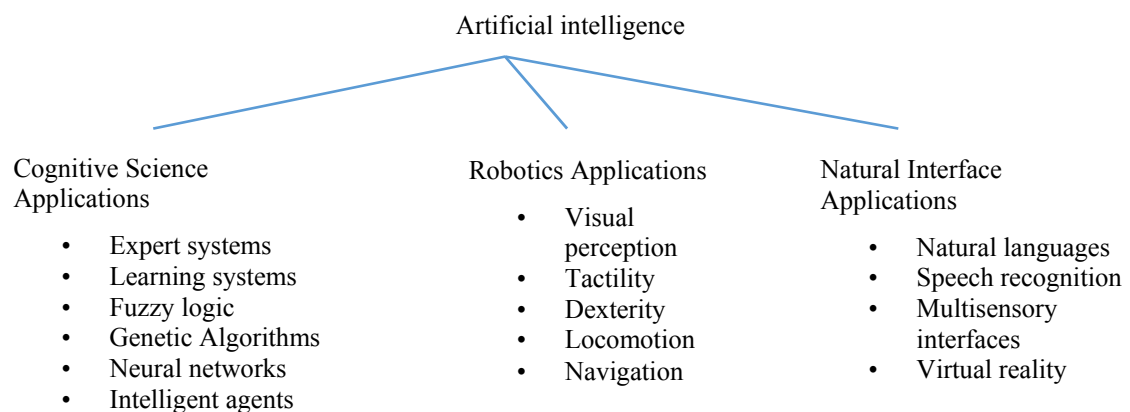
3.1 Artificial Intelligence (AI)

AI is a field of science and technology based on disciplines such as computer science, biology, psychology, linguistics, mathematics, and engineering (S. Russell, P. Norvig, 2016). AI can be defined as intelligent systems with the ability to think and learn (Russell, Norvig, & Intelligence, 1995). AI embodies a heterogeneous set of tools, techniques, and algorithms. Various applications and techniques fall under the broad umbrella of AI, ranging from neural networks to speech/pattern recognition to genetic algorithms to deep learning. AI involves using tool based on intelligent behavior of humans in solving complex issues, designed in a way to make computers execute tasks that were earlier thought of human intelligence involvement (Opeyemi Bello et al., 2015). The major application domains of AI include a variety of applications in cognitive science, robotics, and natural interfaces. The goal of AI is the development of computer functions normally associated with human physical and mental capabilities, such as robots that see, hear, talk, learning, and problem solving. With a greater computational information processing capacity and an analytical approach, AI can extend humans' cognition when addressing complexity, whereas humans can still offer a more holistic, intuitive approach in dealing with uncertainty and equivocality in organizational decision making (Mohammad

Hosseini Jarrahi, 2018). AI systems enable humans to make better decisions because AI “can sift through vast amounts of data to highlight the most interesting things, at which point managers can drill down, using human intelligence, to reach conclusions and take actions” (Hoffman, 2016). Thus, AI is being applied to many applications in business operations and managerial decision making, as well as in many other fields.

3.2 Artificial Intelligence Technologies

Artificial intelligence (AI) has attracted a lot of media coverage recently, and companies are rushing to figure out how AI technologies will impact them (Ben Lorica, 2017). The many application areas of AI are summarized, including neural networks, fuzzy logic, genetic algorithms, virtual reality, and intelligent agents (figure 1). Neural nets are hardware or software systems based on simple models of the brain's neuron structure that can learn to recognize patterns in data. Fuzzy logic systems use rules of approximate reasoning to solve problems where data are incomplete or ambiguous. Genetic algorithms use selection, randomizing, and other mathematics functions to simulate an evolutionary process that can bring better solutions to problems. Virtual reality systems are multisensory systems that enable human users to experience computer-simulated environments as if they actually existed. Intelligent agents are knowledge-based software surrogates for a user or process in the accomplishment of selected tasks.



Source: James A. O'brien & George M. Marakas. "Management information systems", Eighth edition

Fig. 1: The major application areas of AI

4. ADVANTAGES AND CHALLENGES OF APPLYING AI TECHNOLOGY TO SUPPORT MANAGEMENT DECISION MAKING IN VIETNAMESE BUSINESSES

AI and other digital technologies such as block-chain, the Internet of Things, and platforms and cloud-based services have the potential to transform Vietnam into Asia's next high-performing economy, and to bring up the living standards of all of Vietnam's citizens over the coming decades. Applying AI technology to support decision-making in businesses will help Vietnamese businesses to make effective decisions in the context of nowadays' volatile business environments.

4.1 The advantages of applying AI technology to support management decision making in Vietnamese businesses

There has been a recent boom in both digital hardware and software exports, Vietnam's young population is rapidly taking-up new mobile internet services, and the Vietnam Government is implementing wide-reaching Industry 4.0 policies to jump start the modernization of Vietnam's major industries and grow new industries. In Vietnam, AI has been included in the list of high technologies prioritizing development investment since 2014. The Government identified this as one of the breakthrough technologies that spearheaded the Industrial Revolution 4.0 and needed to conduct research but no specific contents to promote development (Ho Dac Loc & Huynh Chau Duy, 2020).

Besides the efforts of the State, AI has been strongly applied by corporations such as FPT and Viettel in many fields such as health care, education, agriculture, transportation, e-commerce AI technology has also brought Vietnam to the development over time.

The research and application of AI platform has been done and at FPT, AI has been applied (Thanh Duong, 2020). For businesses, product integration and human resource development... AI applications at FPT are being deployed include: Intelligent transport system in Ho Chi Minh City, self-propelled level 3 self-propelled vehicles avoid obstacles and in October 2019, everyone can experience a part of FPT's self-driving car. FPT provides comprehensive artificial intelligence platform FPT (Pham Thi Thu Ha, 2019). AI has built in "senses" for machines to understand and interact with people through 4 modules: Computer vision, speech synthesis and recognition, processing natural language and digital knowledge system. Currently, the AI platform of FPT. is used by more than 27,000 programmers, receiving more than 5 million requests and 500,000 monthly end users (Quynh Tram, 2020).

Viettel is the first unit to deploy AI application in endoscopic image diagnosis, helping to automatically

identify, localize and evaluate the damage of the digestive system, which has many common diseases in Vietnam. Using AI helps diagnose 5 times faster than traditional methods, accuracy up to 90%. In the management of forests and agriculture, Viettel pioneered the application of solutions to statistics on forest area and forest condition completely automatically with 80% accuracy, 5 times more timely response. Solutions to help solve the problem of building forest databases and forest management maps are being deployed (Thanh Duong, 2020).

In Vietnam, it is expected that by 2020 there will be about 50 billion IoT devices (The network of things connected to the internet, also known as the network of devices connected to the internet) and the reality of this system is mostly poor security, 80% is a security vulnerability, which is easy to spread and businesses often cannot defend themselves against cyber attacks, so Viettel has built a solution to prevent denial of service attacks (Quynh Tram, 2020). Viettel's **Denial of Service** (Dos) can monitor 24/7, detect 100% of the attack, with saving costs of about 90%, 0.1% lower than the cost of paying experts (Thanh Duong, 2020).

In the world and in Vietnam, AI is considered as one of the core technologies of the Industrial Revolution 4.0. Therefore, AI is expected to promote and spread the development of technology, at the same time through connecting research institutes, universities, businesses, technology corporations, start-ups... Vietnam will building a strong AI community.

In 2019, Hanoi University of Science and Technology establishes and enrolls undergraduate AI majors with a limited number to ensure the quality of AI human resources (Pham Thi Thu Ha, 2019). In addition, the launch of the Vietnam Union of AI Communities with a large number of members marked a new development of the AI ecosystem in Vietnam.

On the other hand, the young talent team develops rapidly, in a focused and potential manner. National scientific and technological research funds are strengthened or prioritized to finance AI-related research projects; At the same time, expand the training and education on AI; the number of AI startups is constantly increasing; and the number of young people and scholars from abroad returning to the country has increased sharply since Vietnam implemented AI development strategies.

With a young and vibrant population, high investment and a location in the heart of high-growth Asian economies, Vietnam has a good chance of surging forward with the new digital tools available, if the transition is managed well.

According to Deputy Prime Minister of Vietnam Vu Duc Dam, AI is no longer a scientific story, but an economic and social issue to develop Vietnam. The

world has changed, become more transparent, science and technology in general has grown significantly, more connected with the link between people, machines, governments, businesses, schools... and big data promote resources the development of AI (Pham Thi Thu Ha, 2019).

4.2 The challenges of applying AI technology to support management decision making in Vietnamese businesses

Firstly, lack of finance and information are the main barriers to perform digitalization in businesses in Vietnam. In particular, the ambiguous economic promotion plan and the uncertain impacts of technology adoption, and too costly investment, are the most important challenges for applying of AI technologies in Vietnam, especially for small and medium enterprises.

Secondly, in Vietnamese enterprises, the quality of information and databases is weak and insufficient. Data warehousing, an integral part of this, provides an infrastructure that enables businesses to extract, cleanse, and store vast amounts of data (Hamid R. Nemati et al., 2002). The basic purpose of a data warehouse is to empower the knowledge workers with information that allows them to make decisions based on a solid foundation of fact. However, only a fraction of the needed information exists on computers; the vast majority of a firm's intellectual assets exist as knowledge in the minds of its employees. What is needed is a new generation of knowledge-enabled systems that provides the infrastructure needed to capture, cleanse, store, organize, leverage, and disseminate not only data and information but also the knowledge of the firm.

In particular, the big data problem, Vietnam needs to share more with the community, even other countries, because the data should not only be talked about in a closed room, but in a common plane to spread and share among countries.

Thirdly, Vietnamese businesses currently do not have hardware and software R&D platforms in the field of AI such as Google Deepmind¹ or Microsoft AI Platform.

Last but not at least, in Vietnam, the organizations that understood and have already adopted AI cited a talent gap, competing investment priorities, and concerns about security as their main barriers, such as companies in the sectors of electricity, oil and gas, mining, and seafood. Meanwhile, companies that haven't yet adopted AI cited the need to identify business use cases, lack of management support, and limited technology capabilities as their main challenges.

5. DISCUSSION

Application of AI technology in business decision-making in Vietnam business will face some difficulties. The difficulties that can be mentioned are:

Information quality: High-quality decisions require high-quality information regardless of information systems. Even with timely, accurate information, some managers make bad decisions. Making the right decision depends on the qualifications and capabilities of the administrator. However, as analyzed above, in reality, the quality of information and information databases of Vietnamese enterprises is weak and limited by the issues related to personal information prescribed by law (Van Anh, 2018). In addition, the management skills of Vietnamese executives need to be improved to make the right decision based on the support of decision-making tools such as AI technology.

Management filters: According to Hofstede, Vietnam has cultural characteristic like other Asian countries, which is a big gap of power. This means that the people will obey the leadership, the employees follow the boss because they take it for granted. Moreover, Vietnam is ranked a moderate score in uncertainty avoidance index (Sower JC, Sower VE, 2005). It means that Vietnamese people will not be willing to accept new things, changes that they have never experienced. They sometime could be threatened by ambiguous situations so they often try to avoid these uncertainties by establishing some formal rules and detailed operation plans in order to prevent problems that may occur. They have a certain level of risk aversion, delay to make immediate decisions when feeling uncertain, and tend to reject unprecedented ideas or behaviors (Cuong DM, Swierczek, FW, 2008). The majority of domestic corporate managers are no exception. In a company, managers filter by turning off information they do not want to hear because it does not conform to their prior conceptions. While the values and behavior of managers is changing, new businesses can achieve transformation and real innovation. Therefore, in order to apply AI technology to support decision-making effectively, Vietnamese administrators need a change in awareness, improved management skills and readiness to access new technologies to improve the organization's management efficiency and fulfill its goals in today's rapidly changing environmental conditions.

Organizational inertia and politics: In Vietnam, many organizations are bureaucracies with limited capabilities and competencies for acting decisively. When environments change and new business models should be followed, strong forces within organizations resist making decisions calling for major change.

In Vietnam, to promote the application and development of AI technology in businesses, the

¹ <https://deepmind.com/research/alphago>

government needs to put in place an action plan and AI plan, increase investment in research and development (R&D), establish a research base, introduce mechanisms to attract talent, and tax incentives. All these policies will promote efficiency, prompt businesses to speed up the application of AI technology and are gradually shaping the situation of three houses (industry – training – research) and coordinating to promote AI development

Although information systems supporting decision-making can lead to higher results, they cannot improve all the different kinds of decision making in an organization or in all managerial roles. The most commonly stated reasons for Vietnamese enterprises to invest in AI technology is to reduce input costs, increase productivity and enhance business management. According to statistics, in Vietnam there are over 97% of small and medium enterprises, of which nearly 60% of enterprises are very small (Bui Bao Tuan, 2019). Small businesses are not motivated to adopt AI technologies for environmental protection and risk management. However, the figure for environmental protection and risk management increases considerably for enterprises that deal with foreign partners. Export enterprises put significantly more weight on risk management and environmental issues compared to companies that only supply the domestic market.

6. REFERENCES

- [1] A.S. Rao, G. Verweij (2017). *Sizing the prize: What's the real value of AI for your business and how can you capitalise*, PwC Report.
- [2] Basu, R., Archer, N., & Basudeb, M. (2012). *Intelligent decision support in healthcare*. Analytics. Retrieved from <http://analytics-magazine.org/intelligent-decision-support-in-healthcare/>
- [3] Belcher, Lloyd, and Hugh Watson. *Assessing the value of Conoco's EIS*. MIS quarterly, September 1993.
- [4] Ben Lorica, *The state of AI adoption*. O'Reilly Media. 12/18/2017
<https://www.oreilly.com/radar/the-state-of-ai-adoption/>
- [5] Brynjolfsson, E., & McAfee, A. (2012). *Winning the race with ever-smarter machines*. MIT Sloan Management Review, 53 (2), 53-60.
- [6] Bui Bao Tuan. *Assistance of State for small and medium enterprises in Vietnam*. Finance magazine, Term 2, December 2019 (Vietnamese)
- [7] Captain, S. (2017, January 5). *Can IBM's Watson do it all?* Fast Company. Available at <https://www.fastcompany.com/3065339/can-ibms-watson-do-it-all>
- [8] Cuong DM, Swierczek, FW. *Corporate culture, leadership competencies, job satisfaction, job commitment and job performance: A comparison of companies in Vietnam and Thailand*. Journal of J Am Acad Bus Camb 2008; 13(1): 159-65.
- [9] Davenport, T. H., & Kirby, J. (2016). *Just how smart are smart machines?* MIT Sloan Management Review, 57(3), 21-25.
- [10] Gantz, John. *The new world of enterprise reporting is here*. Computer World, February 1, 1999.
- [11] Gupta, K. M., & Gunasekaran, A. (2005). *Costing in new enterprise environmental. A challenger for managerial accounting researchers and practitioners*. Managerial Auditing Journal, 20(4), 337-353.
- [12] Guszczka, J., Lewis, H., & Evans-Greenwood, P. (2017). *Cognitive collaboration: Why humans and computers think better together*. New York, NY: Deloitte University Press.
- [13] Hamid R. Nemati, David M. Steiger, Lakshmi S. Iyer, Richard T. Herschel. *Knowledge warehouse: an architectural integration of knowledge management, decision support, artificial intelligence and data warehousing*. Decision Support Systems, Elsevier, June 2002).
- [14] Ho Dac Loc and Huynh Chau Duy (2020). *Developing artificial intelligence in Vietnam: Current situation and solutions*, Vietnam Journal of Science and Technology Online, 2020, ISSN 26159759 (Vietnamese).
- [15] Jack Clark. "Why 2015 Was a Breakthrough Year in Artificial Intelligence". *Bloomberg News*, 2015 <https://www.bloomberg.com/news/articles/2015-12-08/why-2015-was-a-breakthrough-year-in-artificial-intelligence>
- [16] James A. O'brien & George M. Marakas. *Management information systems*. Eighth edition.
- [17] James Manyika, Kevin Sneider (2018). *AI, automation, and the future of work: Ten things to solve for*. Mckinsey Global Institute
- [18] José Antonio Pérez-Méndez, Ángel Machado-Cabezas. *Relationship between management information systems and corporate performance*. Revista de Contabilidad-Spanish Accounting Review • 1 January 2015.
- [19] Kalakota, Ravi, and Andrew Whinston (2001). *E-Business 2.0: Roadmap for success*. Reading, MA: Addison-Wesley.
- [20] L. Mia, B. Clarke. *Market competition, management accounting systems and business unit performance*. Management Accounting Research, 10(1999), pp. 137-158.
- [21] M. Al-Omiri, C. Drury. *A survey of factors influencing the choice of product costing systems in U K. organizations*, Management Accounting Research, 18(2007), pp. 399-424, Managerial Auditing Journal, 20 (4) (2005), pp. 337-353.
- [22] Marwala, T. (2015). *Causality, correlation, and artificial intelligence for rational decision making*. Jurong East, Singapore: World Scientific.

- [23] Mohammad Hossein Jarrahi (2018). *Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making*. BUSHOR-1478; No. of Pages 10, Published by Elsevier.
- [24] N. Urbach, B. Müller (2012). *The updated DeLone and McLean model of information systems success* 10.1007/978-1-4419-6108-2_1
- [25] Nowduri, S. (2011). *Management information systems and business decision-making: review, analysis, and recommendations*. Journal of Management and Marketing Research. 7, 1-8,
- [26] Opeyemi Bello, Javier Holzmann, Tanveer Yaqoob, Catalin Teodoriu (2015). *Application of artificial intelligence methods in drilling system design and operations: a review of the state of the art*. Jaiscr, vol. 5, no. 2, pp. 121-139.
- [27] Ouellette, Tim. *Opening your own portal*. Computerworld, August 9, 1999. Retrieved from <http://www.aabri.com/manuscripts/10736.pdf>
- [28] Pham Thi Thu Ha. *Developing Artificial Intelligence (AI) in Vietnam: Current Situation, International Experience and Development Trends*. Vietnam News Agency, 11/14/2019 8:11'(GMT+7) (Vietnamese).
- [29] Quynh Tram, *Development of Artificial intelligence industry in Vietnam*, 7/24/2020.
- [30] <https://hcmuni.fpt.edu.vn/phat-trien-nganh-tri-tue-nhan-tao-tai-viet-nam>.
- [31] S. Ransbotham, D. Kiron, P. Gerbert, M. Reeves (2017). *Reshaping Business With Artificial Intelligence*. MIT Sloan Management Review and The Boston Consulting Group.
- [32] S. Russell, P. Norvig (2016), *Artificial Intelligence: A Modern Approach*, 3rd Global Edition, Pearson.
- [33] Sower JC, Sower VE. Moderator Variables in Cultural Values and Business Ethics Research: Important to External Validity. *SW Bus Econ J*, 2005.
- [34] Thanh Duong, *FPT ambitions to bring AI Vietnam to the top of the world*. VNexpress, 6/23/2020. (Vietnamese). <https://vnexpress.net/fpt-van-hanh-so/fpt-tham-vong-dua-ai-viet-nam-len-hang-dau-the-gioi-4119517.html>
- [35] Thanh Duong, *Three projects applying artificial intelligence of Viettel*. Vnexpress, 8/26/2020 (Vietnamese). <https://vnexpress.net/ba-du-an-ung-dung-tri-tue-nhan-tao-cua-viettel-3975253.html>
- [36] Turban, Efraim, and Jay Aronson. *Decision support systems and Intelligent Systems*. Upper Saddle River, NJ: Prentice Hall, 1998.
- [37] Turban, Efraim, and Jay Aronson. *Decision support systems and Intelligent system*. Upper Saddle River, NJ: Prentice Hall, 1998.
- [38] Van Anh, *Vietnam's digital economy is likely to become less competitive*, VOV.vn, 2018 (Vietnamese).
- [39] Vandenbosh, Betty and Sid Huff. *Searching and scanning: How executives obtain information from executive information system*. MIS Quarterly, March 1997.
- [40] Watson, Hugh, and John Satzinger. *Guidelines for designing EIS Interfaces*. Information systems management, Fall 1994.
- [41] Winston, Patrick. *Rethinking Artificial Intelligence*. Program Announcement, Massachusetts Institute of Technology, September 1997.

FDI INFLOWS TO VIETNAM BEFORE AND IN THE COVID-19 PANDEMIC: STATE OF PLAY AND PROSPECTS FOR THE END OF 2020

Vu Thanh Huong^{1,*} and Nguyen Thi Hai Ly²

¹ Department of World Economy and International Economic Relations, Faculty of International Business and Economics, University of Economics and Business, Vietnam National University – Hanoi

² Faculty of International Business and Economics, University of Economics and Business, Vietnam National University – Hanoi

*Corresponding author: huongvt@vnu.edu.vn

Abstract

Since the beginning of 2020 when the Covid-19 pandemic appeared and broke out, the world economy has been experiencing a considerable decline in FDI flows and facing the risk of uncertain recovery in the coming time. In this context, FDI inflows to Vietnam are also affected by this pandemic. The paper aims at examining and comparing FDI inflows to Vietnam before and during the Covid-19 epidemic, providing some outlooks of the world economy and global FDI, and then analyzing prospects for FDI inflows to Vietnam by the end of 2020. The results show that the Covid-19 pandemic has immediate impacts on FDI inflows to Vietnam but these effects are not serious. Even though total registered FDI, realized FDI and the number of new FDI projects have decreased in the Covid-19, there are encouraging results when total newly registered FDI has still increased, and FDI sector's imports and exports have just slightly decreased. The paper points out that prospects for Vietnam to attract FDI by the end of 2020 is positive if Vietnam it can take full advantage of the ability to control well the Covid-19 and the EVFTA. The paper concludes by drawing some implications for Vietnam to realize these prospects.

Keywords: Covid-19, FDI inflows, Vietnam.

1. INTRODUCTION

Vietnam after 30 years of Doi Moi has succeeded at creating more favorable investment environments to attract foreign direct investment (FDI) through reducing tax burden, diversifying types of investment incentives and reforming administrative procedures. As a result, FDI flows into Vietnam has been increased over time. According to Vietnam's Foreign Investment Agency (2020a), in 2019, the total FDI inflows to Vietnam reached approximately USD 38.02 billion, increasing by 7.2% compared to that of the same period in 2018. The implemented FDI capital was USD 20.38 billion – an increase by 6.7% over the same period in 2018.

Since the beginning of 2020 when the Covid-19 pandemic appeared and broke out, the world economy has been experiencing a considerable decline in economic growth rate, trade, and investment, and facing the risk of uncertain recovery in the coming time. Disruption of global value chains, movement of supply chains and decrease in demand have led to shrinking FDI in many countries around the world, including Vietnam. Besides these negative impacts, the Covid-19 pandemic might provide Vietnam with a

number of new opportunities and prospects in attracting FDI outflows from China and other countries because Vietnam is so far assessed to be successful at controlling the pandemic. The paper aims at examining and comparing the state of play of FDI inflows to Vietnam before and during the pandemic, then analyzing prospects for Vietnam's FDI inflows by the end of 2020 and eventually proposing some recommendations for promoting FDI into Vietnam in the coming time.

2. FDI INFLOWS TO VIETNAM BEFORE AND DURING THE COVID-19 PANDEMIC: STATE OF PLAY

2.1 FDI inflows to Vietnam before the Covid-19 pandemic

Total FDI capital and projects

2010 – 2019 was the booming period of FDI in Vietnam. During this period, the number of newly licensed projects increased sharply. In 2010, Vietnam had only 968 newly licensed projects while this figure in 2019 was 3883 (Figure 1), an increase of 4 times compared to that of 2010 and 27.5% compared to that of 2018.

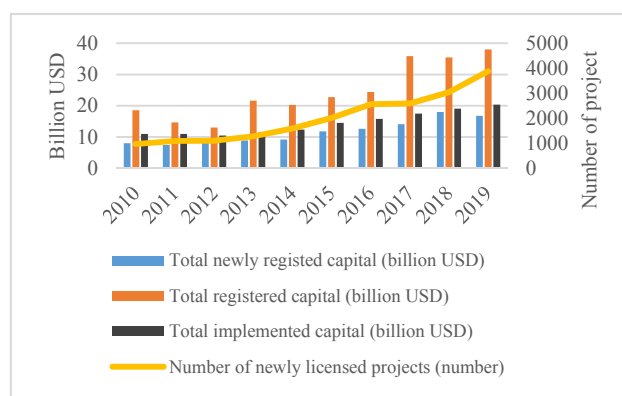


Fig. 1: FDI flows into Vietnam in the period 2010 – 2019

Source: Foreign Investment Agency's FDI database from 2010 to 2019

In parallel with the increase in new FDI projects, in the period 2010 - 2019, total newly registered FDI capital in Vietnam increased at a high growth rate of 10% per year on average from USD 8 billion in 2010 to USD 16.1 billion in 2019 (Figure 1). In 2011, because of the impact of the global financial crisis and domestic issues such as sharp increase in inflation, inefficient public investment, freezing real estate market, wobbled stock market and high bankruptcy, FDI in Vietnam decreased strongly to USD 7.43 billion by nearly 7.2% compared to that of 2010. From 2012 up to 2019, FDI inflows experienced an upward trend and the highest increase was recorded in 2015 as the result of Vietnam's efforts in improving the investment-related legal system. The 2014 Investment Law, which took effect on July 1st 2015, revised the shortcomings of the 2005 Investment Law, especially the provisions on tax incentives, thereby creating a more favorable investment environment for attracting FDI into Vietnam. By 2019, the total newly registered capital was USD 16.75 billion, equivalent to 93.2% of that of the same period in 2018 (Foreign Investment Agency, 2020a).

The total registered FDI capital, which includes newly registered capital, adjusted capital and capital contributed and shares purchased by foreign investors, in the period 2010 - 2019 increase rapidly and steadily over the years. In the first year of the period, the total FDI flows into Vietnam was USD 18.59 billion. Then in the last year of the period, this figure was USD 38.02 billion, witnessing a double increase compared to that of 2010 and an increase of 7.2% compared to that of 2018. The annual growth rate of registered FDI capital in this period was 11.13% on average.

The realized FDI also increased steadily in the period 2010 – 2019 to reach USD 20.38 billion at the final year – the record level so far, increasing by more than 1.9 times from USD 11 billion in 2010 and by 6.7% compared to that of 2018. That Vietnam can maintain an increase in realized FDI in 2019 is encouraging given the decline in global FDI. However, the growth

rate of FDI in 2019 decreased compared to that of 2017 and 2018¹ (Foreign Investment Agency, 2018, 2020a).

Accumulated by December 2019, Vietnam had 30,827 valid projects with a total registered capital of USD 362.58 billion. The accumulated implemented capital was 211.78 billion USD, equivalent to 58.4% of the total valid registered capital.

FDI by partners

In 2019, South Korea was the biggest investor with a total registered capital of USD 7.92 billion, accounting for 20.8% of total FDI flows into Vietnam. Hong Kong ranked second with USD 7.87 billion and Singapore ranked third with USD 4.5 billion (Figure 2). Japan, China, Taiwan and Thailand were also major investors in Vietnam. In 2019, FDI from China and Hong Kong increased strongly mainly due to the impact of the US-China trade war. From January to August 2019, 26 enterprises shifted from China to Vietnam. Specifically, in 2019, investment from China increased by nearly 1.65 times and from Hong Kong by 2.4 times over the same period in 2018 (Foreign Investment Agency, 2020a). FDI from China in 2019 increased by 17% compared to that of 2018, which was much higher than the increase of 7.2% of overall FDI inflows in Vietnam and the highest increase among Vietnam's top 10 biggest investors.

¹ In 2017, reimbursed FDI increased by 10.7% compared to that of 2016. In 2018, it increased by 9.1% compared to that of 2017.

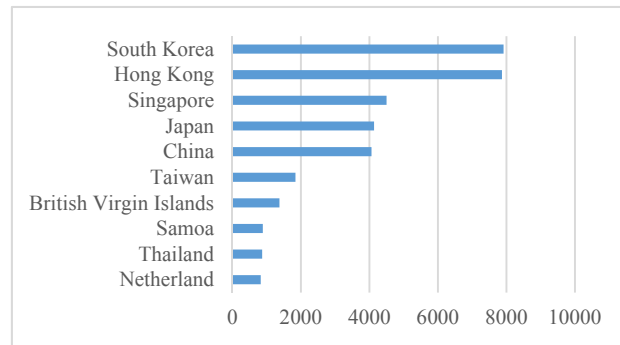


Fig. 2: Top 10 FDI investors in Vietnam in 2019 (Unit: Million USD)

Source: Foreign Investment Agency's FDI database in December 2019

Accumulated by December 2019, South Korea was the biggest investor in Vietnam with 8,467 projects worth

USD 67 billion USD, followed by Japan, Singapore, Taiwan and Hong Kong (Table 1).

Table 1: 10 biggest FDI investors in Vietnam (Accumulation of projects having effect as of December 20, 2019)

No.	Investors	Number of projects	Total registered investment capital (Billion USD)	Proportion of registered capital (%)
1	Korea	8,467	67.70	18.67
2	Japan	4,385	59.33	16.36
3	Singapore	2,421	49.77	13.73
4	Taiwan	2,692	32.36	8.93
5	Hong Kong	1,735	23.44	6.47
6	British Virgin Islands	841	21.72	5.99
7	China	2,807	16.26	4.49
8	Malaysia	616	12.63	3.48
9	Thailand	560	10.90	3.01
10	Netherland	344	10.05	2.77

Source: Foreign Investment Agency's FDI Database in 2019

FDI by economic sector

In the period 2012 – 2019, the processing and manufacturing, and real estate sectors were always two biggest FDI recipients (Figure 3). In 2019, FDI in manufacturing and processing increased sharply and attracted more than 64% of the total newly registered FDI capital in Vietnam, followed by real estate (10.2%) and wholesale and retail, repair of motor vehicles and motorcycles (6.8%).

Accumulated by December 2019, the manufacturing and processing sector had 14,442 valid projects with

more than USD 214 billion of registered capital, accounting for more than 59% of the total registered FDI capital in Vietnam. Real estate ranked second with 868 valid projects and more than USD 58 billion USD of registered capital, accounting for more than 16%. Followings are also big FDI receiving sectors: electricity, gas, water, and air conditioning production and distribution (accounting for 6.5%); accommodation and food services 3.3%); construction (2.8%) and wholesale, retail and repair of motor vehicles and motorcycles (2.2%).

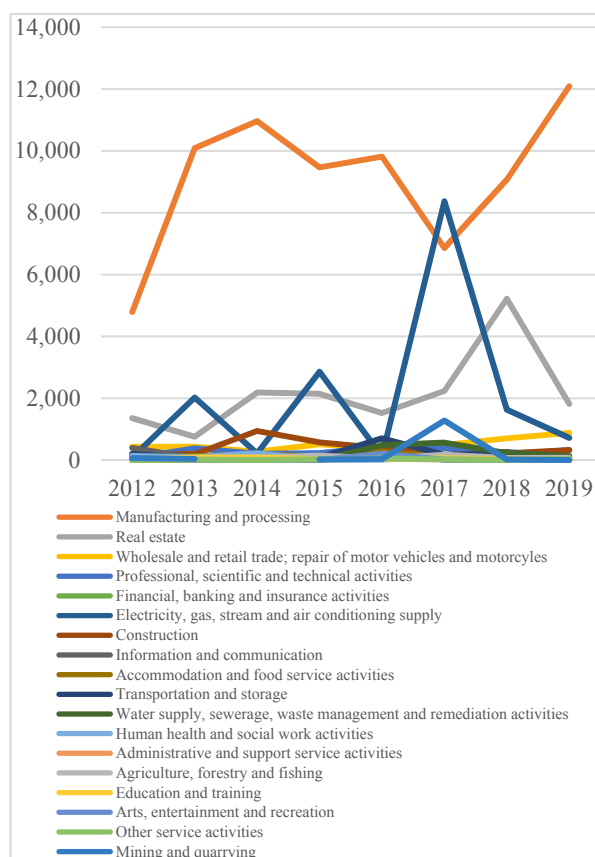


Fig. 3: Total registered FDI to Vietnam by economic sectors, 2012 – 2019 (Unit: million USD)
 Source: Foreign Investment Agency's FDI Database from 2012 to 2020



Fig. 4: Trade of the FDI sector in Vietnam, 2010 – 2019 (Unit: billion USD)
 Source: Foreign Investment Department's FDI Database from 2010 to 2020

Trade of FDI sector

In the period 2010 – 2019, FDI enterprises were the main driving force to promote trade and contribute largely to Vietnam's trade surplus. Exports and imports of the FDI sector increased sharply and steadily, along with the growing contribution of this sector to Vietnam's trade surplus over time (Figure 4).

Particularly in 2019, imports of the FDI sector reached nearly USD 145.5 billion, increasing by 2.5%

compared to that of the same period in 2018 and accounting for 57.4% of Vietnam's total import turnover. The corresponding figures for exports of the FDI sector were USD 181.4 billion, 3.4% and nearly 68% of Vietnam's total export turnover. 2019 is the fourth consecutive year that Vietnam achieved trade surplus, which has been contributed considerably by the FDI sector. In this year, FDI sector's trade surplus of USD 34.56 billion was the source to offset trade deficit of the domestic business sector and resulted in

Vietnam's total trade surplus of USD 11.12 billion USD (General Department of Vietnam Customs, 2020b).

2.2 FDI inflows to Vietnam in the Covid-19 pandemic

Total FDI capital and projects

In the early months of 2020, the Covid-19 pandemic has considerably affected Multinational Corporations (MNCs)'s intention to expand existing investment as

well as implement new investment, making global FDI inflows plummet. In this context, FDI inflows to Vietnam has also decreased compared to that of the same period in 2019, but there are still some encouraging signals when newly registered FDI capital continues to increase in the first four months and implemented capital tends to increase during first eight months of 2020 (Figure 5).

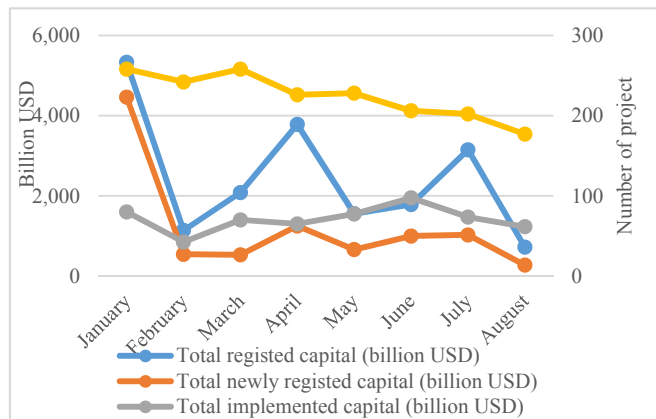


Fig. 5: FDI inflows to Vietnam in the first 8 months of 2020
 Source: Foreign Investment Agency' FDI Database in 2020

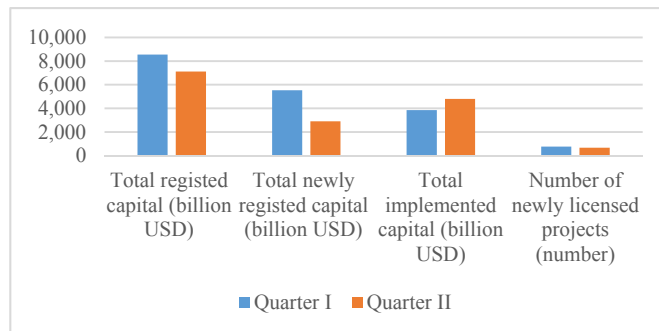


Fig. 6: FDI inflows to Vietnam in the first and second quarter of 2020
 Source: Foreign Investment Agency's FDI Database in 2020

In the first quarter of 2020, FDI flows into Vietnam plummeted in February due to the effects of the Covid-19 epidemic and Tet holiday, and then increased in March (Figure 5). In the whole quarter, registered FDI capital reached USD 8.55 billion USD, which was equivalent to only 79.1% of that of the same period in 2019 but still increased compared to the same period in 2016, 2017 and 2018. Another positive signal is that newly registered FDI capital in this quarter reached USD 5.5 billion, an increase of 44.8% over the same period in last year (Foreign Investment Agency, 2020b). The realized capital in the first three months of 2020 reached USD 3.8 billion, equivalent to 93.4% of that of the same period in 2019. Also, during this period, there were 758 newly licensed projects, a

decrease of 3.4% in number of projects over the same period last year.

Entering the second quarter of 2020, FDI flows into Vietnam after a sharp increase in April decreased in May and slightly increased again in June (Figure 5), partly due to Vietnam's good epidemic control. In the second quarter, the newly registered FDI capital reached USD 2.9 billion USD, the number of newly licensed projects was 660 and the total registered FDI capital reached USD 7.1 billion, declining by 16.79% compared to that of the first quarter of 2020 (Figure 6). One of the main reasons for the sharp decline in registered capital in the second quarter was the more complicated developments of the Covid-19 epidemic globally. However, FDI flows into Vietnam showed

positive signal when the total realized capital in this quarter continued to increase relatively strongly to USD 4.8 billion, growing by 24.68% over the same period last year and 37.14% over the first quarter. It implies that in the first 6 months of 2020, FDI in Vietnam has been flowing strongly into licensed and on-going projects while capital inflows to new projects have decreased.

July 2020 witnessed a sharp increase in total registered FDI capital compared to that of the previous months of the year (after April only) and the same period in 2018 (Figure 5). In the first 7 months and especially in July, thousands of experts from Korea, Hong Kong and Japan have received supports to enter Vietnam to maintain and expand production. However, in August, the total registered capital, newly registered capital, implemented capital and the number of new projects all fell sharply compared to the previous four months. The

decline in August are related to the second Covid-19 outbreak in Vietnam, so investors decide to halt investment activities and wait to see further progress of the epidemic.

By the end of August 2020, the total registered FDI capital reached USD 19.5 billion, declining by 13.7% compared to that of the same period in 2019 (Figure 6). The newly registered capital was over USD 9.7 billion USD, up by 6.6% and the realized capital was USD 11.3 billion, down by 6% over the same period last year. In these eight months, there were 1,797 new licensed projects, a decrease of 25.3% over the same period in 2019 (Figure 7).

Accumulated by the end of August 2020, there are 32,539 valid FDI projects investing in Vietnam with a total registered capital of nearly USD 381.12 billion and implemented capital of USD 223.1 billion (Foreign Investment Agency, 2020d).

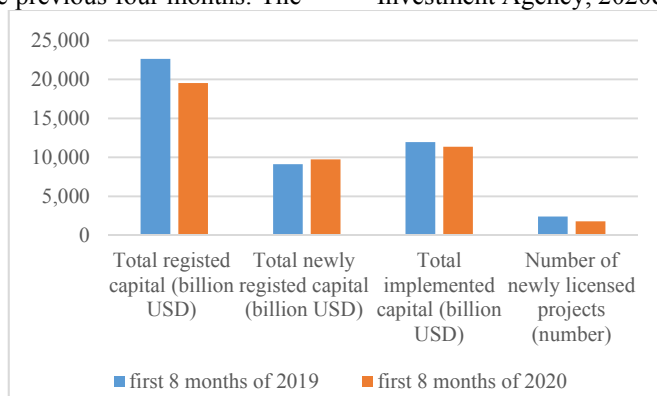


Fig. 7: FDI inflows to Vietnam in the first 8 months of 2019 and 2020

Source: Foreign Investment Agency's FDI Database by month in 2019 and 2020

In summary, the Covid-19 epidemic with considerably negative impacts on the world economy has resulted in stagnation and difficulties in production and business globally. The restricted movement of investors and the exchange of goods and services on a global scale has thereby negatively affected investors' decisions on new investment and expansion of ongoing projects in Vietnam. These factors have made the total registered FDI, the realized FDI as well as the number of newly licensed projects in the first 8 months of 2020 in Vietnam decrease compared to those of the same period in 2019. However, there are still some remarkable results when the total newly registered FDI increased in comparison with that of the same period last year. In addition, FDI in Vietnam increased in April and July when the Covid-19 has been in good control in Vietnam. Therefore, in the current situation when the second Covid-19 wave in Vietnam seems to be under good control, Vietnam's outlook of attracting FDI in the last months of the year is relatively positive.

FDI by partner

In the first 8 months of 2020, investment promotion activities have undergone big changes. The number of

delegations coming to Vietnam to search investment opportunities have sharply declined, especially from major partners such as Japan, Korea, Singapore, ASEAN, the US and the EU. Many investment seminars, conferences and forums have to be postponed or canceled.

In the first eight months of the year, 106 countries and territories have invested in Vietnam. Singapore is the largest investor, accounting for 33.5% of the total investment capital in Vietnam, followed by South Korea (Figure 8). Other major investors in Vietnam are China, Japan, Thailand and Taiwan. Compared to the list of the top 10 largest investors in Vietnam in 2019, the list in 2020 (as of August) adds Cayman Island while Samoa is out of the list. In addition, ranks of the largest investors also change significantly when Singapore jumps from 3rd place in 2019 to 1st place in 2020. Correspondingly, China's rank is from 5th to 3rd place while South Korea's rank drops from 1st place to 2nd place and Hong Kong from 2nd to 7th.

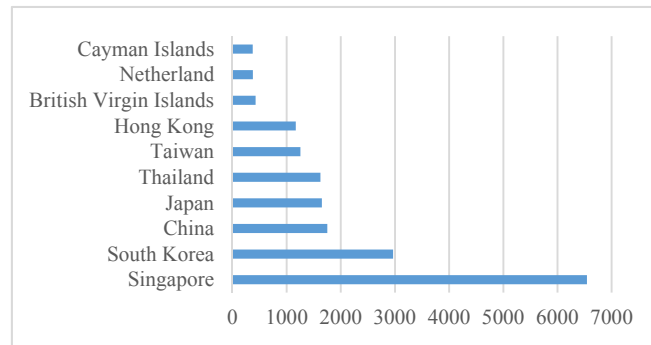


Fig. 8: FDI inflows to Vietnam by partners in the first 8 months of 2020 (Unit: million USD)

Source: Foreign Investment Agency's FDI Database by month in 2020

Accumulated by the end of August 2020, 137 countries and territories have invested in Vietnam, of which Korea ranks first with a total registered capital of more than USD 70 billion, accounting for 18.4% of total registered FDI inflows to Vietnam. Japan ranks second with 15.81%, followed by Singapore (14.43%), Taiwan (8.71%) and Hong Kong (6.54%).

FDI by economic sector

In the first 8 months of 2020, foreign investors have invested in 18 economic sectors, of which the processing and manufacturing sector ranked 1st with total registered capital of over USD 9.3 billion, accounting for 47.66% of total registered FDI in

Vietnam and representing a decline by more than 40% over the same period in 2019. Electricity production and distribution ranked 2nd with total registered capital of over USD 4 billion, accounting for 20.6% of total registered capital; followed by real estate business, and wholesale and retail (Table 2). Notably, while FDI in almost all sectors decreased, FDI in some sectors increased impressively including electricity, gas, water and air conditioning production and distribution (639%); finance, banking and insurance (920%); agriculture, forestry and fishery (162%), and education and training (104%).

Table 2: Total registered FDI inflows to Vietnam by economic sector in the first eight months of 2019 and 2020

No.	Sector	2019 (Unit: million USD)	2020 (Unit: million USD)	Growth rate (%)
1	Manufacturing, processing	15740.2	9312.8	-40.83
2	Electricity, gas, steam and air conditioning production and distribution	543.0	4015.9	639.56
3	Real estate	2311.9	2872.7	24.26
4	Wholesale and retail trade; repair of motor vehicles and motorcycles	1185.6	1208.4	1.92
5	Professional, scientific and technical activities	1094.6	687.2	-37.22
6	Construction	548.9	273.6	-50.16
7	Financial, banking and insurance activities	26.1	267.7	925.43
8	Accommodation and food service activities	176.4	259.1	46.90
9	Information and communication	275.9	209.9	-23.92
10	Transportation and storage	168.3	149.3	-11.33
11	Agriculture, forestry and fishing	51.3	134.7	162.71
12	Education and training	34.1	69.5	104.16
13	Administrative and support service activities	69.3	32.7	-52.77

14	Public health and social work activities	177.9	20.5	-88.48
15	Water supply, sewerage, waste management and remediation activities	131.8	10.2	-92.25
16	Mining and quarrying	39.9	5.3	-86.61
17	Other service activities	10.1	5.0	-50.81
18	Arts, entertainment and recreation	42.2	3.9	-90.82
	Total	22627.36	19538.34	-13.65

Source: Foreign Investment Agency's FDI Database in 2019 and 2020

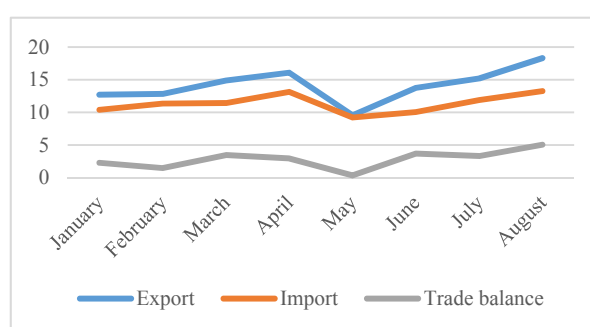


Fig. 9: Trade of FDI sector in the first 8 months of 2020 (Unit: billion USD)

Source: Foreign Investment Agency's FDI Database in 2020

Five big FDI projects in the first eight months of 2020 are in electricity, gas, water and air-conditioning production and distribution, and manufacturing and processing sectors, namely: (1) Liquefied natural gas power plant project (LNG) Bac Lieu (Singapore) with registered capital of USD 4 billion; (2) Southern Vietnam Petrochemical Complex (Thailand) project in Ba Ria - Vung Tau, adjusted to increase capital of USD 1.39 billion; (3) Radian Jinyu Tire Factory Project with a total capital of USD 300 million by Chinese investors in Tay Ninh; (4) Victory project - High-tech electronics manufacturing factory in Dong Van, Ha Nam (Taiwan), total investment capital of USD 273 million and (5) Office project at 29 Lieu Giai (Singapore), adjusted to increase capital by USD 246 million.

Trade of the FDI sector

Despite being affected by the Covid-19 epidemic, the first eight months of 2020 has witnessed an upward trend of FDI sector's export turnover, except for May (Figure 9). August recorded strong growth of both exports and imports of the FDI sector as its exports increased by 20.44% and imports by 11.37% compared to that of July. Besides, the FDI sector still recorded a trade surplus of USD 22.5 billion, offsetting the trade deficit of USD 11.6 billion of the domestic sector and contributing to Vietnam's trade surplus of USD 10.9 billion in the first 8 month of 2020.

However, compared to the same period last year, trade of the FDI sector has witnessed a decline. For the first 8 months of 2020, FDI sector's exports reached USD 113.31 billion, down by 4.47% while imports reached USD 90.75 billion, down by 5.34% as compared to that of the same period in 2019 (Foreign Investment Agency, 2020d). This is a remarkable change compared to the previous Covid-19 when the FDI sector has always been the driving force for Vietnam's trade growth. In Covid-19, the domestic sector from the beginning of the year up to now continues to be a bright spot when its trade turnover in the first 8 months increased compared to the same period last year, in which export increased by 15.3% and imports by 2.9% (General Department of Vietnam Customs, 2020). The main export products of the FDI sector in 2020 continue to be mobile phones and accessories; computers, electronic products and components; textiles and footwear. Meanwhile, the FDI sector imports mainly computers, electronic products and components; machinery, equipment, tools and spare parts.

3. PROSPECTS FOR FDI INFLOWS TO VIETNAM AT THE END OF 2020

3.1 New context and prospects for global FDI flows

The world economy is facing a "crisis like no other" and in uncertain recovery as the Covid-19 pandemic continues to be out of control in many countries and is

always at danger of coming back even in well-controlled countries (IMF, 2020). The pandemic incorporating with trade tensions between the United States and China, and increased trade protectionism are posing a series of unprecedented challenges. These combined factors have led to breakdown of global value chains, decline in demand, and disruptions of supply, and eventually result to disruptions, contractions and even closures of production by many MNCs around the world. Besides, reinvested earnings of MNCs also decrease in the Covid-19 period, leading to the decline in global FDI flows in both greenfield investment (GI) and Mergers & Acquisitions (M&A) (OECD, 2020; UNCTAD, 2020). In the first two months of 2020, the value of GI projects in non-OECD countries decreased by 36% in comparison with that of the same period in 2019 and by 15 – 30% compared to that of 2018 (OECD, 2020). From the beginning of the Covid-19 crisis to March 2020, investors removed from developing countries USD 83 billion, which was the largest capital outflow ever recorded (Thomson, 2020). FDI in the industrial sector fell the most. The decline of FDI flows due to the Covid-19 epidemic has had strong impacts on developing countries that has heavily been dependent on this source of capital for economic development (OECD, 2020).

The recovery of FDI globally requires substantial efforts beyond financial packages. MNCs are generally larger and more productive, and perform more R&D than their domestic firms. Therefore, the reposition strategy of MNCs will help governments cope with the effects of this crisis. Cross-border collaboration between companies can support to find long-term business solutions such as restoring production while protecting workers. In the long term, Covid-19 may lead MNCs to shift their production geographically, especially from China to other Asian countries such as Indonesia, Malaysia, India, Vietnam, Thailand, and the Philippines. The trend of shifting investment at the global scale has been conducted before the Covid-19 pandemic under the impact of the US – China trade war. In fact, the pandemic is the catalyst that makes this process faster and more drastic.

The Covid-19 pandemic has also created a new impetus for companies to build up a more flexible production network, construct supply chains closer to the retail markets and accelerate digitization. Under the influence of Covid-19 and increased protectionism, they can also accelerate the trend of restructuring Global Value Chains (GVCs) towards a simpler, more flexible and shorter value chain. MNEs are as a result can shorten the distance between suppliers and customers, and further promote vertical integration for improved production flexibility and sustainability.

In the new and uncertain context of Covid-19, global FDI inflows are predicted to fall by 40% in 2020 to below USD 1 trillion USD, then further decline by

5 – 10% in 2021 and possibly recover by 2022. However, this forecast is uncertain as the global capital flow outlook is highly dependent on the length of the pandemic and the effectiveness of government policy interventions. In addition, geopolitical and financial risks, and trade tensions also increase the uncertainty of global FDI flows in the future (UNCTAD, 2020).

The impact of Covid-19 although severe everywhere will vary by groups of countries. Developing countries are forecast to see the biggest decline in FDI as they depend more on FDI inflows in industries which are deeply involved in global value chains. These industries are heavily affected by the pandemic but have not received economic supports as much as those in developed countries. FDI inflows to Africa are estimated to decrease by 25 – 40% while that of developing Asian countries will be hit severely to fall by 30 – 45% due to their vulnerability to disruption of supply chain, heavy reliance on FDI in industries that are deeply involved in global value chains and pressure from the diversification of production sites of MNCs. For developed countries, FDI inflows to Europe are projected to decrease by about 30 – 45%, while that of North America and other developed economies will decline by about 20 – 35%.

The impact of the Covid-19 pandemic will also vary across economic sectors. Most sectors will be affected, but FDI will continue to plummet in sectors such as aviation, hotels, tourism, restaurants, entertainment, and the energy sector (UNCTAD, 2020). Meanwhile, FDI may increase in the digitization and health-related sectors (OECD, 2020).

For M&A, the global M&A felt sharply in the first half of 2020 but investors delay negotiating new deals rather than withdrawing from deals that they have negotiated. It is difficult and costly for investors to cancel the deals, so investors tend to continue postponing deals to wait and see economic developments in the future (OECD, 2020). Therefore, in the short term, from now to early 2021, if the world economy recovers, it is likely that M&A deals will increase sharply. On the other hand, if the prospect of economic recovery is low, investors will start to cancel transactions and make M&A flows decline sharply, especially in developed countries where M&A plays an important role and accounts for more than half of the total value of global M&A deals. The divestment phenomenon is also likely to increase if the recovery prospects of the world economy are low in 2021.

3.2 Prospects for FDI inflows to Vietnam

With the impact of the US – China trade war, new contexts of the world economy in the Covid-19 pandemic and projections of the decline in global FDI, FDI inflows to Vietnam in the last months of 2020 will be difficult to be out of this trend. However, if Vietnam can take full advantage of two factors, namely the

ability to control well the epidemic up to now and the Vietnam – EU Free Trade Agreement (EVFTA) that has just come into effect at this special time, then Vietnam can restart economic activities faster than other countries around the world. These factors will bring about advantages for Vietnam over other countries in receiving the current shifting investment flows, thereby possibly helping FDI flows into Vietnam recover to 2019 levels by the end of 2020 and slightly increase in the first half of 2021.

There might be a change in FDI inflows to Vietnam by industry. Before the Covid-19 epidemic, FDI in Vietnam mainly focused on processing and manufacturing industries, real estate, and wholesale and retail. Since the Covid-19 epidemic happened, foreign investors in Vietnam have been strongly shifting their investments to areas namely: (i) information technology and high technology, for example Samsung; (ii) logistics; (iii) e-commerce such as Alibaba, and (iv) consumer goods and retail such as Zara, H&M. In the near future, besides the above-mentioned sectors, FDI projects will be likely to continue pouring into: (i) Vietnam's exporting sectors such as textiles and garments, and furniture; (ii) Asia's common traded commodities such as food, paper, plastics and rubber, metal products, construction materials, and machinery-related products such as computers, phones and electronic components. For machinery and equipment sector, Vietnam has been an attractive destination of a series of MCNs such as Samsung, LG, Intel and Panasonic before the pandemic. For textile and garment sector, Vietnam has potential to boost FDI inflows in producing facemask and workwear. Healthcare is another potential industry which is capable of attracting FDI in the near future when Vietnam is considered to have good epidemic control and begins to produce medical equipment to fight against the epidemics. In addition, due to Vietnam's increasing demand for energy, which is also the top priority development area of the Government, the energy sector is also a potential sector to attract FDI into Vietnam.

Vietnam has the prospect to attract FDI flows shifting from China under the complicated context of the Covid-19 integrating with other reasons, for example the US-China trade tension is escalating, protectionism is increasing, and the MNCs are promoting the reorganization of production chains and shifting investment from China to other countries to reduce risks, diversify production chains and take advantage of new opportunities from new potential markets. In such a context, Vietnam is emerging as a potential destination to receive FDI outflows from China. The revised Enterprise Law and Investment Law have created a corridor and a more favorable environment for Vietnam in attracting foreign investment. In addition, Vietnam's deep international economic integration, increasing living standards, and similar

advantages as China in terms of culture, politics, and geographic location help foreign investors reduce production displacement costs while maintaining a close relationship with production facilities in China. In fact, in the first few months of 2020, some MNCs have plans to shift their investment to Vietnam, such as Google plans to produce cheap smartphones (Pixel 4a) in Vietnam while Microsoft plans to produce notebooks and desktops in the second quarter of 2020. Additionally, Apple has an intention to produce wireless headphones (Air Pods) in Vietnam instead of China with 3 – 4 million units. Komatsu also shifts the production lines of components used for motorized chassis and electrical wires back to Japan and to Vietnam. It implies that the prospect for Vietnam to attract FDI outflows from China will be more realistic and faster under the impact of Covid-19. However, it would be worth noting that the movement of MNCs out of China will not be taken place immediately but there must be a roadmap usually about 2-5 years. Global supply chains have been settled down and MNCs cannot move or shift their investment quickly as the cost-benefit analysis of movement must be taken into careful consideration. In addition, MCNs can move just a part of their supply chains rather than moving entirely out of China where is still a large-scale and attractive market with many advantages in supporting industries, human resources and high-tech ecosystems. Therefore, the opportunity for Vietnam to attract capital flows out of China is a reality, but the shift of investment out of China will not be massive, fast, and short-term. In addition, the movement speed of FDI from China into Vietnam also depends on Vietnam's capacity of enterprises and the whole economy, as well as the FDI attracting policies in the coming time.

Vietnam also has the prospect of attracting FDI from other countries in the world in the coming time when MNCs try to expand and diversify their supply chains. It is because Vietnam is a bright spot in controlling Covid-19, and a potential market with nearly 100 million people and cheaper costs than some other ASEAN countries such as Malaysia, Singapore, Thailand and Indonesia, especially labor and land costs. Vietnam now has implemented a series of FTAs with a lot of big trade partners around the world. Typically, out of 30 enterprises participating in Japan's support program to diversify their supply chains to ASEAN countries, 15 desire to open more factories in Vietnam (Thuy An, 2020). In addition to MNCs from Japan, MCNs from Korea – Vietnam's biggest foreign investor, from the EU – where Vietnam has the advantage that EVFTA has just come into effect on August 1st 2020, and from the US – whose trade tension with China is escalating – are possible to promote investment in Vietnam. This prospect is also consistent with Vietnam's policy of attracting high-quality, high-tech and environmental-friendly FDI. However, there are some obstacles for Vietnam to

become a new attractive investment destination replacing China when Vietnam still has low local content rate and intransparent legal regulations, and lacks of high-quality human resources.

The outlook of attracting FDI into Vietnam in the coming time is also positive when Vietnam has achieved new turning point in international economic integration, especially with the effective EVFTA in the Covid-19. EVFTA taking effect in this special time will bring about valuable opportunities as well as more advantages for Vietnam over other countries in attracting FDI not only from EU businesses but also businesses around the world who want to access the EU market. Attracting FDI from the EU will also help increase the quality of FDI into Vietnam, especially in the sector that the EU enterprises have advantages in such as high-tech processing and manufacturing industries, clean energy and renewable energy... In addition, FDI from the EU to Vietnam may also increase in the service sectors that are advantages of the EU and more opened to the EU than other WTO members such as financial services, logistics, computer services, environmental services, higher education, distribution, telecommunications and health.

4. CONCLUSION AND IMPLICATIONS

The paper analyzes FDI inflows to Vietnam before and in the Covid-19 epidemic. The results show that before Covid-19, 2010 – 2019 was the booming period of attracting FDI in Vietnam as the number of newly licensed projects increased continuously, and the total registered and implemented capital tended to increase over years. In 2010 – 2019, Vietnam's total newly registered capital, total registered capital, and total implemented capital increased by an average of 9.21%, 11.13% and 7.27% per year, respectively. The biggest investors in Vietnam during this period were Korea, Japan, Singapore, Taiwan and Hong Kong. The two biggest FDI receiving sectors were processing and manufacturing, and real estate. The FDI sector has always been the engine of Vietnam's trade growth during this period.

Starting in early 2020, the Covid-19 pandemic has immediate impacts on FDI inflows to Vietnam although these effects are not serious. Vietnam cannot avoid the general trend of FDI decline in the world, therefore total registered FDI, realized FDI and the number of new FDI projects have all decreased in the first eight months of 2020 in comparison with that of the same period in 2019. However, there are still encouraging results when total newly registered FDI has still increased over the same period last year. Imports and exports of the FDI sector has decreased by only around 4 – 5%. It shows that in the Covid-19, FDI inflows to Vietnam as well as the performance of FDI sector in Vietnam have been affected but not too severe. In terms of partners, there are some changes in

investor ranks when Singapore and China replace South Korea and Hong Kong to become the largest investors in the first 8 months of 2020.

The paper also provides some outlook of the world economy and global FDI, thereby analyzing FDI prospects in Vietnam in the coming time. The paper argues that Vietnam is possible to avoid a further decline in FDI in the last months of the year if it can take full advantage of two factors namely the ability to control well the Covid-19 and the entry into force of EVFTA. Besides traditional FDI receiving sectors including garments and textiles, real estate, wholesale and retail, furniture, machinery and equipment, some emerging areas potential to attract more FDI are health and energy. Besides, Vietnam has the potential to attract FDI flows shifting from China as well as other countries when MCNs try to expand and diversify their supply chains. Based on these analyses, the paper proposes some implications for Vietnam to realize these prospects.

Firstly, Vietnam needs to effectively implement policies to support economic recovery and growth in the Covid-19: (i) continue to strictly control the epidemics in order to consolidate confidence of foreign investors in Vietnam's market stability; (ii) promote efficient public investment in the second half of the year to offset the difficulties of domestic enterprises, thereby creating a driving force for economic growth in this difficult time.

Secondly, Vietnam needs to quickly and transparently construct and publish policies to attract shifting capital flows with clear information on priority sectors and regions. At the same time, it is necessary to review the existing industrial parks and then propose strategies of preparing infrastructure for future investment such as adjusting and expanding the existing industrial parks, or constructing new industrial parks. Together with FDI attracting policies, it is of great importance to design proper policies to select high-quality, high-technology and environmental-friendly FDI projects to Vietnam.

Thirdly, Vietnam should continue improving FDI attracting policies. It is a necessity to prioritize to attract FDI into a number of fields such as information technology and telecommunications to develop high-tech infrastructure, catch up with the digital trend and thereby increase the ability to meet foreign investors' future demand when entering Vietnam. In addition, Vietnam should keep on track of administrative reforms in order to facilitate foreign investors when investing in Vietnam and continue improving investment environment on basis of combating corruption and improving the quality of human resources.

Fourthly, Vietnam needs to quickly issue policies and action plans to implement EVFTA and the Vietnam-EU

Investment Protection Agreement (EVIPA) in order to take full advantage of attracting FDI from the EU. The government should also promote promulgation about EVFTA for businesses and the community as a whole.

Finally, improving the competitiveness of the whole economy is a long-term solution to attract high quality FDI inflows to Vietnam on the basis of increasing the economy's resilience to external shocks, utilizing all available resources to efficiently invest in infrastructure development, promoting economic restructuring, and strengthening the quality of human resources and technology.

5. REFERENCES

- [1] Foreign Investment Agency (2018), *The current situation of foreign investment in 2018*, Available: <https://dautunuocngoai.gov.vn/detail/6109/tinh-hinh-thu-hut-dau-tu-nuoc-ngoai-nam-2018> [Accessed 5 September 2020].
- [2] Foreign Investment Agency (2020a), *The current situation of foreign investment in 2019*, Available: <https://dautunuocngoai.gov.vn/detail/6318/tinh-hinh-thu-hut-dau-tu-nuoc-ngoai-nam-2019> [Accessed 5 September 2020].
- [3] Foreign Investment Agency (2020b), *The current situation of foreign investment in the first 3 months of 2020*, Available: <https://dautunuocngoai.gov.vn/tinbai/6344/Tinh-hinh-Dau-tu-nuoc-ngoai-3-thang-dau-nam-2020>, [Accessed 10 September 2020].
- [4] Foreign Investment Agency (2020c), *The current situation of foreign investment in the first 7 months of 2020*, Available: <https://dautunuocngoai.gov.vn/tinbai/6374/Tinh-hinh-thu-hut-dau-tu-nuoc-ngoai-7-thang-dau-nam-2020> [Accessed 10 September 2020].
- [5] Foreign Investment Agency (2020d), *The current situation of foreign investment in the first 8 months of 2020*, Available: <https://dautunuocngoai.gov.vn/tinbai/6374/Tinh-hinh-thu-hut-dau-tu-nuoc-ngoai-7-thang-dau-nam-2020> [Accessed 10 September 2020].
- [6] IMF (2020), *World economic outlook update – June 2020: A crisis like no other, an uncertain recovery*, International Monetary Fund, Washington, D.C., the US.
- [7] OECD (2020), *OECD Policy responses to Coronavirus (Covid-19): Foreign direct investment flows in the time of Covid-19*, Organization for Economic Cooperation Development, Paris, France.
- [8] Thomson, L. (2020), *The Great Lockdown: Worst Economic Downturn Since the Great Depression*, Available: <https://www.imf.org/en/News/Articles/2020/03/23/pr2098-imf-managing-director-statement-following-a-g20-ministerial-call-on-the-coronavirus-emergency> [Accessed 5 September 2020].
- [9] Thuy An (2020), “Many countries are in shock when 15 Japanese enterprises choose Vietnam”, *VTV News* 24/7/2020, Available: <https://vtv.vn/kinh-te/nhieu-nuoc-lan-can-soc-khi-15-doanh-nghiep-nhat-chon-viet-nam-20200724070811522.htm> [Accessed 20 August 2020].
- [10] Vietnam's General Customs (2020), *The current situation of Vietnam's imports and exports in December and 12 months of 2019*, Truy cập từ: [https://www.customs.gov.vn/Lists/ThongKeHaiQuan/ViewDetails.aspx?ID=1734&Category=Ph%](https://www.customs.gov.vn/Lists/ThongKeHaiQuan/ViewDetails.aspx?ID=1734&Category=Ph%truy cập ngày 10/9/2020), truy cập ngày 10/9/2020.
- [11] UNCTAD (2020), *World investment report 2020: International production beyond the pandemic*. United Nations Conference on Trade and Development, New York, the US.

HOW LOCAL ECONOMIC GOVERNANCE AFFECTS THE NON-STATE ENTERPRISE SECTOR DEVELOPMENT IN VIETNAM?

Dao Thi Bich Thuy

University of Economics and Business, VNU Hanoi

Email: thuydaokt@vnu.edu.vn

Abstract

Since 2000, the non-state enterprise sector in Vietnam has experienced significant growth and gradually replaces the position of the state-owned enterprise sector. The purpose of this study is to investigate the impact of local economic governance on the development of the non-state enterprise sector. The Provincial Competitiveness Index is used as a measure for quality of local economic governance. The non-state enterprise sector development is assessed in two aspects: capital growth and capital productivity. The empirical study is conducted at the local level with all 63 provinces nationwide in the period from 2006 to 2011. The finding shows that improvement in time costs, transparency, business support services, legal institutions, and labor training play as driving forces of investment since they have a positive impact on the growth of capital resource in the sector. Besides, capital productivity in the sector will increase when there are improvements in land access, informal charges, and labor training. Meanwhile, land access and proactivity of provincial leadership seem to be ineffective in investment stimulation and proactivity of provincial leadership and legal institutions act as a hindrance to the increase of capital productivity.

Keywords: Local economic governance, provincial competitiveness index, non-state enterprise sector.

1. INTRODUCTION

The enterprise sector takes an important position in the economy as being a major part of the formal economic sector that generates output in the economy, creates jobs and income for workers and contributes significantly to the government tax revenue. In Vietnam, while the informal economic sector with individual and households economic actors still dominates, the development of the enterprise sector is even more meaningful when it helps to restructure the economy in the direction of raising the share of formal economic sector and reducing the share of informal economic sector. Among the various factors, the performance and growth of the enterprise sector are directly affected by business environment and which in turn is determined by the quality of economic governance of the local government. Business environment can stimulate innovation, dynamics and competitiveness of businesses or it can hinder the operation and development of businesses.

From a local government perspective, business environment encompasses business and economic development policies and strategies, local laws and regulations governing business activities and institutions organizing for dialogue between government and the business sector and other stakeholders, White, 2018 [1]. Local government can create a conducive business environment by pursuing policies and strategies for economic and business development that identify local challenges, problems

and opportunities and help economic actors to respond to these; enacting local laws and regulations that govern business activities in an efficient and effective manner, ensuring they are a realistic and proportionate response to the problems they are designed to address; and institutionally arranging for dialogue between government and local business sector so that the business community can talk to the government and the government can consult them on its plans and proposals.

The Provincial Competitiveness Index (PCI) which has been jointly developed by the Vietnam Chamber of Commerce and Industry (VCCI) and USAID [2] identifies 9 local economic governance dimensions that develop business-friendly regulatory environment for business sector development. First, entry costs for new entrants. Simple and inexpensive business licensing procedures will encourage the growth of new businesses. Second, land access and security of tenure is about the ability to acquire land and maintain property rights. When the access to land is easy and property rights for the use of land is secured, businesses will have more incentive to invest. Third, transparency reflects ability and equality among firms in accessing legal documents and the degree of interaction between local government and business community. Fourth, time costs of regulatory compliance measure time required for the compliance of provincial administration activities and their frequency. Fifth, informal charges are sorts of unofficial extra fees required in doing business. This is

considered as proxy for corruption. Sixth, proactivity of provincial leadership shows the creativity and cleverness of provincial authorities in implementing central policy as well as designing their own initiatives for private sector development. Business sector benefits when provincial leaders are active, willing, and capable of solving firms' problems and assisting local firm development. Seventh, business support services assess the efficiency of private sector development services provided by local government (trade and investment promotion, partner matching, the availability and quality of infrastructure...). Eighth, labor training measures efforts of the province in improving skills and competencies of local workers and promoting the labor market. Ninth, security and conflict resolution are critical aspects in the investment climate. Legal institutions measure confidence of the private sector in the provincial legal institutions. A safe investment environment and a sound business dispute and conflict resolution mechanism enhances investors' confidence in starting and doing business.

There are several studies on the impact of local economic governance on the business sector development in Vietnam. Malesky, 2007 [3] argued that local economic governance plays an important role in the development of the FDI sector. The study looked at 3 aspects which are FDI attraction measured by new FDI licensed projects, implementation measured by the ratio of implemented FDI and registered FDI and additional investment measured by additional capital for existing projects. The finding showed that different sets of local economic governance impact on these aspects. Transparency and business support services are driving forces of investment attraction while 6 governance factors including land access, legal institutions, transparency, business support services, proactivity of provincial leadership and labor training have a positive effect on FDI implementation. Meanwhile land access, business support services, proactivity of provincial leadership and labor training are governance factors influential in firm decision to expand an existing project.

In their study, Nguyen et al., 2014 [4] found only two governance dimensions which are transparency and land access have a positive effect on FDI attraction in Vietnam.

Doan and Lin, 2016 [5] again explored the role of local economic governance in attracting FDI in Vietnam in the period 2006-2014 and showed that transparency, time costs of regulatory compliance, and business support services are significant determinants of FDI.

Dao, 2017 [6] placed the interest in the enterprise sector in Vietnam and the study found that the growth of the sector's output is positively affected by labor training, time costs, informal charges, transparency, and business support services.

In another approach, when assessing the effect of local economic governance on the economic performance of the business sector in Vietnam, Phan, 2013 [7] found that improvement in business support services, more proactivity of provincial leadership, easier land access and more security of tenure, and reduction of informal charges positively associate with ROA (return on asset) and ROCE (return on capital employed).

Since the year 2000, the non-state enterprise sector in Vietnam has developed remarkably. This sector has emerged to become a major part as it gradually replaces the position of the state-owned enterprise sector. It would be of interest to explore the impact of local economic governance on the development of the non-state enterprise sector. We assess the sector development in two aspects: capital growth and capital productivity. The rest of the paper is organized as followed. Section 2 presents the fact on the development of the non-state enterprise sector. Model specification, data and methodology is then provided in Section 3, followed by Section 4 on results and discussion and finally Section 5 is the conclusion.

2. OVERVIEW OF THE NON-STATE ENTERPRISE SECTOR DEVELOPMENT

In the structure by type of ownership, the enterprise sector has 3 sub-sectors including the state-owned enterprise sector, the non-state enterprise sector, and the FDI sector. The state-owned enterprise sector includes central and local state-owned enterprises. The non-state enterprise sector includes private enterprises, partnerships, private limited liability companies and joint stock corporations. The FDI sector includes 100% foreign owned enterprises and foreign joint ventures. In the 2000-2018 period, the enterprise sector has experienced a clear shift in the structure of capital resource. The share of capital resource in the non-state enterprise sector increased significantly during this period. On average over the 5-year period, this share has steadily increased from only 16.4% in the first period to 35.9% in the second period, and then to 49.8% in the third period and in the last period, it reached at 53.4%. Meanwhile, the share of the state-owned enterprise sector has decreased sharply from 62.2% in the first period to 28.3% in the last period. The share of the FDI sector fluctuates slightly at first and then later remains relatively stable.

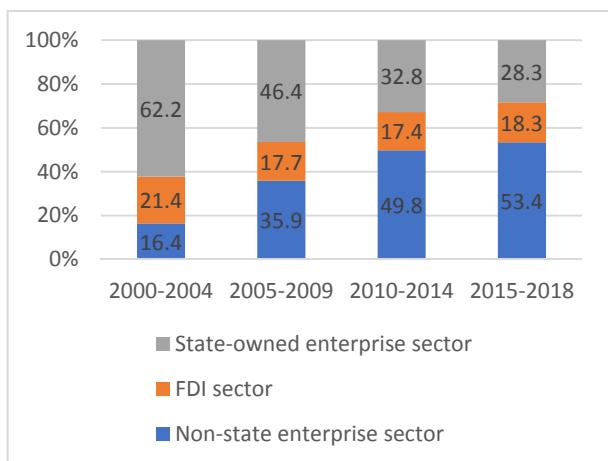


Fig. 1: Structure of capital resource in the enterprise sector by type of ownership

Source: The author own’s calculation from the General Statistic Office’s data [8]¹

A similar picture is observed in the structure of employment in the enterprise sector. The non-state enterprises have contributed an increasing share and become a main provider of jobs in the enterprise sector. In the first five years of the 2000-2018 period, the non-state enterprise sector contributed only 36.5% of employment, but by the end of the period this share had increased to 60.6%.

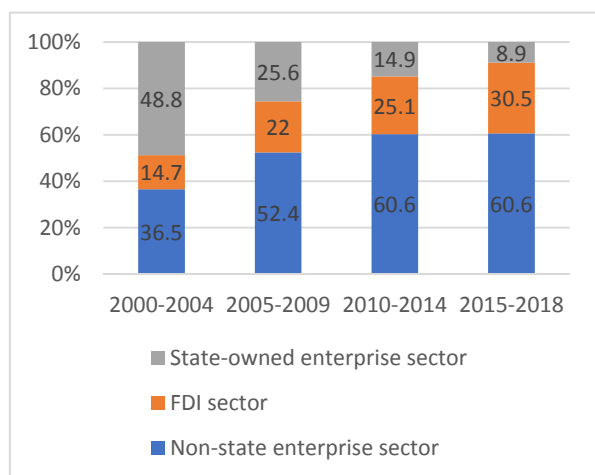


Fig. 2: Structure of employment in the enterprise sector by type of ownership

Source: The author own’s calculation from the General Statistic Office’s data [8]²

¹ The share of capital resource in each sub sector is measured as the capital resource in each sub sector divided by the total capital resource in the entire enterprise sector.

The 2000-2018 period witnessed a strong growth in the non-state enterprise sector in terms of the number of enterprises as well as the size of capital resource and output. During this period, the number of enterprises grew at an annual average rate of 17.2%, bringing the number of enterprises in 2018 nearly 17 times higher than in 2000. The size of capital resource experienced an impressive growth at an average growth rate of 25.2% per year. Based on the 2010 price level, the size of capital resource in the non-state enterprise sector in 2018 was 48 times higher than in 2000. Similarly, the output of this sector has also increased significantly at an average rate of 17.3% per year³. However, when having a close look, one can see that this period revealed two clear phases. In the first phase from 2001 to 2010, the non-state enterprise sector experienced stronger growth than in the second phase from 2011 to 2018. In the first phase, the growth rates in the number of enterprises, size of capital resource and output were 22.7%, 36.4% and 23.8% respectively. In the second phase, this number decreased to 10.4%, 11.2% and 9.2%, respectively.

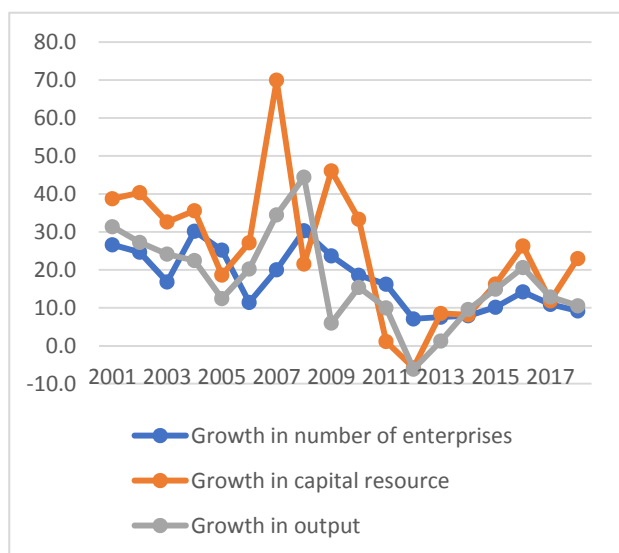


Fig. 3: Growth in the non-state enterprise sector

Source: the author own’s calculation from the General Statistic Office’s data [8]⁴

² The share of employment in each sub sector is measured as the number of employees in each sub sector divided by the total number of employees in the entire enterprise sector.

³ Output of the non-state enterprise sector is measured by business turnovers of enterprises in this sector.

⁴ The formular for the annual growth rate of a variable is the percentage change of that variable (i.e. the value of the variable in this year minus the value of the variable in previous year and all divided by the value of the variable in previous year).

In the 2000-2018 period, the output of the non-state enterprise sector increased, but its growth rate was not comparable with the growth rate of the capital resource in this sector. This reflects a decline in capital productivity. Capital productivity is measured by the ratio Y / K - output per unit of capital which tells us how much output can be created from 1 unit of capital. Capital productivity in the non-state enterprise sector tends to decrease clearly and this rings an alarming bell since this sector is expected to replace the position of the state-owned enterprise sector in the future.

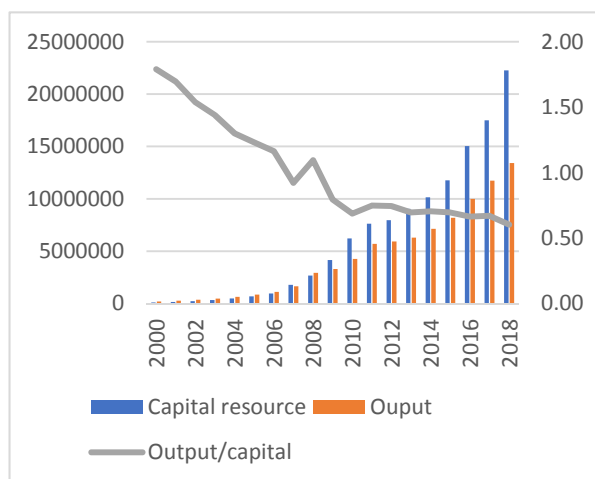


Fig. 4: Capital productivity in the non-state enterprise sector

Source: the author own's calculations from the General Statistic Office's data [8]⁵

3. MODEL SPECIFICATION, DATA AND METHODOLOGY

The study to assess the impact of local economic governance on the development of the non-state enterprise sector is conducted at the local level with all 63 provinces nationwide. The development of the non-state enterprise sector is assessed on the two aspects: growth in capital resource and capital productivity. The empirical study uses a combination of two datasets. The first dataset is the Provincial Competitiveness Index (PCI) which is used as a measure of local economic governance. Nine sub-indices of PCI represent local economic governance dimensions including entry costs, land access and security of tenure, transparency, time costs of regulatory compliance, informal charges, proactivity of provincial leadership, business support services, labor training and legal institutions. Each sub-index is constructed with the maximum score of 100 and a higher score reflects a better quality of local economic governance in creating a healthy and

favorable business environment. The second dataset comes from the *Business results survey of the non-state enterprise sector* published by Vietnam General Statistic Office [9]. This second dataset provides data for capital resource and capital productivity in the non-state enterprise sector.

The regression equations for the 2 models are written as:

Model 1

$$LNK_{i,t} = c + \alpha_i + \beta_1 PCIMK_{i,t} + \beta_2 PCILA_{i,t} + \beta_3 PCITR_{i,t} + \beta_4 PCITC_{i,t} + \beta_5 PCIIC_{i,t} + \beta_6 PCIPL_{i,t} + \beta_7 PCIES_{i,t} + \beta_8 PCILT_{i,t} + \beta_9 PCILR_{i,t} + e_{i,t} \quad (1)$$

Model 2

$$LNKP_{i,t} = c + \alpha_i + \beta_1 PCIMK_{i,t} + \beta_2 PCILA_{i,t} + \beta_3 PCITR_{i,t} + \beta_4 PCITC_{i,t} + \beta_5 PCIIC_{i,t} + \beta_6 PCIPL_{i,t} + \beta_7 PCIES_{i,t} + \beta_8 PCILT_{i,t} + \beta_9 PCILR_{i,t} + e_{i,t} \quad (2)$$

Where subscript i indicates province and subscript t is time in year.

In equation (1), the dependent variable LNK is the natural logarithm of the size of capital resource in the non-state enterprise sector in each province each year. In equation (2), the dependent variable LNKP is the natural logarithm of the capital productivity - measured by the ratio of the output and the size of capital resource in the non-state enterprise sector in each province each year. Business turnovers of enterprises are used as proxy for the sector's output. In both equations, the explanatory variables are the nine sub-indices of the PCI. PCIMK is entry cost for new firms, PCILA is land access and security of tenure, PCITR is transparency, PCITC is time costs of regulatory compliance, PCIIC is informal charges, PCIPL is proactivity of provincial leadership, PCIES is the business support service, PCILT is labor training and PCILR is the legal institutions. To adjust for the impact of inflation, capital resource is valued at the 2010 price level by dividing the data in each year by the GDP deflator for that year. Data for GDP deflator is available at World Databank [10]. Due to the availability of data for the non-state enterprise sector at provincial level, the empirical study period is chosen from 2006 to 2011.

Data for the 63 provinces is collected over the same period which forms a panel data. Regression analysis on panel data requires for the control of unobserved factors affecting the dependent variable. Because each province has its own characteristics, these unobserved factors are regarded as provincial heterogeneity. The variable α_i includes unobserved factors that affect the dependent variable and therefore reflect local specific impacts. Regression analysis is performed with Stata program. Various diagnostic tests reveal that there are problems of cross-sectional dependence, serial correlations and heteroskedasticity. With the presence

⁵ Capital productivity is calculated as the ratio of output (measured by business turnover) and the size of capital resource.

of these problems in data, Torres-Reyna, 2007 [11] suggests using the generalized least square method. The regression results are presented in Table 1.

4. RESULTS AND DISCUSSION

Table 1. Impact of local economic governance on the development of the non-state enterprise sector

Model 1

Dependent variable: LNK: Size of capital resource

Explanatory variables	Coefficient	P - value
PCIMK: entry cost for new firms	-0.074	0.207
PCILA: land access and security of tenure	-0.257	0.000***
PCITR: transparency	0.291	0.000***
PCITC: time costs of regulatory compliance	0.338	0.000***
PCIIC: informal charges	-0.034	0.656
PCIPL: proactivity of provincial leadership	-0.097	0.028**
PCIES: business support service	0.186	0.000***
PCILT: labor training	0.120	0.027**
PCILR: legal institutions	0.186	0.000***
CONSTANT	6.379	0.000

(***): 1% statistical level of significance, (**): 5% statistical level of significance, (*): 10% statistical level of significance

Source: The author's own calculation (see Appendix).

Model 2

Dependent variable: LNKP: Capital productivity

Explanatory variables	Coefficient	P - value
PCIMK: entry cost for new firms	-0.037	0.177
PCILA: land access and security of tenure	0.105	0.001***
PCITR: transparency	-0.016	0.591
PCITC: time costs of regulatory compliance	-0.032	0.165
PCIIC: informal charges	0.176	0.000***
PCIPL: proactivity of provincial leadership	-0.039	0.060*

PCIES: business support service	0.003	0.823
PCILT: labor training	0.081	0.001***
PCILR: legal institutions	-0.064	0.010**
CONSTANT	-0.975	0.001

(***): 1% statistical level of significance, (**): 5% statistical level of significance, (*): 10% statistical level of significance

Source: The author's own calculations (see Appendix).

Size of capital resource

The results of Model 1 show that seven out of nine local economic governance dimensions have a statistical significant impact on the growth of capital resource in the non-state enterprise sector, of which five sub-indices have a positive and two sub-indices have a negative effect. Improvements in time costs, transparency, business support services, legal institutions and labor training are found to be driving forces of investment in the sector.

First, time costs have the largest impact on capital growth. Time costs refer to the time that enterprises have to spend to comply with administrative regulatory procedures as well as the time for inspections by local regulatory agencies into their business. It takes enterprises away from their productive activities and thus incur costs on them. Reduction in time costs would save costs for enterprises and allow them to direct more time and resources to the business and production activities. Next, transparency has the second largest impact. Improvement in transparency allows enterprises to have more and equal access to the provincial planning and legal documents necessary to run their business. Better knowledge in provincial planning clearly benefits enterprises since it reduces the investment risk and thus gives them more incentive to undertake new investment ventures. This may also help to facilitate fair competition among enterprises since some firms cannot take advantages over others by paying to establish relation with local authorities to gain competitive information. Corruption is likely to reduce and this raises investors' confidence. Local government and business interaction via communication forums helps local authorities consulting with the business community when making policies tailored to the needs of businesses and support the business sector growth. New policies and regulations once are consulted and well communicated with the business community and predictably implemented should not cause any obstacle to the business performance. Besides, highly sophisticated web pages provided by provinces detailing provincial

regulations, the location of industrial zones, and charting investment incentives would save costs for firms searching for information needed for their business activities. Third, business support services including private sector trade promotion programs and business partner matchmaking realize its effect when it brings new business development opportunities for enterprises. Through the creation of business parks and industrial zones, local governments help to form cluster industries – groups of business locating together in a geographic area to benefit from “economies of agglomeration”, the benefits accruing to each business from its proximity to the others. In addition, when local governments assist private firms in the acquisition and use of new technologies, they indirectly stimulate the level of investment in the business sector as firms must make investment for the use of the new technologies. Fourth, local legal institutions once regarded as providing a safety investment environment or as an effective vehicle for dispute resolution or as an avenue for lodging appeals against corrupt official behavior would raise investors’ confidence. When firms have more confidence, they are likely to invest more. Fifth, labor training policies are implemented to promote vocational training and necessary skills development for local workers in order to meet the labor requirements of businesses. Provinces with relatively high-level vocational training for the local labor force have a major competitive advantage for business sector development as firms find it easier to the employment of needed skilled workers.

The two local economic governance factors including land access and proactivity of provincial leadership unexpectedly show a negative impact on the growth of capital resource. Land access combines two dimensions of the land problems which are how easy it is to access land and the security of tenure once land is acquired. One possible explanation for the negative relation between land access and growth of capital resource is that if it is not easy to access land then that may simply not all enterprises have equal access to land. This would give huge advantages to enterprises that have access to land over enterprises having difficulty in land access. Those enterprises see big opportunity for business expansion since they face with low competition with their rivalries and therefore want to invest more. Proactivity of provincial leadership captures the creativity and cleverness of provincial leaders in implementing central policy as well as designing their own initiatives for local private sector development. A negative relation between improvement in proactivity of provincial leadership and growth of capital resource in the non-state enterprise sector would imply that proactivity of provincial leadership seems to be ineffective in stimulating investment. Possibly, provincial leaders do not gain trust in the business community so that

investors may not believe efforts taken by the provincial authorities acting in favor of enterprises.

Capital productivity

As can be seen in the result table for Model 2, a different set of local economic governance factors impacts capital productivity. Improvement in informal charges, land access and labor training show to have a positive effect on the increase of capital productivity. First, informal charges have the largest impact on capital productivity. Informal charges are transaction costs, lubrication costs that enterprises must pay in the hope of facilitating their business. These costs are the source of corruption and when they are high there would be a great burden on firms. Improvement in informal charges lowers corruption practices which clearly reduce the cost burden on firms, improve competitive advantage and eventually increase their economic performance and investment efficiency. Second, as mentioned previously land access is about the ability to acquire land and the security of tenure once land is acquired. When it becomes easier for enterprises to access land and when the risks of tenure are reduced (lower possibility of expropriation, unfair compensation values, or changes in the lease contract) and so the duration of tenure is guaranteed, businesses will be assured of long-term development orientation and pursue more effective investment strategies. Third, increases in labor training help improving the quality of labor force. More proficient workers with a higher level of expertise and technological knowledge can take advantages of modern scientific advances and thus become more productive. Higher labor productivity increases output from a given level of investment and is therefore a decisive factor in the efficiency of investment projects.

Proactivity of provincial leadership again has a negative effect on capital productivity. Even more surprising, legal institutions show to be a hindrance to the increase of capital productivity. At this point, it is hard to give reasonable explanations for this. A deeper study into this problem is needed for a proper understanding.

5. CONCLUSION

Since 2000, the non-state enterprise sector in Vietnam has experienced strong growth in terms of the number of enterprises as well as the size of capital resource and output. However, the growth of output has not caught up with the growth of capital resource resulting in an ever declining in capital productivity. This is an alarming point for the performance of the non-state enterprise sector since this sector is expected to replace the position of the state-owned enterprise sector in the future.

The study aims to assess the impact of local economic governance on the development of the non-state enterprise sector. We found that not all local economic governance dimensions have a positive effect on capital growth and capital productivity. There are governance dimensions that have beneficial impacts but yet other governance dimensions have no or even negative impacts. Besides, the magnitude of the effect is different among the various governance dimensions. Improvement in time costs, transparency, business support services, legal institutions, and labor training play as growth stimulators for capital resource, however, each with a different size effect. Meanwhile, informal charges, land access and labor training are found to be determinants of capital productivity as reduction of informal charges, easier access to land and more security of tenure, and better labor training will increase capital productivity.

Interestingly, there is a pair of local economic governance dimensions that show opposite sign effects on capital growth and capital productivity. Improvement in land access while having a negative effect on the growth of capital resource, positively affects capital productivity growth. Improvement in legal institutions is a driving force of investment but it has a negative effect on capital productivity. Proactivity of provincial leadership has a negative effect on both capital growth and capital productivity. This calls for the need of local leaders to gain trust in the business community. For this to happen, provincial authorities should put more effort to prove their integrity, capacity, and determinate in providing a business environment conducive for the non-state enterprise sector development.

6. APPENDIX

Model 1

Cross-sectional time-series FGLS regression

Coefficients: generalized least squares
Panels: homoskedastic
Correlation: no autocorrelation

Estimated covariances = 1 Number of obs = 378
Estimated autocorrelations = 0 Number of groups = 63
Estimated coefficients = 10 Time periods = 6
Wald chi2(9) = 242.45
Log likelihood = -531.8723 Prob > chi2 = 0.0000

lnk	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
pcimk	-.0742036	.0588531	-1.26	0.207	-.1895537 .0411464
pcila	-.2579915	.0647531	-3.98	0.000	-.3849052 -.1310779
pcitr	.2915367	.0660387	4.41	0.000	.1621032 .4209701
pcite	.3387605	.0496623	6.82	0.000	.2414243 .4360967
pciic	-.0340723	.0764696	-0.45	0.656	-.18395 .1158055
pcipl	-.097741	.0443787	-2.20	0.028	-.1847216 -.0107604
pcies	.1864305	.0362267	5.15	0.000	.1154275 .2574334
pcilt	.1208297	.0546339	2.21	0.027	.0137492 .2279102
pcilr	.1867825	.0527778	3.54	0.000	.0833399 .290225
_cons	6.379169	.649536	9.82	0.000	5.106101 7.652236

Model 2

Cross-sectional time-series FGLS regression

Coefficients: generalized least squares
Panels: homoskedastic
Correlation: no autocorrelation

Estimated covariances = 1 Number of obs = 378
Estimated autocorrelations = 0 Number of groups = 63
Estimated coefficients = 10 Time periods = 6
Wald chi2(9) = 68.53
Log likelihood = -244.7293 Prob > chi2 = 0.0000

lnkp	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
pcimk	-.0372083	.0275336	-1.35	0.177	-.0911732 .0167566
pcila	.1053615	.0302938	3.48	0.001	.0459867 .1647363
pcitr	-.0165982	.0308953	-0.54	0.591	-.0771518 .0439554
pcite	-.0322305	.0232338	-1.39	0.165	-.0777679 .0133069
pciic	.1765793	.0357752	4.94	0.000	.1064611 .2466975
pcipl	-.0390956	.0207619	-1.88	0.060	-.0797882 .0015971
pcies	.0037954	.0169481	0.22	0.823	-.0294223 .0370132
pcilt	.0818431	.0255597	3.20	0.001	.031747 .1319392
pcilr	-.064035	.0246913	-2.59	0.010	-.1124292 -.0156409
_cons	-.9754307	.3038763	-3.21	0.001	-1.571017 -.3798441

7. REFERENCES

- [1] White, S. (2018) "Creating a better local business environment (Part 1): the role of local government", from <<https://simonwhite.com.au/2018/02/06/local-business-environment-1-role-local-government/>>
- [2] VCCI and USAID: The Provincial Competitiveness Index Reports.
- [3] Malesky, E. (2010). "Provincial governance and foreign direct investment in Vietnam". 2010, from <<https://sites.duke.edu/malesky/files/2014/07/Provincial-Governance.pdf>>
- [4] Nguyen, V., Chu, N., Tran, Q., and Pham, H. (2014). "Đánh giá tác động của chất lượng thể chế cấp tỉnh tới khả năng thu hút FDI vào các địa phương tại Việt Nam". *Tạp chí Khoa học ĐHQGHN, Kinh tế và Kinh doanh*, 30(1), (2014) 53-62.
- [5] Doan, H., and Lin, J. (2016). "Provincial governance and foreign direct investment in Vietnam: an empirical study at sub nation level". *International Journal of Humanities and Applied Social Science*, 1(2), 1-11.
- [6] Dao, T. (2017). "Local economic governance and the development of the business sector in Vietnam", *Tạp chí Khoa học ĐHQGHN, Kinh tế và Kinh doanh*, 33(5), 2017, 16-25.
- [7] Phan, V. (2013). "Effects of changes in provincial governance on the economic performance of the business sector: an empirical study using Vietnam's Provincial Competitiveness Index". *Waseda Business and Economic Studies*, Waseda University, 49, 57-82.

- [8] Vietnam GSO: Business results of Vietnamese enterprises in the period 2000-2014, Development of Vietnam enterprises in the period of 2006-2011, 2020 Vietnamese enterprises white book.
- [9] Vietnam GSO: Business results survey of the non-state enterprise sector.
- [10] World Databank: World Development Indicators.
- [11] Torres-Reyna, O. (2007). "Panel Data Analysis Fixed and Random Effects using Stata", from <<https://www.princeton.edu/~otorres/Panel101.pdf>>.

IMPACT OF DIGITAL PLATFORM ON THE INTERNATIONALIZATION STRATEGY OF MICRO- AND SMALL-SIZED WOMEN-OWNED ENTERPRISES

Le Huong Linh¹, Bui My Trinh¹

¹VNU International School - Vietnam National University, Hanoi

Email: linhlh@isvnu.vn, trinhbm@isvnu.vn

Abstract

Digital trade provide firms huge opportunities to directly access foreign markets. Yet, many businesses still face barriers in adoption of digital platforms. This study focuses on micro and small-sized businesses owned by women.

The study aims to (1) review policies to encourage the implementation of digital platforms for micro and small sized women-owned enterprises in their business and production (2) analyze the macro-environmental factors namely, institution-specific, competition-specific, and resource-specific when they apply digital platforms. The survey was carried out during January to April 2020, resulting in 151 usable responses. The respondents are micro and small enterprises in Hanoi, Ho Chi Minh City, and Thai Nguyen and Lam Dong province.

Keywords: digital platform, women-owned enterprises, micro- and small-sized enterprises, internationalization.

1. INTRODUCTION

The development of information technologies industry and digital trading platforms has transformed a number of firms into virtual structure and strategy (Melén et al., 2019). The digital transformation increasingly creates numerous opportunities for micro and small businesses and providers doing their business abroad. The total value of the platform companies with a market capitalization of over US\$100 million was estimated to reach more than \$7 trillion in 2017, 67% higher than in 2015 (UNCTAD, 2019).

The existing broad studies focused on large multinational enterprises who have been familiar with multiple digital trading platforms to enhance their retailing internationalization. Yet, a few research investigated, micro- and small-sized women-owned enterprises in emerging markets and their efforts to overcome the contextual barriers to boost the international performance (Hutchinson & Quinn, 2012; Melén et al., 2019). Previous studies have illustrated that the digital internationalization of local small firms are hampered by the underdeveloped information and communications technology infrastructures (Yu et al., 2017), institutional complexity, and limited resource-specific factors (Melén et al., 2019). However, some other factors concerning the “inexperienced exporters” and lack of technical capability may discourage the firms to approach digital platforms and internationalizing process (Wright et al., 2007).

The purpose of this study is to explore how the market forces (pertaining to institutions, competitive ambiguity and resources) of technical mechanism (digital platforms) will shape the international strategies of

micro- and small-sized women-owned enterprises (MSWEs). This paper uses a strategy tripod as theoretical background to investigate how institution-specific, resource-specific, and competition-specific factors shape their digital sustainability strategies toward internationalization (Peng et al., 2009).

The previous study of strategy tripod framework is beneficial in capturing how international business is developed in the context of small enterprises. Our study can enrich the existing literature with relevant insights into how MSWEs in emerging markets (Vietnam) form their sustainability strategies toward gaining competitive advantages via approaching digital platforms. Second, this study offers contextual practices for internationalization research, policy makers and practitioners to face the challenges and remove barriers, participate in the digital platforms, gaining advantages from international marketing and international retailing entry.

The survey was carried out on target of 151 respondents who registered their business as micro and small enterprises in Vietnam, including provinces and cities such as Hanoi, Ho Chi Minh City, Thai Nguyen and Lam Dong.

2. CONCEPTUAL FRAMEWORK

2.1 Theoretical background of Digitalization and the internationalization of MSWEs

Information and communications technology (ICT) advances have created innumerable innovative breakthroughs as a new game to enhance business efficiency and effectiveness for domestic firms (Melén et al., 2019). A digital platform is a mechanism to

lower the cultural and language barriers to approach international business disregard of distant locations and time differences. Technical ICT enabled e-commerce, digital communication devices and intermediaries open up for local manufacturing firms numerous opportunities of untapped broad market segments, low-cost marketing channels, despite their scarce resources.

Digital technology has speeded up significantly, which offer a reliable and responsive interaction to facilitate business communication and transaction (Pousttchi & Hufenbach, 2014). Advances in digital technology allow the automated and semi-automated communication, customized consumer decision journey (Van Bommel, 2014), improving the logistics chain (Khullar, 2019).

By taking advantage of the strategy tripod framework, the study investigates dominant factors and forces that influence MSWEs' efforts to develop their business digitally and internationally.

Micro and small-sized women owned enterprises

Micro and small-sized enterprises in this study can be classified by two main categories: number of workers (average annual number) and capital of the firm (total asset on the firm's balance sheet). According to Government of Vietnam (2009), micro firms are the firms which have less than 10 workers. Small sized firms in trade and services are the firms having from 10 to 50 people and less than VND 10 billion of capital. Small sized firms in other sectors rather than trade and services (such as agriculture, construction and industry) have larger number of workers (10 to 200) and capital (less than VND 20 billion).

Women owned enterprises: definitions of women owned enterprises are diversified among sources in terms of proportion of capital ownership or management (IFC, 2013; OECD, 2012; SBA, 2016; World Bank, 2020). To achieve the mentioned purposes, in this study we use the definition of World Bank (2020) which refers to women owned enterprise as the one owned and managed only by women.

Institution-specific factors

Institutions are set up to regulate the business game, which is including the formal laws, policies and regulations (North, 1990). The conceptualization of institutions is accompanied with regulative, normative, and cognitive configurations to standardize the norms. Through the formal and informal institutional instruments, people shape their market behaviors conforming to conservative local institution.

Resource-specific factors

The natural attributes of resource are scarce, heterogeneous, tradable or limited accession (Barney, 1991; Hall, 1992). To gain the sustainable competitive advantage, people need to achieve the valuable, rare, inimitable and non-transferable resources (Lippman &

Rumelt, 1982). Whereas resources are context dependent, firms who can increase the valuable resource, would improve its business performance and prevent its rivals from replication of firm's success achievements (Lippman & Rumelt, 1982).

Competition-specific factors

The dynamic view is an approach to marketing strategy which argues that firms' most critical activities are gaining competitive advantage, structuring the markets, and determining transaction conditions in environmental turbulence. Other industrial organization perspectives propose micro-economic forces as the impact on perfect competition including pricing power, market share, asymmetric information, and uneven distribution (Bain, 1968; Conner, 1991). Porter's five forces model figures out competitive intensity and advantages (Porter, 1979).

2.2. Institutional forces to enhance competition of MSWEs in the process of digitalization and internationalization

Women-owned enterprises account for a small proportion of the world business. In addition, the number of women-owned enterprises participating in export is a limited number. A survey of 19,000 enterprises in 99 developing countries shows that only 36% of businesses are women partly or wholly owned; only 15% of exporters are female. Female businesses also have limitation of their technological use. The World Bank study shows that the frequency of using e-mail among women-owned businesses is 12% lower than that of men-owned businesses (World Bank, 2020).

Gaitan G. (2018) examines that women encounter difficulties accessing digital platforms. It is conventionally believed that females are more likely to have difficulty in technology-related subjects than male. EQUALS, Mobile Technology Programme, SheTrades WEConnect International are global programmes and global networks connecting female entrepreneurs from all countries moving towards multinational corporations online. The national initiative includes several digital projects including the Femmes Digitales Programme, ChileCompra, which are innovative platforms promote female entrepreneurship in the digital age of emerging economies.

2.3. Vietnam's MSWEs and their digital business activities toward internationalization

A study by AlphaBeta (2019) on the application of e-commerce shows that the business sales on e-commerce platforms of Vietnamese enterprises reached VND 97 trillion (US \$ 4.3 billion), accounting for 2% of the total export value of 2017. Currently, domestic renowned digital commerce platforms such as Lazada, Tiki, Sendo, and Shopee proactively support

local enterprises easily and conveniently access the domestic market. Besides, foreign e-commerce platforms such as Amazon, eBay, and Alibaba offer many small and medium-sized enterprises the opportunities to integrate into international markets.

However, according to the Vietnam E-commerce Association (2019), there are difficulties and barriers coming from the firm capacity. The business investment environment supports women, which show no differences between female and male-owned enterprises in business operation. Interestingly, this study figured out seven misconceptions which have constrained female entrepreneurs' business development (IFC, 2017).

Le et al. (2016) mentions main challenges faced by women-owned enterprises are: (i) Lack of knowledge and skills in corporate governance, human resources, finance, and marketing; (ii) Access to capital sources and markets; (iii) Build customer network, business relationship; (iv) Balance business management with family (for female entrepreneurs); (v) Have less time for the business operations due to their duty to perform the role of the woman in the family and thus affecting the business performance.

VCCI (2019) through a survey of about 10,000 businesses in 63 provinces/cities to find out about their difficulties, stresses that the biggest difficulty encountered by female owned enterprises is finding customers (63%). Thus, e-commerce development is a solution to help small and medium-sized businesses directly approach customers more easily.

3. METHODOLOGY

3.1 Research design and sampling

The research team surveyed 151 MSMESEs in Hanoi, Ho Chi Minh City, Lam Dong, and Thai Nguyen, including 73 male-owned and 78 female-owned businesses to find out about the needs and difficulties, challenges when applying digital trade to develop production and business, especially finding out how the differences between enterprises owned by women and men are. Among the surveyed firms, (i) 38.4% are engaged in exporting and mainly exporting directly. Main export markets are America, Western Europe, Japan, Korea, ASEAN, China, Taiwan; (ii) 63.2% of enterprises operate in manufacturing sectors including textile, food processing, ceramics, bamboo and rattan handicrafts, and the remainders are in construction, commerce and transportation.

3.2 Data collection

According to the survey results, most enterprises (98.7%) use the internet for their business activities, and on average 32.1% of regular employees use the internet for work. The industrial business is varied by firm categories. Firms operate in manufacturing

account for 24.3%. 44.6% firms are in trade, service, construction, and transportation.

Most businesses use the internet to send and receive e-mail transactions with customers (98.0%) and to seek information (97.7%). Proportion of enterprises updating information on their websites (31.1%) and doing business on e-commerce trading floors is much lower (31.8%). This shows the humble engagement of these enterprises in digital platforms. The main activities of e-commerce such as transactions, ordering, payment, and delivery are still limited. Interestingly, there is a significantly higher share of internet use to (i) run a business; (ii) do business on e-commerce platforms; and (iii) update information on websites of female-owned enterprises compared to their male counterparts (see Table 1).

Table 1: Internet-based Business Activities

Internet-based Business Activities	Total	M	F
Send/receive e-mail transactions with customers	98.0	100	96.2
Look for information	94.7	95.9	93.6
Advertise on social networks	57.6	49.3	65.4
Business Operation	49.7	41.1	57.7
Business on the e-commerce platform	31.8	20.5	42.3
Update information on the website of the enterprise	31.1	23.3	38.5

Notes: M: Male-owned enterprises, F: Female-owned enterprises.

Source: Enterprises survey on application of digital platforms in April 2020.

All the enterprises are micro and small-sized. A 58.9% of the respondents reported that they do not have professional/technical information technology or e-commerce staff. In addition, businesses have little investment in the activities of information technology and e-commerce. Their investment focuses predominantly on hardware, software, and human resources.

When asked about the national digital platform programmes (such as National trade promotion programme; National brand programme; Design capacity building programme; SheTrade programme supporting female owned businesses to access e-commerce; LinkSME programme), the enterprises answered that they were not aware of the programmes or were notified of the programmes, but neither learned nor received training. Besides, they want to be more updated with these programmes/policies. In addition, enterprises confirmed that they would like to hear from the government about the United States and European regulations on children's health and safety, particularly strict regulations on health-related goods (food, cosmetics) and children's toys.

4. DATA ANALYSIS AND DISCUSSION

4.1. Institution-specific factors

To start online business in international markets and remove the cultural and technical barriers, firms need to adapt to the formal institutional factors generated from legitimate frameworks. All the efforts to export goods across borders would help firms achieve the profit margins in both domestic and foreign market operations (Melén et al., 2019). To build a long-term business with global customers, it is necessary to gain a stable position through institutional mechanism. Institutions play a crucial role in obtaining firm's reputation and liability in their operations. Financial services and digital platforms should be enhanced and secured for all customers.

Regrettably, all survey indicators related to e-commerce activities only partially meet the requirements (See Table 2). Accordingly, three indicators achieving the highest scored are Internet connection infrastructure and information technology (2.65 out of 3) and Payment infrastructure (2.45) and Searching for workers with e-commerce skills/expertise (2.36). Even with the survey's above-average ranking, the information and communication infrastructure in Vietnam can not be assessed "good" internationally. Indeed, compared to other countries in the region, Vietnam currently has medium quality and speed regarding phone and broadband (SpeedTest, 2020).

The four indicators evaluated with the lowest scores are Intellectual property regulations (2.00); Regulations on dispute settlement between businesses and online customers (2.05); Regulations on protection of online shopping consumers pursuant to international standards (2.06); Regulations on customs procedures for low value/small parcels (2.10) (see Table 2). These are the obstacles that enterprises face when applying e-commerce to doing business, particularly in export.

Regarding customs procedures for low value/small parcels, enterprises think that it is time-consuming and costly to export, which is a major obstacle for micro and small enterprises (World Bank, 2019). The most troubling problem is procedures, as Vietnam takes much longer than other countries (World Bank, 2019). World Bank studies show that the index of Vietnam's cross-border trade has increased slowly since 2015 and has remained unchanged and in the last 3 years (World Bank, 2014, 2015, 2016, 2017, 2018, 2019). Thus, Vietnam's ranking dropped quite seriously to the 104th (World Bank, 2019) despite a series of drastic measures set out in Resolution No.2 in 2019 (Government of Vietnam, 2020).

The indicator of Regulations on intellectual property is rated the lowest in our survey reflecting the limited enforcement of intellectual property rights in Vietnam. Yet despite of their considerable investment in product

design, some managers are very concerned about the copying of product designs when posting images of their products online, particularly in the domestic market. According to GIPC (2019), the key weaknesses of Vietnam's intellectual property environment includes inadequate protection of life sciences patents, gaps in copyright protection, high physical counterfeiting rates and rampant online infringement, and poor enforcement (estimated 74% rate of software piracy).

Table 2: Institutional factors

Institutional Factors	Score	F	M
Infrastructure for internet connection and information technology	2.65	2.67	2.63
Online payment infrastructure	2.45	2.49	2.4
Looking for employees with e-commerce skills/expertise	2.36	2.51	2.21
Regulations on electronic transactions, encouraging electronic transactions	2.33	2.4	2.25
Regulation on electronic signature and electronic contracts	2.22	2.27	2.16
Regulations on promotion of non-cash payment	2.20	2.23	2.16
Regulations on encouragement of launching & conducting electronic transactions	2.19	2.21	2.16
Regulations on access to digital data and services	2.14	2.17	2.1
Regulations on customs procedures for small/low value parcels	2.10	2.15	2.07
Regulations on the protection of online shopping consumers pursuant to international standards	2.06	2.07	2.06
Regulations on disputes settlement between businesses and online customers	2.05	2.03	2.06
Regulations on intellectual property	2.00	2.00	2.00

Notes: M: Male-owned enterprises, F: Female-owned enterprises

Source: Enterprises survey on application of digital platforms in April 2020

4.2 Resource-specific factors

Majority of the firms reveal their inherent capability insufficiencies to introduce their own products to the international market via the intermediaries. The relationship with capable external experts, professionals and partners would repair the resource shortages and capability insufficiency (Hutchinson & Quinn, 2012). Specifically, the IT networks and partnership would build up and maintain the network, fix up any technical operation problems, understand customer virtual experience in order to obtain their preferences and positive behavior. Logistics outsources and services could improve customer value for their fast deliveries and back-end supporting activities.

Up to 53% of businesses reported difficulties in developing and managing website contents. The key reasons for this are the lack of IT resources for

uploading and maintaining website contents (76.3%); (ii) safety and security concerns for online payments (52.5%), and (iii) costly website development and maintenance (51.3%). In terms of gender, businesses owned by women (62.8%) face more difficulties than male counterparts (42.5%) in building and managing website contents. The lack of human resources is considered the most severe impediment by both sexes (see Table 3).

Table 3: Digital-related Resource factors

Resource factors	F	M
Concerns about safety and security of online payment when selling through website	57.1	45.2
Expensive website construction and maintenance	63.3	32.3
Lack of manpower to post and manage website content (like product descriptions and photos)	81.6	67.7
Difficulties in finding/using outsource logistics, delivery, and transportation services	44.0	7.0
Difficulties in platform operation	28.0	12.5

Notes: M: Male-owned enterprises, F: Female-owned enterprises.

Source: Enterprises survey on application of digital platforms in April 2020.

The popular forms of payment are still Visa card, Master card, PayPal, bank transfer, Cash on Delivery (COD), Letter of Credit (LC) and Telegraphic Transfer (T/T payment). The majority of businesses reported joining e-commerce platforms without difficulty (82.2%). In the case of enterprises facing difficulties in entering e-commerce platforms, the proportion of female-owned enterprises is higher than that of male-owned enterprises. They have two main difficulties: lack of human resources with foreign language skills for entry to foreign markets and lack of human resources with qualified e-commerce skills.

4.3 Competition-specific factors

The international competition requires firms to effectively adopt the technology, adapt and coordinate in its turbulent foreign environment (Tolstoy et al., 2016). Many difficulties from cross-national coordination are languages, cross-border virtual presences, custom procedures, brand awareness and differentiations (Hutchinson et al., 2009).

Interestingly, the e-commerce industry in Vietnam is competitive (iPrice Group, 2019). According to our survey, most companies (78.2 per cent of respondents) have heard and known about these types of sales on digital platforms. Thus, it can be said that the potential for companies to sell goods on digital platforms is quite good.

To sell their goods online, most companies want to create a website. But the result shows that only 32.6

percent have made transactions via their websites. There are two key reasons to discourage them from using trading on their websites. The first explanation is that there is a shortage of human capital to handle and maintain content on websites. Companies do not want to use the outsourced service because of concerns about the security of company and customer information. The second explanation for poorly protected websites was a financial restriction. As a result, few businesses process their transactions via the Internet. As a result, most businesses post details on their websites, then customers contact them directly and pay via bank transfer.

Table 4: Competition-specific factors- Challenges/Barriers to internationalization

Competition-specific factors	Total	F	M
Complicated import and export customs procedures through e-commerce	36.4	42.3	30.1
Detailed product description in English	31.8	35.9	27.4
Cross-border payments	28.5	33.3	23.3
The cost of investment for the booth on the electronic trading platform is high	25.8	32.1	19.2
Understanding of foreign markets	25.8	25.6	26
Cross-border export and import services are expensive	17.9	25.6	9.6
Liability for online sellers to overseas markets	15.9	19.2	12.3
Online Advertising	12.6	11.5	13.7
There is no challenge	5.3	3.8	6.8

Notes: M: Male-owned enterprises, F: Female-owned enterprises.

Source: Enterprises survey on application of digital platforms in April 2020.

The prevailing obstacles that are considered barriers to the activities of digital platforms and businesses are summarized in Table 4. The three key challenges are: Complex E-Commerce Import and Export Customs Procedures, Detailed Product Description in English, and Cross-Border Payment. In this respect, there is not much difference between the two groups of companies. Both male and female groups are most faced with these challenges. The English language often prevents transactions with international clients.

There are no major variations between female-owned and male-owned companies in terms of revenue, export revenue, company website traffic and the presence on Google Search. The study compared the export costs between the online method and the traditional method. The proportion of female-perceived cost savings of the

online payment system relative to the traditional method (34.5 per cent) is much smaller than that of their male peers (53.3 per cent).

5. CONCLUSION

The study used the strategy tripod to assess the impact of competition-specific, institution-specific and resource-specific factors on the MSWE's digital international sustainability strategies. The review of the legal documents and the practical research carried out by the survey of 151 companies showed that:

First, the analysis of *institution-specific factors* does not show a different approach for women-owned enterprises compared to enterprises owned by men. Laws, programmes and measures to encourage development of e-commerce are generally applied without any gender discrimination. The result is similar to the current one, which also identifies that, in general, the business investment environment in Vietnam supports women doing business, and the challenges faced do not differ between female and male-owned enterprises in business executives. Despite of a number of global initiatives, support programmes of non-governmental organizations for MSWEs, such as SheTrade, the Vietnamese government's programmes specified MSWEs is very limited.

Second, the interpretation of *resource-specific factors* analysis is slightly different from previous studies. Most current international studies show that gender-related capabilities in the application of technology in general and digital platforms in particular, typically women-owned enterprises, have difficulty in taking advantage of the technology benefits. The difference from existing studies, however, is that MSWEs are likely to have overwhelming strength in the domestic market compared to male-owned companies. This function is an inevitable consequence of the limitations mentioned above, but if they discover their niche markets, it could become the strength of MSWEs.

Third, MSWEs all face the same challenges in terms of *competition* as their male counterparts when exporting. Compared to traditional export methods, MSWEs have been successful in gradually taking advantage of the digital platform to lower online export costs. However, MSWEs do not have a competitive advantage over male-owned enterprises when exporting via digital platforms because they do not know how to effectively use online mechanism to save costs. In order to improve capacity and reduce the cost of online exports, MSWEs would be engaged in the learning and training of digital platforms.

This study analyzed the utilization of digital platforms in the internationalization of MSWEs. MSWEs face more disadvantages compared to men-owned businesses due to limited resources, competitiveness and regulations. However, despite their limitations in

reaching international markets, many MSWEs gradually see their advantages in the domestic market, digital platform identification, as part of their internationalization strategy. More importantly, there is no inequality or discrimination between different sizes of business and gender. However, fairness does not lie in treating different objects / groups in the same way, but there is a need for appropriate treatment of different objects / groups. Consequently, not seeing MSWE as a disadvantaged group of companies is a disadvantage for them.

The study can be used a reference to enterprise management, social organizations, and stakeholders to adjust their programs and activities which aimed at this vulnerable group. MSWEs themselves can take proactive role to systematically and efficiently develop their internationalization strategy to maximize market benefits.

6. REFERENCES

- [1] AlphaBeta. (2019). *The data revolution: How Vietnam can capture the digital trade opportunity at home and abroad*. Retrieved from Hanoi:
- [2] Bain, J. (1968). Industrial Organization, 2. B. In: New York, John Wiley and Sons, Inc.
- [3] Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management*, 17(1), 99-120.
- [4] Conner, K. R. (1991). A historical comparison of resource-based theory and five schools of thought within industrial organization economics: do we have a new theory of the firm? *Journal of management*, 17(1), 121-154.
- [5] Gaitan G., L. A. (2018). *Overcoming Gender Challenges in E-Commerce: What is being done to support women*. Geneva: CUTS International, Geneva.
- [6] GIPC. (2019). *Inspiring Tomorrow: U.S. Chamber International Intellectual Property Index*: U.S. Chamber Global Innovation Policy Center.
- [7] Government of Vietnam. (2009). *Decree No.56/2009/ND-CP on supporting small and medium sized enterprises*.
- [8] Government of Vietnam. (2020). *Resolution No.2/NQ-CP on continuing to perform major tasks and solutions to improve business environment and national competitiveness in 2020*.
- [9] Hall, R. (1992). The strategic analysis of intangible resources. *Strategic management journal*, 13(2), 135-144.

- [10] Hutchinson, K., & Quinn, B. (2012). Identifying the characteristics of small specialist international retailers. *European Business Review*, 24(2), 106-119. Retrieved from <https://doi.org/10.1108/09555341211203982>. doi:10.1108/09555341211203982
- [11] Hutchinson, K., Quinn, B., Alexander, N., & Doherty, A. M. (2009). Retailer internationalization: overcoming barriers to expansion. *The International Review of Retail, Distribution and Consumer Research*, 19(3), 251-272. Retrieved from <https://doi.org/10.1080/09593960903233673>. doi:10.1080/09593960903233673
- [12] IFC. (2013). Improving Access to Finance for Women-Owned Businesses in India. In: IFC Washington, DC.
- [13] IFC. (2017). *Women-Owned Enterprises in Vietnam: Perceptions and Potential*. Retrieved from IFC: East Asia and the Pacific
- [14] iPrice Group. (2019). The Map of E-commerce in Vietnam. Retrieved February 1, 2020 <https://iprice.vn/insights/mapofecommerce/en/>
- [15] Khullar, K. (2019). How Headless Commerce Can Transform the Retail Industry. *Clutch.co*, Retrieved from <https://clutch.co/web-developers/resources/how-headless-commerce-transform-retail-industry>.
- [16] Le, Q. C., Nguyen, V. H., Nguyen, T. D. H., Greig, F., & Smoots, K. H. (2016). *Women-owned small and medium sized enterprises in Vietnam: Situation analysis and policy recommendations*. Retrieved from Hanoi:
- [17] Lippman, S. A., & Rumelt, R. P. (1982). Uncertain imitability: An analysis of interfirm differences in efficiency under competition. *The bell journal of Economics*, 418-438.
- [18] Melén, S., Nordman, E., Tolstoy, D., & Özbek, N. (2019). "It's a new game out there": e-commerce in internationalising retail SMEs. *International Marketing Review*. doi:10.1108/IMR-03-2018-0107
- [19] North, D. (1990). *Institutions, institutional change and economic performance*. Cambridge: Cambridge University Press.
- [20] OECD. (2012). *Share, size and industry of women-owned enterprises*.
- [21] Peng, M. W., Sun, S. L., Pinkham, B., & Chen, H. (2009). The Institution-Based View as a Third Leg for a Strategy Tripod. *Academy of Management Perspectives*, 23(3), 63-81. Retrieved from <https://doi.org/10.5465/amp.2009.43479264>. doi:10.5465/amp.2009.43479264
- [22] Porter, M. (1979). E., 1979. How Competitive Forces Shape Strategy. *Harvard Business Review*, 57(2), 137-145.
- [23] Pousttchi, K., & Hufenbach, Y. (2014). Engineering the Value Network of the Customer Interface and Marketing in the Data-Rich Retail Environment. *International Journal of Electronic Commerce*, 18(4), 17-42. Retrieved from <https://doi.org/10.2753/JEC1086-4415180401>. doi:10.2753/JEC1086-4415180401
- [24] SBA. (2016). *The Women-Owned Small Business Federal Contract Program*. Retrieved from <https://www.sba.gov/federal-contracting/contracting-assistance-programs/women-owned-small-business-federal-contracting-program>
- [25] SpeedTest. (2020). Speedtest Global Index. Retrieved August 10, 2020 <https://www.speedtest.net/global-index>
- [26] Tolstoy, D., Jonsson, A., & Sharma, D. D. (2016). The Influence of a Retail Firm's Geographic Scope of Operations on Its International Online Sales. *International Journal of Electronic Commerce*, 20(3), 293-318. Retrieved from <https://doi.org/10.1080/10864415.2016.1121760>. doi:10.1080/10864415.2016.1121760
- [27] UNCTAD. (2019). *Trade and Development Report 2019: Financing A Global Green New Deal*: United Nations
- [28] Van Bommel, E., Edelman, D. and Ungerman, K. (2014). Digitizing the consumer decision journey. *McKinsey Quarterly*, Retrieved from <https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/digitizing-the-consumer-decision-journey#>.
- [29] VCCI. (2019). *Doing Business in Vietnam: Evaluation of Women-Owned Enterprises*. Retrieved from Hanoi.
- [30] Vietnam E-commerce Association. (2019). *Vietnam E-Business Index 2019 Report*. Retrieved from Hanoi.
- [31] World Bank. (2014). *Doing business 2015*: World Bank Publications.
- [32] World Bank. (2015). *Doing business 2016*: World Bank Publications.
- [33] World Bank. (2016). *Doing business 2017*: World Bank Publications.
- [34] World Bank. (2017). *Doing business 2018*: World Bank Publications.
- [35] World Bank. (2018). *Doing business 2019*: World Bank Publications.

- [36] World Bank. (2019). *Doing business 2020*: World Bank Publications. <https://doi.org/10.1080/00343400601120288>. doi:10.1080/00343400601120288
- [37] World Bank. (2020). *The Enterprise Survey: Gender*. Retrieved from: <http://www.enterprisesurveys.org/data/exploretopics/gender>
- [38] Wright, M., Westhead, P., & Ucbasaran, D. (2007). Internationalization of Small and Medium-sized Enterprises (SMEs) and International Entrepreneurship: A Critique and Policy Implications. *Regional Studies*, 41(7), 1013-1030. Retrieved from
- [39] Yu, Y., Wang, X., Zhong Ray, Y., & Huang, G. Q. (2017). E-commerce logistics in supply chain management: Implementations and future perspective in furniture industry. *Industrial Management & Data Systems*, 117(10), 2263-2286. Retrieved from <https://doi.org/10.1108/IMDS-09-2016-0398>. doi:10.1108/IMDS-09-2016-0398

ANALYSING THE IMPACT OF THE COVID-19 PANDEMIC ON GLOBAL TOURISM: SUGGESTION FOR VIETNAM TOURISM

Doan Hai Anh^{1*}

¹Department of Economics, School of Economics and Management, Hanoi University of Science and Technology

*Email: anh.doanhai@hust.edu.vn

Abstract

The COVID-19 pandemic is still going on and perhaps after that, the economic recession that is considered to be the worst in history will occur. Analysts say that the global economy has to take a long time, many years, to overcome the damage caused by Covid-19. While highly uncertain, early projections from UNWTO for 2020 suggest international arrivals could decline by 20 to 30% relative to 2019. Tourism is especially susceptible to measures to counteract pandemics because of restricted mobility and social distancing. As a part of global economy, Viet Nam Tourism, which accounts for nearly 10% of Vietnam's GDP, is being affected intensely. In this paper, descriptive statistical method has been used, data is collected from the reports of the impact of the pandemic on global tourism in general and Vietnam tourism in particular. The aim of this process is having an overview of the impact that Vietnam is dealing with, the outcomes of paper is the suggestions for both Viet Nam tourism companies and policy makers to overcome this difficult period.

Keywords: The COVID-19 pandemic impact, Tourism, the world tourism industry, Vietnam tourism.

1. INTRODUCTION

A pneumonia of unknown cause detected in Wuhan, China, was first reported to the WHO Country Office in China on 31 December 2019. In early January 2020, 41 patients with confirmed infections by a novel coronavirus (COVID-19) had been admitted to hospitals in China (Huang et al., 2020). Even though the virus spread rapidly in the country's Wuhan region, it was initially largely disregarded by political leaders in other parts of the world (although intelligence services issued warnings of a potentially cataclysmic event; Washington Post, 2020). To contain the virus, Wuhan was put into lockdown (a combination of regional and individual quarantine measures), and case numbers in China stabilized at around 80,000 by mid-February (ECDC 2020). By then, global air transport had already carried the virus to all continents and, by mid-March, it had been established in 146 countries. The number of confirmed infections worldwide quickly doubled, linked to a number of super-spreading events, such as the ski destination Ischgl in Austria (Anderson et al., 2020; Johns Hopkins, 2020). From here, the infection rate accelerated through community transmission and, by 15 April, confirmed cases approached 2 million (with over 125,000 deaths) in over 200 countries (ECDC 2020). The real total number of cases remains unknown as testing is limited in most countries. With no vaccine to prevent the disease and limited medical interventions available to treat it, most countries responded with various forms of nonpharmaceutical interventions (NPI), including lockdown (home isolation, voluntary/required quarantine), social distancing (vulnerable or entire

populations), closure of schools/universities and non-essential businesses/workplaces, cancelling or postponing events (i.e. major conferences and trade shows, concerts and festivals, political debates and elections, sports seasons and the summer Olympics), and bans on gatherings of people over certain numbers. International, regional and local travel restrictions immediately affected national economies, including tourism systems, i.e. international travel, domestic tourism, day visits and segments as diverse as air transport, cruises, public transport, accommodation, cafes and restaurants, conventions, festivals, meetings, or sports events. With international air travel rapidly slowing as a result of the crisis, and many countries imposing travel bans, closing borders, or introducing quarantine periods, international and domestic tourism declined precipitously over a period of weeks. Countries scrambled to return travelers home, which in the case of important outbound markets involved hundreds of thousands of citizens in all parts of the world. As an example, on 23 March, the British Foreign Secretary urged British tourists to return home, "advising against all but essential international travel", and highlighting that "[...] international travel is becoming more difficult with the closure of borders, airlines suspending flights, airports closing, exit bans and further restrictions being introduced daily" (FCO (The Foreign & Commonwealth Office), 2020). Cruise ships soon became the worst-case scenario for anyone stuck in the global tourism system. Starting with the Diamond Princess on 1 February 2020, at least 25 cruise ships had confirmed COVID-19 infections by 26 March 2020 (Mallapaty, 2020) and at the end of March

ten ships remained at sea unable to find a port that would allow them to dock. Idealized safe environments (Cordesmeyer & Papathanassis, 2011) at sea turned into traps, with thousands of passengers held in cabin quarantine and facing the challenge of returning home. Within countries, the virus affected virtually all parts of the hospitality value chain. The impact of cancelled events, closed accommodations, and shut down attractions became immediately felt in other parts of the supply chain, such as catering and laundry services. Restaurants had to close as well, though in some countries, a switch to take-away/delivery sales allowed some to continue operations. Reports on lay-offs and bankruptcies followed, with British airline FlyBe succumbing first to market pressure, declaring bankruptcy on 5 March 2020 (Business Insider, 2020). Major airlines including Scandinavian Airlines (17 March 2020), Singapore Airlines (27 March 2020) and Virgin (30 March 2020), as well as tour operators including German TUI (27 March 2020) have already requested tens of billions of US\$ in state aid. The situation is unprecedented. Within the space of months, the framing of the global tourism system moved from overtourism (e.g. Dodds & Butler, 2019; Seraphin et al., 2018) to nontourism, vividly illustrated by blogs and newspaper articles depicting popular tourism sites in “before” and “after” photographs (Cond e Nast Traveller, 2020). While some commentators already speculate on “What will travel be like after the Coronavirus”, with some unrealistically optimistic perspectives already having proven wrong (Forbes, 2020), the general belief is that tourism will rebound as it has from previous crises (CNN, 2020). However, there is much evidence that COVID-19 will be different and transformative for the tourism sector. Governments only begin to understand that, unlike other business sectors, tourism revenue is permanently lost because unsold capacity – for instance in accommodation – cannot be marketed in subsequent years, with corresponding implications for employment in the sector.

Against this background of a rapidly evolving global pandemic, this paper has four interrelated goals.

- First, to critically review the literature on the impact of pandemics on global tourism.
- Second, the paper provides a rapid assessment of the reported impacts of COVID-19 on global tourism in general and on Viet Nam’s tourism in particular through to the end of March 2020, including documented travel restrictions by each country and declines in air travel and accommodations. The differential regional impacts and implications for development are also examined.
- Recognizing that the impact to global tourism has only just begun, the third goal is to summarize early estimates of the damage to the tourism economy over 2020 and beyond. Because of the tremendous

uncertainty, these early estimates are critically assessed against available epidemiological modelling and public health scenarios for restrictions on travel and public gatherings.

- Finally, the paper considers how the COVID-19 pandemic may change tourism, and some of the key research needs to understand these changes and contribute to a more sustainable post-pandemic tourism sector for Viet Nam’s tourism.

2. PANDEMICS AND GLOBAL TOURISM

The world has experienced a number of major epidemics/pandemics in the last 40 years, yet none had similar implications for the global economy as the COVID-19 pandemic. COVID-19 is not as contagious as measles and not as likely to kill an infected person as Ebola, but people can start shedding the virus several days in advance of symptoms (Bai et al., 2020; Rothe et al., 2020). As a result, asymptomatic people transmit COVID-19 before they know to self-isolate or take other measure like physical distancing in public or wearing mouth/nose coverings to prevent spread of the virus through speaking, coughing, or sneezing. With very limited testing in many countries, also due to the unavailability of tests, unknowingly asymptomatic transmission is thought to be substantive (Li et al, 2020).

It is important to note that global tourism has been exposed to a wide range of crises in the past. Between 2000 and 2015, major disruptive events include the September 11 terrorist attacks (2001), the severe acute respiratory syndrome (SARS) outbreak (2003), the global economic crisis unfolding in 2008/2009, and the 2015 Middle East Respiratory Syndrome (MERS) outbreak. None of them led to a longer-term decline in the global development of tourism, and some of them are not even notable, with only SARS (-0.4%) and the global economic crisis (-4.0%) leading to declines in international arrivals (World Bank 2020a, 2020b). This would suggest that tourism as a system has been resilient to external shocks. However, there is much evidence that the impact and recovery from the COVID-19 pandemic will be unprecedented.

3. COVID-19 AND GLOBAL TOURISM

Since 31 December 2019 and as of 21 September 2020, **31 091 469 cases** of COVID-19 (in accordance with the applied case definitions and testing strategies in the affected countries) have been reported, including **961 352 deaths**.

Cases have been reported from:

- **Africa:** 1 408 440 cases; the five countries reporting most cases are South Africa (661 211), Egypt (102 015), Morocco (101 743), Ethiopia (68 820) and Nigeria (57 242).
- **Asia:** 9 420 535 cases; the five countries reporting most cases are India (5 487 580), Iran (422 140),

Bangladesh (348 916), Saudi Arabia (329 754) and Iraq (319 035).

- **America:** 15 704 633 cases; the five countries reporting most cases are United States (6 804 814), Brazil (4 544 629), Peru (768 895), Colombia (765 076) and Mexico (697 663).
- **Europe:** 4 524 724 cases; the five countries reporting most cases are Russia (1 103 399), Spain (640 040), France (453 763), United Kingdom (394 257) and Italy (298 156).
- **Oceania:** 32 441 cases; the five countries reporting most cases are Australia (26 898), Guam (2 117), New Zealand (1 464), French Polynesia (1 318) and Papua New Guinea (517).
- **Other:** 696 cases have been reported from an international conveyance in Japan.

The main reasons for the increasing pandemic threat in the 21st century are: a rapidly growing and mobile world population; urbanization trends and the concentration of people; industrialized food production in global value chains; increased consumption of higher-order foods including meat; and, the development of global transport networks acting as vectors in the spread of pathogens (Pongsiri et al., 2009; Labonte et al., 2011). Disease outbreaks such as SARS, Ebola, Marburg, hantavirus, Zika and avian influenza are all outcomes of anthropogenic impacts on ecosystems and biodiversity (Petersen et al., 2016; Schmidt, 2016; World Bank, 2012). As Wu et al. (2017, p.18) noted, “High-risk areas for the emergence and spread of infectious disease are where [...] wild disease reservoirs, agricultural practices that increase contact between wildlife and livestock, and cultural practices that increase contact between humans, wildlife, and livestock [intersect]”. As a result of global change, the rate at which major epidemics and pandemics occur has been increasing. It is generally recognised that the twentieth century experienced three pandemics. The so called “Spanish” flu or influenza of 1918-1919, the “Asian” flu (H2N2) of 1957 and the “Hong Kong” flu of 1968. The twenty-first century has already experienced four pandemics: SARS in 2002, “Bird flu” in 2009, MERS in 2012, and Ebola which peaked in 2013-2014, with the increase in pandemic outbreaks since 2000 believed to be strongly related to the global change factors noted above (Coker et al., 2011; Greger, 2007; Wu et al., 2017).

As the number of COVID-19 cases exploded and spread globally, travel restrictions spread out from the

Wuhan region epicenter (local lockdown beginning 23 January) to most countries by the end of March. Using country population data, it can be estimated that over 90% of the world’s population are in countries with some level of international travel restrictions and many of these countries also have some degree of restrictions on internal movement, including limited air travel and stay at home orders. This unprecedented response closed borders in a wide range of industrialized countries to all foreign nationals, and virtually all other countries have implemented at least some travel restrictions, including travel bans from selective countries, arrival quarantines, and/or health certificate requirements.

The rapid emergence, scientific understanding, and NPI responses to COVID-19 evolved over approximately eight weeks, and tourism organizations struggled to comprehend the scope of what was happening: The uncertainty and dynamics of the pandemic and policy responses is exemplified in estimates of COVID-19 impacts on the sector by the United Nations World Tourism Organization (UNWTO), which were significantly revised between early and late March. A 6 March 2020 press release from UNWTO (2020a) estimated the pandemic would cause international tourist arrivals to decline 1-3% (compared to 2019) rather than the forecasted 3-4% growth. Three weeks later, on 26 March, a press release updated this assessment to a 20-30% loss in international arrivals (UNWTO 2020b). These major modifications demonstrate the difficulty of projections at this time, so that all estimates of eventual consequences for tourism must be interpreted with extreme caution, and are at best indicative at present.

As a result of travel restrictions and lockdowns, global tourism has slowed down significantly, with the number of global flights dropping by more than half (Figure 1): as case numbers rose, travel bans grounded a growing number of carriers. Passenger numbers are likely to have declined even more steeply, as many airlines adopted specific seating policies to maintain a distance between customers. As an example, Air New Zealand’s seating restrictions to meet government requirements of social distancing imply that the airline is flying at less than 50% capacity even when “full” (Air New Zealand, 2020).

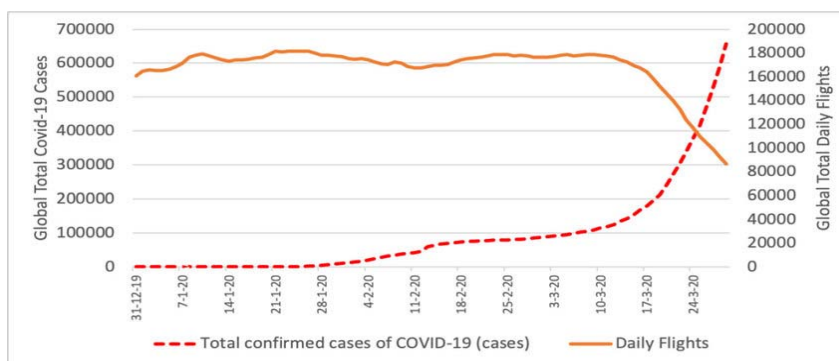


Fig. 1: Daily global COVID-19 cases and global flights

Data sources: ECDC (2020), FlightRadar24 (2020).

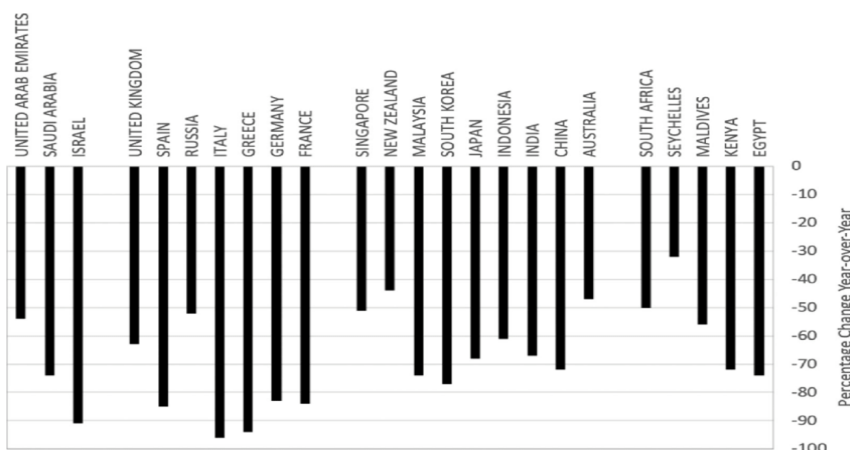


Figure 2. Accommodation occupancy rate change for the week of 21 March (year over year)

Data source: STR (2020a)

The impact of the crisis on the accommodation sector is illustrated in Figure 2 for the week of 21 March, in comparison to the same week in 2019. In all countries, guest numbers have declined significantly, by 50% or more. The hardest hit were countries heavily exposed to the crisis with large case numbers causing dramatic newspaper headlines (Italy) as well as countries imposing drastic measures to restrict movement in the population (Greece, Germany). Countries that appear to have fared better (Seychelles, Sweden, New Zealand) may still have had large visitor numbers in March, with tourists considering to ride out the crisis in countries perceived as safer. However, even in those situations, tourists are being asked by many countries to return home.

As highlighted, UNWTO (2020b) has projected a 20-30% decline in 2020 international arrivals that would translate into losses of tourism receipts of US\$300-450 billion. Much higher is the estimate by WTTC (2020), anticipating a loss of up to US\$2.1 trillion in 2020. Though very significant fiscal and monetary programs have already been implemented, it is currently unclear how these will profit the tourism sector, or whether they will stimulate tourism demand. The following sections discuss industry expectations and provide an

outlook for major tourism subsectors, including aviation; accommodation; meetings, incentives, conferencing & exhibitions (MICE) and sporting events; restaurants; and cruises. For anyone employed in global tourism, the current crisis will also have become a personal one, as many businesses have already laid off most of their staff. A key question for all tourism subsectors is thus when travel – international as well as domestic -, or when tourism and hospitality businesses such as accommodation, cafes, or restaurants can reopen.

4. IMPACTS ON VIET NAM TOURISM

It is expected that in 2020, the number of international tourists will decrease by 20-30%, it is estimated that the loss is about 300-450 billion USD to international tourism activities, equivalent to nearly one third of the 1,500 billion USD. that the industry obtained in 2019.

Vietnam Tourism is not an exception in the impact of the COVID-19 epidemic. According to the General Statistics Office, international visitors to Vietnam in March 2020 plummeted to nearly 450,000, down 68.1% over the same period in 2019 and down 63.8% compared to February. Two largest international tourist markets of Vietnam, China and South Korea, both

decreased 91.5% and 91.4%. Total arrivals in the first quarter of 2020 reached 3.7 million, down more than 18% over the same period.

The decline in visitors under the impact of the epidemic affected tourism service revenues in the first quarter of 2020. According to the General Statistics Office, revenue from accommodation and catering services in the period was estimated at 126,200 billion VND, equivalent to 10% of the total revenue from commercial activities and services of the country, a decrease of 9.6% compared to the first quarter / 2019.

Travel tourism revenue in the first quarter of 2020 was estimated at 7,800 billion VND, accounting for 0.6% of the total and decreasing by 27.8% while in the same period due to many tourist attractions stopped working, the number of tourists canceled tours. calendar due to widespread fear of the epidemic. Revenue from most cities with well-known tourist destinations declined. Specifically, Thanh Hoa recorded a decrease of nearly 50%; Ba Ria - Vung Tau down 48.3%; Quang Ninh decreased 47.1%; Khanh Hoa decreased by 43.9%; TP. Ho Chi Minh City decreased 39.9%; Binh Dinh decreased by 24.4%; Da Nang down 19.5%; Hanoi decreased by 18.7%; Hai Phong down 14.9%.

Also according to the General Statistics Office, international visitors to our country in April only reached 26.2 thousand arrivals; in May only reached 22.7 thousand arrivals, the lowest level in many years, down 13.6% over the previous month and 98.3% over the same period last year as Vietnam continued to implement the COVID-19 pandemic prevention and control measures have not yet opened up international tourism, so the number of visitors coming in the month are mainly experts and foreign technical workers working in projects in Vietnam (comments for that, in April and May, there are no foreign visitors coming to Vietnam for the purpose of traveling). Generally, in the first 5 months of this year, international visitors to Vietnam reached 3.7 million, down 48.8% over the same period last year.

The above data shows that the tourism industry has been severely affected by the COVID-19 epidemic. According to the General Department of Tourism, the total revenue from tourism in the five months of 2020 only reached 150,300 billion VND, a decrease of 47.4% compared to the same period in 2019. Although domestic tourism activities up to this point have gradually been recovery when social distancing policy were loosen from April 2020; But international tourism is really stagnant since March 2020 up to now. According to forecasts of the General Department of Tourism, from now to the end of 2020, the tourism industry continues to face difficulties. Although Vietnam has launched the program "Vietnamese people travel to Vietnam" to promote tourism demand. However, if the pandemic can be controlled as well as

at present, the number of domestic tourists by 2020 can only reach about 60-65 million arrivals; For international visitors, in case it is possible to start welcoming guests from the third quarter of 2020, the number of tourists can reach 6-8 million; If welcome from the fourth quarter of 2020, it can achieve 4.5 to 5 million international visitors; It is far below the target of the tourism industry that by 2020, strive to reach about 20.5 million international tourists, serving 90 million domestic tourists.

The above difficulties and challenges require Vietnam's tourism industry to have synchronous measures to stimulate demand for the tourism industry to have a new direction in the current context.

5. SUGGESTIONS FOR VIET NAM TOURISM

Tourism is a sensitive economic sector, very easily affected, but also an industry capable of rapid recovery compared to many other economic sectors. We also expect that after the end of the COVID-19 pandemic, tourism will regain its high growth rate, as it has overcome previous epidemics/pandemics.

About 20 years ago, the world experienced an epidemic crisis of a much lower level than the COVID-19 pandemic. In 2003, the SARS pandemic also made the world suffer. According to the World Health Organization, the epidemic has been reported since November 2002, and as of July 2003, worldwide there are 25 countries with an outbreak of SARS, with a total of 8,098 people infected. Of these, 774 died. By the end of July 2003, no new cases had been reported and the WHO declared the global epidemic to be over. According to experts, the SARS epidemic caused about 40 billion USD of damage worldwide.

At that time, world tourism was difficult. According to the UNWTO report, international arrivals in 2003 decreased by 1.5%, from 703 million in 2002 to 690 million. In particular, the number of international visitors to many destinations has halved for two consecutive months (April, May). Asia and Pacific region, which is growing steadily, has decreased dramatically (-9.0%); in which Southeast Asia decreased by 13.9%. After the SARS 2003 epidemic, entering 2004, world tourism rebounded with positive results in many regions and destinations. In 2004, the number of international tourists reached 763 million, an increase of 10.7% compared to 2003; Asia and Pacific region has a very high growth rate (+ 27.9%). Southeast Asia grew strongly with a leap of 31%, especially Cambodia (+ 51%) and Malaysia (+ 49%). Total international tourism revenue increased by 18.9% in USD terms (8.2% in Euro terms).

In March and April 2003, SARS epidemic occurred in Vietnam. Fortunately, our country soon controlled and announced the end of the epidemic. But actually, the next 2 months (5 and 6) is the month with the lowest number of arrivals in the year (the "bottom" of the chart

line). It took the next 3 months, until September to reach the same level in 2002 and the last 3 months of the year regained a high growth rate compared to the same period last year, but for the whole year 2003, Vietnam still fell to 7, 6%. The whole year had 6 months of negative growth. In 2003, in return for the number of international tourists decreased (-7.6%), although domestic tourism was strongly affected, but also soon recovered, the number of domestic tourists for the whole year still grew. is 3.8%. As a result, total tourism revenue decreased only 4.3%. In 2004, international visitors to Vietnam increased significantly, reaching 20.6% compared with 2003. Domestic visitors increased by 7.4%. Total revenue from tourists for the whole year increased by 18.2%. Thus we can see that the post-epidemic control period is also the time when tourism can grow again and demand is often very high. So perhaps tourism in Vietnam should take advantage of this time to be able to have the best preparations for that future. We fully have the belief that Vietnam will be the ideal destination and to be the desired destination with the successes in epidemic prevention, which are recognized by the world, thereby creating confidence and safety for guests who choosing Vietnam as their destination after a long time suffered from NPI. To achieve that goal, in my personal view, we can implement the following solutions:

- Firstly, for tourism's companies, it is necessary to take measures to reassure tourists through strengthening medical measures, such as allocating resources to ensure hygiene for transport services, providing medical certificates; At the same times, it is necessary to have an impact assessment on vulnerable workers in the tourism sector, such as women, and ethnic minority communities because the recent ecotourism trend has brought many benefits to them. It is necessary to boost demand for domestic tourism services, after that is international tourism. Ensuring sufficient hygienic and affordable accommodation facilities, travel businesses and tourism service providers to meet demand is forecast to increase, albeit with an increase in slow next time. To revive the domestic tourism market, first of all it is necessary to focus on passengers on business trips, as this will be the first recovery network (as shown above, arrivals in April and May 5 are mainly foreign experts and technical workers working in projects in Vietnam).
- Secondly, for policy makers, Increasing promotion of Vietnamese tourism via Internet, maybe through music videos promoting anti-Covid movement or through hotel booking applications... in the IOT era (Internet of things). Complementing these business and policy perspectives is the question of changes in consumer behaviour and travel demand. Behaviour is influenced by a number of factors that include personal economic wellbeing and disposable income, changes in cost, perceived health risks, and changed capacities for

consumption as a result of pandemic restrictions (Lee & Chen, 2011). As Fan et al. (2018, p.132) commented, "Intense media coverage may lead populations to overreact to mild pandemics", affirming that behaviors are strongly influenced by the communication of information from news and social media (Kantar, 2020; Kristiansen et al., 2007).

- Thirdly, also for policy makers, in order to more strongly recover domestic and international tourism, it is necessary to better understand the development of the sector by collecting high frequency data through rapid surveys. The COVID-19 crisis changed the needs of tourists and led to many changes in behavior. Vietnam will need to work closely with private associations in assessing the financial health of the tourism industry. This assessment should consider regional differences and characteristics of each group of tourism service businesses, such as size, domestic, international, public, private, etc. To formulate effective policies, we need to update information on both supply and demand in this sector.

- Fourthly, for both companies and policy makers, improve the quality of tourism products and destinations. Accordingly, it is necessary to combine solutions to reduce service prices (as some places have done) in parallel with improving service quality. In terms of prices, in the short term, standard tools such as tax, fee, and fee reductions can be used - although this may reduce budget revenues. Therefore, to be more effective, it is necessary to focus on the quality of tourism products. Destinations with lower tourist density, such as those located in remote areas, need increased coordination with community-level infrastructure investment programs. This aims to make tourist destinations more hygienic, thereby improving the quality of the travel experience with a long-term strategy of promoting ecology and attracting international visitors back to Vietnam.

6. CONCLUSION

In the context of the global recession, the Covid-19 pandemic has not stopped yet, but it is still possible to believe that the tourism industry will be much improved in the second half of this year and is expected to rebound strongly after when the pandemic was completely controlled and vaccines against diseases were widely circulated. This is entirely possible when in recent years, travel spending has been in the top 10 of global consumer spending needs. People are spending more and more money on tourism, relaxation, and famous landmarks with higher demand such as luxury and better hotels, better food and the need to be served more diverse services.

In China, hotel bookings rose 40% in the first week of March after pandemic had swept the country since the end of last year. In particularly, flights to China also increased 230% compared to February, showing an improvement in tourism demand of the people after the

government implement hard policy to prevent pandemic spread. China's domestic tourism market is planning to reinstate 70% of its operating capacity by the end of this year in response to a restriction on overseas travel, just as China is still maintaining checks control and isolation for foreigners entering.

Many perspectives on the world tourism industry to the end of 2020 show that the tourism industry will reduce visitors from 58% to 78% this year, which could cause the industry's revenue to decrease by more than \$ 1.2 trillion. and more than 100 million jobs globally if measures to prevent and limit inter-country movement last until the end of December this year. However, it is judged that the recovery is starting with good first steps, both by boosting domestic tourism demand and lifting some entry bans in many countries. In the world. It is forecasted that by 2021, global tourism can flourish again. We all hope that the whole economy in general and the global tourism industry in particular will soon back to normal condition, after this period of slowing down. This is also an opportunity for businesses and organizations in tourism have time to prepare and restructure, as well as a lesson for us to deal with unexpected events such as Covid-19 occurs in the future.

7. REFERENCES

- [1] Bai, Y., Yao, L., Wei, T., Tian, F., Jin, D.-Y., Chen, L., & Wang, M. (2020). "Presumed asymptomatic carrier transmission of COVID-19". *JAMA*, 323(14), 1406. <https://doi.org/10.1001/jama.2020.2565>
- [2] Coker, R. J., Hunter, B. M., Rudge, J. W., Liverani, M., & Hanvoravongchai, P. (2011). "Emerging infectious diseases in southeast Asia: regional challenges to control." *The Lancet*, 377(9765), 599-609. [https://doi.org/10.1016/S0140-6736\(10\)62004-1](https://doi.org/10.1016/S0140-6736(10)62004-1).
- [3] Cond e Nast Traveller. (2020). "Before and after: How coronavirus has emptied tourist attractions around the world." Retrieved March 31, 2020.
- [4] Cordesmeier, M., & Papathanassis, A. (2011). "Safety perceptions in the cruise sector: A grounded theory approach." In P. Gibson, A. Papathanassis, & P. Milde (Eds.) *Cruise sector challenges* (pp. 127–146). Gabler Verlag.
- [5] Dodds, R., & Butler, R. (Eds.). (2019). "Overtourism: Issues, realities and solutions." De Gruyter.
- [6] European Centre for Disease Prevention and Control (ECDC). (2020). COVID-19 Situation update worldwide. Retrieved April 4, 2020, from <https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases>.
- [7] European Council. (2020). Statement by President Michael and President von der Leyen after the extraordinary G20 video conference on COVID-19. Retrieved April 4, 2020.
- [8] Hopkins, J. (2020). Coronavirus COVID-19 global cases by Johns Hopkins CSSE. <https://www.arcgis.com/apps/opsdashboard/index.html>
- [9] Johnson, N. P., & Mueller, J. (2002). Updating the accounts: global mortality of the 'Spanish' 1918–1920 influenza pandemic. *Bulletin of the History of Medicine*, 76(1), 105–115.
- [10] Jonas, O. (2014). "Pandemic risk". World Bank.
- [11] Kantar. (2020). Global study of 25,000 consumers gives brands clearest direction on how to stay connected in a pandemic world. Press Release.
- [12] Li, R., Pei, S., Chen, B., Song, Y., Zhang, T., Yang, W., & Shaman, J. (2020). "Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV2)." *Science*, doi: 10.1126/science.abb3221
- [13] UNWTO. (2020a). COVID-19: UNWTO calls on tourism to be part of recovery plans. <https://www.unwto.org/news/covid-19-unwto-calls-on-tourism-to-be-part-of-recovery-plans>.
- [14] UNWTO. (2020b). International tourist arrivals could fall by 20-30% in 2020. Retrieved April 5, 2020, from <https://www.unwto.org/news/international-tourism-arrivals-could-fall-in-2020>
- [15] Washington Post. (2020). US intelligence reports from January and February warned about a likely pandemic. Retrieved April 14, 2020. https://www.washingtonpost.com/national-security/us-intelligence-reports-from-januaryand-february-warned-about-a-likely-pandemic/2020/03/20/299d8cda-6ad5-11ea-b5f1-a5a804158597_story.html
- [16] World Bank. (2012). *People, pathogens and our planet: Volume 2 – the economics of One Health*. World Bank.
- [17] World Bank. (2020a). Air transport, passengers carried. Retrieved April 4, 2020, from <https://data.worldbank.org/indicator/is.air.psg>
- [18] World Bank. (2020b). International tourism, number of arrivals. Retrieved April 4, 2020, from <https://data.worldbank.org/indicator/ST.INT.ARVL>
- [19] Wu, T., Perrings, C., Kinzig, A., Collins, J. P., Minter, B. A., & Daszak, P. (2017). Economic growth, urbanization, globalization, and the risks of emerging infectious diseases in China: a review. *Ambio*, 46(1), 18–29. <https://doi.org/10.1007/s13280-016-0809-2>

BOUNDARY CONDITIONS TO THE TRUST – COMMITMENT RELATIONSHIP: TESTING THE MODERATING EFFECT OF PROACTIVENESS IN A TRANSITIONAL, DYNAMIC MARKET

Ta Minh Quang

Faculty of Business Administration, National Economics University, Vietnam
Marketing and Consumer behavior, Wageningen University, The Netherlands

Le Cong Tru

Agriculture and Forestry University, Vietnam

Li., P. T. M. Ingenbleek., J. C. M. van Trijp

Marketing and Consumer behavior, Wageningen University, The Netherlands

Correspondence: quangtm@neu.edu.vn.

Abstract

The relation between trust and commitment is a cornerstone of relationship marketing domain. The relation is however mainly tested in high-income markets. The transitional, dynamic settings in many emerging markets may pose boundary conditions to this relation. Using a sample of 200 independent farmers in the Vietnamese shrimp sector, this study tests the effect of trust on affective and calculative commitment and examines the moderating effect of proactiveness on these relationships. The results show that consistent with previous studies, the effect of trust on affective commitment is positive. The effect on calculative commitment, which was found negative in high-income markets, is however found positive in our study. Additionally, proactiveness is found to negatively moderate both relationships. Our findings presents boundary conditions to the trust-commitment relation and suggest that the basic principles of relationship marketing might not fully translate into transitional, dynamic markets and call for more fundamental relationship marketing research in these markets.

Keywords: Relationship Marketing, Transitional Markets, Trust, Commitment.

UNCITRAL ODR – THE DAWN OF AN EXPECTATION FOR A GLOBAL LEGAL FRAMEWORK TO RESOLVE CROSS-BORDER E-COMMERCE DISPUTES

Dang Hoang Minh¹, Nguyen Dinh Thuy Huong²
Ngo Ho Anh Khoi^{3,*} and Tran Thi Thuy⁴

¹ Faculty of Business Administration, FPT University - Can Tho Campus, Can Tho, Vietnam

² Faculty of Navigation, Vietnam Maritime University, Hai Phong, Vietnam

³ Faculty of Engineering and Technology, Nam Can Tho University, Can Tho, Vietnam

⁴ Center for Output Standards and Human Resource Development, Can Tho, Vietnam

*Corresponding author: nhakhoi@nctu.edu.vn or ngohoanhkhoi@gmail.com

Abstract

The rapid development of Information and Communication Technology (ICT) in the past three decades has formed a concrete foundation for e-commerce activities to be blossomed significantly, which is evidenced by the introduction of numerous e-commerce platforms throughout the world. Although these platforms, particularly the giant ones, have conducted a high volume of cross border transactions, the value of every transaction remains low. These features of cross border e-commerce do require a legal framework to resolve effectively disputes occurred during the transactions, particular the cross-border ones where these disputes could be subjected to different jurisdictions. This research aims to demonstrate that Online Dispute Resolution (ODR) is an Alternative Dispute Resolution to resolve potential disputes happening in e-commerce trades and the failure of UNCITRAL ODR, which is introduced by The United Nations Commission on International Trade Law (UNCITRAL), for an expectation of an international legal framework to resolve cross border e-commerce disputes.

Keywords: ODR, e-commerce, international law, UNCITRAL, disputes, legal framework.

1. INTRODUCTION

The significant development of Information and Telecommunication Technology (ICT) for the past three decades has enabled the general approach of people to own a digital device with Internet connection equipped. This can be regarded as one of the essential conditions for the formation of e-commerce platforms, particularly giant ones which have the capacity to perform cross border transactions on cyberspace. Gradually, these platforms have proved their key roles in international trading activities in various areas, both in terms of the number of transactions and the value of respective transactions carried. Thanks to e-commerce, the formats of B2B and B2C transactions have also been changed dramatically to be more modern and convenient. Sellers and customers can meet each other in a digital space, which is commonly known as cyberspace, to perform commercial activities while in the past, they are supposed to meet, negotiate terms of the contract and then sign this contract directly. Hence, customers can save a huge amount of time since they will not lose their time in choosing appropriate products and then traveling just to collect them. Instead, these products will be on-hand delivery to them and their job is simply made some clicks on the websites of sellers.

This key advantage of e-commerce could explain for the blossoming of e-commerce websites in recent years, which attract the participation of many sectors in the market, both domestically and internationally. Some leading e-commerce platforms can be listed as Amazon, Alibaba or eBay, which have already proven their pillar role in international e-commerce by providing cyber zones called marketplace, where buyers and sellers or between sellers can meet to trade. Notably, these trading activities are real ones, but they are performed visually. This model allows international transactions can be carried with a very high volume. Multinational companies and traditional outlets, malls, or retail systems also take part in this trend by designing their websites to be attractive, distinctive, and user friendly. New products are updated frequently on these with marketing campaigns aiming at customers' experiences (Chung, 2015). As estimated, the global value of e-commerce activities in 2019 was over 3.5 trillion USD and this number can reach 4.2 trillion USD (Clement, 2020). These number are dynamic examples demonstrating that e-commerce is no longer a mere toll serving for specific businesses, but it has become a business model for any goods producers, services providers or sellers who want to push their products or services to international market (Bae, 2016).

This commercial trend of e-commerce in global trade requires a system of exhaustive and effective online dispute resolution, which is underpinned by a solid legal framework to resolve problems or disputes (Johnson & Post, 1996). Departing from this point of view, the United Nations Commission on International Trade Law (UNCITRAL) has already made significant efforts in constructing a model framework, which includes general rules and principles, to standardize the domestic laws serving for the operation of ODR systems in all over the world. In Vietnam, despite the fact of the e-commerce blossoming of activities in recent years, this topic remains new since there are rarely researches have explored such a necessary field. Some previous studies carried in Vietnam did draw some understandings about UNCITRAL ODR such as the possibility of application ODR in Vietnam (Ha&Le, 2017), or the legal issues that Vietnam law should focus when applying ODR system (Phan, 2016). In line of that, this paper will make a further attempt to analyze the ODR's definitions to evaluate the UNCITRAL ODR in the context of international law. To conclude, this study will argue that UNCITRAL ODR remains a sole expectation, rather than forming an international legal framework serving for the development of ODR system in this digital age.

2. ODR'S DEFINITION

In domestic or international trade, dispute is a certain topic that all relevant parties do not want to engage (Petersmann, 2006). It is understandable since disputes can interrupt business activities, cost a lot of expenses, labor as well as cause other consequences. In cross border e-commerce, this view is even more highlighted since these transactions are carried in different countries, which are governed under different jurisdictions. Additionally, such transactions are conducted on cyberspace therefore the resolutions applied to resolve any dispute arising from cross border e-commerce are complicated compared to traditional commercial activities. As a result, any participated party in cross border e-commerce has desperately sought an effective means to resolve the disputes.

For cost-effective, shortening legal procedures as well as saving time, related parties in international trade disputes often seek out-of-court solutions to resolve the matter in question, which are commonly call alternative dispute resolutions (ADR) (Shavell, 1995). ADR is to replace the conventional concepts that disputes should be settled in the courts or any judicial bodies. The advantages of ADR can be at its essence: volunteering and flexibility (Blackman, 1997). Firstly, since engaged parties voluntarily agree to opt for this solution to resolve disputes, they will be more proactive to settle the problems amicably and friendly. The result of the dispute settlement thus satisfies the parties rather than the court's decision, where the satisfaction of one or both parties may not be reached. Secondly, the

procedures, judicial processes as well as applicable laws are applied flexibly rather than forcibly imposed (Bae, 2012). ADR's flexibility is the key enabling this to be an effective means in dispute settlement.

Based on the two factors identified, there are three most popular ADR: negotiation, mediation, and arbitration. In negotiation, parties shall themselves draw the problems out, discuss and bargain their benefits until a common goal to resolve the disagreement is met (Exon, 2011). In all processes, related parties will work together without any intervention from third parties. Since negotiation is conducted among related parties, it can show all advantages of ADR's flexibility in resolving disputes in terms of content and formality.

Mediation is another ADR, which a neutral party shall arrange and support to resolve disputes in an entire process. The effectiveness of mediation can be compared to negotiation due to the similarity of both methods in many aspects, namely mutual communication, voluntary of parties, and procedural flexibility. However, since the information and procedure are conducted via a mediator, who then uses such information to convince parties to agree on the solution. Hence, mediation can cost more time than negotiation and during the mediation process, the role of mediators is essentially important. Currently, there is no widespread agreement on the competence and qualification of mediators as well as official standards of mediators recognized. Rather, a good mediator is evaluated based on his charisma in defining an appropriate solution, which is accepted by all related parties. Mediation is a non-binding; non-guarantee process and parties can stop such process any time upon their wish. Hence, this can be regarded as the disadvantage of mediation and negotiation since these ADR rely totally on parties' goodwill to perform.

In contradiction to mediation and negotiation, commercial arbitration is an ADR in which the winning party shall be secured their rights through an award arbitration. Though in terms of formality and procedure, arbitration is similar to mediation since it is carried via a third party, the competence and the enforcement of arbitration award are however the distinctions of arbitration to mediation. Arbitrators can decide and make the final decision for the dispute. The finality of the arbitrator's award has been backed up by domestic laws according to the New York Convention 1958 on the Recognition and Enforcement of Foreign Arbitral Awards, to which mediator cannot have this power. Additionally, resolving disputes through arbitration is different from the court since arbitrators are not to be bound to settle the case by laws. Arbitrators shall make their decision based on the agreements of parties and specific rules of arbitration centers. While the judges of the court shall consider facts, evidence, and laws to reason before making a decision, arbitrators can extend their performance

thanks to professional knowledge, experiences, and relevant commercial expertise besides the law to make the arbitration awards (Moffitt & Schneider, 2014). These unique characteristics enable commercial arbitration to be an effective ADR, which is often opted by businessmen and applied frequently in international trade.

Despite the availability of different concepts, ODR can be simply defined as an ADR conducted via the Internet (Ebner & Zeleznikow, 2015). From this understanding, ODR can be classified into 3 means: Online negotiation, online mediation, and online arbitration. This classification enhances the advantages of ODR to traditional ADR in shortening the time and saving cost significantly since the dispute resolutions are carried on the cyberspace with the support of ICT devices. Generally, there have been 4 phases in the development of ODR recognized (Tyler, 2003). The initial phase started from 1990 to 1996 and this is the experimental phase of computer solutions. From 1997-1998, a milestone in ODR development was set with the very first website of ODR service introduced. In the next phase (1999-2000), the significant development of economy and IT services attracted the attention of many companies about ODR's projects with many platforms established, which most of them did not exist on the market any longer. From 2001, technologies applied in ODR have gradually been incorporated to judicial institutions, such as courts or administrative bodies, as a tool complementing to resolve the disputes.

Since the ODR's growth attaches closely to the development of the Internet, ODR promises to be an effective solution to settling disputes arising from cross border e-commerce activities. If the time and traveling, procedural expenses are great concerns in traditional ADR, ODR reveals to overcome this hurdle despite the fact that parties can be located in different areas with huge geographical distance since the entire process to resolve any commercial dispute can be handle via online platforms (Cortes & Esteban de la Rosa, 2013). Time, venue, and neutral parties to participate in dispute resolution are within the choice of related parties and thus, such advantage of flexibility secures the most convenience of the participants.

There are three factors that should be available to secure the effectiveness of the ODR system, which are fairness, trust, and security (Mania, 2015). In order to have fairness, ODR must provide an operating process, which is clear and transparent in terms of the legal principle used as well as an advocacy for related parties. These should be done in the same way as we often see in the courts. Also, parties' faith and reliability should be regarded as a part of fairness as well. Secondly, the trust has to be formed through specific relationships of the trust of users to ODR systems, the mutual trust between users in choosing ODR to resolve problems, and the trust of users to the

information provided or requested by the ODR system throughout the process of dispute settlement. Lastly, since information serving for dispute settlement is communicated on cyberspace, dispute parties and the neutrals should be equipped with security solutions to protect the information provided, such as personal information, business know-how, evidence, contracts, and other transaction data.

Although plenty of certain advances demonstrated, ODR does remain some key concerns (Shin, 2015). Firstly, the immune from human impacts can be regarded as an advantage, but it is also a disadvantage of ODR. During the settlement of disputes, the appropriate presentation to present the matter is always important since the way we speak is more important than what we say. In complicated issues, mediators or arbitrators should acknowledge exhaustively this principle and this is very essential since it can have some certain influence on the result of the settlement. This is the art of mediators and arbitrators since no machine can interpret. In the real-world, mutual communication of eyes, voice, and gesture are essential elements for all involved parties, which help them in identifying facts, reasoning arguments, creating trust, and controlling emotion rather than relying on messages and evidence appeared on the computer screens. The mutual interaction between humans in numerous cases can serve a key role in delivering a good solution. Secondly, the linguistic difference is another problem in ODR. The majority of available ODR employs English as the main language and this generally forms a huge barrier in international trade in case sellers and buyers speak different languages. Thirdly, security is another challenge for the reliability and use of the ODR system to resolve disputes. This challenge is even enhanced in commercial activities, where business secrecy, product information, and intellectual property are always priorities requiring a high level of security. In addition to that, identifying parties before participating in the process also requires some online protocols to make sure that the participants are the right ones who have disputes that need to be resolved. Lastly, a legal framework to ensure the enforcement of the result of the ODR process is the most important factor, since it decides the success or failure of the application of ODR in the real situation of commercial activities. This is not only an explicit matter of ODR but it also a concern of ADR in general. The result of negotiation, meditation, or arbitration is less value in international trade disputes once there is an absence of a global legal framework, which is recognized by nations to secure the enforcement of that. New York Convention 1958 has been resoundingly successful in forming a concrete legal foundation for the enforcement of the foreign arbitral awards and the question raised can be to what extent the results of ODR can be enforced after finishing the dispute settlement process. Against that backdrop,

UNCITRAL ODR – the online dispute resolution introduced by UNCITRAL, was expected to form model legal principles applying in resolving disputes in cross border e-commerce.

3. RESULTS AND DISCUSSION

UNCITRAL has been established since 1966, which is mainly in charge of forming model laws and principles to harmonize the legal systems of member nations. It aims to facilitate international trade under a common international legal framework. In 2010, UNCITRAL mandated a committee to build up general principles about ODR (Nakornphanom, 2017). The tasks of this committee were to focus on resolving e-commerce disputes between B2B and B2C via ODR systems. After rounds of discussion with some versions proposed, which took into account the contributions of nations, member delegations, and experts, in the 49th session held in 2016, UNCITRAL approved a technical note of ODR instead of model rules and principles as it had done with international arbitration and electronic commerce. This technical note of UNCITRAL defines basic principles in resolving disputes through ODR systems applying for e-commerce transactions, which are carried with high volume and low value. Accordingly, a technical note is solely a descriptive document without any binding effect, which is presented in 12 sessions and 52 paragraphs. Some notorious points can be named as follows:

3.1 ODR Principle

Four key principles of UNCITRAL ODR includes fairness, transparency, due process, and accountability (see UNCITRAL, technical note on online dispute resolution (2017) UN, para 7). UNCITRAL also pointed out that online disputes should be resolve in a fast, simple, and effective way, which can be applied widely in the real world. Some significances of the principles of UNCITRAL ODR can be observed that these are catching up with the rapid development of ICT as well as create the most convenience for the users in interacting with ODR systems. Accordingly:

- Fairness: ODR platform administrators should ensure that neutrals who participate in resolving disputes should adopt a code of ethics to avoid any conflicts of interest. A mechanism of identifying the conflicts of interest is also be established to identify and resolve any potential conflicts of interest if any (see UNCITRAL, technical note on online dispute resolution (2017) UN, para 13-14).
- Transparency: Any relationship between the ODR administrator and a particular vendor should be disclosed so that users of the service are informed of potential conflicts of interest. ODR administrator may wish to publish anonymized data or statistics on outcomes in

ODR processes, in order to enable parties to assess its overall record, consistent with applicable principles of confidentiality (see UNCITRAL, technical note on online dispute resolution (2017) UN, para 10-12).

- Compliance: the ODR administrator may wish to implement comprehensive policies governing the selection and training of neutrals. An internal oversight/quality assurance process is also recommended to help the ODR administrator to ensure that a neutral conforms with the standards it has set for itself (see UNCITRAL, technical note on online dispute resolution (2017) UN, para 15-16).
- Accountability: the ODR process should be based on the explicit and informed consent of the parties (see UNCITRAL, technical note on online dispute resolution (2017) UN, para 17).

3.2 Process of UNCITRAL ODR

According to UNCITRAL, a process of resolving online disputes will include three stages: negotiation; facilitated settlement; and a third (final) stage. (see UNCITRAL, technical note on online dispute resolution (2017) UN, para 18) When a claimant submits a notice through the ODR platform to the ODR administrator, the ODR administrator informs the respondent of the existence of the claim and the claimant of the response. The first stage of proceedings will commence with negotiation, where the claimant and respondent will communicate the information to each other via the platforms of ODR. If that negotiation process fails (i.e. does not result in a settlement of the claim), the process may move to a second, “facilitated settlement”. In that stage of ODR proceedings, the ODR administrator appoints a neutral who communicates with the parties in an attempt to reach a settlement. If facilitated settlement fails, a third and final stage of ODR proceedings may commence, in which case the ODR administrator or neutral may inform the parties of the nature of such stage.

3.3 Scope of the ODR process

UNCITRAL views that ODR is particularly useful to resolve cross border e-commerce transactions conducted with high volume but low value. An ODR process may apply to disputes arising out of both a business-to-business as well as business-to-consumer transactions. Additionally, an ODR process may apply to disputes arising out of both sales and service contracts. (see Uncitral, technical note on online dispute resolution (2017) UN, session 4).

Challenges of constructing a legal framework for resolving disputes arising out of cross border e-commerce transactions are significant. Therefore, the UNCITRAL technical note is highly appreciated when

member nations and ODR administrators can refer to these basic principles as a source to build up their own ODR regulations or domestic laws for the ODR system.

4. CRITIQUES ON UNCITRAL ODR

Doubtlessly, Uncitral ODR is the evidence of international efforts to contribute to the development of ODR in terms of setting up a set of basic principles. However, to reach a consensus in agreement for a set of binding ODR principles is impossible within the context of the ICT development among nations, particularly between developed and third world countries in today world due to the different levels in approaching to the use of the Internet. This is the key factor leading to the failure of introducing a common model of ODR procedures despite the fact that detail of such had already been completed.¹ Consequently, the technical note is introduced as a source of reference, which describes basic definitions and essential stages in ODR with certain participants in-need. Furthermore, this technical note is totally a non-binding document and its validity remains debatable since it is not appropriate to refer to as an official source in dispute settlement.

Another noticed point of this technical note is in the last stage of ODR, where the ODR administrators or neutrals inform the parties of the nature of this stage. The vagueness in describing the final stage of UNCITRAL ODR can be explained as the failure of the UNCITRAL committee in looking for a balance point in the concept of involved parties during drafting this document. Recalling to the time when model principles of ODR were prepared, while the first two stages of such ODR procedure were accepted by nations and delegations, the last stage was failed to obtain the consensus of parties. The US, Columbia, Honduras, and Kenya delegations suggested that the last stage of ODR would be conducted through arbitration. These delegations believed that a final decision under the form of an arbitral award, which is final and enforceable, would be a motivation attracting users to employ ODR for dispute settlement. Additionally, when arbitration is integrated into the ODR process, the arbitral awards shall be secured to be enforced by the New York Convention 1958. On the other hand, the delegation of European nations requested that the last stage of ODR should be non-binding, but only advocating related parties about the dispute in question. This delegation believed that it was not worth referring to New York Convention 1958 to resolve the disputes in this situation since the value of such are low, and

thus the enforcement of the arbitral award is not cost-effective. Moreover, mutual agreement between parties in choosing ODR as a means of dispute settlement is enough for resolving disputes in line with the parties' mutual agreement and goodwill. Hence, this delegation emphasized that instead of focusing on the enforcement of the ODR result, it was better to focus on encouraging people to use ODR for dispute settlement and respect the ODR's result. Due to the difference in the stances of delegations, while the deadline of the committee for the respective task was in 7/2015, UNCITRAL required that the committee should introduce a descriptive document to describe ODR and as a result, the UNCITRAL ODR technical note was presented against the acceptance of delegations in 2016. The approval of this document remains a big question about its role in cross border e-commerce as well as its vagueness in legal effectiveness. Therefore, this can be deemed as an disappointment of an expectation for a legal framework for the ODR model at the international level.

5. CONCLUSION

With certain advantages in terms of cost-effective and time saving, ODR promises to be an effective ADR with a lot of potentials. This is because the development of ODR is accelerated by the complimentary of ICT development. However, ODR has been so far looking for a solid legal framework, which underpins its position in international trade, particularly in cross border e-commerce activities. Although UNCITRAL ODR is not regarded as an official legal instrument for online dispute settlement, the effort of UNCITRAL should be appreciated since the ODR technical note is the first document at the international level to stipulate ODR with certain definitions and basic principles. Therefore, future researches are called to make a further in-depth investigation on this topic with a hope that a solid legal framework shall be formed to facilitate the settlement of online disputes effectively.

6. REFERENCES

- [1] Amy Schmitz, "Building Trust in E-commerce Through Online Dispute Resolution" (2015) in John A. Rothchild, *Research Handbook on Electronic Commerce Law*, Edward Elgar (2016) Colorado Law Legal Studies Research Paper No. 15-15.
- [2] Bae, Sung-ho, "A Study on ODR Enforcement for Disputes Arising from Cross-border E-Commerce: Focusing on the UNCITRAL and EU" (2016) *The E-business study* 17.
- [3] Bae, Sung-ho, "A Study on Online Dispute Settlement in the Era of FTA" (2012) *The e-Business Studies*, Vol. 13 No. 4.

¹ Cf. the Working Group's working papers containing draft procedural rules (for example WP.133, WP.133/Add.1, WP.130, WP.130/Add.1 and WP.131) at

https://uncitral.un.org/en/working_groups/3/online_dispute_settlement accessed on 30/7/2020

- [4] Blackman, S. H., & McNeill, R. M. "Alternative Dispute Resolution in Commercial Intellectual Property Disputes". (1997) *Am. UL Rev.*, 47, 1709.
- [5] Clement, J., "Retail e-commerce sales worldwide from 2014 to 2023", 2020 at <https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/>.
- [6] Convention on the Recognition and Enforcement of Foreign Arbitral Awards 1958.
- [7] Cortes, Pablo & Esteban de la Rosa, Fernando, "Building a Global Redress System for Low-Value Cross-Border Disputes" (2013) *International and Comparative Law Quarterly*, 62(2) at 421.
- [8] Chung, Ha-Sung, "Online ADR for the E-Commerce? European Union's ADR Legislation for Cross-Border Online Trade" (2015) *Journal of Arbitration Studies* Vol. 25 No. 3.
- [9] Ebner, Noam & Zeleznikow, John, 'Fairness, Trust, and Security in Online Dispute Resolution' (2015) *Hamline Journal of Public Law and Policy*, Vol. 36, No. 2.
- [10] Exon, S. N., "The Next Generation of Online Dispute Resolution: The Significance of Holography to Enhance and Transform Dispute Resolution" (2011) 12.1 *Cardozo Journal of Conflict Resolution*.
- [11] Ha Cong Anh Bao & Le Hoang My Hanh, "Online Dispute Resolution – The possibility of application in Vietnam" (2017) *Vietnam's Journal of foreign trade*, Vol. 93.
- [12] Johnson, D. R., & Post, D. G., "Law and borders: The rise of law in cyberspace" (1996) *Stanford Law Review* 48.
- [13] Mania, Karolina, "Online dispute resolution: The future of justice" (2015) *International Comparative Jurisprudence* 1.
- [14] Moffitt, M. & Schneider, A. K., *Dispute Resolution: Examples & Explanations* (Wolters Kluwer 3rd Ed. 2014).
- [15] Nakornphanom, Kodchakorn-Na, "The Use of Online Dispute Resolution under the United Nations Dispute Resolution Framework" (2017) 4 (2) *International Journal of Crime, Law and Social Issues* 58.
- [16] Petersmann, E. U. "Justice as conflict resolution: Proliferation, fragmentation, and decentralization of dispute settlement in international trade" (2006). *U. Pa. J. Int'l Econ. L.*, 27, 273.
- [17] Phan Thi Thanh Thuy. "Online dispute resolution: challenging legal issues for Vietnam" (2016) *VNU Journal of Science: Legal Studies*, S.I. v. 32, n. 4.
- [18] Shin, Koon-Jae, "A Study on Resolution Methods of Overseas Direct Purchase Dispute by ODR" (2015) *Journal of Arbitration Studies*, The Korean Association of Arbitration Studies, Vol. 25 No. 1.
- [19] Shavell, S. "Alternative dispute resolution: an economic analysis" (1995) *The Journal of Legal Studies*, 24(1), 1-28.
- [20] Susskind, R., *Tomorrow's lawyers: An introduction to your future* (2013) Oxford University Press.
- [21] Tyler, M. C. *Seventysix and counting: "An analysis of ODR sites"* (2003) in Lodder, A. R., Clark, E., Gordon, T. F., Katsh E., Rule, C., Thiessen, E. M., Verheij, B., Walton, D. N, & Zeleznikow, J., *Essays on legal en technical aspects of Online Dispute Resolution* (2003) *Papers from the ICAIL 2003 ODR Workshop*.
- [22] UNCITRAL, *technical note on online dispute resolution* (2017) UN, para 7, 10-12, 13-14, 15-16, 17-18; section 4.
- [23] Working Group's working papers containing draft procedural rules (for example WP.133, WP.133/Add.1, WP.130, WP.130/Add.1 and WP.131) at https://uncitral.un.org/en/working_groups/3/online_dispute.

RESEARCH ON INFLUENCING ECONOMIC AND ENERGY STRUCTURAL FACTORS CO₂ EMISSION REDUCTION IN VIETNAM

Phan Dieu Huong^{1,*}

¹Department of Industrial Economics, School of Economics and Management,
Hanoi University of Science and Technology

*Corresponding author: huong.phandieu@hust.edu.vn

Abstract

The surging rate of CO₂ emission in the past few years has raised concerns on environmental security for the government and Vietnamese citizens. Rising demands for social development, economic and population growth, enhancing standards of living require the use of energy and possibly increasing carbon dioxide emission, having direct impacts on the environment and human health. Hence, it is necessary to have different analyses assessing the degree of influences on each factor causing CO₂ emitted and appropriate approaches to effectively control and reduce the carbon emission. This study uses regression analysis and statistics on CO₂ emission, energy uses, and Vietnamese economy and social status during the 2005-2017 period, to estimate effects of these factors on emitting CO₂ in Vietnam and proposing suitable solutions to reduce the amount of carbon emission in Vietnam.

Research results show that the main factors affecting CO₂ emissions are population, GDP, the proportion of fossil energy in total final energy consumption, electricity production and the proportion of thermal power in total electricity production. Increasing 1 unit of GDP (\$ 2010) would result in an average increase of 1.321 units of CO₂ emissions, corresponding to an increase of 1 unit of fossil energy share in total final energy consumption and 1 unit of thermoelectric proportion in electricity generation will rise CO₂ emissions in Vietnam by 360.017 and 103.931 units relatively in 2005-2017 period. Adapting the appropriate trend on these factors would have a positive impact on CO₂ emissions reduction.

Keywords: Factor, CO₂ emission, Vietnam.

1. INTRODUCTION

Nowadays, environmental issues have become one of the most pressing concerns on both national and international scales. Reducing emission, in particular carbon dioxide emission, is an urgent and important task for developing countries such as Vietnam, as the environment pollution and the quickening growth rate of emission are heavily imputed to the consequences of economic growth and social development in recent years. The environmental problems are complex, and there have been numerous studies, researches focused on looking for suitable solutions in reducing CO₂ emission, adapted to different national conditions including Vietnam. Apart from qualitative researches identifying factors affecting carbon dioxide emission, there are necessarily quantitative researches examining the level of influences for each factor and determining the most crucial factors in precipitating emitted CO₂, for practical solutions.

To meet the requirements of quantitative research methods on factors causing carbon emission in Vietnam, this paper uses a regression method with data statistics related to Vietnam's energy, economy, society from 2005 to 2017. The selection of the research phase

depends not only on the source of statistical data on socio-economic, energy-environment... but also through preliminary research on the development through each 5-year development period of the entire economy. The use of historical statistics prior to 2004 may increase the number of observations for the study, however the factors that influence CO₂ emissions in the current period will not significantly reflected due to the change in economic structure, the proportion of production and use of energy types in the period 2005 – 2017 compared to the previous period. In particular, the policies in exploitation, production, efficient use and energy saving have a direct and indirect impact on CO₂ emissions in Vietnam in the current period. Therefore, the author chooses the study period from 2005 – 2017 with the latest statistics in order to assess the basic factors affecting CO₂ emissions of Vietnam in the current period.

The main data figures were obtained from databases of Energy Institute, the official publication of the General Statistics Office of Vietnam, the official website of ADB and Worldbank.

2. LITERATURE REVIEW

Nowadays, generally, environmental issues have garnered not only nationwide attention but globally speaking as well. There have been several types of research studies focused on assessing the effects of different elements leading to emitting carbon dioxide. Researches could use factor separation methods (IAEA, 2005), (Perry Sadorsky, 2020), Yi Liang, Dongxiao Niu, Haichao Wang and Yan Li (2017) or econometric methods to evaluate the impact of those factors on CO₂ emissions (B. W. Ang, Na Liu, 2007; Usama Al-mulali, 2012). Studies were conducted in many countries around the world such as the US (Xue-ting Jiang, 2018), Japan (Hiroto Shiraki, 2020), South Korea (Juchul Jung, 2016), Malaysia (Mustapa, 2018)... or comparing between countries to identify similar factors that lead to CO₂ emissions (Xue-ting Jiang, 2018; Pasquale Paziienza, 2015; Ghouali, 2015). Research on relations between emitting CO₂ and those factors could be applied for the whole economy (Faisal Mehmood Mirza, 2017) Syed Jawad Hussain Shahzad or specifically done for each industry (Mustapa, 2018; Z. G. Liu, 2016; Pasquale Paziienza, 2015). Studying of different elements that result in CO₂ emissions in Vietnam has been closely-observed and conducted by (Nguyen Thi Hoa, 2018) using the IO (Input-Output Structural Decomposition Analysis) method, (Le Trung Thanh, Nguyen Duc Khuong, 2017) applying the ARDL (Autoregressive Distributed Lag) model, (Phan Dieu Huong, 2006) using factor decomposition method. Despite in a few of Vietnamese research papers mentioning the use of data statistic in the past, and not examining important factors such as population, industry structure in the economy, final energy consumption, the density of fossil energy used in final energy consumption or electricity generation and the structure of Vietnam electricity generation would be considered prominent factors for the amount of carbon dioxide emitted in Vietnam. Therefore, it is a must to have other studies, researches investigating different aspects that could be highly influential to CO₂ emission in Vietnam given a more up-to-date database statistic.

3. RESEARCH METHODS AND DATA SOURCES

It is undeniable that every economic and social development requiring either direct or indirect energy use, which both lead to a rising carbon emission rate.

$$Y = b_0 + b_1. \text{Population} + b_2. \text{GDP} + b_3. \text{Industrial density/GDP} + b_4. \text{Final Energy Consumption} + b_5. \text{Fossil energy/Final Energy Consumption} + b_6. \text{Electricity production} + b_7. \text{Density of thermal power/ electricity generation} \quad (1)$$

$$Y = b_0 + b_1. X_1 + b_2. X_2 + b_3. X_3 + b_4. X_4 + b_5. X_5 + b_6. X_6 + b_7. X_7 \quad (2)$$

The central question then becomes; how emitting CO₂ is directly affected by economic growth, social development and energy usage. Therefore, studies on quantitative assessments of factors that directly affect economic growth, social development to CO₂ emissions for different country and development stage need to be conducted.

Based on qualitative analysis of correspondence between CO₂ emissions (dependence variable – Y) and independent variables (X_i, i = 1 ÷ 7) showing economic, social and energy development, regression models studying factors influencing CO₂ emissions from 2005 to 2017 are illustrated as following:

X1: population (million people), expect positive regression coefficient (when population increases, emissions increase).

X2: GDP (10⁹ \$), undefined regression sign.

X3: the proportion of industry contributed to GDP, expect positive signs (increasing the industrial density can raise energy use and CO₂ emissions).

X4: a sum of final energy consumption (Ktoe), undefined sign (increasing energy consumption while reducing the density of energy generating high emission intensity can reduce emissions or vice versa).

Variable X5: density of fossil energy in consumption, expect positive signs (increasing the proportion of fossil energy will increase CO₂ emissions).

Variable X6: amount of electricity generated (Ktoe), undefined sign (depending on the density of electricity produced from hydroelectricity and renewable energy).

Variable X7: density of thermal power/electricity generation, expect positive sign (increasing the density of thermoelectricity in total electricity produced will increase CO₂ emissions).

Within the scope of this research and analyzing context, only CO₂ emissions from energy production and use are considered, not considering CO₂ emissions from deriving energy from external sources or other sources such as reforestation, livestock breeding... Gross Domestic Product (GDP) at the prevailing market price. Assuming a linear relationship between CO₂ emissions and independent variables from X1 – X7, the regression model has the form of:

Table 1. Vietnam's CO₂ emissions data during the period (2005-2017) and independent variables

Year	Y (10 ⁶ t CO ₂)	X1 (10 ⁶ people)	X2 (10 ⁹ \$)	X3	X4 (Ktoe)	X5	X6 (Ktoe)	X7
2005	99.24	83.83	57.65	0.41	34254.70	0.49	6102.71	0.75
2006	101.99	84.62	66.39	0.42	37609.49	0.49	5215.38	0.66
2007	112.87	85.42	77.52	0.41	40467.14	0.50	5762.69	0.66
2008	124.33	86.24	98.27	0.40	43267.10	0.53	6311.97	0.64
2009	138.73	87.09	101.63	0.40	45788.36	0.56	7153.14	0.64
2010	154.68	87.97	112.77	0.41	47444.99	0.55	8244.56	0.70
2011	154.56	88.87	134.60	0.32	48484.59	0.54	9017.27	0.60
2012	153.24	89.80	155.48	0.34	49301.57	0.53	10217.06	0.55
2013	159.43	90.75	170.44	0.33	50605.53	0.53	11065.19	0.55
2014	174.94	91.71	185.76	0.33	52247.93	0.55	12392.69	0.58
2015	202.77	92.68	191.29	0.33	54080.34	0.55	13995.12	0.65
2016	242.07	93.64	201.33	0.33	56802.27	0.62	15177.45	0.62
2017	242.46	94.60	220.38	0.33	59921.53	0.62	16538.04	0.53

Source: Energy Institute, General Statistics Office of Vietnam, Worldbank.com, ADB.org

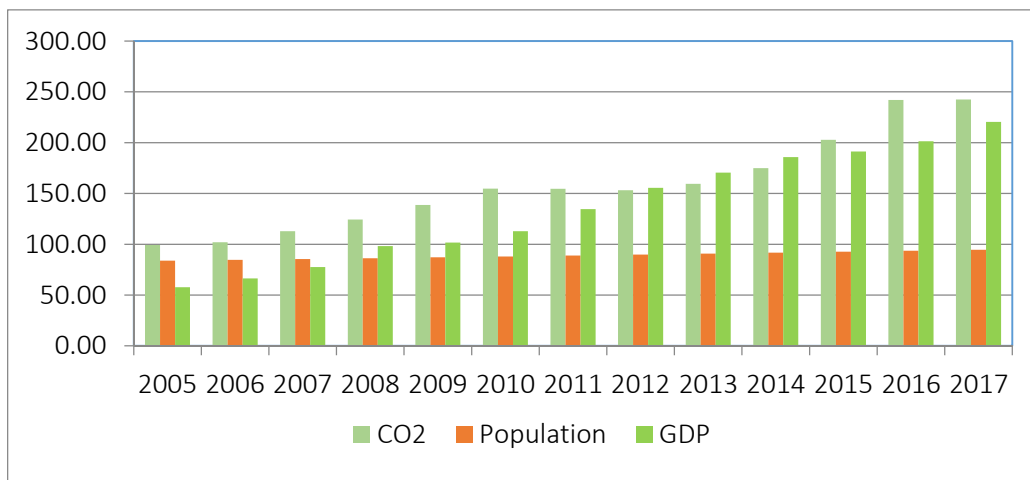


Fig. 1: CO₂ emissions, population, and GDP of Vietnam during 2005-2017.

From the given statistics of Vietnam in the period (2005-2017) and linear regression method to build a realistic model demonstrating the association between CO₂ emissions and independent variables, one follows steps of omitting statistically insignificant variables, obtaining an appropriate model for the research objectives.

Applying necessary tests with the given models, analyzing obtained results from the model, estimating CO₂ emissions when the independent variables would move in the same direction as economic and energy development policies in the future.

4. TEST RESULT AND RESEARCH ORIENTATION/METHODS IN REDUCING CO₂ EMISSION IN VIETNAM

4.1. Descriptive statistics

During the research period between 2005 and 2017, Vietnam's population increased from 83.83 million to 94.6 million people (increase by an average 1.01 percent per year), GDP also accreted from \$56.65 billion to \$220.38 billions (current prices), GDP at constant prices of \$ 2010 grew by an average of 6.39% per year.

The final energy consumption increased by an average of 4.77%/year during the research period and the electricity generation increased by 8.66%/year. As can be seen from (2005-2017) in Vietnam, the final energy consumption and electric power were not income-elastic (income elasticity 0.4). The income elasticity of electric consumption was higher than the income elasticity of final energy consumption (income elasticity of electricity demand 0.73). However, if GDP is calculated at the constant price of \$ 2010, the electricity consumption was income elasticity, the income elasticity of final energy consumption increases to 0.75. Hence, there is a difference in the calculating results between coefficients for income elasticity when GDP is calculated at current and constant prices during the research period. The proportion of industry contributed to Vietnam's GDP decreased during the research period from 41% to 33%. In contrast, the

density of fossil energy consumption in total final energy consumption increased over time from 49% to 62%, this would be a sign reasoning for escalation of CO₂ emission. At the same time, high-density Vietnam's thermal power in total electricity production would also be the cause of rising carbon emissions during the study period.

4.2. Analysis of regression models' results

Implementing estimation on the regression model representing the relationship between CO₂ emissions and independent variables as presented in Vietnam's statistics for the period 2005-2017, after omitting statistically insignificant variables yields from the last resulted model:

Model 1. Using GDP at the current price.

Table 2. The relationship between CO₂ emission and independent variables X1, X2, X5, X6

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R	0.9976					
R Square	0.9951					
Adjusted R Square	0.9927					
Standard Error	4.0224					
Observations	13					
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	4	26538.319	6634.580	410.049	0.000	
Residual	8	129.440	16.180			
Total	12	26667.759				
	<i>Coefficients</i>	<i>Std. Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-1685.736	436.883	-3.859	0.005	-2693.190	-678.283
X1	19.828	5.721	3.466	0.008	6.636	33.019
X2	-1.027	0.306	-3.361	0.010	-1.732	-0.322
X5	302.116	72.994	4.139	0.003	133.792	470.441
X6	0.006	0.002	3.420	0.009	0.002	0.009

The regression model depicts the relationship between carbon dioxide emissions and population, GDP, the density of fossil energy in total final energy consumption, and the amount of electricity produced in Vietnam, 2000-2017:

$$Y = -1685.736 + 19.828 * X1 - 1.027 * X2 + 302.116 * X5 + 0.006 * X6 \quad (3)$$

Estimated regression coefficients are statistically significant (P-value < 0.05). To accurately assess the impact of each independent variable on CO₂ emissions, it is necessary to convert the estimated regression coefficients into standardized regression coefficients.

Source: Author's calculation

Standardized regression coefficient = Non-standardized regression coefficient * [Standard deviation (X) / Standard deviation (Y)] (4)

Standardized regression coefficients corresponding to variables X1, X2, X5 and X6: 1.480; -1.194; 0.264; 0.456.

Arranging the variables in descending order based on their influences on Vietnam's CO₂ emissions, during the 2000-2017 period by absolute values of the standardized regression coefficients: X1; X2; X6 and X5 (Population, GDP, electric power and fossil energy share in total final energy consumption).

Assessing the fit of the model through (i) the coefficient of determination in the model, the adjusted coefficient of determination is quite high, the model is suitable for analyzing and forecasting; (ii) evaluate the overall significance of the estimated model by hypothesis testing $R^2 = 0$ (Sig. F = 0.000 < 0.05, reject hypothesis $R^2 = 0$). Regression models have intimated relations with established independent variables. The Durbin Watson value (DW = 2.888) falls into the range of (0-4) without autocorrelation detected between independent variables.

High coefficient of determination and adjusted coefficients of determination ($R^2 = 0.9951$; adjusted- $R^2 = 0.9927$) show the close relationship between CO₂ emissions and independent variables, the implication of explaining the fluctuation of CO₂ emissions through independent variables is promising.

According to the model results obtained from statistics between 2005 and 2017 of Vietnam, when the population, the proportion of fossil energy consumption in the total final energy consumption, the amount of electricity produced increasing steadily accrete CO₂ emissions, in which population growth has the worst influence (an increase of 1 unit of the population will accelerate CO₂ emission to 19,828 units on average). The estimated coefficient GDP is negative, meaning

that increasing GDP will reduce CO₂. This is not necessarily consistent with specific fluctuations of CO₂ emissions and GDP. However, in pragmatic settings, there could be a negative relationship between GDP and CO₂ emissions when the structure of industries shifts towards service and trade sectors or decreasing the proportion of industrial involvement and other industries in the economy relatively. With the data range from 2005-2017 and restriction/limitation of possible incomplete variables/factors affecting Vietnam's CO₂ emissions, the interpretation of signs of GDP estimated coefficient in the model could only be used to assess the relative degree of influence to other variables in the model. It is also possible to add statistics or variables showing the more detailed structural changes of sectors contributed to GDP than choosing one industrial density contributing to the GDP of Vietnam in the research period. This result is also consistent with contention of the U-curve theory (EKC - Kuznets curve in environmental economics). Therefore, the model can be fully used in analyzing the level of influences for those factors leading to the CO₂ emission of Vietnam during the research period.

The restriction of the above model can be overcome by using GDP at a fixed price (\$ 2010). The table is used with the same variables as model 1 with GDP at \$ 2010 prices.

Table 3. Vietnam's CO₂ emissions during 2005-2017 with independent variables (GDP in \$ 2010)

Year	Y (10 ⁶ t)	X1 (10 ⁶ people)	X2 (10 ⁹ \$ 2010)	X3	X4 (Ktoe)	X5	X6 (Ktoe)	X7
2005	99.24	83.83	85.352	0.41	34254.70	0.49	6102.71	0.75
2006	101.99	84.62	91.308	0.42	37609.49	0.49	5215.38	0.66
2007	112.87	85.42	97.817	0.41	40467.14	0.50	5762.69	0.66
2008	124.33	86.24	103.356	0.40	43267.10	0.53	6311.97	0.64
2009	138.73	87.09	108.935	0.40	45788.36	0.56	7153.14	0.64
2010	154.68	87.97	115.932	0.41	47444.99	0.55	8244.56	0.70
2011	154.56	88.87	123.166	0.32	48484.59	0.54	9017.27	0.60
2012	153.24	89.80	129.629	0.34	49301.57	0.53	10217.06	0.55
2013	159.43	90.75	136.658	0.33	50605.53	0.53	11065.19	0.55
2014	174.94	91.71	144.835	0.33	52247.93	0.55	12392.69	0.58
2015	202.77	92.68	154.509	0.33	54080.34	0.55	13995.12	0.65
2016	242.07	93.64	164.105	0.33	56802.27	0.62	15177.45	0.62
2017	242.46	94.60	175.284	0.33	59921.53	0.62	16538.04	0.53

Source: Energy Institute, General Statistics Office of Vietnam, Worldbank.com, ADB.org

Performing regression methods with GDP calculated at the price of \$ 2010 and omitting the variables that are

not statistically significant, the final model results obtained are:

Table 4. The relationship between CO₂ emissions and the independent variables X2, X5, X7

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R	0.998					
R Square	0.996					
Adjusted R Square	0.991					
Standard Error	3.619					
Observations	13					
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	3	26550.284	8850.095	678.028	0.000	
Residual	9	117.474	13.053			
Total	12	26667.759				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-267.689	23.651	-11.318	0.000	-321.191	-214.187
X2	1.321	0.091	14.474	0.000	1.114	1.527
X5	360.017	53.104	6.779	0.000	239.887	480.148
X7	103.931	22.787	4.561	0.001	52.383	155.479

Source: Author's calculation

Regression model 2, depicts the relationship between CO₂ emissions and GDP, the density of fossil energy use/final energy consumption, and the proportion of thermal power/total electricity produced.

$$\text{Model 2: } Y = -267,689 + 1.321 * X2 + 360,017 * X5 + 103,931 * X7 \quad (5)$$

The standardized regression coefficients are calculated similarly and arranged in descending values based off the level of influence on CO₂ emissions of X2, X5 and X7 (0.798; 0.314; 0.142). The estimated regression coefficients are statistically significant (choose 95% confidence level) and the model has practical implication when rejecting the hypothesis $R^2 = 0$ (Sig.F = 0.000 < 0.05).

Model 2, not only could these obtained results from the application of GDP calculated at constant prices explain the practical situation more closely, but also satisfying the model conditions and better explaining fluctuations in CO₂ emissions through independent variables ($R^2 = 99.56\%$). Therefore, choosing model 2 for analyzing and assessing the impacts of different factors on Vietnam's CO₂ emissions in the period of 2005-2017 is more appropriate than model 1.

Model 2 results show that by increasing GDP, increasing the proportion of fossil energy in total final energy consumption, and increasing the proportion of thermoelectricity in electricity generation all increase Vietnam's CO₂ emissions during the research period.

Increasing \$10⁹ unit of GDP (\$ 2010) would result in an average increase of 1.321 million tons of CO₂ emissions, corresponding to an increase of 1% of fossil energy share in total final energy consumption and 1% of thermoelectric proportion in electricity generation will rise CO₂ emissions in Vietnam by 360.017 million tons and 103.931 million tons relatively in 2005-2017 period.

4.3. Pathway of reducing CO₂ emissions in Vietnam

In order to reduce Vietnam's CO₂ emissions in the future, it is not necessary that reducing the country's GDP is a resolution but rather increasing GDP at a faster pace than the growth rate of CO₂ emissions or to shift the economic structure towards industries producing low emissions but high contributions to GDP, such as trade and services industry. However, the future strategy for national economic development is considered a macroscopic and complex issue that does not depend on environmental issues solely but also would be planned by competent authorities, and thus, it is completely outside the scope of the study. The analysis result shows that the density of fossil energy use in total final energy consumption and the density of thermoelectric production in total electricity production has a major impact on CO₂ emissions. Reducing the use of fossil energy and thermal power should promote and be converted into the use of biomass energy, natural gas and renewable energy. In addition, it is crucial to improve energy efficiency in general to reduce energy

intensity and the intensity of CO₂ emission in energy-consuming industries and other sectors in the economy. Energy-saving should be understood not only through its denotation applied in using energy, but also in a broader context, as using materials such as iron, steel, cement, bricks... or other national resources. Everyone should keep a good habit of maintaining economical and efficient use of energy and which then, would create a sense of self-awareness in every daily-life activities and related fields.

5. CONCLUSION

The surge in CO₂ emissions during the period 2005-2017 in Vietnam is a good sign neither for the environment, nor for national sustainable development goals. During the research period, Vietnam's CO₂ emissions were significantly affected by economic growth, increasing final energy consumption, in which a large proportion of fossil energy accounted for, and electricity production from thermal power stations in the system. Researching and evaluating factors influencing CO₂ emissions for Vietnam have become urgent actions required to reduce CO₂ emissions while maintaining socio-economic development. The regression study results of relations between CO₂ emissions and factors related to economic development (GDP, the proportion of industry contribution to GDP), society (population), energy (consumption of final energy, energy production), energy consumption structure (density of fossil energy in total final energy consumption, the density of thermoelectric production in total electricity production) depict that variables have major influences on CO₂ emission are population, GDP, the proportion of fossil energy in total final energy consumption, electricity production and the proportion of thermal power in total electricity production. Adapting the appropriate trend on these factors would have a positive impact on CO₂ emissions reduction.

Solutions to reduce CO₂ emissions in Vietnam should be implemented synchronously and diversely from policy orientation, technical and economic efficiency measures, and publicizing in the social community. It is primal to establish well-implemented policy orientations in the economical, efficient way from extraction and processing of energy to energy efficiency. In addition to lowering energy intensity and emission intensity by applying technical measures that directly impact the consumption of raw materials, consideration should be given to implementing energy price solutions, and carbon taxes on the actual energy consumption. The shift in the structure of energy consumption and electricity production from fossil energy to renewable energy needs to be advanced at an accelerated pace and called for further quantitative studies on involvement rates, maintaining environmental sustainability and preserving total system efficiency.

6. REFERENCES

- [1]. B. W. Ang, Na Liu (2007), Energy decomposition analysis: IEA model versus other methods, *Energy Policy*, Volume 35, Issue 3, 2007, Pages 1426-1432, ISSN 0301-4215.
- [2]. Faisal Mehmood Mirza, Afra Kanwal (2017), Energy consumption, carbon emissions and economic growth in Pakistan: Dynamic causality analysis, *Renewable and Sustainable Energy Reviews*, Volume 72, 2017, Pages 1233-1240, ISSN 1364-0321.
- [3]. Ghouali Yassine Zakarya, BELMOKADDEM Mostefa, SAHRAOUI Mohammed Abbes, GUELLIL Mohammed Seghir (2015), Factors Affecting CO₂ Emissions in the BRICS Countries: A Panel, *Data Analysis, Procedia Economics and Finance* 26 (2015) 114-125.
- [4]. Hiroto Shiraki et all (2020), *Applied Energy*, Volume 259, 114196, ISSN 0306-2619.
- [5]. Nguyen Thi Hoa, Kathleen B. Aviso, Dien Quang Le & Akihiro Tokai (2018), *Journal of Sustainable Development*; Vol. 11, No. 4; 2018, ISSN 1913-9063 E-ISSN 1913-9071, Published by Canadian Center of Science and Education.
- [6]. Phan Dieu Huong, Tran Thanh Lien, Pham Thu Ha (2006), Method of calculating and analyzing emissions from the energy balance table - applied to Vietnam from 1990 through 2004, *Collection of Conference papers 20th Science*, Department of Economics and Management, Published by Hanoi University of Science and Technology, Hanoi.
- [7]. IAEA (2005), *Energy indicators for sustainable development: Guidelines and methodologies*, Vienna.
- [8]. Juchul Jung, Gyoungjun Ha & Kyungwan Bae (2016), Analysis of the factors affecting carbon emissions and absorption on a university campus – focusing on Pusan National University in Korea, *Carbon management Journal*, Volume 7, 2016, issue 1-2, page 55-65.
- [9]. Z. G. Liu, S. S. Wang, J. Y. Liu, F. Liu and X. L. Fu (2016), Analysis of factors affecting CO₂ emissions by civil buildings in China's urban areas, *International Journal of Low-Carbon Technologies* 2015, 10, 460-463.
- [10]. Mustapa, S. I., Bekhet, H. A (2018), Factors Influencing CO₂ Emissions and Strategies for Emissions Reduction in Malaysian Transportation Sector, *International Journal of Engineering & Technology*, 7 (4.35) (2018) 823-829.

- [11]. Pasquale Pazienza (2015), The relationship between CO₂ and foreign direct investment in the agriculture and fishing sector of OECD countries: Evidence and policy considerations, *Intellectual Economics Volume 9* (2015) 55-66.
- [12]. Perry Sadorsky (2020), Energy related CO₂ emissions before and after the financial crisis, *Sustainability* 2020, 12, 3867; DOI:10.3390/su12093867.
- [13]. Syed Jawad Hussain Shahzad et all (2017), Carbon emission, energy consumption, trade openness and financial development in Pakistan: A revisit, *Renewable and Sustainable Energy Reviews*, Volume 70, 2017, Pages 185-192, ISSN 1364-0321.
- [14]. Le Trung Thanh, Nguyen Duc Khuong (2017), Factors Affecting CO₂ Emission in Vietnam: A panel data analysis, ISSN 2345-0037, *Organizations and markets in emerging economies*, 2017, Vol.8, No. 2(16).
- [15]. Usama Al-mulali (2012), Factors affecting CO₂ emission in the Middle East: A panel data analysis, *Energy*, Volume 44, Issue 1, 2012, Pages 564-569, ISSN 0360-5442.
- [16]. Xue-ting Jiang, Qiang Wang, Rongrong Li (2018), Investigating factors affecting carbon emission in China and the USA: A perspective of stratified heterogeneity, *Journal of Cleaner Production*, Volume 199, 2018, Pages 85-92, ISSN 0959-6526.
- [17]. Yi Liang, Dongxiao Niu, Haichao Wang and Yan Li (2017), Factors Affecting Transportation Sector CO₂ Emissions Growth in China: An LMDI, Decomposition Analysis, *Sustainability* 2017, 9, 1730.

A TAXONOMY OF ESTABLISHING ENTERPRISES IN VIETNAM: LEGAL FRAMEWORK AND MODEL DIVERSIFICATION*

Nguyen Van Lam

Department of Management Science and Law, School of Economics and Management,
Hanoi University of Science and Technology, Hanoi, Vietnam

Abstract

Every form of business has its advantages and disadvantages and the selection of a type of business depends on the willpower of investors. Therefore, the diversity of enterprise forms offer investors suitable business organization, which enables them to exercise the freedom to conduct a business. However, the current law of Vietnam has not anticipated all types of links which restricts the choices of a form of business that are available for investors. This paper examines the theoretical basis of the establishment and development and assesses the current legal status of forms of business in Vietnam. Based on that, the author makes proposals and recommendations to improve the legal framework governing the types of business in Vietnam.

Keywords: Business freedom, business law, forms of enterprises.

1. INTRODUCTION

Vietnam is on path of development and strong integration into international economy. In the market economy, the role of law is to identify the factors and create guarantee for the exercise of business freedom by respecting and recognizing the creativity of investors in forms of enterprises. One of the characteristics of the law is to be predictive to respond promptly to the social conditions and to favour greater openness for the types of business organizations in practice simultaneously. Only then the law is stable and sustainable.

Over the past three decades, Vietnamese lawmakers have introduced into the law the popular types of enterprise forms in the world such as partnership, limited liability Company (single-member or multi-member), joint stock Company, private business, which gives investors freedom of choice. It could be said that the introduction of Enterprise Law in 2005 (has changed under the 2014 Enterprise Law) replaced the 1999 Enterprise Law, which reflects the Party's directions and the Government policies of expanding the right of investors to establish an enterprise to conduct business and creates legal equality for business entities simultaneously.

The legal form of an enterprise plays an important role in not only defining the rights and obligations of the owners, but also having devastating long-term effects on the development orientations and vision of the

company in the future. Therefore, in theory and business practices, the law that stipulates to limit enterprise forms which are considered popular will restricts investors on exercising the freedom to choose forms of enterprises to conduct business, because of not covering all the type of business which has been come out, developed in the world and recorded in the history of Vietnamese Law.

2. THEORETICAL BASIS OF THE ESTABLISHMENT AND DEVELOPMENT OF ENTERPRISE FORMS

The foundation of the formation and development of all types of businesses is the exercise of citizens' right to free will, the freedom of forma associations and to conduct business. These three rights belong to the field of natural law. Particularly, business freedom is considered an important part of citizens' freedoms because "*business freedom is a system of interconnected rights that the law must recognize*" (Cuong, 2004).

Business freedom is understood as "*the ability of the entity to conduct business activities in certain forms in order to achieve the purpose of seeking profit*" (Cuong, 2004). In a larger sense, business freedom can be understood as "*Organizations and individuals are able to do as they want, to choose and to make decisions on matters in relation to business operations of the company for the purpose of profitability*" (Hai, 2016). In a narrower sense, business freedom is "An

* This study is in the content of elementary level topic at Hanoi University of Science and Technology on "Orientations for the development of legal regulations on Partnership Limited by Shares in Vietnam: Theory and practice", Code: T2018-PC-103 in 2019.

individual's right to start and run his business without intervention, restrictive delays and harassment of the government" (Terry & Anthony, 2010). In practice, each state has a different level and expression of recognizing and guaranteeing the right to business freedom, which is expressed through the provisions of law.

The content of business freedom includes a system of rights attached to business entities, which are first and foremost expressed through rights such as: "i) *Property rights*; ii) *Freedom of enterprise establishment (which includes freedom of business activities, business location and business model)*; iii) *Freedom of contracts*; iv) *Freedom in completion according to law*; v) *Self-determination in dispute resolution*" (Cuong, 2004). Therefore, the aforementioned right must be specified in the law in each country. The State not only needs to recognize, but also to protect and ensure the citizens' rights to business freedom to be effectively implemented in practices. The legal system of each country plays a crucial role in recording the content and ensuring the rights to business freedom to be enforced in practice. In other words, the legal system in a market economy serves as "*A framework for business freedom to be specified, be protected and be limited in necessary cases to ensure the sustainable development, to suit public interests, and to minimise the impacts on the right to business freedom of the different entities*" (VCCI, 2002). Business freedom is one of the basic civil rights determined by the Constitution and stipulated in detailed through relevant specialized laws. However, "*Business freedom is usually limited by liberty of others, and thus the state law must intervene*" (Hieu, 2017). Nonetheless, the interference must be based on the basic principles of state intervention in a market economy. Specifically, the State needs to interfere in business freedom when needed: "*(i) The safeguarding of social order; (ii) Protection of competitive environment; (iii) Consumer protection; (iv) Environmental protection...*" (Hieu, 2017).

It is possible to explain state intervention in business freedom by considering such meaning as: Firstly, ensuring the effectiveness of the law to business needs; secondly, ensuring equality and fairness among business entities from different economic sectors. Each state aims to protect the core values, social order and legitimate interests of subjects in society.

In Vietnam, the 2013 Constitution stipulates that everyone has the right to conduct any business activity that is not prohibited by laws. This provision "*expresses the openness and encouragement of the State to business activities of the people and enterprises. This is also an important premise to change process of thinking of state authorities for business activities*" (VCCI, 2017). Along with the Constitution, two important regulations, the 2014 Enterprise Law and the 2014 Investment Law, have

increasingly guaranteed and expanded the business freedom of investors.

In the context of business freedom, the right to freely select a type of enterprise is considered the most basic and core content. Accordingly, investors have the right to select or create business types with legal characteristics that suit their needs and desires to carry out business activities.

Basically, the differences between types of businesses can be mentioned as the ability to raise capital; owner liability; internal organization structure; involvement of owner management... Such differences create the advantages and limitations of each type of business. The choice of suitable form of business organization is very important for investors, which has a huge impact on the operation and development of the enterprise after establishment.

From the objective requirement of the economic development, there is a need for capital contribution and subjectively, investors expect to share the risk burdens in business and seek higher profits, which lead to the establishment of different types of companies.

3. EVALUATIONS OF THE CURRENT STATUS OF THE LAW REGULATING THE TYPES OF COMPANIES IN VIETNAM

In Vietnam, European company legislation was introduced into Vietnam by the French in the late 19th and first half of the 20th century. Therefore, Vietnamese company law has been greatly affected by the European company law. French commercial law is applied in different territories of Vietnam. Forms of enterprises appeared in the French colonial codes such as the Civil Code enforced in the Southern and Northern courts of 1931, the Middle Civil code and Middle Commercial Code of 1942. Vietnamese corporate law in this period were considered "*copies of French company law*" (Hai & Godon, 2005). However, after the country reunified and launched its Doi Moi Programme up to this time, many types of businesses have not been lawfully stipulated by laws.

Up to now, the establishment of the 2005 Enterprise Law and the amended 2014 Law (effective from July 1, 2015) has greatly contributed to facilitating the people to be engaged in business by choosing the diversified forms of enterprises to establish and operate. However, the lawmakers have lacked an accurate awareness of the types of businesses that remained from former times in the world and in the history of Vietnam. In order to explain the causes of the absence of regulations can be considered under the historical development aspect of the Company Law and the views of lawmakers, as following details:

Firstly, based on the history development of enterprises law in Vietnam

During the French colonial period, the French introduced the company law based on the practical activities of the marchants. However, the types of companies have not yet been able to stick to the economic activities and habits of Vietnamese people interrupted when Vietnam was divided into two regions with different legal systems. The North started the process of socialist construction after 1954 and to build a state-subsidized bureaucratic centrally-planned economy. The South followed the Republic of Vietnam regime and the 1972 Saigon Commercial Code contained provisions regarding private equity association which was continually noticed from Article 236 to 294.

After the national liberation in 1975, the State controlled all production factors and retained the right to decide on the use of production and distribution of income. A centrally planned economy consisted of two major economic sectors, namely state-owned and collective. "Only socialist economic organizations (state-owned and collective) are allowed to conduct business, while other economic sectors are restricted and banned" (Cuong, 2014). Therefore, forms of enterprises did not grow and the State did not issue the company law.

At the Congress of the Vietnamese Communist Party in 1986, Vietnam began to carry out the renovation, in which a multi-component commodity economy functioning in accordance with market mechanisms under the management of the State resulted was promoted, which in turn made possible enterprises. (Faculty of Law – Vietnam National University, 2001). The 1990 Company Law and the 1999 Enterprise Law were enacted one after the other, creating a legal basis for the types of companies to be established and developed. However, these regulations were established by subjective will of lawmakers, but not derived from practical business needs. The proof is that the 1990 Company Law stipulated two types of companies only, including joint stock and limited liability. The 1999 Enterprise Law separated limited liability company into two types of single-member and multi-member and added two forms of Partnership and Private Enterprise. However, the type of single-member limited liability company was permitted to be established by organizations only, not individuals. Until the 2005 Enterprise Law, organizations and individuals were both allowed to establish such kind of company. The initial form of partnership was only stipulated at four articles of the 1999 Enterprise Law. Up to now, the current Enterprise Law was issued in 2014 retains these types of businesses.

Secondly, based on the legislator's perspective on business freedom

In order to conduct business activities, citizens have the right of freedom to choose business lines for capital

investment, establish an enterprise, select the business model, determine the type of capital contribution assets, operate the organization system and manage enterprises structure. Therefore, the rights of citizens is to be free to choose types of businesses within the framework laws.

Citizens' freedom of doing business and state management related to legal forms of enterprises are still guaranteed and effective. According to Trien et.al (1972), the problem may derive from the point of view that the state must interfere, restrict trade freedom because it is necessary to guide the national economy to a certain purpose. The provisions on business freedom in Vietnamese law are usually the rights of enterprises, which means that business freedom only arises after the investors have chosen the type of business to establish and operate.

It is quoted in Vietnam Enterprise Law, Article 7 (2014) that: "*Rights of enterprises: 1. Freedom of doing business in the fields that are not prohibited by law. 2. Autonomy in business and selection of form of business organization; proactively select business lines, areas, forms of business; adjust business lines and scale. 3. Selection the form and method of mobilizing, allocating and using capital. 4. Proactively looking for markets, customers and signing contracts*".

Thirdly, based on the notion that there is no need to expand the new types of businesses because of the advantages of current ones that attract a huge amount of investors.

Amongst the current types of enterprises in Vietnam, Limited Liability Company (one or more than one member) and Joint Stock Company are the most popular types, favored by the majority of investors based on their advantages. The other forms, depending on the business lines, investors may choose or be required to set up according to certain types of enterprises such as Partnership, Joint Venture Company, Private Business.

In addition, when a minority of society and investors accept or choose some specific types of businesses, the law does not need to regulate them, avoiding the massive and complicated things. Legal experts also argue that whether to change the regulations on administrative procedures of Partnership Company because this type of company is not effective in practice. On Tien's research (2014), when contributing to a partnership company, the capital contributor may face with much higher risk than when lending or depositing money in a bank. In case the general partners do not work effectively, the capital contributor not only fails to gain interest but may lose his/her money but cannot blame on anyone. Therefore, although the type of partnership should not be eliminated, it is necessary to research and stipulate that

the partnership is unlimitedly responsible and does not need capital contributors.

It can be seen that, in recent years, the process of completing the legal provisions on forms of enterprises has created remarkable achievements for the economy and society. Enterprise Law has been developed to reach the needs of the real life. Through business practices, it is found that the types of companies themselves have established a firm position in the system of enterprises in Vietnam and affirmed its indispensable role in the development of social economy (Van, 2008).

4. ORIENTATION FOR COMPLETING THE LEGAL FRAMEWORK ON TYPES OF BUSINESSES IN VIETNAM

The restriction on the types of businesses is not consistent with improvement of enterprises law on expanding business freedom, and not in line with the development of the economy in practice. Up to now, the current demand for Enterprise Law should continue to be improved in the direction of expanding business freedom in accordance with the rules and integration of the market economy. The developing trend of the law is to recognize and adjust the needs of business and production activities of investors in Vietnam.

4.1. Ensuring and expanding the business freedom for citizens

The Resolution of Vietnam Politburo No.48-NQ/TW clearly defined that: *“Developing and completing the law on ownership and business freedom. Improving the mechanism to protect business freedom according to the principles that citizens can do everything which is not prohibited by law”*. In the 2013 Constitution, the right to business freedom was approached as “citizens can do what the law does not prohibit”, instead of “citizens are allowed to do what the law allows”. This is an important change in the approach of citizens' freedom on doing business. Therefore, lawmakers in Vietnam need to consider amending and supplementing the current Enterprises Law to ensure and expand business freedom for investors as followings:

Firstly, the Enterprises Law needs to be “designed” with more diversified types of business organizations so that investors have more choices to select their companies' suitable types. It is necessary to study and learn from the business forms that have been recognized by Vietnamese and international laws in order to build and record in the law.

Secondly, in order to provide legal mechanism to protect investors and related third parties, the Enterprises Law needs to “recognize” and “acknowledge” the types of business organizations which generate from real business life and are created by investors, especially in the context of Vietnamese

law does not recognize the type of business organization established by investors in practice.

4.2. Creating the legal basis for the establishment and development of various types of businesses

It can be said by Van (2008) that it is thanks to *“the diversity of economic sectors along with the freedom of doing business - the indispensable product of the multi-sector commodity economy under the market mechanism, which leads to the the diversity of business types”*. Therefore, in order to explain the formation of the types of company, some authors argue that: *“If we research on the basis of three factors, name as: facilities, management and responsibility, different types of new businesses will emerge. In other words, by law, governments have added and trimmed the kind of partnership to create other forms to help the economy develop”* (Bich & Cung, 2009).

In practice, the factors to combine into different types of companies are limited, so the types of companies formed and recognized by countries in their laws are also limited. The choice of business type depends on the conditions and requirements of the investor. It is the difference between the types of companies creating a market power which help traders to choose to establish or convert to conduct their business activities. The role of law is to recognize and create the legal framework for the forms of businesses created in real life. According to Bich & Cung (2009), *“the establishment and development of different types of companies requires a legal adjustment”*.

Example, Partnership Limited by Shares (Kommanditgesellschaft auf Aktien (KGaA) in the law of the Federal Republic of Germany is a good combination of a joint stock company and a limited partnership. The Company Law Germany's shows a flexible combination based on a combination of two types of limited liability and unlimited liability of owners to create multiple types of enterprises for investors to choose. In France, Partnership Limited by Shares has many similarities with a Joint Stock Company and a Partnership Limited as stipulated in the Commercial Code from Article L. 226-1 to Article L226-24.

In Vietnam, although the current Law on Enterprise regulates only specifies what types of claims are common, but does not take into account the types of regulation that have been regulated in the world and the history of Vietnamese law (such as Partnership Limited by Shares), the right to choose the type of business of the investor is limited. *“Perhaps, before studying abroad, we should review what was in Vietnam before. The forms of companies in Europe or America that we transform into our law have been in the law in the old regimes whose completeness and sophistication are not inferior to those of Europe and America”* (Cuong, 2006).

4.3. Completing the legal system to meet the integration requirements of the country's economy

Completing the legal system in order to carry out citizens' business freedom is a normative requirement in the current market economy in Vietnam. One of the principles expressing business freedom is "citizens can do everything that the law does not prohibit". Accordingly, the foundation of the freedom is that the Government must publish manifestly what the law prohibits. If there is no provision in the law, citizens have right to do so.

Currently, forms of enterprises in Vietnam include: one-member limited liability companies, two or more limited liability companies, joint stock companies, partnership and private companies. Thus, if the law does not provide another form, citizens still have the right to choose the form unlisted. In fact, there are no regulations on not allowing citizens the right to choose a type of business that is not stipulated in the current Enterprises Law.

4.4. Ensuring the feasibility and effectiveness of the law on types of businesses

The feasibility of the law is often evaluated based on the accordance of the content with actual socio-economic conditions. The consistency of the legal provisions with real life clearly reflects the correlation between the legal level and the level of socio-economic development. The legal provisions on Joint Stock Company must be issued at an appropriate time to meet the needs of the economy and the business life.

When drafting the amendments of the 2005 Enterprises Law, the Government identified the highest goal which is "creating new breakthroughs, contributing to economic institutional reforms, and enhancing the competitiveness of investment and business environment, in order to promote domestic internal resources and attract foreign investment" (Government, 2014).

It can not be denied that under the current conditions, the laws on enterprises need to be improved by offering a variety of types of businesses which need to be acknowledged in diversified way, especially the forms of enterprises which have the nature of linking people and simple structure and suitable with Vietnamese culture and trading habits. In addition, the legal regulations must ensure clarity, transparency, stability and safety for the investors.

5. SOME RECOMMENDATIONS TO ENSURE THE RIGHT TO FREELY CHOOSE THE TYPE OF BUSINESS

The legal system requires diversifying types of businesses as a basis for investors to choose the right type and ensure the right to choose the type of business. Because choosing the form of business before starting a

business is very important, it has a great impact on the existence and development of the business. On the contrary, "the monopoly of some types of enterprises of course does not lead to the need for transformation and also does not facilitate choice" (Cuong, 2002). Because if there are no laws clearly defining the legal status of business entities, these entities will not be able to participate in transactions, cannot conduct production and business activities.

"The purpose of law is not to eliminate and restrict freedom, but to protect and develop freedom" (Hai, 2013). The right to business freedom is seen as part of the system of citizens' rights, it is inevitable, an intrinsic human value that the state recognizes and guarantees it the conditions for reality show. When the law guarantees the right to business freedom to contribute to improving the business environment, developing businesses, enhancing and attracting all resources into production and business.

To ensure the citizens' right to freely choose the type of enterprise, our State must:

First, it is necessary to have freedom of doing business in general and the right to choose a type of business in particular according to the 2013 Constitution: The right to business freedom is approached in the direction of "citizens have the right to do everything that is not prohibited by law", which gives citizens the right to actively choose and carry out their business activities that are not prohibited by law. Therefore, specialized law must concretize the 2013 Constitution, ensuring maximum rights due to business activities to all activities of the company. In the enterprise law, it is necessary to emphasize that the rights of business are the rights of citizens, not just the rights of enterprises according to the provisions of Article 7 of the Law on Enterprises 2014.

Second, recognizing the importance of the right to freely choose the type of enterprise in the provisions of the law: Laws should only recognize and ensure the exercise of business freedoms of citizens. "Government has the responsibility to provide the necessary protective tools for the people to exercise their liberties" (Nghia, 2010).

Third, it is necessary to add new types of companies to the enterprise law: The 2014 Enterprise Law stipulates that the types of enterprises have no change compared to the 2005 enterprise law development, when the jurisprudence enters a new stage of development, it is required that lawmakers must research and build new types of businesses to suit real life. Only then will citizens be fully guaranteed the freedom to choose the type of business to conduct their business. Faced with the requirements of changing the economy and improving environmental investment, the work of perfecting the law on companies in Vietnam "must be done on the basis of selectively collecting foreign

experiences. for the law of Vietnam to increasingly approach towards integration with the world law” (Van, 1998).

Example, based on the experience of the laws of some countries on Partnership Limited by Shares and legislative techniques in Vietnam, the addition of the institution of Partnership Limited by Shares to the current Law on Enterprise's regulations is considered a superior plan and ensures consistency. The law creates an equal legal environment for all types of businesses. Specifically, the institution of the Partnership Limited by Shares is built into a separate chapter in the current Law on Enterprise.

6. CONCLUSION

The types of businesses that are regulated in the law in Vietnam today, have responded to the application of the business life realization requirements of investors. However, if the law is limited to the current types of businesses, investors are still limited in choosing the types of businesses to launch their own business fantasies. Meanwhile, business practices are rich and diverse in terms of capital contribution to become members, requiring corporate law to recognize and accept many types of businesses, ensuring investors' right to choose./.

7. REFERENCES

- [1] Bich, N. N., Cung, N. D. (2009), Company: Capital, Management and Dispute under Enterprise Law 2005, Tri thuc Publisher, pp. 19, 41.
- [2] Cuong, B. N. (2002), The role of economic law in ensuring freedom of business, Journal of legal science, (7).
- [3] Cuong, N. H (2006), Contribute to the Publication of Law Reform in Vietnam today, Judicial Publishing House.
- [4] Cuong, B. N. (2004), Some issues of business freedom in current Vietnamese laws, National Politics Publisher, Hanoi, pp. 16, 43, 23, 13.
- [5] Government (2014), Statement of the 2014 Enterprise Law project, Hanoi.
- [6] Hai, B. X. (2016) (chủ biên), Legal textbook on business subjects (1st ed.), Hồng Đức Publisher – Lawyers' Association, pp. 68.
- [7] Hai, B. X. & Gordon, W. (2005), “Transitional Adjustment Problems in Contemporary Vietnamese Company Law”, Journal of International Banking Law and Regulation, (20) (11), pp. 567-568.
- [8] Hieu, N. A. (2017), “The rationality of the law to limit business freedom of citizens”, Journal of Democracy and Law, (6) (303), pp. 6-10.
- [9] Law Faculty, Vietnam National University (2001), Vietnam economic law (3rd ed.), Hanoi National University Publisher, pp. 160.
- [10] National Assembly (2013), Constitution of 2013.
- [11] National Assembly (2014), Enterprise Law of 2014.
- [12] Nghia, P. D. (2010), Economic Law Curriculum, Public Security People Publishing, pp.102-103.
- [13] Politburo (2005), Resolution No.48-NQ/TW, Strategy of building and completing the legal system of Vietnam to 2010, orientations to 2020, Hanoi.
- [14] Van, N. T. T. (2008), Some issues about enterprises and improvement of the businesslaw in Vietnam today, National Politics Publisher, pp. 62, 65.
- [15] VCCI and World Bank (2017), Review: Business conditions and freedom of doing business in Vietnam, Hanoi, pp.1.
- [16] VCCI (2002), Report on Building business legal system to encourage market economy development, Hanoi, pp. 30.
- [17] Terry Miller & Anthony B. Kim (2010), Defining Economic Freedom, - 2010 Index of Economic Freedom, The Heritage Foundation & The WallStreet Journal, pp. 59.
- [18] Tien, V. G. (2014), Repositioning Partnership Company, http://duthaoonline.quochoi.vn/DuThao/Lists/DT_DUTHAO_LUA_T/View_Detail.aspx?ItemID=753&TabIndex=5&YKienID=444, [accessed on 6/2018].
- [19] Trien, L. T., Tho, N. V., Tan, N (1972), Vietnamese Commercial Law interpretation, Volume II, Saigon, pp. 693.

STARTING A BUSINESS WITH UNIVERSITY SPIN-OFF MODEL – SOME LEGAL PROBLEMS IN VIETNAM AND EXPERIENCES FROM CHINA

Nguyen Thi Thuy Hang^{1,*}

¹ Department of Management Science and Law, School of Economics and Management,
Hanoi University of Science and Technology, Hanoi, Vietnam

*Email: hang.nguyenthithuy@hust.edu.vn

Abstract

University Spin-off model is currently a startup trending that many scientists in universities and research institutes around the world develop priority. In Vietnam, due to many difficulties in legal regime, administrative procedures, intellectual property protection, etc., this model has not really received the appropriate investment. Meanwhile, China is one of the countries has the number of spin-off enterprises increasing rapidly and operating effectively.

The article focuses on exploiting some legal aspects related to starting a business with spin-off model in Vietnam, then contacting some policies of China in order to draw on experiences for Vietnam in proposing solutions to further promote this model at universities and building a suitable legal regime.

Keywords: Spin-off, university, legal problems, starting a business.

1. INTRODUCTION

Starting a business is no longer a strange concept in the socio-economic life of any country in the world. As science and technology developing, the needs to get rich of people is also paid more attention to invest, the start-up and technology start-up are more popular, especially in university.

Universities in the development and integration trend have 3 tasks to perform: (1) training generations of excellent students to meet social needs; (2) researching and developing the science and technology to catch up with the world's advanced research directions; (3) applying the achievements of science and technology to the nation construction. The above three tasks are linked and mutually supportive [1]. Most of the universities have been doing the first two tasks very well, but the third task still faces many difficulties. The implementation and application of scientific research results into practice are still limited. The process of commercializing these research results encounters many problems not only in terms of technology but also the related legal aspects. The spin-off model is considered as an optimal solution to this problem. However, due to legal loopholes as well as inconsistent perceptions, this model has not been commonly applied in Vietnamese universities today. Meanwhile, not only the developed countries in the world such as the US, Switzerland, Canada, etc., but also countries in Asia such as Korea, Japan and even our neighbor China, the policies on Science and technology enterprises in general as well as the spin-off model in particular are relatively popular and developed. Researching Vietnam's regulations combined with learning from Chinese experiences will be a suitable lesson for

universities in Vietnam today in process of starting a business by the spin-off model.

2. CONTENT

2.1 Definition

* Starting a business (start-up)

Starting a business means you have cherished your own business, usually you will set up a business in which you are a manager, founder or co-founder. The provision of new products, new services or even the sale of existing items on the market according to their own ideas... are called startups.

The definition of "starting a business" also changes over time with different researchers. By the turn of the 20th century, the definition of "starting a business" was perfected and expressed as the process of creating a business organization by the entrepreneur [2].

Starting a business involves many activities related to organizing the organization. The process includes generating of an idea for the enterprise (called concept development), researching the idea's potential for success, and writing a business plan. Someone who is starting a new business is called an entrepreneur. This person takes on the financial risks of the initiation, operation, and management of the business. An entrepreneur may want to establish a small, local business organized as a sole proprietorship (a business owned and operated by a single person), or he or she may hope to one day grow his or her business into a large, multinational business organized as a corporation [3].

* University Spin-off

University Spin-off is a concept that refers to a specific startup model in the field of science and technology related to universities, research institutes, scientists as well as feasibility scientific and technological research results can be commercialized in practice.

Currently, there is no unified concept of university spin-off around the world, however, through research and synthesis from many sources, we can suggest a concept that is closest and most relevant to Vietnam at present as follows: The spin-off company is a very special company and *not fully comparable to other companies such as collegiate start-ups or technology-based start-ups in general* [4]. This model is germinated from a university or research institution, separated from this parent organization to active independently. In this company, the scientists who created the scientific and technology assets will participate in the management process of the business. The spin-off which aims to exploit and commercialize research results becomes the effective choice for scientist in university nowadays.

Summary, University Spin-offs are companies created for the exploitation of products or services that are developed using knowledge or technologies generated by academic research. University spin-offs normally emerge as the initiative of researchers who put their entrepreneurial abilities to work by marketing their ideas with the assessment and, if necessary, the participation of their parent institution. The university can participate in many ways but is normally most present in the spin-off's early stages, negotiating licenses, contracts and agreements, developing business plans, looking for financial resources for the spin off, providing it with installations and state of the art scientific equipment and also hosting the company in its own institutional setting, which favors the company's development[5].

Thus, starting a business by spin-off model is the fact that universities and scientists choose the form of spin-off company to start their business with purpose to commercialize their own scientific research results in order to make a profit and bring the research product to real life.

2.2 Some legal problems about university spin-off in Vietnam

In theory, universities can choose from a range of different ways to commercialize knowledge. The first option is patents and licensing for technological inventions. The second option is to cooperate directly with enterprises, called Researching Contracts. In this case, universities direct their research to problems that a collaborative company must be faced and provide related know-how. Third option to commercialize knowledge is to form university spin-off enterprise.[1].

In particular, the form of spin-off establishment is considered as the most optimal solution and a suitable start-up method for scientists today.

According to The Special 301 Report of the Office of the United States Trade Representative (USTR), Vietnam remains on the Watch List in 2020 on intellectual property. The Special 301 Report is an annual review of the intellectual property enforcement and protection status of countries that are trading partners of the United States. Based on the results of the survey and evaluation, the USTR will rank the countries concerned about intellectual property according to two lists: Watch List and Priority Watch List. According to the 2019 Special 301 Report, Vietnam is believed to be failing to provide adequate and effective border protection measures against counterfeit and pirated goods, not adequately addressing the emerging challenge, existing and continuing related to copyright infringement, including online piracy [6]. This situation continues to be reflected in the 2020 report: *While there have been positive developments over the past year, such as the issuance of the national intellectual property (IP) strategy, continued public awareness campaigns and training activities, and reported improvements on border enforcement in some parts of the country, IP enforcement continues to be a challenge and the online sale of pirated and counterfeit goods remains a serious problem. Lack of coordination among ministries and agencies responsible for enforcement remains concerning, and capacity constraints related to enforcement persist, in part due to a lack of resources and IP expertise. Vietnam continues to rely heavily on administrative enforcement actions, which have consistently failed to deter widespread counterfeiting and piracy* [7].

Thus, although there are legal institutions on intellectual property, the system of intellectual property protection in Vietnam has not really been effective.

In addition, the linkage between the university and enterprise is being focused more but often focuses on sponsored projects rather than support and joint ventures developing on the basic of scientific research.

In particular, the legal system of science and technology still has many weaknesses. We have science and technology law, high technology law, decree guiding science and technology enterprises, but none of the documents have mentioned the concept of spin-off. Many scientists therefore become confused when there is a need to commercialize their research results.

The above shortcomings lead to the fact that there is still not a true spin-off enterprise in universities in Vietnam. Enterprises in the university may be the science and technology enterprises but they are still mainly ordinary businesses, carrying out many other activities like normal businesses beside science and

technology activities to bring profit but not really focus on the commercialization of scientific research results.

According to the Ndonzuan, et al. (2002) model, the academic spin-offs creation involves four successive stages, which are not wholly independent of each other, as follows: Stage 1: to generate business ideas from research; Stage 2: to finalize new venture projects out of ideas; Stage 3: to launch spin-off firms from projects; Stage 4: to strengthen the creation of economic value by spin-off firms [8].

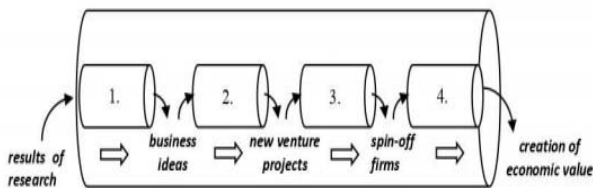


Fig. 1: The global process of valorisation by spin-offs
Source: Ndonzuan, F.N., Pirnay, F. and Surlemont, B. (2002).

Thus, the formation of university spin-off enterprise must be based on business ideas derived from researched technology. These technologies must therefore be protected by intellectual property prior to the establishment of a business, avoiding legal problems encountered in the using process.

Statistics show that, in recent years, the registration intellectual property has been paid attention and has grown somewhat. However, the growth rate for patent applications is quite slow with 4705 applications [9].

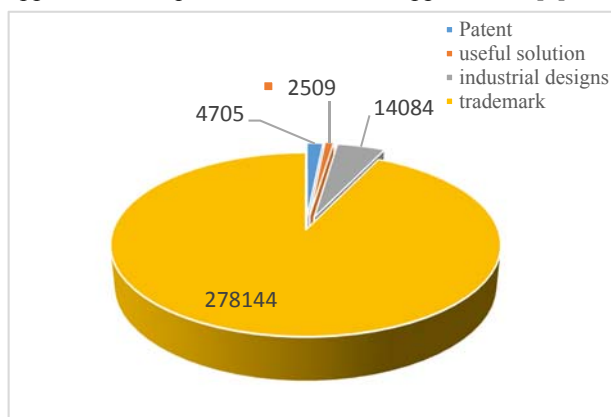


Fig.2: Rate of application for IP object registration in the period 2011-2019 [9]

Source: National Office of Intellectual Property of Vietnam

Another problem is that in stage 4, after the establishment of an enterprise, the development and inheritance of scientific and technological research results does not really become the main activity of the enterprise. Enterprises are somewhat bewildered in their operating path, making them not really on the right path of a true spin-off as mentioned above.

Decision No. 2133 / QD-TTg approving the master plan for development of Science and Technology to 2020 and a vision to 2030 dated December 1, 2011 has introduced a policy to promote commercialization of scientific and technological products, contributing to the development of the science and technology market, encourage technology incubation and spin-off enterprise development. However, to promote the birth and development of any organization or business, it is necessary to have certain preferential policies, or simplify administrative procedures, to facilitate the founder realized his desire to start a business.

The incentives for science and technology enterprises in Vietnam are currently specified in Decree No. 13/2019/ND-CP dated February 1, 2019 ("Decree13"), including incentives for exemption and reduction of corporate income tax (Article 12 - Decree13), exemption from land rent, water surface rent (Article 13 - Decree13), preferential credit (Articles 14 - Decree13), enjoy preferential taxes, other service fees (Article 16 - Decree13). These incentives will also apply to university spin-off enterprises. Despite of such a lot of incentives, science and technology businesses or spin-off have not really exploded.

According to Deputy Minister of Science and Technology Tran Van Tung, up to this point, according to the criteria of science and technology enterprises (S&T), there are more than 3,000 enterprises eligible for the certification of science and technology enterprises. In which, there were 468 enterprises granted science and technology enterprise certificates as of August 2019; 36 enterprises were granted certificates of hi-tech activities (19 enterprises were granted certificates for high-tech application projects and 17 enterprises were granted certificates of hi-tech enterprises); more than 800 enterprises have been granted patents, industrial designs, and have not yet registered for science and technology enterprises; more than 1,400 software enterprises in the information technology sector; more than 400 businesses are operating in hi-tech parks and agricultural high-tech zones... [11]

Thus, despite the conditions, enterprises in Vietnam are not very interested in applying for science and technology enterprise certificates. Therefore, university spin-off enterprises are also very difficult to establish. Some reasons can be showed such as:

First, many businesses are currently enjoying incentives in other fields with a higher or equivalent level, some incentives for science and technology enterprises are not synchronized due to different perceptions of the authorities.

Second, universities have been aware of the role of spin-off model, but they are still not very excited about the establishment of this enterprise with the aim of commercializing their research results. Scientists have many concerns about business, starting a business or

not really understanding the operating model of this business.

Third, according to current regulations, the newly born science and technology enterprises, by the end of the first year, the rate of revenue of enterprises from technology products must reach 30% of total revenue, the second year must reach 50% and the third year must reach 70%. If they do not reach this rate, they will not be recognized as a science and technology enterprise or will be revoked science and technology certification. This is a very difficult thing for a new business [12].

In addition, the incentives are universal, not really winning with the actual wishes of businesses. According to regulations, income of science and technology enterprises from production and trading of products formed from scientific and technological results are entitled to preferential corporate income tax exemption or reduction as implementing new investment projects in the field of scientific research and technological development, specifically: tax exemption for 04 years and 50% reduction of payable tax amount for the next 9 years. But for young enterprises, if there are no inputs for new products, it is very difficult for businesses to generate revenue, so tax incentives will not really make sense in this case [12]. In fact, there are many enterprises said that "we don't need tax incentives, please create a market for us. We create a product of science and technology about the environment, about construction, about fire, about health, medical waste disposal, so the first customer is the government, is the projects. If government put us in those projects, we pay taxes in full" [12].

Another problem is credit incentives. According to regulations, when meeting certain criteria, science and technology enterprises will be the National Technology Innovation Fund, Science and Technology Development Fund of ministries, ministerial-level agencies, Governmental agencies, provinces and centrally-run cities provide loaned with preferential interest rates, interest support and loan guarantees. Of course, credit always has strict regulations. No one will lend you when there is nothing to be sure you can return the loan. Therefore, in most cases collateral is required. Although the law allows intellectual property rights to be considered an asset, it is extremely difficult to get a patent or a science and technology project as collateral for a credit loan. Therefore, this incentive is necessary, but it is more important to have specific guidance on this provision in order to create conditions for businesses to access loans more easily and conveniently.

In addition, the current administrative procedures are also an obstacle preventing scientists wanting to start a business. In order to be recognized as a science and technology enterprise, enterprises must proceed a lot of procedures according to Decree 13. In case of approval under the 592 Program, it is even more complicated.

592 Program is a program of the Ministry of Science and Technology, initiated in 2012, with the aim of supporting the development of science and technology enterprises and science and technology public organizations that implement the autonomy mechanism, self-responsibility. Mr. Tran Dac Hien - currently Director of the National Department of Science and Technology Information - Ministry of Science and Technology, in an interview pointed out: maybe enterprises are afraid of the approval procedures of the 592 program, because this review process is being implemented according to the regulations of the Ministry on the management of science and technology enterprises at the national level, so the application process is quite a lot [12].

Besides that, the guiding documents for this issue are not specific and complete yet. "Decree 13" has come into effect from March 20, 2019 but until now, there is no circular to guide. Not to mention that there are still no specific document adjusting university spin-off model. This is also considered one of the barriers in the start-up process of scientists.

2.3 Experiences from China

China is one of the countries with a developed scientific and technological system. The Chinese government and many universities have had long-term policies for technology transfer modalities such as licensing, selling patents or building a spin-off enterprise model that stems from the spirit of scientists' entrepreneurship [1]. Because this investment interest, the system of science and technology enterprises in universities in China developed strongly early.

As in many countries, market-oriented reform of the Science and Technology (S&T) system in China is being enacted in tandem with market-oriented economic reform, which reached full development in the mid-1980s [12]. However, a huge system for Research and Development (R&D) developed under the centrally - planned regime from the 1950s on [10]. Specially, Chinese Academy of Science (CAS) was founded in 1949. It is a leading academic institution and comprehensive research and development center in natural science, technological science and hi-tech innovation in China. It operates over a hundred research institutes nation-wide and has over 500 private S&T spin-off enterprises [14].

The explosive development of spin-off enterprises from R&D institutions shows the correctness and timeliness of the Chinese government's system of science and technology policies.

In August of 1988, the State Council of China officially approved the implementation of Torch Program - a plan to develop hi-tech industries in China. Torch Program is the beginning of the reform to facilitate the combination of industry and technology by the market

system and of the development of high and new technology industries. *By the early 1990s, a large number of such enterprises had emerged from science and engineering R&D institutes. The number of these apparent "spin-offs" grew very rapidly following the launch of the Torch Program in 1988, which provided formal policy support for the development of such enterprises [13].*

Torch Program has really launched the rise of high-tech startups in China. Built around competitiveness clusters where incubators and financing institutions are brought together, it has evolved since its creation in 1988 by the Ministry of Science and Technology and has adapted to the country's rapid growth. Beijing's Zhongguancun, for example, is often cited as the richest technology hub and the leading technology hub among the 54 other competitive clusters. Due to its proximity to the prestigious universities of Beijing and Qinghua University, the first entrepreneurs to benefit from it are students or researchers who have come to market the work of their university research and gain access to the most qualified labor pool from the country. From these "spin-off" companies (derivative company with independent capital from the parent company) or "spin-out" (derivative company intended to be sold by the parent company) which appeared in the mid-1980s, spawned companies like Lenovo, the third largest computer producer in the world [15].

However, the origins of this kind of institutional development can be traced back to the beginning of the 1980s, and the number of spin-offs was already significant by 1988. As in other aspects of change during this period, therefore, the formalities of policy followed the practice, sanctioning and providing further support for institutional innovations that had been at least partially tested and found useful [13].

The 863 and 973 programs of the Chinese government were initiated that strongly encouraged the development of high technology in a variety of scientific and technical fields, increased the research, development and technology transfer capacity of the country. They intend to build technological capacity, create awareness of technological advancement and increase R&D- related spending in science & technology enterprises such as the establishment of science zones, hi-tech zones and Incubator combines universities and businesses within a local area [1].

Specifically, the 863 program or State High-Tech Development Plan was suggested in 1986. This was a program funded and administered by the government of China intended to stimulate the development of advanced technologies in a wide range of fields for the purpose of rendering China independent of financial obligations for foreign technologies. And the 973 Program or also known as National Basic Research Program was initiated in 1997 by the Chinese

government to develop basic research, innovations and technologies aligned with national priorities in economic development and social development.

Along with the above programs, China also enacted many policies and laws to promote and support the development of enterprises in universities, especially university spin-off.

First, the Chinese state continues to support technology projects in key areas but is also increasingly committed to improving the protection of intellectual property rights, contract law, and law for private businesses. The long-term goal is to have commercialization activities coordinated under market principles and mechanisms outside of some focus areas [1].

Second, scientists in universities had been allowed to set up spin-off enterprises. Private ownership of companies has been allowed to personnel of most universities since 2000, and today, most of the university administration in China is no longer hindered personal projects [1].

The general legal framework of the state, policies, attitudes and perspectives from universities to spin-off enterprises have changed significantly, in particular:

Top universities are increasingly taking advantage of the opportunities to improve the patent system, the number of patent applications is increasing, most prominent in this regard include Tsinghua University, Zhejiang University and Shanghai Jiaotong University [1]. In report released on April 7, 2020, the World Intellectual Property Organization (WIPO) said that China in 2019 surpassed the United States of America as the top source of international patent applications filed with WIPO amid another year of robust growth for the Organization's international intellectual property services, treaty-adherence activity and revenue base. With 58.990 applications filed in 2019 via WIPO's Patent Cooperation Treaty (PCT) System, China ended the U.S. (57,840 applications in 2019) reign as the biggest user of the PCT System that helps incentivize and spread innovation – a position previously held by the U.S. each year since the PCT began operations in 1978. The US ranked second with 57.840 applications, followed by Japan (52.660), Germany (19.353) and Korea (19.085) [16].

Many universities are also aware of technology transfer and the local development potential that can be accessed through the formation of spin-off enterprise model. Universities have begun to improve the business climate and provide financial support to scientists so that they can manage to find other outside funding on their own [1].

Not only facilitating in terms of policy for university spin-off enterprises but also in the field of start-ups, the Chinese state also invests heavily. **In August 2016, China announced the launch of an investment fund**

worth 200 billion yuan (US \$ 30 billion) to stimulate innovation and modernization of state-owned enterprises, especially by facilitating Easy event for the creation of startups, this amount of investment far exceeds that of other funds in the world combined. Although this investment fund does not really target the spin-off model, the State's interest in funding start-ups contributes to stimulating the scientists' desire to enter the business market.

3. SOLUTION AND CONCLUSION

Through actual survey, S&T enterprises were often formed in Vietnam by two main types: (1) Enterprises are formed from one department/ division or from a group of institute researchers or universities. Examples, Petroleum Products and Additives Development Company (APP) that was founded from a lubricant research department and the founder used to be the director of the Institute of Industrial Chemistry; S&T enterprise IMI Company was formed from the Research Institute of Machine Design and Industrial Tools (referred to as Industrial Machine and Tools Institute for short); Netnam Company was formed from a research group of the Institute of Technology information under Decision 68; The company produces software technology established by a research officer from the Institute of Information Technology. (2) The enterprise was established from transforming the entire public research and research institute Industrial technology. Example: Chemical industrial design institute transformed into Chemical design and consulting company (CECO) [17]. For the university spin-off, the Pharmaceutical Company from Hanoi University of Pharmacy is a typical form. The company was born and operates with the aim of implementing the research results of the lecturers and researchers of the university in order to produce effective medicinal products in the treatment and service of disease prevention and treatment disease for the people and for export.

Thus, the rise of startups is inseparable from universities and research centers. With a strong potential in science and technology, universities can completely implement the commercialization of their research results by themselves. Among the selectable ways, setting up a university spin-off enterprise to achieve start-up goals as well as bring products from the laboratory to market is considered the best solution for university as well as scientists who have entrepreneurship.

China, with its ambitions, has set out a lot of policies to promote the development of enterprises, especially science and technology enterprises and university spin-off enterprises.

The article does not depth analysis of each specific legal regulation of China, but only stops at the name of programs, policies and incentives that have created the

explosion of science and technology enterprises in this country. Combined with the pointing out some legal problems of Vietnam as mentioned above, we can point out some solutions to further promote to start a business by university spin-off model in Vietnam as follows:

Firstly, it is necessary to review the legal system to perfect mechanisms and policies to create consistency, ensure enforcement, to encourage S&T enterprises to form and develop. Quickly complete the guiding documents of Decree 13.

Secondly, implementing closely and synchronize the Intellectual Property Law, avoiding the situation in many localities that the implementation is not serious so that the infringement of intellectual property rights occurs frequently. Disseminate laws and reform administrative procedures to promote the patent granting and recognition of science and technology enterprises. To thoroughly settle violations in the field of intellectual property, creating a healthy environment for scientists entering the business market.

Thirdly, the assignment of the ownership and the right to use research results that are invested by the State, supporting institutions, enterprises, or the host organization should also be specified. At present, the procedure for transferring ownership is still complicated, if not clearly defined, it can lead to disputes in the application process between the owner and the scientist - the entrepreneur.

Besides "592 Program", we also should consider building some other programs to review and support university spin-off enterprises to establish and develop. Developing funds, ensuring the investment capital to attract businesses. Regulating suitable incentive policies that meeting the needs of entrepreneurs. Specifically, we need to promote the venture capital support funds, formation and implementation in practice the program "incubating technology" - "incubating business by forming business skills training courses to investment in the construction of business nurseries in two technology parks high (Hoa Lac and Ho Chi Minh City), a few other areas around national universities and national science centers [18]. The strong investment of China is the most obvious lesson for us in the process of considering the appropriate budget for the situation of the country as well as the needs and desires of the spin-offs.

Mr. Huynh Quyet Thang - Vice Rector of Hanoi University of Science and Technology, in an interview, pointed out three basic reasons leading to the rate of successful start-ups by teachers, scientists, and students is very low as follow: (i) administrative procedures, (ii) protection of rights and know-how of scientific and technological, (iii) the distrust of scientists (who holds the results of scientific and technological research) with investors [12]. Therefore, perfecting the legal

framework for start-up with science and technology enterprise as well as university spin-off model is extremely necessary. In this legal framework, the State special attention should be paid to clarifying the concept, structure and organization of spin-off, issues of startup incentives, business incentives and support, protection of intellectual property rights, how to commercialize research results, and especially administrative procedures, to ensure that the establishment and operation process is easy and efficient.

Summary, *spinoffs are one of the rare yet significant engines of direct commercialization of university intellectual property. They are a valuable entity because of the various benefits they bring to universities and society at large; they are a source of local and national economic growth with the capability of providing significantly higher revenue to the universities than licensing as a result of equity partnerships between universities and spinoffs [8].* Starting a business with the university spin-off model, therefore, is the most effective choice for universities and scientists in the process of commercializing their scientific and technological research results.

4. REFERENCES

- [1] Barbara Bigliardi, Francesco Galati, and Chiara Verbano (2013), "Evaluating Performance of University Spin-Off Companies: Lessons from Italy", *Journal of Technology Management & Innovation*, Volume 8, Issue 2, 178-188.
- [2] Bich Lien (2020), "Việt Nam sẽ có 5000 doanh nghiệp khoa học công nghệ", Báo điện tử Đảng Cộng sản Việt Nam, posted on 04/02/2020.
- [3] Cengage (2020), "Starting a business", Encyclopedia.com, updated on 05/9/2020.
- [4] Duong Ngoc Hong (2019), "Thực trạng khởi nghiệp đổi mới sáng tạo tại Việt Nam: khó khăn và giải pháp", *Industry and Trade Magazine* online, posted on 29/7/2019.
- [5] Hadrien Markabi (2016), "China: the State favors startups but not necessarily innovation", *Asialyst.com*, posted on 13/12/2016
- [6] Nguyen Duc Minh (2004), "Kinh nghiệm một số nước về tổ chức và hoạt động của doanh nghiệp khoa học và công nghệ - Gợi suy cho Việt Nam", *Vietnam Journal Science and Technology policies and management*, ep.3, No.4, 2014.
- [7] Nguyen Tien Thang, Nguyen Vu Nhan, To Hong Duc, Phan Thi Thuy Hang (2020), "Nghiên cứu xây dựng mô hình doanh nghiệp spin-off tại Trường Đại học Thủ đô Hà Nội nhằm thúc đẩy hoạt động thương mại hóa kết quả nghiên cứu khoa học", *Science Magazine* No. 40/2020, pp.132-141.
- [8] NOIP (2020), "Tình hình nộp đơn đăng ký và văn bằng bảo hộ các đối tượng sở hữu công nghiệp của các tỉnh, thành phố của Việt Nam trong những năm gần đây", *Asset Publisher*, 08/8/2020.
- [9] SENESCIÈNCIA (2014), "The University spinoff - La fusión entre academia e industria", *ub.edu/Senesciencia* – number 4, uploaded 04/10/2014.
- [10] Shulin Gu (1994), "Spin-off enterprises in China: Channelling the components of R&D Institutions into Innovative Businesses", *UNU/INTECH Working paper* No.16.
- [11] Svetlana Viktorovna Shvedova Irina Mikhailovna Maevskaya (2019), "Entrepreneurial university: Tools and models for integrating the third mission in education institutions, *Journal of supranational policies of education*", 2019, No.10, pp.57-77.
- [12] Swissnex China (2011), "A quick overview of Chinese S&T System", <http://Swissneschina.org>, uploaded on 8/2014.
- [13] Tran Thi Minh Nguyet (2017), "Nguyên nhân chậm phát triển của các doanh nghiệp khoa học và giải pháp để hoàn thành mục tiêu 500 doanh nghiệp khoa học công nghệ vào năm 2020", <https://moj.gov.vn>, posted on 08/9/2017.
- [14] USTR (2020), "2020 Special 301 Report", *The Office of the United States Trade Representative*, 4/2020, p.66.
- [15] Vietnam Government (2019), Decree No.13/2019/ND-CP dated 01/02/2019: Science and Technology Enterprise.
- [16] VinhBross (2020), "Xâm phạm quyền sở hữu trí tuệ ở Việt Nam và thực trạng giải quyết", https://bross.vn/Ip_New_Update, posted on 04/5/2020.
- [17] Vu Thuy Lien (2008), "Hình thành doanh nghiệp spin-off trong các tổ chức nghiên cứu và phát triển góp phần thúc đẩy thương mại hóa các kết quả nghiên cứu (trường hợp ngành dược)", *Science Master thesis* 2008 – Social Sciences and Humanitie University.
- [18] WIPO (2019), "China becomes Top Filer of International Patents in 2019 amid robust growth for WIPO's IP services, treaties and finances", <http://wipo.int>, posted on 07/4/2020.

Section 2
FINANCE AND ACCOUNTING

THE INFLUENCE OF EARNINGS MANAGEMENT ON BANK EFFICIENCY: EVIDENCE FROM FRONTIER MARKETS

Wil Martens¹, Prem Yapa², Maryam Safari², Pham T M Phuong³

¹RMIT University, Hanoi, Vietnam

²RMIT University, Melbourne, Australia

³FPT University, Hanoi, Vietnam

*Corresponding author: wil.martens@rmit.edu.vn

Abstract

This study examines the relationship between bank efficiency and earnings management (EM) using a large sample of banks from 22 frontier market countries from 2011 - 2018. We hypothesise that EM via loan loss provision (LLP) and loan loss reserves (LLR) adversely impacts bank efficiency. Employing stochastic frontier analysis as a technical efficiency measurement, and random effects and truncated regression to reveal their relationship, we find support for this prediction. Also, in three of the five geographic regions tested, efficiency scores are higher for larger banks. This finding is weakly consistent with previous studies. The inclusion of macro variables played only a limited role in the results. Overall, findings indicate that presenting persistent earnings via income smoothing reduces efficiency and makes banks less competitive. Our study makes an important contribution to the literature by deepening the understanding of the impact of EM on the technical efficiency of frontier market banks.

Keywords: Stochastic Frontier Analysis, Earnings Management, Frontier Markets, Performance Evaluation, Banking Industry, Income Smoothing, Loan Loss Provisions.

1. INTRODUCTION

This study aims to examine the impact of income smoothing on the technical efficiency of the frontier market banking sector. We apply a variety of measurement analyses quantifying the impact of income smoothing (a form of earnings management) via loan loss provisions (LLP) and loan loss reserves (LLR) on bank efficiency. The inclusion of LLP and LLR in the model is underpinned by recent empirical studies in frontier markets, e.g. (Taktak et al., 2010; Ahmed et al., 2014).

It is not uncommon for banks in frontier markets to suffer crises from solvency issues¹ from unsound practices², from regional financial market collapses³, or as a result of a global market collapse⁴. Countries experiencing such crises face wide-spread macroeconomics impacts⁵, while the banks operating within those countries experience significantly negative impacts on their performance (Grant and Wilson,

2012). To maintain financial market integrity and stability, and to protect investors, a 2014 G20 summit discussed the need to impose stricter financial disclosure guidelines within proposed reforms of global financial regulations (Avgouleas, 2009). The International Monetary Fund additionally expressed significant concerns about the under-provisioning practices of banks that expose banks to financial difficulties due to unexpected defaults or economic shocks (Ozili, 2017a; Leika et al., 2020; IMF, 2020).

Bank behaviour across frontier market countries should differ significantly from those in developed markets because bank regulatory institutions differ, as do enforcement levels (Odell and Ali, 2016). As banks often act as financial intermediaries and agents of economic growth in the markets they operate in, the level of income smoothing of frontier markets banks merits particularly close attention to ensure its practices do not mask performance shortfalls. Examination also ensures that financial reports remain accurate and informative (Choi et al., 2017).

Our study contributes to current empirical research on bank efficiency and frontier market banking system as follows: first, the applied methodological concept provides an analysis of efficiency levels based on the individual banks' inputs/outputs. Efficiency results are then compared with the estimated optimal levels. The decomposition of technical efficiency through the use of three inputs and two outputs is an important addition to the current research on bank efficiency. Second, we

¹Lithuania lost access to parts of their assets held in Russia after the collapse of the Soviet Empire, (Zoli, 2001).

² Some countries in Central and Eastern Europe and Commonwealth of Independent States possessed extensive non-performing loans during the transition processes of removing enterprise subsidies, and towards internal and external liberalisation (Tang et al., 1999).

³ 1994 Latin America debt crisis, 1997 East Asian financial crisis due to currency devaluations (Patel and Sarkar, 1998; Leung, 2009).

⁴ 2007-2008 Subprime mortgage crisis.

⁵ for example: recession and high levels of unemployment.

examine the linkages between income smoothing and bank efficiency. We apply the fixed effects and truncated regression approaches that quantify the impact of LLP and LLR as income smoothing vehicles on bank efficiency. Third, we analyse bank efficiency by size and across five geographical regions.

The efficiency methodology applied is based on the parametric model that was simultaneously introduced by Aigner et al. (1977) and Meeusen and Van Den Broeck (1977) based on a Cobb-Douglas production form of inputs and outputs individually (Addai-Asante and Sekyi, 2016). Previously, studies on bank efficiency have focused mainly on developed and developing countries. Our separate examination of frontier markets allows for specific identification of policy efficacy and regulatory needs.

The remainder of this paper is organised as follows. Section 2 reviews prior literature and outlines the study's hypotheses development. Section 3 explains the research design and describes the data sets. Section 4 presents and discusses empirical results. Section 5 concludes with key observations and recommended avenues for future research.

2. RELATED RESEARCH AND HYPOTHESES DEVELOPMENT

2.1 Frontier market contextual setting

Frontier markets are distinct from emerging or developed markets (FTSE, 2020; MSCI, 2019). The frontier market classification is less dependent on gross national income (GNI) or economy size and more on a country's political and market environment. To qualify as a frontier market country, the country must score between "partially" and "modestly" with regards to the depth and breadth of their financial markets, their legal and regulatory infrastructure, and the ease with which foreign investors can do business (MSCI, 2019). To give reference to the size of frontier markets, combined they account for approximately 11 per cent of the world's population yet only 0.43 per cent and 0.11 per cent of the world's nominal GDP and market capitalisation, respectively⁶. 5-year returns of the MSCI Frontier Market Index⁷ diverged by 55.6 per cent from the S&P Index, the latter posted positive returns, while the former posted negative⁸. Divergent market returns support Speidell and Krohne (2007)'s finding of a low correlation between frontier and developed markets. Researchers (Berger et al., 2011; Chen et al., 2014) found that frontier markets exhibit low levels of

integration with world markets. Yavas and Rezayat (2016) note that spillover effects from developed markets to global markets provide an opportunity for diversification.

In 2011, frontier markets had a combined market value of 715 billion USD; emerging-markets, the next step up on the economic development ladder, had a market value of 20 trillion USD (Speidell, 2011). As at 2016, the World Bank estimated frontier market capitalisation at 1.04 trillion USD (Bank, 2020). Increased development and idiosyncratic growth may reward investors with significant returns (or losses) in frontier markets; upside returns can, however, be stymied when firms manage their earnings in an attempt to present the appearance of consistent profits or to smooth earnings' fluctuations. EM compromises investor protection, capital market stability, and macroeconomic growth (Leuz et al., 2003).

Abidi et al. (2016) suggest frontier markets are vulnerable to capital outflows, which could jeopardise macroeconomic performance, an issue heightened after the global financial crisis. Despite this vulnerability, capital continues to flow to nations with growth opportunities and lower costs. Speidell (2011) states that a large number of foreign investors directly invested into frontier markets due to their young and growing populations, a boom in trade, investment and technological catch-up potential, rapid penetration of mobile communications, abundant natural resources, and a growing middle class. These factors combined, attest to the growth potential of frontier markets.

Following the Asian and global financial crises of 1997 and 2007-2008, many institutional reforms ensued. Reforms allowed for the participation of foreign institutions in domestic markets, the introduction of more diverse and sophisticated financial products, and persistent demands for improved accounting and auditing standards (Noble and Ravenhill, 2000; Duffie, 2018). Barriers to geographic expansion and interest rate ceilings were additionally eliminated. Young (2013) finds reformed regulatory practices and global governance institutions to be an essential dynamic in how business groups are regulated. From these reforms, commercial banks experienced substantial competition from in-state and out-state banks (Wu, 2010). Banks that can thrive in this environment offer stability and resilience; this is particularly significant in frontier markets where banks are the foremost suppliers of credit.

2.2 Efficiency studies in the frontier markets sector

Bank efficiency considers the proximity of a bank's costs to a best-practice when outputs under the same costs are taken into account (Berger and Mester, 1997). Increasing competition heightens the necessity for increased efficiency. More efficient financial institutions are more profitable and generate greater

⁶Source: World Bank, 2017.

⁷The Morgan Stanley Capital International (MSCI) Frontier Market Index captures large and mid-cap representation across frontier markets, covering about 85 per cent of the free float-adjusted market capitalisation in each country in 2017.

⁸Source: Thomson Reuters Eikon. January 2014 to December 2018. S&P returned 40.7%. MSCI Frontier Market Index return -14.9%.

intermediated fund flow (Djalilov and Piesse, 2016). How banks are impacted by increased competition depends on how efficiently they are run (Mester, 1996).

Concerning country-specific frontier market bank efficiency, in Vietnam, bank efficiency was not statistically different between pre and post public offerings (Nguyen et al., 2016). In Pakistan, the technical efficiency of Islamic banks was found to be lower than that of conventional banks when measured in terms of constant return to scale (Gishkori and Ullah, 2013). In Kenya, public sector banks displayed greater efficiency than those of private sector banks (Miencha et al., 2015). In Bulgaria, private banks exhibited greater efficiency over state-owned banks, and that European Union (EU) membership was associated with significant efficiency improvements (Tochkov and Nenovsky, 2011). In Nigeria, approximately 25 per cent of the country's banks were found to be inefficient despite mergers and acquisitions, and that market power had a positive impact on efficiency (Ajao and Ogunniyi, 2010). In Jordan, bank asset size and the number of employees were found to have an adverse relationship to bank efficiency (Bdour and Al-khoury, 2008). In Croatia, foreign-controlled banks were the most efficient, and new banks more efficient than the older banks (Jemric and Vujcic, 2002).

Research examining bank efficiency in transition economies⁹ found that consolidation increased bank efficiency. Lin and Fu (2017) note that international institutional investors participation positively impacted profit efficiency and reduced insider ownership. Olson and Zoubi (2011)'s Middle East and North African (MENA) country study revealed MENA banks to be slightly less cost-efficient than European banks, but similar to banks in developing economies. Mlambo and Ncube (2011) found South African banks's efficiency to trend upward during 1998-2008, despite the falling number of efficient banks. Additionally, Johnes et al. (2014)'s mixed-development study¹⁰ found greater inefficiency in Islamic banks than a conventional bank, and the degree of inefficiency increased over the global financial crisis. In a separate bank study, Sufian and Akbar Noor Mohamad Noor (2009) found a significant positive relationship between size, capitalisation, profitability, and efficiency. Chipalkatti and Rishi (2007) found that weaker Indian banks¹¹ had an incentive to under provision their LLPs and understate gross non-performing assets to increase capital adequacy ratios. The authors also found strong evidence that weaker banks understate their non-

performing assets. In a somewhat related study, Arora et al. (2018) find no relationship between nonperforming assets and a banks' technical efficiency, yet note that a significant source of inefficiency is a gap in technology.

The volume of literature on bank efficiency reflects its importance in academia and industry. As frontier markets transition into developed markets, frontier markets tend to liberalise, with new entrants stoking competitive forces (Arshad et al., 2019). Improved efficiency and productivity gains are goals of a bank in a competitive market and become a supplementary source of information on a banks' performance. Efficiency measurements also aid in the establishment of realistic targets during an organisation's development by highlighting performance constraints (Kamau, 2011).

2.3 Efficiency measurements

Efficiency measurement is a core concept in production economics (Devine et al., 2018). The application of an "efficient frontier" is a stricter measurement of efficiency than financial ratios because statistical techniques remove price effects and other exogenous market factors. Since Douglas and Cobb (1928)'s seminal work, there have been many attempts to quantify the maximum output for given a set of inputs¹². At the outset, researchers considered only the "average" input-output relationship assuming no inefficiency. Over time, however, this assumption could no longer be supported (Badunenko and Mozharovskyi, 2016). As a result, best practice studies are generally divided between parametric and non-parametric methods. Parametric measurement techniques require the specification of a particular frontier function, a specification not required for non-parametric methods (Murillo-Zamorano and Vega-Cervera, 2001). Data envelopment analysis (DEA), a popular non-parametric method, imposes less structure on the frontier function but does not allow for random errors (Battese et al., 2000). Conversely, stochastic frontier analysis (SFA), a parametric method, the main advantages are the allowance of measurement errors and the generation of firm-specific estimates (Ding and Sickles, 2018). The SFA approach also can distinguish inefficiency from random errors, thereby avoiding biased results.

In a dual methods bank efficiency comparison (using DEA and SFA), Silva et al. (2017) finds both methods produced a consistent trend on global efficiency scores despite differences in individual efficiency results. Silva et al. (2018) considered the trend to be of more value than the efficiency score itself. Combining

⁹Transition economies are those countries moving from a centrally planned economy to a market economy (Turley and Luke, 2012)

¹⁰Study sample: Bahrain, Bangladesh, Brunei, Egypt, Indonesia, Jordan, Kuwait, Malaysia, Mauritania, Pakistan, Palestine, Qatar, Sudan, Tunisia, Turkey, UAE and Yemen

¹¹As defined by capital adequacy ratios and earnings before provisions and contingencies

¹²Examples include Leontieff production function, constant elasticity of substitution (CES), and transcendental logarithmic production and cost functions.

factors of scale, scope, and operational efficiency,¹³ bank efficiency can range between 0 and 100 per cent. Theoretically, a bank is considered optimally efficient if it produces an output level and mix that maximises profits and minimises possible costs. However, high efficiency does not necessarily imply high effectiveness, and, indeed, most banks are not fully efficient (Kumar and Gulati, 2009).

2.4 Earnings management

There is ample evidence of income smoothing in the banking industry as banks may be more inclined than manufacturing firms to smooth their earnings (Ma, 1988; Gulzar et al., 2011; Abernathy et al., 2014). In years of notably strong or weak earnings, banks may seek to lessen earnings volatility by respectively reducing or increasing reported earnings (Ozili, 2017b). Smoothed earnings avoid potential scrutiny of the bank's financials by regulators, the market authority, or shareholders (Liu and Ryan, 2006; Beatty et al., 2002). A bank's ability to demonstrate public confidence via low stock price volatility while maximising wealth, are unique previews of the banking industry. Commercial banks also operate in highly regulated industries where regulators and accounting standard bodies scrutinise non-performing loan ratios, capital adequacy ratios, and liquidity ratios. When combined or taken separately, efforts to avoid regulations while projecting an appearance of soundness give rise to EM incentives.

How banks account for problem loans may differ, but the resultant long-run impact on net income will be consistent (Ma, 1988). Banks provision for loan losses during good economic times to absorb them during economic downturns. The magnitude of provisioning often is bolstered by statistical provisioning to anticipate the next economic cycle, but actual amounts are left to management discretion (Saurina, 2009).

Following Adams et al. (2009) and Wu et al. (2016), we test income smoothing via LLP and LLR. Increases in these provisions will consequently decrease the ratio of earnings to assets and firm book value. Kim and Kross (1998) found that banks with low regulatory capital ratios record a lower level of LLPs¹⁴. LLPs provides a mechanism for which earnings may be managed and a proxy for which it can be measured (Jin et al., 2018) and is well-suited to investigate the income increasing aspect of earnings management (Kanagaretnam et al., 2015). Dong (2012) shows a positive relationship between bank performance and LLP, potentially signalling LLP employment for income smoothing purposes. Moreover, managers may

allow LLP to increase and strengthen credit risk management capabilities due to risks arising from the lending business (Sangmi and Nazir, 2010).

Conversely, LLRs are the estimated amount of the bank's loss exposure to cover uncollectible outstanding impaired loans. LLRs of commercial banks are the largest component of bank accruals and are generally many times larger than their equity (Wahlen, 1994; Altamuro and Beatty, 2010). LLRs can be used to smooth earnings (Ahmed et al., 1999; Kilic et al., 2012; Ozili, 2017a). An "excess" of reserves is regarded as managing earnings and is viewed negatively by the accounting profession (Koch and Wall, 2000; Dolar and Drickey, 2017).

Based on the above discussions, the following hypotheses are formalised:

Ceteris paribus:

H1 *Use of Loan Loss Reserves as an EM vehicles negatively impacts bank efficiency.*

H2 *Use of Loan Loss Provisions as an EM vehicle negatively impacts bank efficiency*

3. RESEARCH DESIGN

3.1. Description of the data

This study focuses on 22 frontier countries with data from the BankFocus database for the years 2011 to 2018 inclusive. To avoid survivorship bias, past and present publicly listed commercial banks for each country are included. Banks with incomplete financial data for SFA and EM purposes are eliminated. Also eliminated are banks with less than two consecutive years of data and those with negative equity, interest expense, and total revenue. Five hundred and forty-nine banks and 3,429 observations remain after eliminations. Bangladesh is the country with the most numerous banks (52), while Argentina and Lithuania possess the least (9). Big banks outnumber small banks by 334 to 238. Geographically, Europe and the Americas respectively are the most (204) and least (11) bank-populous regions represented. An unbalanced panel data set was used, owing to bank entries and exits from markets. A complete listing of the sample by year, region, and size can be seen in Table 1.

¹³Scale efficiency measures the level of output for which the average cost is examined. Scope efficiency examines the average cost and the creation of varieties of outputs. Operational efficiency measures maximum achievable output for a given level of inputs (Said, 2012)

¹⁴LLP is an income statement expense account utilised to reflect expected future losses that can arise from their loan portfolios (Ahmed et al., 1999).

Table 1: Banks by Year, Size and Geographic Location

Panel A					Panel B									
Sample by Country and Bank Size					Sample by Year, Size and Region									
Country	Banks	N	Big	Small	Year	Bank	N	Big	Small	Africa	Americas	Asia	Europe	Middle East
Argentina	9	78	4	5	2011	41	286	35	11	6	0	13	14	13
Bahrain	26	169	19	7	2012	51	304	22	22	10	0	6	19	9
Bangladesh	53	336	37	16	2013	79	473	44	34	11	0	21	33	13
Bulgaria	24	140	13	11	2014	81	493	41	35	15	3	22	25	14
Croatia	36	220	11	25	2015	81	497	45	31	19	2	23	23	11
Estonia	12	69	3	9	2016	90	504	52	38	11	2	24	34	21
Jordan	19	130	15	4	2017	81	493	59	31	19	3	21	34	12
Kenya	45	243	14	31	2018	63	379	36	31	13	1	13	22	12
Kuwait	12	82	10	2										
Lebanon	38	226	27	11										
Lithuania	9	54	6	3										
Mauritius	24	126	11	13										
Morocco	17	92	10	7										
Nigeria	35	194	22	13										
Oman	17	108	11	6										
Pakistan	32	194	24	8										
Romania	28	155	16	12										
Serbia	29	200	12	17										
Slovenia	21	108	16	5										
Sri Lanka	23	147	13	10										
Tunisia	26	177	11	15										
Vietnam	32	181	29	3										
Total	567	3429	334	233	Total	567	3429	334	233	104	11	143	204	105

¹ Banks with total assets greater than 1 billion USD are considered big as per Siems et al. (1992) and Navaretti et al. (2019); small otherwise

² Asia includes: Bangladesh, Pakistan, Vietnam, Sri Lanka | Africa includes: Kenya Mauritius Morocco Nigeria Tunisia | Americas countries include: Argentina | European countries include: Croatia, Estonia, Lithuania, Romania, Serbia, Slovenia | Middle Eastern countries include: Bahrain, Jordan, Kuwait, Lebanon, Oman

Table 2: Descriptive Statistics of key Variables

Stochastic frontier arguments	Mean	Std.Dev	1st Quartile	Median	3rd Quartile
Price of Deposits (W1)	0.59	13.43	0.02	0.04	0.06
Price of Labor (W2)	0.02	0.02	0.01	0.01	0.02
Price of Physical Capital (W3)	6.85	113.55	0.27	0.60	1.42
Total Financial Securities (y1)	1,139,524.0	2,659,164.0	60,834.6	305,144.1	896,525.0
Total Loans (y2)	2,757,976.0	4,991,452.0	309,087.3	1,155,074.0	3,036,222.0
Total Operating Cost (TOC)	107,286.5	189,086.6	15,113.7	46,789.7	118,234.2

Regression arguments	Mean	Std.Dev	1st Quartile	Median	3rd Quartile
Total Assets	4,835,772.0	8,525,795.0	529,546.9	1,895,257.0	5,127,845.0
Fixed Assets	65,437.3	135,583.1	5,843.0	22,006.5	66,459.7
Total Deposits	3,637,405.0	6,483,415.0	345,757.9	1,375,604.0	3,858,692.0
Total Liabilities	4,302,115.0	7,715,444.0	438,516.5	1,639,897.0	4,537,809.0
Loan Loss Provisions (%)	0.01	0.05	0.00	0.01	0.01
Loan Loss Reserves (%)	0.07	0.14	0.01	0.04	0.07
Net Income Growth (%)	-0.20	7.08	-0.31	0.03	0.31

Notes: All variables are reported in thousands of USD

Table 3: Correlation Matrix of Key Variables

	w1	w2	w3	y1	y2	TOC	TA	FA	TD	TL	LLP	LLR
Price of Labor (w2)	0.1771* 1											
Price of Physical Capital (w3)	-0.0205	0.1958* 1										
Total Financial Securities (y1)	-0.0291	-0.3732*	-0.1971* 1									
Total Loans (y2))	-0.1270*	-0.4345*	-0.1642*	0.7902* 1								
Total Operating Cost (TOC)	-0.0471*	-0.1291*	-0.0765*	0.8126*	0.8914* 1							
Total Assets (TA)	-0.1043*	-0.4481*	-0.1929*	0.8801*	0.9771*	0.9136* 1						
Fixed Assets (FA)	-0.0073	-0.1871*	-0.4160*	0.7586*	0.8021*	0.8550*	0.8332* 1					
Total Deposits (TD)	-0.1727*	-0.4441*	-0.1927*	0.8657*	0.9529*	0.8847*	0.9731*	0.8152* 1				
Total Liabilities (TL)	-0.1049*	-0.4524*	-0.1922*	0.8784*	0.9759*	0.9080*	0.9973*	0.8295*	0.9808* 1			
Loan Loss Provision (%)	0.1099*	0.2219*	0.0748*	-0.0398*	-0.0047	0.0809*	-0.0235	0.0540*	-0.0211	-0.022 1		
Loan Loss Reserve (%)	-0.1081*	0.1945*	-0.0772*	-0.0367	-0.0926*	0.0147	-0.0764*	0.0548*	-0.0835*	-0.0821*	0.3758* 1	
Net Income Growth (%)	-0.0078	-0.1236*	-0.0249	0.0818*	0.1183*	0.0747*	0.1114*	0.0526*	0.1098*	0.1112*	-0.1108*-	0.1228*

Notes: Significance is identified at three levels: 0.05*, 0.01**, and 0.001*

3.2. Selection of variables

As a service industry, banks can define inputs and outputs by several different approaches. The “production” approach views banks as producers, using labour and capital to produce deposits and loans in terms of the number of accounts. The “value-added” approach states that all liabilities and assets of banks have some output characteristics, rather than categorising them as either inputs or outputs only. The “intermediation” approach assumes that banks collect deposits to transform them, using labour and capital, into loans and other assets. In the intermediation approach, banks are considered financial intermediaries connecting savers and investors (Sealey Jr and Lindley, 1977). Because the intermediation approach better

represents the role of banking in providing financial services (Berger and Humphrey, 1997; Altunbas et al., 2007; Vu and Turnell, 2010), we adopt the intermediation approach to bank inputs and outputs.

Following Ding and Sickles (2018), this study selects the following three input variables: (i) borrowed funds; (ii) labour; and (iii) capital. Borrowed funds are calculated as the quotient of interest paid on deposits over total deposits. Labour is calculated as the quotient of salary expenses over full-time equivalent employees. Capital is calculated as the quotient of amortisation and depreciation of premises and fixed assets over gross premises and fixed assets. The following two outputs are selected: (i) securities and (ii) loans. Securities are the sum of securities held to maturity and securities

available for sale. Loans are calculated as the net of gross loans less reserves for loan loss provisions. Fonseca and Gonzalez (2008) and Kanagaretnam et al. (2009) document a positive relationship between prior loan loss reserves and the provision for loan losses. Accordingly, our study follows Fonseca and Gonzalez (2008) and Cho and Chung (2016) and includes loan loss reserve in the model to control for non-discretionary proportional contribution to the loan loss provisions.

Table 2 reports descriptive statistics for the study sample. The mean and median *Loan Loss Provision* (scaled by total assets) are both 0.01, with a standard deviation of 0.05, indicating significant variation across the sample. A similar conclusion can be drawn about the *Loan Loss Reserve* (LLR) (scaled by total assets) as the mean is 0.07 with a standard deviation of 0.14. *Net Income Growth* had an overall negative mean (-0.20), while the median and standard were 0.03 and 7.08, respectively. Despite all the banks in the sample possessing similar frontier market classification characteristics, significant diversity exists.

To examine the relationship among the regressors, we include a Pearson’s correlation matrix (Table 3) of the variables from Table 2. Of note, is that most variable are statistically significantly correlated with one another, with a *Loan Loss Provision* (LLP) being a notable holdout. LLP is not significantly correlated with the other balance sheet items (Total Loans, Total Assets, and Total Liabilities). Also, the relationship between *Net Income Growth* and the *Price of Labour* and *Price of Physical Capital* were also found not be statistically significant.

3.3. Bank efficiency

This study applies the SFA approach in its estimation of efficiency. The principal idea of SFA technical efficiency (TE) can be formalised as the ratio realised output, given a specific set of inputs to a maximum attainable output, as per Eq (1):

$$TE_{it} = \frac{y_{it}}{y_{it}^*} = \frac{f(x_{it}; \beta) e^{-u_{it}} e^{v_{it}}}{f(x_{it}; \beta) e^{v_{it}}} = e^{-u_{it}} \in (0, 1] \quad (1)$$

Where y_{it}^* is the maximum attainable output for unit i given x_{it} and where $f(x_{it}; \beta)$ is a log-linear production function. ε denotes the error term.

Following researchers (Altunbas et al., 2007; Ding and Sickles, 2018; Anastasiya Shamshur, 2019), this paper specifies a cost frontier model with two-output (γ), and three-input (w), parameters via the translog functional form as per Eq (2). TOC is a vector of the dependent variable total cost, γ_m is the m^{th} bank’s outputs ($m = 1, 2$). w_n is n^{th} input price ($n = 1, 2$). w_3 is the price of borrowed funds. β is a vector of the coefficients to be estimated. v is a random error identically and independently distributed as $N(0, \sigma_{2n})$. The term μ measures the distance of an individual bank to the

efficient frontier and represents a onesided inefficiency of a bank. Subscripts denoting firm and year have been dropped for simplicity of presentation. Table 9 describes the input and output variables.

$$\ln\left(\frac{TOC}{w_3}\right) = \beta_0 + \sum_m \alpha_m \ln y_m + \sum_n \beta_n \ln\left(\frac{w_n}{w_3}\right) + \frac{1}{2} \sum_m \sum_j \alpha_{mj} \ln y_m \ln y_j + \frac{1}{2} \sum_n \sum_k \beta_{nk} \ln\left(\frac{w_n}{w_3}\right) \ln\left(\frac{w_k}{w_3}\right) + \sum_n \gamma_n \ln\left(\frac{w_n}{w_3}\right) \ln y_m + u + v \quad (2)$$

Technical inefficiency is expressed as per Eq. (3) in the following general form:

$$u_{it} = \delta_0 + \sum_{k=1}^n \delta_k z_{kit} + \omega_{kit} \quad (3)$$

where ω is stochastic noise; z denotes exogenous variables affecting bank efficiency; δ are estimated coefficients. If δ is negative (positive), it indicates a positive (negative) relationship between variables and bank efficiency. Following Eq. (2) and Eq. (3), the estimation for the parameters of the SFA model can be achieved by applying the maximum likelihood estimation method, which estimates the likelihood function in terms of two variance parameters (Kea et al., 2016) as per Eq 4:

$$\gamma = \sigma_u^2 / \sigma_s^2; \sigma_s^2 = \sigma_v^2 + \sigma_u^2 \quad (4)$$

where γ reflects the impact of random disturbances (v, u) and will fall in the range between zero and one. The closer γ is to one, the smaller the gap between actual output and maximum possible output. When γ is at one, the sample bank is fully efficient, whereas a γ close to zero, is essentially meaningless, since it indicates that SFA output is uncontrolled by random factors.

3.4. Income Smoothing

Our study also examined the impact of income smoothing through LLPs or LLRs on TE scores in the banking industry of frontier markets. Wang (2003) shows that consistent estimators of the regression coefficients can be obtained via ordinary least squares regression (OLS), notwithstanding that technical efficient regression coefficients range between zero and one. Despite the evidence supporting OLS, this paper follows Wu et al. (2016) and applies both the random effect regression and the truncated regression model for greater robustness¹⁵. Variance inflation factor test (VIF) tests for multicollinearity, report a value of 3.41

¹⁵The choice for the random effects regression stems from its out-performance over the fixed effect model in explaining mean technical efficiency (Odeck and Brthen, 2012). The Breusch-Pagan Lagrange Multiplier test supports the Hausman test, which indicates that the random effects (RE) model is most appropriate. Support of for the truncated regression over the use of a Tobit regression as per Casu and Molyneux (2003) and Batir et al. (2017), follows suggestions made by Simar and Wilson (2007) and Perelman and Serebrisky (2010) who note that the choice of a truncated model is dictated by the nature of the technical efficiency measure, which by definition is bounded at 1.0

on the full sample of data, indicating that the independent variables are not highly correlated. The final model used is stated via Eq (5).

$$TE_{it} = \alpha_0 + \alpha_1 \frac{LLP_{it}}{TA_t} + \alpha_2 \frac{LLR_{it}}{TA_t} + \alpha_3 LN Assets_{it} + \alpha_4 GROW_{it} + \alpha_5 \frac{LIAB_{it}}{TA_t} + \sum Year_i + \sum Country_i + \varepsilon_{it} \quad (5)$$

where TE is the technical efficiency based on SFA analysis. LLP and LLR are respectively loss provisions scaled by loans, and loan loss reserves scaled by loans. $LNASSETS$ is the natural logarithm of total assets and is used to control for firm size. $GROW$ is the growth rate of net income and a control variable for the growth opportunities of banks. $LIAB$ is total liabilities scaled by total assets and is a proxy for the risk taking of the individual bank. $\sum Year$ and $\sum Country$ are respectively year-specific and country-specific effect dummy variables. These dummy variables control for different levels of loss provision across countries and capture unobserved time-invariant effects not included in the regression. The error term is denoted by ε . Subscripts i and t denote company and time, respectively. This study predicts that the α_1 and α_2 coefficients will be negative if banks manage earnings using LLP and LLR vehicles.

4. RESULTS

4.1. Estimation of results for Stochastic Frontier Analysis

Table 4 shows the results of the SFA efficiency model for banking institutions for the entire population of frontier markets for the years 2011 to 2018 by country and region. Also shown are the mean scores by country and year, and the efficiency scores for large and small banks. Overall, the efficiency scores appear to fall during the sample period. Banks in Argentina and Nigeria report the lowest mean efficiency scores of 67.1 per cent and 76.7 per cent, respectively. The most efficient commercial banks are in Lithuania and Mauritius with, mean efficiency scores of 84.1 and 83.4 per cent. Figure 1 and Figure 4 provide a visual illustration of efficiency scores by year and by country.

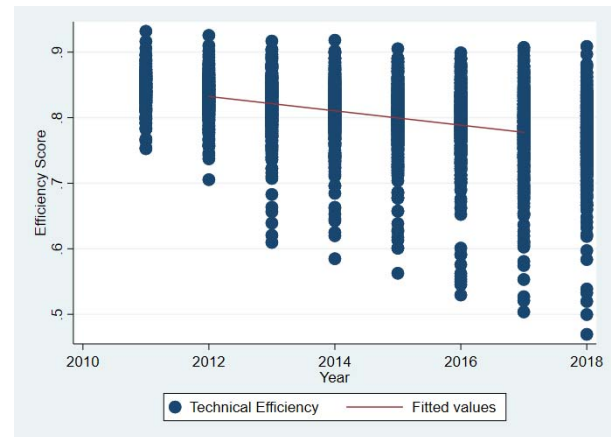


Fig 1: Efficiency Scores by Year

4.2. Efficiency scores by region

The findings in Table 4 also report the efficiency across the five geographical regions in the sample. The region with the highest mean efficiency score is Europe at 82.6 per cent efficient. The Americas is the least efficient region with a mean score of 66.7 per cent efficient. However, this should be taken with circumspection, as the Americas region includes only one country (Argentina). Additionally, Argentina faced a particularly difficult financial situation that left the country with half as many fixed assets compared to the pre-financial crisis years (years 2001 vs. 2015) and very little credit growth (Ferro et al., 2018). An examination of the most and least efficient regions finds Lithuania has the highest efficiency score in Europe, while Romania has the lowest at 84.1 per cent and 80.0 per cent, respectively. Novickyte and Drozd (2018) state Lithuanian banks markedly outperformed other banks operating in the EU, as the banking sector is dominated by foreign banks¹⁶. Figure 3 provides a visual illustration of efficiency scores by region.

¹⁶Local banks suffered heavy losses during the global financial crisis, losses which were amortised from 2012 onward (Racickas and Vasiliauskaite, 2010).

Table 4: Efficiency scores by year, country and bank size

Country	2011	2012	2013	2014	2015	2016	2017	2018	Mean	Large Banks	Small Banks
										(Mean)	(Mean)
Argentina	0.776	0.747	0.688	0.701	0.663	0.623	0.603	0.569	0.671	0.667	0.634
Bahrain	0.851	0.841	0.838	0.823	0.816	0.806	0.792	0.764	0.816	0.819	0.805
Bangladesh	0.836	0.821	0.813	0.798	0.781	0.773	0.760	0.746	0.791	0.783	0.795
Bulgaria	0.852	0.844	0.832	0.827	0.825	0.822	0.809	0.816	0.828	0.835	0.814
Croatia	0.850	0.841	0.841	0.833	0.830	0.829	0.814	0.815	0.832	0.821	0.838
Estonia	0.840	0.842	0.849	0.848	0.834	0.823	0.811	0.767	0.827	0.833	0.814
Jordan	0.862	0.849	0.831	0.818	0.809	0.800	0.783	0.767	0.815	0.811	0.825
Kenya	0.823	0.795	0.801	0.787	0.768	0.749	0.740	0.732	0.774	0.762	0.769
Kuwait	0.859	0.847	0.835	0.827	0.818	0.801	0.786	0.776	0.819	0.820	0.792
Lebanon	0.857	0.845	0.835	0.822	0.808	0.784	0.768	0.748	0.808	0.813	0.793
Lithuania	0.863	0.853	0.836	0.838	0.845	0.842	0.829	0.821	0.841	0.843	0.832
Mauritius	0.876	0.848	0.838	0.839	0.823	0.830	0.821	0.801	0.834	0.851	0.802
Morocco	0.863	0.853	0.831	0.817	0.813	0.803	0.800	0.767	0.818	0.818	0.824
Nigeria	0.816	0.794	0.784	0.768	0.753	0.756	0.736	0.726	0.767	0.754	0.781
Oman	0.855	0.841	0.815	0.797	0.787	0.770	0.762	0.745	0.796	0.813	0.737
Pakistan	0.834	0.824	0.814	0.802	0.798	0.787	0.778	0.765	0.800	0.798	0.804
Romania	0.824	0.813	0.813	0.806	0.801	0.796	0.784	0.762	0.800	0.799	0.800
Serbia	0.821	0.815	0.796	0.794	0.801	0.809	0.802	0.796	0.804	0.810	0.799
Slovenia	0.863	0.852	0.846	0.847	0.843	0.836	0.825	0.809	0.840	0.838	0.847
Sri Lanka	0.845	0.822	0.813	0.808	0.803	0.785	0.769	0.752	0.800	0.792	0.804
Tunisia	0.854	0.841	0.836	0.821	0.811	0.804	0.781	0.764	0.814	0.800	0.826
Vietnam	0.844	0.823	0.835	0.828	0.819	0.812	0.799	0.782	0.818	0.815	0.831
Mean	0.844	0.830	0.819	0.811	0.802	0.793	0.780	0.763	0.805	0.804	0.798
Region											
Africa	0.835	0.814	0.805	0.789	0.774	0.766	0.750	0.739	0.784	0.769	0.790
Americas	0.776	0.747	0.688	0.701	0.663	0.623	0.603	0.569	0.671	0.667	0.634
Asia	0.838	0.822	0.819	0.807	0.797	0.786	0.774	0.758	0.800	0.795	0.802
Europe	0.846	0.837	0.829	0.824	0.820	0.819	0.808	0.797	0.822	0.826	0.817
Middle East	0.856	0.844	0.832	0.818	0.809	0.792	0.778	0.761	0.811	0.815	0.791

¹ Results from the non-parametric Mann-Whitney test show that the null hypothesis H_0 of equality of mean technical efficiency across bank size. The null hypothesis was accepted at the 5% significance level indicating no significant difference in efficiency between large and small banks

² The Kruskal-Wallis test for equality of medians had a chi-square value of 512.592 with 4 degrees of freedom and a p-value less than 0.05, indicating the efficiency score median is unequal between regions. Levene's T-test for equal variances results in a T value of 42.12, and the null of equal variance between the groups is rejected at a p-value less than 0.05.

Table 5: Earnings Management Random Effect Regression Results

Variable	Random Effects Regression							
	All	Size		Region				
		Big	Small	Africa	Europe	Middle East	Americas	Asia
Intercept	0.767*** (0.026)	0.707*** (0.036)	0.737*** (0.047)	0.733*** (0.061)	0.774*** (0.042)	0.608*** (0.098)	-0.381 (1.003)	0.626*** (0.053)
Loan loss Provision	-0.046*** (0.010)	-0.027 (0.022)	-0.046** (0.014)	-0.146** (0.053)	-0.007 (0.011)	-0.222** (0.077)	0.837 (0.972)	-0.011 (0.050)
Loan Loss Reserves	-0.027*** (0.005)	-0.030* (0.013)	-0.022*** (0.007)	0.031 (0.020)	-0.014** (0.005)	-0.050 (0.027)	-0.656 (0.877)	-0.128*** (0.031)
Ln Total Assets	-0.001 (0.002)	0.002 (0.002)	0.004 (0.004)	0.002 (0.004)	-0.001 (0.003)	0.009 (0.007)	0.069 (0.070)	0.010* (0.004)
Net Income Growth	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.017 (0.010)	-0.000 (0.000)
Total Liabilities	0.018 (0.013)	0.027 (0.021)	-0.012 (0.022)	-0.036 (0.024)	0.046 (0.024)	0.020 (0.030)	-0.012 (0.162)	-0.019 (0.021)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F Statistic	293.79	355.45	28.22	101.90	30.43	96.37	5.85	179.21
Adj. R ²	0.515	0.671	0.087	0.69	0.142	0.65	0.561	0.715
Observations	2557	1748	809	458	857	516	35	726

Notes: Significance is denoted by the *p-value* at three levels: 0.05*, 0.01**, and 0.001***

F Statistics are significant at the 0.01 level, except Americas, which is significant at the 0.05 level.

Table 6: Earnings Management Truncated Regression Results

Variable	Truncated Regression							
	All	Size		Region				
		Big	Small	Africa	Europe	Middle East	Americas	Asia
Intercept	0.838*** (0.010)	0.822*** (0.018)	0.800*** (0.030)	0.889*** (0.014)	0.814*** (0.017)	0.725*** (0.021)	0.633*** (0.042)	0.875*** (0.015)
Loan loss Provision	-0.069*** (0.015)	-0.081 (0.043)	-0.060** (0.018)	-0.118* (0.051)	-0.020 (0.015)	-0.375*** (0.107)	0.773 (0.550)	-0.376*** (0.049)
Loan Loss Reserves	-0.040*** (0.005)	-0.100*** (0.017)	-0.031*** (0.007)	-0.077** (0.027)	-0.027*** (0.006)	-0.070 (0.039)	-0.978 (0.542)	-0.036** (0.012)
Ln Total Assets	-0.004*** (0.001)	-0.005*** (0.001)	-0.002 (0.002)	-0.004*** (0.001)	-0.002** (0.001)	-0.005** (0.001)	0.022*** (0.004)	-0.001 (0.001)
Net Income Growth	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.001)	-0.017*** (0.005)	-0.001*** (0.000)

Total Liabilities	0.009 (0.008)	0.056*** (0.014)	-0.078*** (0.014)	-0.118*** (0.017)	0.010 (0.015)	0.164*** (0.015)	-0.383*** (0.030)	-0.116*** (0.015)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R ²	0.035	0.029	0.039	0.032	0.032	0.035	0.024	0.03
Observations	2557	1748	809	458	857	516	35	726

Notes: Significance is denoted by the *p*-value at three levels: 0.05*, 0.01**, and 0.001*** All Sigma values are significant at the 0.01 level.



Fig. 2: Histogram and Kernel Density of Efficiency Scores by Region

4.3. Efficiency scores by bank size

Table 4 also presents mean efficiency scores by large and small banks at 80.4 and 79.8 per cent efficient, respectively. These mean values show large banks to be more efficient; however, a Mann-Whitney test for equality of means shows no significant difference between large and small banks. When scores were examined by size and region, 3 out of the 5 regions reported higher scores for large banks. Accordingly, our findings align with Girardone et al. (2004) and Ruslan et al. (2019) in that there is no clear relationship between size and efficiency. This may be due to external macroeconomic factors beyond the control of the bank, or internal factors such as less effective asset management.

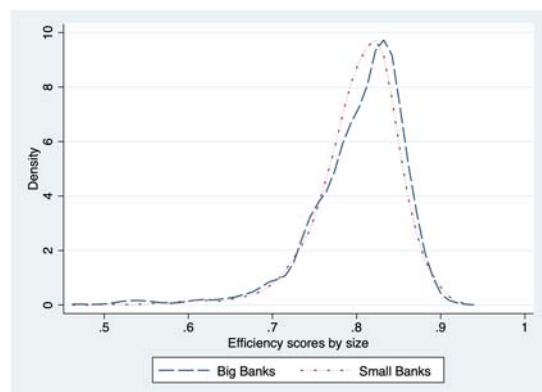


Fig. 3: Histogram and Kernel Density of Efficiency Scores by Size

4.4. Earnings management, efficiency, and regions

Tables 5 and 6 report the outcome of the full sample data assessed via random effects and truncated regression, respectively.

Regression findings signify that LLPs and LLRs are significant and also negative when applied to the entire data set (coefficients of -0.046 and -0.027 respectively for random effects regression, and -0.069 and -0.040 respectively for truncated regression). The negative coefficients for both variables suggest an inverse relationship between technical efficiency and both LLP and LLR. Results between the two methods show only slight differences in the degree of managed earnings. This finding, therefore, supports hypotheses H1 and H2.

Results from both regression models reveal a statically significant relationship between LLPs and small banks and between LLRs and both big and small banks. From this, it is inferred that large banks are more likely to employ LLRs as a vehicle to manage earnings, while small banks use both LLP and LLR to smooth earnings.

In the Americas region, our study failed to detect a meaningful relationship between efficiency and EM. These results are supported by Fonseca and Gonzalez (2008) and Jin et al. (2018), who also failed to discover a relationship. The authors suggest that greater investor protection available to investors was able to constrain EM and that the use of allowances was not for opportunistic purposes. For the other regions, the figures indicate a banks' preferences for income smoothing vehicles. In the Middle East, LLPs is preferred, while in Africa, it is LLR. The Asian region showed mixed results with both LLP and LLR being significant and negative for the random effects method, yet both LLP and LLR methods showed a significant relationship in the truncated model. Overall, European banks appear to favour LLR as an EM technique.

5. ADDITIONAL CONTROL VARIABLES

To add robustness and to mitigate a potential omitted variable bias, a number of bank and country-specific control variables were added to Eq (5). Specifically, inflation and GDP growth were included to control for the variability in accounting earnings due to macroeconomic factors. Return on Assets (ROA) was

included as a financial performance measure for to address the possibility that abnormal operating activities are correlated with firm performance (Huang and Sun, 2017). *Rule of Law* and *Regulatory Quality* were included. *Rule of Law* is an overarching norm of cultural autonomy and antithetical to corruption (Licht et al., 2007). *Regulatory Quality* is an external environment that reinforces the role of institutional shareholders in ensuring accurate reporting of earning. Regulatory quality also strengthens the effect of institutional ownership on EM (Bao and Lewellyn, 2017). *Change in Loan Losses* is a proxy for the level of risk institutions face as higher loan losses require increased LLP for the additional risk (Anandarajan et al., 2006). Commission fee and fee income (CFEE) is the ratio of commission fee and other income to total assets. Higher commission fees may indicate an interest in non-depository banking activities and a need for higher loan loss reserve allocations (Anandarajan et al., 2007; Hasan and Hunter, 1999).

Regression results show that the inclusion of control variables does not quantitatively change the main variables under the truncated regression method, however a few difference are noted. Under the random effect regression, LLP remains inversely related with efficiency but fails to show statistical significance in a few subsections of the random effects estimation and a negative relationship in the truncated regression for small banks as well as African banks. Total liabilities also shows a significant positive relationship with efficiency. Liabilities are considered a proxy for risk taking and thus a negative coefficient is to be expected. This relationship only holds under random effects regression; under truncated no significant relationship between efficiency and liabilities was found for all data, but show significantly negatively for small banks. Additional illumination on the relationship between efficiency and other controls variables are noted below while Table 7 and Table 8 show the results.

Inflation is shown to have a negative impact on efficiency under both regression estimations, whereas GDP growth is positively impacted. The logic here is that When GDP growth is robust, banks are more likely to have more deposits and higher loan growth (Dietrich and Wanzenried, 2014). Inflation conversely, influences a banks ability to allocate resources (Azad et al., 2017), Inflation's impact is particularly true when it is unpredicted for costs will rise, negatively impacting efficiency (Boyd and De Nicolo, 2005). ROA showed a significantly positive relationship with efficiency. This is inline with Adelopo et al. (2018) and Farandy et al. (2017) and suggests that higher levels of bank profitability will produce a more efficient bank. Rule of law and Regulatory Quality were not significant, suggesting that institutional frameworks do not influence costs and ergo efficiency. Change in Loan Losses, a risk proxy, was similarly found not to impact

efficiency. CFEE exhibited a strong, significant negative relationship with efficiency, which suggests that income from non-depository banking activity harms efficiency.

6. CONCLUSION

This study aims to address the question in the literature on bank efficiency and income smoothing. First, we provide results 8 of the SFA model to analyse the efficiency score of the entire population of frontier market commercial banks individually, by size and by region. Second, we assessed EM's impact on a banks' technical efficiency score. Results suggest income smoothing has a statistically significant negative impact on efficiency. The results are robust and similar conclusions are attained after running random effects regression or truncated regression.

Results indicate that managers motivated to perform income smoothing via LLPs and LLRs, encounter lower technical efficiency. These findings concur with Wu et al. (2016)'s non-parametric efficiency assessment model. This study failed to find any statistically significant relationship between the efficiency of bank size. Banks with significant assets or a large labour pools did exhibit greater efficiency. This finding concurs with Elyasiani and Mehdian (2019), yet fail to align with Colesnic et al. (2019), who found small Middle Eastern banks to possess greater efficiency. Banks with larger fixed assets may experience costlier non-performing loan disposals and are consequently less efficient. This study, thereby further illuminates the idiosyncrasies of the frontier market, a consequence of their limited transparency, weak management capabilities, and inadequate investments in productivity-enhancing activities such as technology (Iqbal, 2007).

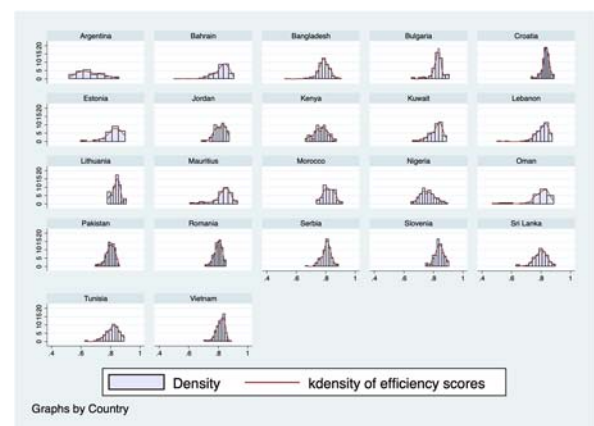


Fig. 4: Density plot of efficiency scores by country

This paper was limited to examining aggregated inputs and outputs compared to the estimated frontier level, a theoretical extension of previous research. Future research could examine the sensitivity of individual efficiency inputs and outputs to assist banks in determining where gains can be best gotten. Future

research would also be wise to control for auditor reputation as Kanagaretnam et al. (2010) note, significant constraint in income-increasing EM is provided by these variables.

Implications from the study's findings suggest that banks should review their use of non-discretionary LLPs and LLRs as EM vehicles due to their adverse impact on a bank's efficiency. As countries in the

frontier market develop, foreign competitors are apt to enter the market and capture market share. To remain competitive, banks need to maximise returns on invested inputs and recognise that the use of income smoothing vehicles harms efficiency and competitiveness.

Table 7: Earnings Management Random Effects Regression With Additional Control Variables

Variable	Random Effects Regression							
	All	Size		Region				
		Big	Small	Africa	Europe	Middle East	Americas	Asia
Intercept	0.873*** (0.018)	0.834*** (0.027)	0.968*** (0.048)	0.651*** (0.094)	0.823*** (0.042)	0.768*** (0.103)	0.935 (0.000)	0.657*** (0.057)
Loan Loss Provision	-0.017 (0.009)	-0.009 (0.022)	-0.018 (0.013)	-0.054 (0.060)	0.005 (0.010)	-0.074 (0.078)	-3.337 (0.000)	0.045 (0.063)
Loan Loss Reserves	-0.014** (0.004)	-0.007 (0.013)	-0.003 (0.007)	0.006 (0.026)	0.000 (0.005)	-0.024 (0.028)	-4.452 (0.000)	-0.098*** (0.029)
Ln Total Assets	-0.005*** (0.001)	-0.004* (0.001)	-0.016*** (0.004)	0.008 (0.006)	-0.004 (0.003)	0.003 (0.008)	0.000 (0.000)	0.011** (0.004)
Net Income Growth	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000* (0.000)
Total Liabilities	0.024* (0.010)	0.044* (0.017)	0.045* (0.023)	-0.008 (0.029)	0.068** (0.022)	-0.027 (0.030)	0.000 (0.00)	-0.042 (0.022)
Inflation	-0.001*** (0.000)	-0.001*** (0.000)	-0.002** (0.001)	-0.000 (0.001)	-0.002*** (0.001)	-0.000 (0.001)	0.000 (0.000)	-0.003*** (0.000)
GDP growth	0.001*** (0.000)	0.000* (0.000)	0.002** (0.001)	-0.003** (0.001)	0.000 (0.000)	-0.000 (0.001)	0.000 (0.000)	0.001 (0.001)
ROA	0.192*** (0.020)	0.156*** (0.043)	0.264*** (0.032)	0.376*** (0.073)	0.216*** (0.023)	0.328* (0.134)	0.000 (0.000)	-0.263** (0.096)
Rule of Law	-0.003 (0.004)	-0.006 (0.004)	0.003 (0.012)	-0.007 (0.016)	-0.020* (0.009)	-0.006 (0.011)	0.000 (0.000)	0.030*** (0.006)
Regulatory Quality	0.007 (0.005)	0.017*** (0.005)	-0.018 (0.014)	0.002 (0.024)	0.013 (0.011)	-0.014 (0.012)	0.000 (0.000)	-0.043** (0.015)
Change in Loan Losses	0.019 (0.010)	-0.021 (0.032)	0.047** (0.014)	0.089 (0.055)	0.032** (0.011)	0.014 (0.104)	0.000 (0.000)	0.018 (0.074)
CFEE	-0.978*** (0.072)	-1.136*** (0.119)	-1.096*** (0.166)	-0.146 (0.231)	-1.319*** (0.206)	-1.214*** (0.180)	0.000 (0.000)	-1.019* (0.412)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R ²	0.5134	0.6491	0.242	0.691	0.312	0.633	0.000	0.723
Observations	2557	1748	809	458	857	516	35	726

¹ Significance is denoted by the *p-value* at three levels: 0.05*, 0.01**, and 0.001***. ² Inflation data and GDP growth figures source from World Bank for the 2011 - 2018. ³ ROA is the ratio of net income to average total assets. ⁴ Rule of law sourced from World Bank and captures perceptions of the extent to which agents have confidence in and abide by the rules of society. Score are collected annually for each year and range from -2.5 to 2.5. ⁵ Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Annual data is sourced from World bank and range from -2.5 to 2.5. ⁶ Change in Loan Losses is the ratio of change in loan losses to total assets. ⁷ CFEE is ratio of commission and fee income to total asset.

Table 8: Earnings Management Truncated Regression With Additional Control Variables

Variable	Truncated Regression							
	ALL	Size		Region				
		Big	Small	Africa	Europe	Middle East	Americas	Asia
Intercept	0.877*** (0.010)	0.882*** (0.016)	0.856*** (0.029)	0.931*** (0.030)	0.864*** (0.041)	0.811*** (0.020)	0.871*** (0.078)	0.864*** (0.037)
Loan Loss Provision	-0.038* (0.016)	0.019 (0.039)	-0.043* (0.019)	0.412*** (0.066)	-0.032* (0.016)	-0.339*** (0.093)	-1.442 (0.990)	-0.303* (0.125)
Loan Loss Reserves	-0.026*** (0.005)	-0.061*** (0.015)	-0.018** (0.007)	-0.136*** (0.027)	-0.004 (0.006)	-0.103** (0.036)	-0.169 (0.698)	-0.035** (0.011)
Ln Total Assets	-0.004*** (0.001)	-0.005*** (0.001)	-0.005** (0.002)	-0.009*** (0.001)	-0.001 (0.001)	-0.007*** (0.001)	-0.007 (0.011)	-0.004** (0.001)
Net Income Growth	-0.000 (0.000)	-0.000** (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.053** (0.017)	-0.002*** (0.000)
Total Liabilities	0.002 (0.007)	0.017 (0.013)	-0.048*** (0.014)	-0.073*** (0.015)	0.003 (0.014)	0.124*** (0.014)	-0.132 (0.096)	-0.040* (0.019)
Inflation	-0.001** (0.000)	-0.001* (0.000)	-0.002 (0.001)	-0.000 (0.001)	-0.003** (0.001)	-0.000 (0.001)	0.000 (0.00)	-0.004*** (0.001)
GDP growth	0.001* (0.000)	0.000 (0.000)	0.003** (0.001)	-0.001 (0.002)	0.001 (0.001)	-0.001 (0.001)	0.000 (0.00)	-0.000 (0.002)
ROA	0.117*** (0.028)	0.337*** (0.061)	0.091* (0.036)	0.615*** (0.080)	0.071* (0.030)	0.383* (0.154)	0.000 (0.00)	0.091 (0.120)
Rule of Law	0.001 (0.008)	-0.011 (0.007)	0.028 (0.020)	0.004 (0.029)	-0.029 (0.016)	-0.005 (0.020)	0.000 (0.00)	0.038* (0.015)
Regulatory Quality	-0.004 (0.010)	0.024* (0.010)	-0.027 (0.023)	-0.016 (0.040)	0.011 (0.021)	-0.022 (0.023)	0.000 (0.00)	-0.051 (0.034)
Change in Loan Losses	-0.016 (0.017)	0.015 (0.058)	-0.017 (0.020)	0.085 (0.097)	-0.008 (0.016)	0.020 (0.182)	0.000 (0.00)	0.204 (0.181)
CFEE	-0.847*** (0.046)	-1.670*** (0.075)	-0.607*** (0.066)	-1.604*** (0.143)	-2.006*** (0.140)	-0.560*** (0.059)	0.000 (0.00)	-0.211 (0.292)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.2147	0.3169	0.2121	0.3462	0.1461	0.2262	0.004	0.1909
Observations	2557	1748	809	458	857	516	35	726

¹ Significance is denoted by the *p-value* at three levels: 0.05*, 0.01**, and 0.001***. ² Inflation data and GDP growth figures source from World Bank for the 2011 - 2018. ³ ROA is the ratio of net income to average total assets. ⁴ Rule of law sourced from World Bank and captures perceptions of the extent to which agents have confidence in and abide by the rules of society. Score are collected annually for each year and range from -2.5 to 2.5. ⁵ Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Annual data is sourced from World bank and range from -2.5 to 2.5. ⁶ Change in Loan Losses is the ratio of change in loan losses to total assets. ⁷ CFEE is ratio of commission and fee income to total asset.

Table 9: Definition of Key Variables

Symbol	Variable	Description
TOC	Total cost	Interest +non-interest expense
Outputs		
γ 1	Total loans	Net loans (gross loans - reserve for loan loss provision
γ 2	Total financial securities	Securities held to maturity and securities held for sale
Input Prices		
w1	Price of deposits	Interest expense / total deposits
w2	Price of labour	Salaries / Total Assets
w3	Price of physical capital	Expenditure on premises and fixed assets / fixed assets
Earnings Management		
TA	Total assets	Current + Non-Current Assets
FA	Fixed assets	Property, Plant, and Equipment
TL	Total liabilities	Ratio of Current + Non-Current Liabilities of Total assets
LLP (%)	Loan loss provisions	Ratio of Loan Loss Provision of Total Loans
LLR (%)	Loan loss reserves	Ratio of Loan Loss Reserves of Total Loans
GROW (%)	Net income growth	Growth Rate of Net Income

7. REFERENCES

- signaling effects. *Journal of Accounting and Economics* 28, 1-25.
- [1] Abernathy, J. L., Beyer, B., Rapley, E. T., 2014. Earnings management constraints and classification shifting. *Journal of Business Finance & Accounting* 41, 600-626. doi:10.1111/jbfa.12076.
- [2] Abidi, N., Hacibedel, M. B., Nkusu, M. M., 2016. Changing times for frontier markets: a perspective from portfolio investment flows and financial integration. volume 177. *International Monetary Fund*.
- [3] Adams, B., Carow, K. A., Perry, T., 2009. Earnings management and initial public offerings: The case of the depository industry. *Journal of Banking & Finance* 33, 2363-2372.
- [4] Addai-Asante, J., Sekyi, S., 2016. Stochastic frontier analysis of production technology: An application to the pharmaceutical manufacturing firms in Ghana. *World Journal Curr. Economics Res* 2, 1-20.
- [5] Adelopo, I., Lloydking, R., Tauringana, V., 2018. Determinants of bank profitability before, during, and after the financial crisis. *International Journal of Managerial Finance*.
- [6] Ahmed, A., Mohammed, A. Y., Adisa, A. O., 2014. Loan loss provision and earnings management in Nigerian deposit money banks. *Mediterranean Journal of Social Sciences* 5, 49-49.
- [7] Ahmed, A. S., Takeda, C., Thomas, S., 1999. Bank loan loss provisions: a reexamination of capital management, earnings management and
- [8] Aigner, D., Lovell, C. K., Schmidt, P., 1977. Formulation and estimation of stochastic frontier production function models. *Journal of Econometrics* 6, 21-37.
- [9] Ajao, A., Ogunniyi, L., 2010. Technical and scale efficiency of commercial banks in Nigeria. *IUP Journal of Applied Economics* 9, 59.
- [10] Altamuro, J., Beatty, A., 2010. How does internal control regulation affect financial reporting? *Journal of Accounting and Economics* 49, 58-74.
- [11] Altunbas, Y., Carbo, S., Gardener, E. P., Molyneux, P., 2007. Examining the relationships between capital, risk and efficiency in European banking. *European Financial Management* 13, 49-70.
- [12] Anandarajan, A., Hasan, I., McCarthy, C., 2006. The use of loan loss provisions for capital management, earnings management, and signaling by Australian banks. *Discussion Papers. Bank of Finland Research*.
- [13] Anandarajan, A., Hasan, I., McCarthy, C., 2007. Use of loan loss provisions for capital, earnings management and signalling by Australian banks. *Accounting & Finance* 47, 357-379.
- [14] Anastasiya Shamshur, L. W., 2019. Does bank efficiency influence the cost of credit? *Journal of Banking & Finance* 105, 62-73.
- [15] Arora, N., Nidhi, G. A., Kanwar, K., 2018. Non-performing assets and technical efficiency of Indian banks: a meta-frontier analysis. *Benchmarking* 25, 2105-2125. URL:

- <http://ezproxy.its.rmit.edu.au/login?url=https://search-proquest-com.ezproxy.lib.rmit.edu.au/docview/2108848885?accountid=13552>
copyright - Emerald Publishing Limited 2018; Last updated - 2019-12-20.
- [16] Arshad, S., Rizvi, S. A. R., Haroon, O., 2019. Understanding asian emerging stock markets. *Buletin Ekonomi Moneter dan Perbankan* 21, 495-510.
- [17] Avgouleas, E., 2009. The global financial crisis, behavioural finance and financial regulation: in search of a new orthodoxy. *Journal of Corporate Law Studies* 9, 23-59.
- [18] Azad, M. A. K., Munisamy, S., Masum, A. K. M., Saona, P., Wanke, P., 2017. Bank efficiency in malaysia: a use of malmquist meta-frontier analysis. *Eurasian Business Review* 7, 287-311.
- [19] Badunenko, O., Mozharovskyi, P., 2016. Nonparametric frontier analysis using stata. *The Stata Journal* 16, 550-589.
- [20] Bank, W., 2020. Market capitalization of listed domestic companies (% of gdp) – data. <https://data.worldbank.org/indicator/CM.MKT.LCAP.GD.ZS>. (Accessed on 07/21/2020).
- [21] Bao, S. R., Lewellyn, K. B., 2017. Ownership structure and earnings management in emerging markets – an institutionalized agency perspective. *International Business Review* 26, 828-838.
- [22] Batir, T. E., Volkman, D. A., Gungor, B., 2017. Determinants of bank efficiency in turkey: Participation banks versus conventional banks. *Borsa Istanbul Review* 17, 86-96.
- [23] Battese, G. E., Heshmati, A., Hjalmarsson, L., 2000. Efficiency of labour use in the swedish banking industry: a stochastic frontier approach. *Empirical Economics* 25, 623-640.
- [24] Bdour, J. I., Al-khoury, A. F., 2008. Predicting change in bank efficiency in jordan: a data envelopment analysis. *Journal of Accounting & Organizational Change* 4, 162-181.
- [25] Beatty, A. L., Ke, B., Petroni, K. R., 2002. Earnings management to avoid earnings declines across publicly and privately held banks. *The Accounting Review* 77, 547-570.
- [26] Berger, A. N., Humphrey, D. B., 1997. Efficiency of financial institutions: International survey and directions for future research. *European Journal of Operational Research* 98, 175-212.
- [27] Berger, A. N., Mester, L. J., 1997. Inside the black box: What explains differences in the efficiencies of financial institutions? *Journal of Banking & Finance* 21, 895-947.
- [28] Berger, D., Pukthuanthong, K., Yang, J. J., 2011. International diversification with frontier markets. *Journal of Financial Economics* 101, 227-242.
- [29] Boyd, J. H., De Nicolo, G., 2005. The theory of bank risk taking and competition revisited. *The Journal of finance* 60, 1329-1343.
- [30] Casu, B., Molyneux, P., 2003. A comparative study of efficiency in european banking. *Applied Economics* 35, 1865-1876.
- [31] Chen, M. P., Chen, P. F., Lee, C. C., 2014. Frontier stock market integration and the global financial crisis. *The North American Journal of Economics and Finance* 29, 84-103.
- [32] Chipalkatti, N., Rishi, M., 2007. Do indian banks understate their bad loans? *The Journal of Developing Areas* , 75-91.
- [33] Cho, M., Chung, K. H., 2016. The effect of commercial banks' internal control weaknesses on loan loss reserves and provisions. *Journal of Contemporary Accounting & Economics* 12, 61-72.
- [34] Choi, J. H., et al., 2017. *Accrual Accounting and Resource Allocation: A General Equilibrium Analysis*. Technical Report.
- [35] Colesnic, O., Kounetas, K., Michael, P., 2019. Estimating risk efficiency in middle east banks before and after the crisis: a metafrontier framework. *Global Finance Journal*, 100484.
- [36] Devine, P. J., Lee, N., Jones, R., Tyson, W. J., 2018. *An introduction to industrial economics*. Routledge.
- [37] Dietrich, A., Wanzenried, G., 2014. The determinants of commercial banking profitability in low-, middle-, and high-income countries. *The Quarterly Review of Economics and Finance* 54, 337-354.
- [38] Ding, D., Sickles, R. C., 2018. Frontier efficiency, capital structure, and portfolio risk: An empirical analysis of us banks. *BRQ Business Research Quarterly* 21, 262-277.
- [39] Djalilov, K., Piesse, J., 2016. Determinants of bank profitability in transition countries: What matters most? *Research in International Business and Finance* 38, 69-82.
- [40] Dolar, B., Drickey, K. M., 2017. The differential impact of size on earnings management practices of banks: Evidence from the financial crisis of 2008. *Journal of Business and Accounting* 10, 63-80.
- [41] Dong, X., 2012. Research on the relationship of commercial bank's loan loss provision and earning management and capital management. *Journal of Service Science and Management* 05, 171-179. doi:10.4236/jssm.2012.52021.
- [42] Douglas, P., Cobb, C.W., 1928. A theory of production. *The American Economic Review* n.k., 139-165.
- [43] Duffie, D., 2018. Financial regulatory reform after the crisis: An assessment. *Management Science* 64, 4835-4857.

- [44] Elyasiani, E., Mehdian, S., 2019. The comparative efficiency performance of small and large us commercial banks in the pre- and post-deregulation eras. *Applied Economics* 27, 1069-1079.
- [45] Farandy, A. R., Suwito, D. A., Dabutar, L. K., 2017. Efficiency of islamic banks in indonesia: Data envelopment analysis. *International Journal of Economics, Management and Accounting* 25, 337-354.
- [46] Ferro, G., Leon, S., Romero, C. A., Wilson, D., 2018. From scratch to efficiency gains after a financial crisis? a tale of a restructured banking system. *International Review of Applied Economics* 32, 119-133.
- [47] Fonseca, A., Gonzalez, F., 2008. Cross-country determinants of bank income smoothing by managing loan-loss provisions. *Journal of Banking Finance* 32, 217-228.
- [48] FTSE, 2020. *Ftse-country-classification-update-2018.pdf*. <https://research.ftserussell.com/products/downloads/FTSE-Country-Classification-Update-2018.pdf>. (Accessed on 08/19/2020).
- [49] Girardone, C., Molyneux, P., Gardener, E.P., 2004. Analysing the determinants of bank efficiency: the case of italian banks. *Applied Economics* 36, 215-227.
- [50] Gishkori, M. A., Ullah, N., 2013. Technical efficiency of islamic and commercial banks: evidence from pakistan using dea model (2007-2011). *Journal of Business and Management* 7, 68-76.
- [51] Grant, W., Wilson, G. K., 2012. *The consequences of the global financial crisis: The rhetoric of reform and regulation*. Oxford University Press.
- [52] Gulzar, M. A., et al., 2011. Corporate governance characteristics and earnings management: Empirical evidence from chinese listed firms. *International Journal of Accounting and Financial Reporting* 1, 133.
- [53] Hasan, I., Hunter, W.C., 1999. Loan loss provision and income smoothing: An analysis of the thrift industry. *Advances in Quantitative Analysis of Finance and Accounting* 7, 67-81.
- [54] Huang, X. S., Sun, L., 2017. Managerial ability and real earnings management. *Advances in accounting* 39, 91-104.
- [55] IMF, 2020. *Imf occasional paper 188 – financial sector crisis and restructuring – lessons from asia*. <https://www.imf.org/external/pubs/ft/op/opFinsec/op188.pdf>. (Accessed on 07/23/2020).
- [56] Iqbal, Z., 2007. Challenges facing islamic financial industry. *Journal of Islamic Economics, Banking and Finance* 3, 1-14.
- [57] Jemric, I., Vujcic, B., 2002. Efficiency of banks in croatia: A dea approach. *Comparative Economic Studies* 44, 169-193.
- [58] Jin, J., Kanagaretnam, K., Lobo, G. J., 2018. Discretion in bank loan loss allowance, risk taking and earnings management. *Accounting & Finance* 58, 171-193.
- [59] Johnes, J., Izzeldin, M., Pappas, V., 2014. A comparison of performance of islamic and conventional banks 2004-2009. *Journal of Economic Behavior & Organization* 103, S93-S107.
- [60] Kamau, A. W., 2011. Intermediation efficiency and productivity of the banking sector in kenya. *Interdisciplinary Journal of Research in Business* 1, 12-26.
- [61] Kanagaretnam, K., Krishnan, G. V., Lobo, G. J., 2009. Is the market valuation of banks' loan loss provision conditional on auditor reputation? *Journal of Banking & Finance* 33, 1039-1047.
- [62] Kanagaretnam, K., Lim, C. Y., Lobo, G. J., 2010. Auditor reputation and earnings management: International evidence from the banking industry. *Journal of Banking & Finance* 34, 2318-2327.
- [63] Kanagaretnam, K., Lobo, G. J., Wang, C., 2015. Religiosity and earnings management: International evidence from the banking industry. *Journal of Business Ethics* 132, 277-296.
- [64] Kea, S., Li, H., Pich, L., 2016. Technical efficiency and its determinants of rice production in cambodia. *Economics* 4, 22-n/a.
- [65] Kilic, E., Lobo, G. J., Ranasinghe, T., Sivaramakrishnan, K., 2012. The impact of sfas 133 on income smoothing by banks through loan loss provisions. *The Accounting Review* 88, 233-260.
- [66] Kim, M. S., Kross, W., 1998. The impact of the 1989 change in bank capital standards on loan loss provisions and loan write-offs. *Journal of Accounting and Economics* 25, 69-99.
- [67] Koch, T. W., Wall, L. D., 2000. *The use of accruals to manage reported earnings: Theory and evidence*. Federal Reserve Bank of Atlanta working paper 23.
- [68] Kumar, S., Gulati, R., 2009. Measuring efficiency, effectiveness and performance of indian public sector banks. *International Journal of Productivity and Performance Management* 59, 51-74.
- [69] Leika, M., Perez-Saiz, H., Stankova, O. I., Wezel, T., 2020. Stress testing in sub-saharan africa: Practices, communications, and capacity development. *International Monetary Fund* 2020, 7.
- [70] Leung, S., 2009. Banking and financial sector reforms in vietnam. *ASEAN Economic Bulletin*, 44-57.

- [71] Leuz, C., Nanda, D., Wysocki, P. D., 2003. Earnings management and investor protection: an international comparison. *Journal of Financial Economics* 69, 505-527.
- [72] Licht, A. N., Goldschmidt, C., Schwartz, S. H., 2007. Culture rules: The foundations of the rule of law and other norms of governance. *Journal of comparative economics* 35, 659-688.
- [73] Lin, Y. R., Fu, X. M., 2017. Does institutional ownership influence firm performance? evidence from china. *International Review of Economics & Finance* 49, 17-57.
- [74] Liu, C. C., Ryan, S. G., 2006. Income smoothing over the business cycle: Changes in banks' coordinated management of provisions for loan losses and loan charge-offs from the pre-1990 bust to the 1990s boom. *Accounting Review* 81, 421-441. doi:[10.2308/accr.2006.81.2.421](https://doi.org/10.2308/accr.2006.81.2.421).
- [75] Ma, C. K., 1988. Loan loss reserves and income smoothing: the experience in the US banking industry. *Journal of Business Finance & Accounting* 15, 487-497.
- [76] Meeusen, W., Van Den Broeck, J., 1977. Efficiency estimation from cobb-douglas production functions with composed error. *International Economic Review* 18, 435. URL: <http://search.ebscohost.com.ezproxy.lib.rmit.edu.au/login.aspx?direct=true&db=bth&AN=5717635&site=ehost-live&authtype=sso&custid=s5445732>.
- [77] Mester, L. J., 1996. A study of bank efficiency taking into account risk- preferences. *Journal of Banking & Finance* 20, 1025-1045. doi:[10.1016](https://doi.org/10.1016).
- [78] Miencha, I. O., Murugesan, S., Vasanth, V., Lingaraja, K., Raja, M., 2015. Efficiency measurement of kenyan commercial banks. *Mediterranean Journal of Social Sciences* 6, 621. doi:[10.5901/mjss.2015.v6n4s2p621](https://doi.org/10.5901/mjss.2015.v6n4s2p621).
- [79] Mlambo, K., Neube, M., 2011. Competition and efficiency in the banking sector in south africa. *African Development Review* 23, 4-15.
- [80] MSCI, 2019. Market classification - msci. <https://www.msci.com/market-classification>. (Accessed on 06/25/2020).
- [81] MSCI, 2019. Market classification - msci. <https://www.msci.com/market-classification>. (Accessed on 12/23/2019).
- [82] Murillo-Zamorano, L. R., Vega-Cervera, J. A., 2001. The use of parametric and non-parametric frontier methods to measure the productive efficiency in the industrial sector: A comparative study. *International Journal of Production Economics* 69, 265-275.
- [83] Navaretti, G. B., Calzolari, G., Pozzolo, A. F., de Daverio, M. T. T., 2019. Few large with many small: Banks size distribution and cross-border financial linkages. *Journal of Financial Services Research* 56, 229-258.
- [84] Nguyen, T. P. T., Nghiem, S. H., Roca, E., Sharma, P., 2016. Bank reforms and efficiency in vietnamese banks: evidence based on sfa and dea. *Applied Economics* 48, 2822-2835.
- [85] Noble, G. W., Ravenhill, J., 2000. The Asian financial crisis and the architecture of global finance. volume n.k. Cambridge University Press.
- [86] Novickyte, L., Drozd, J., 2018. Measuring the efficiency in the lithuanian banking sector: The dea application. *International Journal of Financial Studies* 6, 37. doi:[10.3390/ijfs6020037](https://doi.org/10.3390/ijfs6020037).
- [87] Odeck, J., Brthen, S., 2012. A meta-analysis of dea and sfa studies of the technical efficiency of seaports: A comparison of fixed and random-effects regression models. *Transportation Research Part A: Policy and Practice* 46, 1574-1585.
- [88] Odell, J., Ali, U., 2016. Esg investing in emerging and frontier markets. *Journal of Applied Corporate Finance* 28, 96-101.
- [89] Olson, D., Zoubi, T. A., 2011. Efficiency and bank profitability in mena countries. *Emerging Markets Review* 12, 94-110.
- [90] Ozili, P. K., 2017a. Bank earnings smoothing, audit quality and procyclicality in africa: the case of loan loss provisions. *Review of Accounting and Finance* 16, 142-161.
- [91] Ozili, P. K., 2017b. Discretionary provisioning practices among western european banks. *Journal of Financial Economics Policy* 9, 109-118.
- [92] Patel, S. A., Sarkar, A., 1998. Crises in developed and emerging stock markets. *Financial Analysts Journal* 54, 50-61.
- [93] Perelman, S., Serebrisky, T., 2010. Measuring the technical efficiency of airports in Latin America. The World Bank.
- [94] Racickas, E., Vasiliauskaite, A., 2010. Global financial crisis and its impact on lithuanian economy. *Ekonomika ir vadyba* , 1006-1017.
- [95] Ruslan, A., Pahlevi, C., Alam, S., Nohong, M., 2019. The role of efficiency mediation in the effect of banks size on bank profitability in indonesia. *Hasanuddin Economics and Business Review* 3, 49-58.
- [96] Said, A., 2012. Comparing the change in efficiency of the western and islamic banking systems. *Journal of Money, Investment and Banking* 23, 149-180.
- [97] Sangmi, P., Nazir, D., 2010. Analyzing financial performance of commercial banks in india: Application of camel model. *Pakistan Journal of Commerce and Social Sciences* 4, n.k.
- [98] Saurina, J., 2009. Loan loss provisions in spain. a working macroprudential tool. *Revista de Estabilidad Financiera* 17, 11-26.
- [99] Sealey Jr, C. W., Lindley, J. T., 1977. Inputs, outputs, and a theory of production and cost at depository financial institutions. *The Journal of Finance* 32, 1251-1266.

- [100] Siems, T. F., et al., 1992. Quantifying management's role in bank survival. *Economic Review* 20, 29-41.
- [101] Silva, T. C., Tabak, B. M., Cajueiro, D. O., Dias, M. V. B., 2017. A comparison of dea and sfa using micro-and macro-level perspectives: Efficiency of chinese local banks. *Physica A: Statistical Mechanics and its Applications* 469, 216-223.
- [102] Silva, T. C., Tabak, B. M., Cajueiro, D.O., Dias, M.V.B., 2018. Adequacy of deterministic and parametric frontiers to analyze the efficiency of indian commercial banks. *Physica A: Statistical Mechanics and its Applications* 506, 1016-1025. doi:10.1016.
- [103] Simar, L., Wilson, P. W., 2007. Estimation and inference in two-stage, semi-parametric models of production processes. *Journal of econometrics* 136, 31-64.
- [104] Speidell, L., 2011. Frontier markets equity investing: Finding the winners of the future. CFA Institute Research Foundation M2011-2 n.k.
- [105] Speidell, L., Krohne, A., 2007. The case for frontier equity markets. *Journal of Investing* 16, 12-22,4.
- [106] Sufian, F., Akbar Noor Mohamad Noor, M., 2009. The determinants of islamic banks' efficiency changes: Empirical evidence from the mena and asian banking sectors. *International Journal of Islamic and Middle Eastern Finance and Management* 2, 120-138.
- [107] Taktak, N. B., Zouari, S. B. S., Boudriga, A., 2010. Do islamic banks use loan loss provisions to smooth their results? *Journal of Islamic Accounting and Business Research* .
- [108] Tang, H., Zoli, E., Klytchnikova, I., 1999. Banking crises in transition economies: fiscal costs and related issues. The World Bank.
- [109] Tochkov, K., Nenovsky, N., 2011. Institutional reforms, eu accession, and bank efficiency in transition economies: Evidence from Bulgaria. *Emerging Markets Finance and Trade* 47, 113-129. doi:10.2753.
- [110] Turley, G., Luke, P. J., 2012. *Transition economics: Two decades on*. Routledge.
- Vu, H. T., Turnell, S., 2010. Cost efficiency of the banking sector in vietnam: A bayesian stochastic frontier approach with regularity constraints. *Asian Economic Journal* 24, 115-139.
- [111] Wahlen, J. M., 1994. The nature of information in commercial bank loan loss disclosures. *Accounting Review* , 455-478.
- [112] Wang, H. J., 2003. A stochastic frontier analysis of financing constraints on investment: the case of financial liberalization in taiwan. *Journal of Business & Economic Statistics* 21, 406-419.
- [113] Wu, J., 2010. The role of state ownership in commercial banks: Experience of cee transition countries .
- [114] Wu, Y. C., Ting, I. W. K., Lu, W. M., Nourani, M., Kweh, Q. L., 2016. The impact of earnings management on the performance of asean banks. *Economic Modelling* 53, 156-165.
- [115] Yavas, B.F., Rezayat, F., 2016. Country etf returns and volatility spillovers in emerging stock markets, europe and usa. *International journal of emerging markets* 11, 419-437. URL: <http://ezproxy.its.rmit.edu.au/login?url=https://search-proquest-com.ezproxy.lib.rmit.edu.au/docview/1835027950?accountid=13552>. date revised - 2016-11-02; Last updated - 2016-11-02.
- [116] Young, K., 2013. Financial industry groups' adaptation to the post-crisis regulatory environment: Changing approaches to the policy cycle. *Regulation & Governance* 7, 460-480.
- [117] Zoli, M. E., 2001. Cost and effectiveness of banking sector restructuring in transition economies. 1-157, *International Monetary Fund*.

CAN THE PERFORMANCE-BASED BUDGETING REAP THE BEST RESULT THROUGH IMPLEMENTATION OF PUBLIC SECTOR SCORECARD? INSIGHT INTO THE MEDIATING ROLE OF ORGANIZATIONAL CULTURE CHARACTERISTICS

Pham Quang Huy¹ and Vu Kien Phuc²

¹ School of Accounting, University of Economics Ho Chi Minh City, Vietnam

² School of Accounting, University of Economics Ho Chi Minh City, Vinh Long Campus, Vietnam

*Corresponding author: pquanghuy@ueh.edu.vn

Abstract

Performance-based budgeting (PBB) has been well-acknowledged as predominant technique which generated a considerable support for the public sector organizations (PSOs) to manage public resources in efficient and effective manner. This research set its sight to leave no stone unturned on the relationship between implementation of public sector scorecard (IPSS) and PBB, and through mediating role of organizational culture characteristics (OCC). The hypothesized framework which expounded the influence of IPSS on PBB through above stated mediator was empirically proved out utilizing a questionnaire-based survey established and administered to a variety of regions in the South Vietnam. In doing so, the data gathered based on convenience and snowball sample of 712 PSOs was analyzed through structural equation modeling (SEM) procedure. The result analyses shed light on the association between IPSS and PBB. In addition, OCC was ascertained to illustrated a statistically significant impact on PBB and acted as a partial mediator on the interconnection between IPSS and PBB. Thus, the observations of the study could increase the deeper knowledges for both scholars and practitioners into the advantages of IPSS, CC and PBB. Besides, it also offered insights on how to designing and manage the IPSS to reap the fruitful success in PBB.

Keywords: Organizational Culture Characteristics, Performance-based Budgeting, Public Sector, Public sector scorecard.

1. INTRODUCTION

Budget has been well-regarded as the most critical issue in an organization (Friyani & Hernando, 2019). The sensitivity and significance of developing the efficiency in budgeting by means of PBB have been the creativity of new public management (Mkasiwa & Gaspar, 2014). Indeed, PBB has been considered as a budgeting mechanism which ideally associated programs with outcomes (Adel Azar et al., 2019) through incorporating performance measures into the budgeting process (Dunning, 2014) with target at gaining public expenses in an efficient and effective way as well as attaining the greater performance (Dunning, 2014). Building on the consensus of numerous researchers, PBB instrument have proved to be by far the most exceptional of other budgeting approaches in such aspects as the capacity of ameliorating in agency program results, decision-making support and coordination between agencies and the legislature (Avwokeni, 2016), enhancing the organizational accountability and transparency (Sterek & Scheers, 2006), advancing organizational flexibility and efficiency (Jakobsen & Pallesen, 2016), straightening staff out by uplifting responsibility

(Helmuth, 2010), sharpening public fund managements in an efficient manner (Clark et al., 2018). Unfortunately, a large body of literature has documented that the actual utilization of performance budgeting was recurrently characterized by restrained performance information and usage of the information offered (Mikesell & Mullins, 2011; Moynihan, 2006). Concretely, numerous decisions related to the utilization of performance information have been prepared for political aims (Moynihan, 2006). Similarly, Lu (1998) indicated the lack of clarity in the application of performance information and performance measurement during the budgeting process in public sector (PS). Alternatively, several difficulties in evaluating management outcomes and budgetary processes owing to the lack of accurateness in performance data related to budgeting have been noticed by Jordan and Hackbart (2005). Moreover, it has been broadly acknowledged that allocations of budgetary resources have been still not grounded on the basis of performance outcomes regardless of the wide development and incorporation of performance measures into budget presentations, (Jordan & Hackbart, 2005; Hijal-Moghrabi, 2017). As such, the reasons were blamed on failure of unsuitable

performance measurement systems as well as failure in performing these systems (Safari et al., 2012). Thus, PBB in PSOs would achieve the higher performance only when it has been embedded in a wider and more accurate performance management framework (Schick, 2007). Importantly, this framework should be comprised of such three steps as measurement, incorporation as well as utilization of performance information (Bouckaert & Halligan, 2008). Nevertheless, both academic researchers and practitioners were recommended to investigate the appropriateness of combination between PBB and management framework before embedding the PBB into this framework.

In this regard, the present research set its sight to probe into the interconnection between IPSS and PBB under the mediating role of OCC. As such, this study has made momentous contribution to the research stream on PBB in both theoretical and practical facets. In term of theoretical points of view, this research bridged the gap of lacking of works related to PBB devoted to developing countries although the matter of good governance based on PBB has been still a key attention regarding to the application of authority and PS management (Surianti & Dalimunthe, 2015). Besides, budget accuracy was impacted by goal setting and the organizational vision and mission were the primary objectives for flawless performance aims were claimed (Locke, 1968). As such, setting goal has been demanded in each entity which was subsequently formed in organizational budget plan. Accordingly, it has been essential to consist of organizational goals to be reached on both the financial and non - financial aspects (Friyani & Hernando, 2019). Importantly, the literature also underlined a wide range of barriers faced by numerous PS leaders (Holzer et al., 2016) which were termed performance barriers (Ammons, 2004). Various alternatives have been suggested to surmount these obstacles, these were still a dramatical limitations for many PSOs (Holzer et al., 2016). Nonetheless, Public Sector Scorecard (PSS) has been the effective performance management framework which was established with the effort to support organizations to ameliorate outcomes without gaining overall cost, and set up performance measures revamp and ensure quality without fostering employees to accomplish arbitrary goals at the cost of bad service to the public (Moullin, 2017). Thus, the second contribution of this research sourced from the fact that this has been the first research focused on the relationship between the PBB in the PSOs and the management framework reserved for the PSO and third sector only - that was PSS. According to Shah and Shen (2008), the most critical components of this budgeting approach have been strategic planning, cost estimation and performance evaluation were found in the characteristics of PSS. This was because PSS have been well-recognized to be the integrated performance

management framework incorporating strategy mapping, service improvement, as well as measurement and evaluation (Moullin, 2017). Moreover, the consequential imperatives and indexes of a fruitful PBB application including constructive organizational culture (Schick, 2014) as well as flexibility enhancement of employee policy and other applicable policies (McNab & Melese, 2003). In response to these concerns, the third contributions of this research lied in the exploration on the mediating role of OCC towards the IPSS-PBB link. Pertaining to practical standpoints, the results analyses have offered a deep understanding for both the PS leaders and policymakers on the benefits of PSS and the role of IPSS in PBB. Additionally, the empirical findings gave rise to implications for the PS leaders and Government in seeking for solutions to improve the budgeting planning through taking notice of IPSS and PBB. Eventually, the empirics released from this research could be treated as the specimen for other developing economies to take the IPSS into consideration in the effort of increasing the performance of PBB.

To that end, this research went all out bridging the aforementioned gaps through handling these following research questions below.

RQ1. *Does IPSS evince a significantly positive impact on the PBB? To what extent does it affect?*

RQ2. *Do OCC manifest the mediating role on the interconnect between IPSS and PBB?*

The rest of this research is made up as follows. A brief confabulation on the relevant literature was clarified in Section 2. The hypotheses establishment and research model are illuminated in Section 3. Subsequently, the methodology employed in this study is described in Section 4. The main instalment of this research is Section 5 which highlighted the result analyses. Finally, the Section 6 comprised of implications, limitations and agenda for further works.

2. LITERATURE REVIEW

2.1. Theoretical underpinning

Expectancy theory. Expectancy theory first founded by Vroom (1964) was grounded on the incorporation between valences which focused on the expected satisfactions from task-linked outcomes, instrumentalities which mentioned on the perceived relationship between outcomes, expectancies which specified as the trust on the interconnection between manner and outcomes. This theory not only seized the expenses and advantages recommended as predicted factors of stakeholders' engagement in the standard-establishing process by prior studies, it also reinforced for the perspicuous thoughtfulness of the stakeholders' perspectives of their capacities to affect the outcome of the standard-establishing process. Expectancy theory models typically demonstrated its significance in illuminating leaders' motivation to conduct timely

procedures (Griffin & Harrell, 1991), to finish projects in the restrictions existed in their expenses budgets (Harrell & Stahl, 1984) and to utilize a decision support system (Snead & Harrell, 1994). Alternatively, expectancy theory was also inaugurated in accounting research stream by Ronen and Livingstone (1975) and was substantiated to be a suitable selection for accounting research stream (McInnes & Ramakrishnan, 1991). As such, expectancy model set up for integration of behavioral considerations in budgeting and experimental investigations of goal setting and budgeting (Harrell & Stahl, 1984).

Goal-setting theory. With the perspectives that goals illustrated a significant impact on staff manner and organizational performance and management operations (Locke & Latham, 2002), goal-setting theory was first discovered by Locke (1968) and was subsequently promoted by Latham and Locke in 1979 (Latham & Locke, 2019). This theory concentrated on such four facets based on the relationship between goals and outcomes as targeted concern at precedence, fostered endeavors, defied persons to employ their proficiency and understanding to ameliorate their opportunities of achievement, and gained innovation (Kaupa & Atiku, 2020). As proposed by Locke and Latham (2013), the flawless goals could reduce confusion, ambiguity, and limitation on orientations amongst subordinates. In addition, goal-setting theory endorsed standpoints of performance management namely acceptance on goals, releasing feedback and undertaking reviews (Kaupa & Atiku, 2020). Building on the recommendation of Jones and Pendlebury (2010), the organizational budget should cover with plans and titular amounts required to perform operations or programs but also consisted of the goals to be accomplished. Therefore, the organizational goals should be forged in the budget plan to allow the organization to reach the performance goals which were in appropriate with the organizational vision and mission. Pertaining to the practical viewpoint, PBB expounded the target outputs and outcomes of planned operations and budgets, execution principles, and evaluation programs which were tightly associated and in line with the assumption of goal-setting theory (Robbins & Judge, 2011). Hence, PBB application was supposed to allow the management to reap the success in the performance setting-targets (Locke & Latham, 2013).

2.2. Conceptual framework

Public sector scorecard. PSS included seven perspectives which could be adjusted grounded on the organizational point of views. With respect to the left position of the PSS consisted of the outcomes, processes, and capabilities (Moullin, 2017). The capabilities referred to the organizational, cultural and resource-based factors to determine the effectiveness of the processes. The efficient and effective processes

would result in the higher outcomes. The right side of PSS expounded various components. In particular, outcomes covered with the key performance outcomes which the entity aimed to attain, those demanded by users and other primary stakeholders, along with financial outcomes namely breaking-even, securing funding and providing value for money. The processes enclosed with only one element, that was, service delivery. Accordingly, service delivery mainly focused on the real experiences of users and stakeholders. The capabilities were composed of innovation and learning, people, partnership and resources which were reinforced by effective and empathetic leadership.

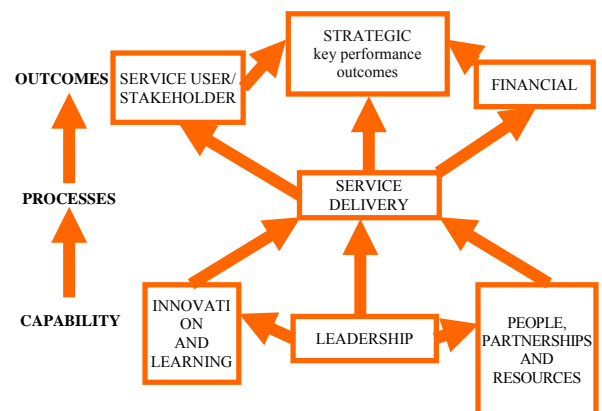


Figure 1: Public sector scorecard framework

(Source: Moullin, 2017)

Performance-based budgeting. PBB was first acknowledged in Amerika 1945s (Goldstein, 2005), and then was supposed to helpful and progressed along with PS reform (Gusti et al., 2017). Notwithstanding a large amount of investigation on performance budgeting, there has been still no broadly consensus on the concept of PBB (Holzer et al., 2016). PBB was regarded as a budgeting system which demonstrated a close relationship between finance and performance target (Gusti et al., 2017). In fact, it was cogitated as an evaluation practices which reflected program performance in resource allocation during the budget input process (Bourdeaux, 2008). Leth et al. (2017) argued that PBB served as PS funding mechanisms which supported the interconnection between funding and outcomes by means of the systematic utilization of formal performance information. Hence, PBB could be referred to strategic practices to plan expected mission and targets in the budget output process (Melkers & Willoughby, 2005) as well as program evaluation (Park, 2018).

Organizational culture. Culture have been broadly well-recognized as a wide range of key knowledges and suppositions distributed by a group of people, evaluations namely in an ethnic group or a nation (Stair & Reynolds, 2010). Besides, culture could be served as a perception comprising of shared values, unwritten principles and presumptions in the entity and the

activities that all groups of people share (Chaffey, 2011). Organizational culture could be defined as system of shared suppositions, values, symbols, meaning, anticipations, actions and beliefs integrated a group of employees (Grunig et al., 2002) and instructs the behavior of its participants (Schermerhorn et al., 2012). Additionally, Robbins and Coulter (2007) supplemented the definition of organizational culture with principles, traditions and methods of conducting works which resulted in an impact on the manner organizational staff behaved. As such, organizational culture hinted at a set of shared meaning grasped by the participants which differentiated the organization with the others (Robbins & Judge, 2011). In brief, the organizations' culture could be dispatched through several methods, comprising of long-standing and often unwritten principles and other traditions which allowed employees to discern what should be and should not be done (Rue & Byars, 2007). In the meanwhile, building on the recommendations of Van Muijen and Koopman (1994), Van Muijen (1998), organizational culture comprised of support, the innovation, the rules, and the goal orientation. Accordingly, support orientation mentioned on involvement, cooperation, human-based, mutual belief, team vivacity, and individual development. With respect to support orientation, communication was typically verbal and informal manner. The organizational staff were fostered to stress their perceptions on their daily work and feelings about each other (Van Muijen et al., 1999). The innovation orientation was defined as seeking for novel information in the surroundings, inventiveness, frankness to change, prediction, and experimentation. The rules orientation placed emphasis on esteem for power, reasonableness of procedures, and distribution of work. Pertaining to rules orientation, the structure was hierarchical and discussion was typically written and top-down. Power was grounded on formal authority (Van Muijen et al., 1999). The goal orientation made a point on sensibleness, performance indicators, achievement, accountability, and fluky reward (Van Muijen et al., 1999).

3. HYPHOTHESIS ESTABLISHMENT AND RESEARCH MODEL

3.1. Hypothesis establishment

Determining the outcomes demanded by the organization, the service users and other stakeholders – consisting value for money – has been the first point of view of a PSS investigation and this outcome concentration drove the whole PSS project, allowing the organization placed more emphasis on attaining these outcomes (Moullin, 2017). The IPSS have been supposed to facilitate to diagnostically monitor whether the organizational operations remained under control and there were any unusual matters happened which were under the demand of timely concerns. As such, PSS could function as a diagnostic control and a

response system associated with reporting and assessing the performance utilized to meet the need of users and key stakeholders. On the other hand, the organizational leader could pass on to their staff a wide range of messages about matters namely the issues which should be concerned or explore and the approaches they were supposed to utilize in their solution, organizational values, fundamental success determinants, chances, precedence, and eventually, the vital uncertainties which were of significance for the organization. Based on labors' point of view, these messages were treated as the hints stressing what was critical for the organization, and according to these, on what matters they were supposed to place their concerns and capacities (Simons, 2000). Hence, IPSS equipped the leader with the chances to notify the staff about the organizational strategies, crucial success determinants and their parts in attaining strategically far-reaching targets, to generate the interconnection between organizational strategy and personal objectives, and with the capacities to give rise to a shared knowledge and willpower among all organizational departments. Alternatively, including all subordinates, IPSS could operate as a control achiever possessing an interactive quality related to the development of organizational communication or a provisions system emphasizing specific positions and organizational plans in term of the implementation of an organizational mission. The PSS framework also contained in employees' skills and motivation, partnership working, resource usages as well as leadership. Notably, the most significance of these matters crucial to the accomplishment of performance management frameworks was establishing a culture of improvement, innovation and learning instead of a top-down blame culture. Taken together, it was evident that these qualities of IPSS could apparently generate positive contributions to organizational culture. Hence, the research hypotheses were drawn as follows.

Hypothesis 1 (H1). IPSS has evinced a substantially positive influence on support orientation

Hypothesis 2 (H2). IPSS has evinced a substantially positive influence on rule orientation

Hypothesis 3 (H3). IPSS has evinced a substantially positive influence on innovation orientation

Hypothesis 4 (H4). IPSS has evinced a substantially positive influence on goal orientation

The consequential imperatives and indexes of a fruitful PBB application including leadership and the sufficient resources to undertake PBB in the organization (Melkers & Willoughby, 2001). Besides, the PBB implementation also required a close involvement of stakeholder. In particular, there were also an urgent claim on legislative and executive agreement on organizational goals and performance evaluations (Wang, 1999), legislators' concerns, commitment and cooperation (Melkers & Willoughby, 1998), or the

encouragement of main budget actors (McNab & Melese, 2003). Importantly, it was evident that the success in PBB largely depended on the validity and reliability of evaluation approaches (Melkers & Willoughby, 2001), performance information and performance monitoring to create appropriate budget allocation determinant (Wang, 1999). Last but not least, the direct association between budgeting and strategic planning systems (McNab & Melese, 2003) as well as the organizational mission, goals and strategies (Melkers & Willoughby, 2001) were also the most important drivers of efficacious results in PBB application. The PSS framework was begun with the strategy mapping establishment. Accordingly, the strategy map was enrooted with a sequence of interactive workshops with relatedly responsible individuals as senior managers, staff, service users and other stakeholders to determine the expected outcomes, the outputs that different processes related should accomplish and the capability outputs which were required to be obtained to allow the staff and processes to reach the outcomes and process outputs demanded. The associations between capabilities, processes and outcomes were subsequently depicted in a draft strategy map for the scrupulous review in the next workshop. The strategy map would be used as a prompt to examine the effectiveness of service delivery in achieving the required outcomes and how it can be improved. Workshop participants will be encouraged to link their discussion to evidence or data available and this will be supplemented where appropriate with specific instruments. This or an ensuing workshop would then concentrate on what was claimed to attain the capability outputs in the strategy map and concretely the management approaches which fostered staff and processes to reap the outcomes demanded. This could relate to supplementary resources in a specific part, ameliorating staff morale, and increased reassuring leadership. It might also link to focusing on how to build a culture of improvement, innovation and learning instead of a blame culture – all fortified by effective leadership (Moullin, 2017). Pertaining to possible performance measures for the components of strategy map, the discussion which dealt with cost-effectiveness of various measures come about with the participation of specialists, stakeholders and funders. All potential measures recommended would be reviewed by taking data quality matters, potential unexpected or perverse influences reduction into consideration. Subsequently, a screening process among potential measures would come into existence to assure the selected measures were cost-effective and offered value for money for the entities. Importantly, performance measures may not be in qualitative manner rather than in quantitative manner. Analyzing and learning from performance measures would offer deep knowledge into the extent to which organizations accomplished in the divergent aspects of the strategy map. The utilization of analytics to pinpoint cause and

effect for timely solutions were suggested as well. In the nutshell, IPSS could be considered as an imperative element in budget preparation and performance, because PSS establishment was verified typically involved in goal setting and evaluation. In the meanwhile, PBB stressed on performance indicators and measures applications within the budgetary process to support the PS and governments manage public resources in efficient and effective manner (Zhao, 2016). Building on these perspectives, the hypothesis was considered as follows.

Hypothesis 5 (H5). IPSS has evinced a substantially positive influence on PBB

The insights into organizational culture have been broadly acknowledged as one of the most critical approach to shape the staff behavior in order to bring out the best organizational performance (Lund, 2003). Indeed, cultural factors would lead to the employee's resistance or willingness to cooperate when the organization established or developed programs or policies. Once employees owned a positive attitude, the transition would happen faster, the operation would be smoother and errors would be reduced. As such, when the organizations had an incentive to improve the quality of information, their staff would place more endeavor to ensure the quality of information than those who did not paid attention to the issues (Xu et al., 2003). The combination between organizational culture and morality would facilitate the organization to reap the best success (Hackney & McBride, 1995). It has also played an important role in coherence and unification among organizational goals, personal values, beliefs and personal behavior (Badaracco & Ellsworth, 1991), and thus encouraged public officials committed to ethical practices as well as and directly contributed to organizational PBB. Especially, as PSOs have depended on the state budget to manage and offer public services to the society, the promotion of ethical behavior in each civil servant and public employee in each organization has been imperative for the establishment of trust relationship and enhance the performance of PBB. Thus, the research hypotheses were established as follows.

Hypothesis 6 (H6). Support orientation has evinced a substantially positive influence on PBB

Hypothesis 7 (H7). Rule orientation has evinced a substantially positive influence on PBB

Hypothesis 8 (H8). Innovation orientation has evinced a substantially positive influence on PBB

Hypothesis 9 (H9). Goal orientation has evinced a substantially positive influence on PBB

3.2. Research model

The theoretical proffered model which concentrated on the interconnection between IPSS and PBB, and depicted one OCC mediator that modified the link of the aforementioned relationship in PSO in the South Vietnam, were demonstrated in Figure 2.

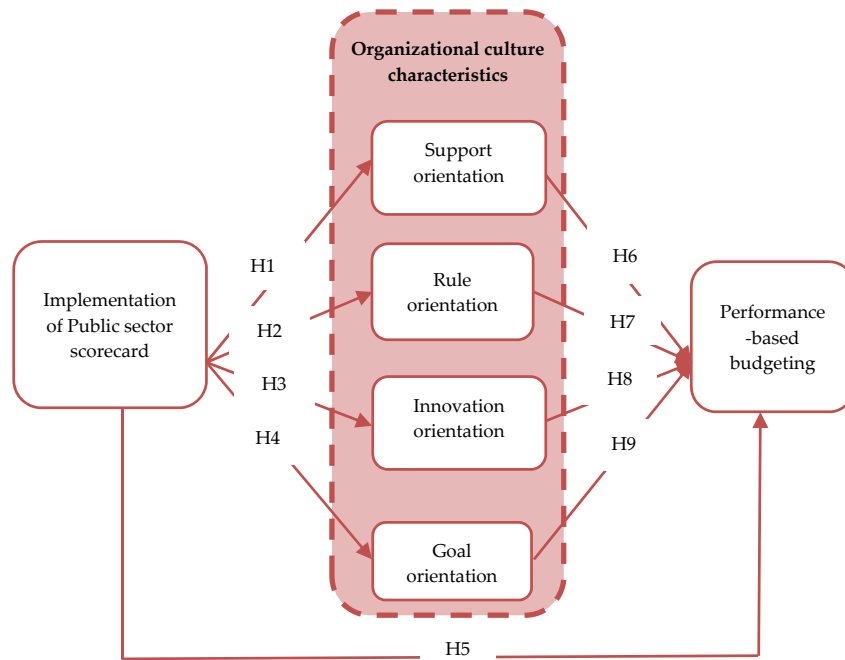


Figure 2: Conceptual proffered model

4. METHODOLOGY DESIGN

4.1. Target population and sampling collection

In order to establish the structured questionnaire, the majority of related variables in this study were mainly drawn on previously validated measures. Nevertheless, the draft questionnaire experienced the translated and back-translated procedures to revamp the exactness of translation and the appropriateness with the Vietnamese context. Additionally, these mentioned procedures were under the careful review of the four professional translators. In other quarters, the qualitative method was employed in this study to apprehend the context of the study at the greatest possible richness degree (Corbin & Strauss, 1990). As such, in-depth semi-structured interviews was made use of in the present study to increase the insights on this subject (DiCicco-Bloom & Crabtree, 2006). Accordingly, there were 8 in-depth semi-structured interviews which were conducted with experts possessing specific knowledge in PSO measurement and management to gather some more useful information. The novel items and Likert-type scales were constituted based on the advices for modification of these experts. These items were evaluated by means of a five-point Likert scale varied 1 (strongly disagree) to 5 (strongly agree).

Subsequently, the pilot test was implemented with the participation of 50 people from the randomly selected respondents from the target population. The Cronbach's α value was utilized to estimate the level of internal consistency of each concept of the pilot questionnaire (Dunn et al., 2013) and requested to be at

(Source: Recommended by authors)

0.7 or more for a widely approval reliability coefficient creation (Hair et al., 2011). The Cronbach's α values were reported to exceed 0.7. In other words, the questionnaire always comprised of reliable and consistent answers since the variables and dimensions of this research covered with approval reliabilities.

In order to investigate research model and hypotheses, a survey-based questionnaire was put to use. The data were gathered from PSOs in the South Vietnam during a period of six months in summer and autumn of 2020. The result observations of the study implemented in this region could be taken into consideration to apply in other developing economies in brief of the same economic conditions (Huy & Phuc, 2020). The quintessential respondents for this research were accountants. This was because accountants have been well-regarded as the crucial respondents in the research stream on organizational measurement and management. Concretely, the empirical findings of Bhimani and Keshtvarz (1999) indicated that more than 75 percent of the accountants in a study of large US companies were actively engaged in strategic management processes namely developing missions, setting strategic objectives, formulating and choosing the best strategy. Therefore, the accounting staff have been supposed to possess a sound accounting expertise, good skills in designing financial information systems (Birkett, 1989) and applying measurement techniques (Binnersley, 1997) to support the organizational leaders in decision-making (Burnett & Hansen, 2008). Especially, they have been considered to play an important role in the organization as an internal

consultant for strategic initiatives and performance management. The sample size criterion could be specified by the utilization of a priori sample size calculator for SEM (Soper, 2015). Hence, inputting the demanded information namely 90% desired statistical power level, 43 observed variables, 6 latent variables, 0.05 probability levels and the anticipated medium effect size of 0.3, the recommended sample size attained from the calculator was 444. Thus, the sample size of 712 obtained in this research was commensurate for reliable result analysis accomplishment.

The socio demographic profile of the respondents indicated that majority of respondents were female (64.76 percent) while male accounted for 34.24 percent. With respect to the age of respondents, approximately 28.65 percent were reported to be from 35 to under 45 years old, followed by the group in the age from 40 to under 50 years old, at 45.51 percent, leaving 25.84 percent for the other two groups. with reference to experience, the highest number of years belonged to “Over 15” group, 216 respondents were “10-15” group, 110 respondents were the “5-10” group and the remaining were classified as “Below 5”. Broadly speaking, the results also demonstrated that the respondents were strikingly qualified and well-educated people with 44.24 percent owing the undergraduate degree and 55.76 percent attaining postgraduate degree.

Building on the recommendation of Armstrong and Overton (1977), the comparison between early and late group of participants was conducted to preclude the appearance of potential non-response bias. Accordingly, the sample was separated into clutches based on the reacting time (early 25% and late 25%) and there was no substantial divergence on organizational age and size. Thus, the results revealed that non-response bias did not exist in this research.

4.2. The measurement instruments

In light of establishing the questionnaire to examine the association between IPSS, OCC and PBB, existing

scales and items adopted in a wide range of research fields and models were taken advantage of in this study as follows.

Public sector scorecard. The criteria for measuring the IPSS grounded on the key advantages of applying this framework which were drawn from the works of Moullin (2017).

Organizational culture characteristics. The dimensions of OCC in this study comprised of support orientation, rule orientation, innovation orientation and goal orientation which were inherited from the contributions of Van Muijen et al. (1999) and substantiated by prior works of Erserim (2012).

Performance-based budget. The measurement scales for PBB in this study were taken as a reference from scale established by Sofyani (2018) and authenticated again by Pratolo et al. (2020).

5. RESULT ANALYSIS

5.1. Convergent validity evaluation

Based on the proposal of Pandey and Jessica (2019), the construct reliability of this research was set up through utilizing Cronbach’s α and composite reliability while convergent validity was determined by factor loadings and average value extracted (AVE). Pertaining to construct reliability, Cronbach's alpha value of this conceptual model exceeded the minimum suggestion of 0.8 (Peterson, 1994) and CR values were over 0.7 which manifested the good reliability (Hair et al., 2014). In term of the convergent validity, the factor loading of each established item obtained the ideal values above 0.6 (Awang, 2012). In the meanwhile, AVE values of all constructs were reported to be greater than 0.5 (Udo et al., 2010). Thus, the results expounded in the Table 1 put accent on perfect convergent validity and construct reliability of each concept (Longoni & Cagliano, 2016).

Table 1: Results summary of Convergent validity and Construct reliability

Construct	Item acronyms	Convergent validity		Construct reliability		Discriminant Validity
		Factor Loadings Ranges	AVE	Cronbach’s Alpha	Composite Reliability	
Implementation of Public sector scorecard	IPSS	0.604 - 0.768	0.503	0.899	0.901	Yes
Support orientation	SUO	0.666 - 0.806	0.542	0.874	0.876	Yes
Rule orientation	RUO	0.699 - 0.774	0.538	0.822	0.823	Yes
Innovation orientation	INO	0.684 - 0.758	0.519	0.866	0.866	Yes
Goal orientation	GOO	0.649 - 0.750	0.508	0.891	0.892	Yes
Performance-based budgeting	PBB	0.679 - 0.739	0.502	0.909	0.911	Yes

(Source: handled primary data, 2020)

5.2. Discriminant validity evaluation

The discriminant validity was determined applying the AVE approach as recommended by Fornell and Larcker (1981). As requested by Fornell and Larcker (1981), the variance of the concepts with its indicators should be greater than other concepts to take for granted that over a half of the concepts' variance was due to its indicators and not due to other concepts in the same model (Henseler et al., 2014). The results in Table 2 validated that all concepts reliability was reported to be higher than their corresponding correlations under the discriminant validity. To put it simply, the measurement model attained the discriminant validity.

5.3. Evaluation of overall model fit

Regarding to the parsimonious fit index of the measurement model and structure model, the value of chi-square to degree of freedom was proved to be below 2 (Byrne, 1989). Alternatively, the RMSEA value was documented to be well under the maximum value of 0.08 proposed by MacCallum and Austin

(2000). Given that the absolute Fit Index values such as Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Tucker Lewis Index (TLI) was indicated to be higher than 0.9, the measurement model and structure model were corroborated to achieve the good fitness of criteria (Ponis et al., 2017).

5.4. Hypothesis testing

Direct effect. Based on the values analysis of hypothesis evaluation expounded in Table 4, IPSS was corroborated to be positively and significantly related to SUO. As such, H1 was accepted. By the same token, the findings made a list of evidence that IPSS has illustrated a significant impact on RUO, INO, GOO respectively in a positive manner. Hence, H2, H3, H4 was validated. Consistent with these hypotheses, this research also found that there was a substantially positive interrelationship between IPSS and PBB. Therefore, H5 was verified. Furthermore, the research observations substantiated a set of hypotheses related to the relationship between each components of OCC and PBB. Thus, H6, H7, H8 and H9 were attested.

Table 2: Results summary of Discriminant validity

	PBB	IPSS	GOO	SUO	INO	RUO
PBB	1					
IPSS	0.258	1				
GOO	0.254	0.264	1			
SUO	0.175	0.167	0.233	1		
INO	0.174	0.112	0.198	0.159	1	
RUO	0.178	0.177	0.278	0.132	0.112	1

(Source: handled primary data, 2020)

Table 3: Results of measurement and structural model analysis.

The goodness of fit measures	CMIN/DF	GFI	CFI	TLI	RMSEA
Recommended threshold	≤3	≥0.9	≥0.9	≥0.9	≤0.08
Measurement Model	1.550	0.923	0.966	0.964	0.028
Structural Model	1.652	0.916	0.960	0.957	0.030

(Source: handled primary data, 2020)

Table 4: Structural coefficients (β) of the proffered model (Source: handled primary data, 2020)

Hypothesis No.	Hypothesized path	Estimate	S.E.	C.R.	Inference
H1	IPSS → SUO	0.187***	0.044	4.215	Supported
H2	IPSS → RUO	0.183***	0.042	4.373	Supported
H3	IPSS → INO	0.136**	0.047	2.900	Supported
H4	IPSS → GOO	0.262***	0.041	6.461	Supported
H5	IPSS → PBB	0.189***	0.047	4.040	Supported
H6	SUO → PBB	0.111**	0.041	2.701	Supported
H7	RUO → PBB	0.125**	0.047	2.670	Supported
H8	INO → PBB	0.113**	0.040	2.854	Supported
H9	GOO → PBB	0.213***	0.046	4.601	Supported

Notes: *p < 0.05; **p < 0.01; ***p < 0.001

Table 5: Results summary of the mediation effects

Hypothesized path			Direct effect	Indirect effect	Result
IPSS	=>	SUO	0.175***	-	No mediation
IPSS	=>	RUO	0.187***	-	No mediation
IPSS	=>	INO	0.120**	-	No mediation
IPSS	=>	GOO	0.272***	-	No mediation
IPSS	=>	PBB	0.178***	0.085**	Partial mediation

(Source: handled primary data, 2020)

Indirect effect. Shankar and Jebarajakirthy (2019) has bifurcated the mediation effects into the two types as partial and full manner. In doing this, Partial mediation was achieved when there were significances on both two aspects, those were direct and indirect influences. In contrast, the accomplishment on indirect impact and insignificance in direct impact would lead to the full mediation (Cheung & Lau, 2008). Based on the observations demonstrated in Table 5, the interconnection between IPSS and PBB (direct effect = 0.178***; indirect effect = 0.085**) was reported to be mediated in partial way by the OCC. Nonetheless, the result findings also made certain that there were no mediation impacts caused by each elements of OCC on association between the IPSS and PBB in a segregate manner.

The Bootstrapping procedure was employed in order to evaluate the statistical significance for each path coefficient (Byrne, 2001). As the primary benefits of Bootstrapping approach lied in its exactness of confidence intervals and in the limitation of normality assumptions (Preacher & Hayes, 2008), the Bootstrapping instrument performed in this research with a sum of 1,500 random observations arisen from the original sample. In addition, the chosen bias-corrected Bootstrapping in this study was with 95 percent confidence intervals in the estimation of the propounded model (Mallinckrodt et al., 2006). Building on the bias-corrected Bootstrapping findings, IPSS and all the four components of OCC illustrated a significant effect on PBB among the PSOs in the South Vietnam.

Table 6: Results of Bootstrapping estimation

Hypothesized path			Bootstrap estimation				Discrepancy		
			Estimate	Mean	SE	SE (SE)	Bias	SE (Bias)	CR
IPSS	→	SUO	0.175	0.174	0.045	0.001	-0.001	0.001	-1
IPSS	→	RUO	0.187	0.187	0.047	0.001	0.000	0.001	0
IPSS	→	INO	0.120	0.121	0.043	0.001	0.001	0.001	1
IPSS	→	GOO	0.272	0.271	0.048	0.001	-0.001	0.001	-1
IPSS	→	PBB	0.178	0.176	0.046	0.001	-0.002	0.001	-2
SUO	→	PBB	0.088	0.090	0.045	0.001	0.001	0.001	1
RUO	→	PBB	0.087	0.087	0.046	0.001	-0.001	0.001	-1
INO	→	PBB	0.106	0.106	0.042	0.001	0.000	0.001	0
GOO	→	PBB	0.149	0.149	0.049	0.001	0.000	0.001	0

(Source: handled primary data, 2020)

6. CONCLUDING REMARK

Based on the Decree No. 16/2015/ND-CP in 2015 promulgated by the Government, the PSOs have been empowered to possess the autonomy in performing duties, establishing the organizational structure,

building the personnel structure. Importantly, the PSOs also possess the financial autonomy stipulated in this Decree. In addition, building on the contributions of Huy and Phuc (2020a, 2020b), PSS were substantiated to generate numerous advantages for the PSOs' operations. Simultaneously, the works of Nguyen et al.

(2020) also documented that PBB model should be taken into consideration in accounting works in PSO. Taken together, the replacements for the present techniques which applied in PSOs would be undoubtedly obtained a consensus among the Government, Agencies and PSOs as these frameworks namely PSS and PBB would soon be authenticated their efficiency and effectiveness in allowing the PSOs keep pace with the rapid changes in the global economic world. As such, building on the assumptions of the expectancy theory and goal-setting theory, the theoretical propounded model set its sights to dig into the association between IPSS and PBB with data gathered from 712 PSOs in the South Vietnam was undertaken and generated several implications in the two aspects namely theoretical and practical manner.

6.1. Implication

Theoretical implication. The study buttressed IPSS implementation could offer apparent information related to organizational goals, performance indicators and measures applications which was necessitated for PBB to attain the success in supporting for the PS and governments manage public resources in efficient and effective manner (Zhao, 2016). In fact, PSS have been contemplated as an effective framework to allow organizations to perk up outcomes for service users and stakeholders in an economic manner, set up measures of performance and constitute a performance management background by means of improvement, innovation and learning approaches (Moullin, 2017). On the other side, the interconnection between IPSS and PBB were partially mediated by OCC. Despite of its quasi-intervening part, the role of OCC should be taken notice as OCC was pondered as a vigorous unifying force that suppressed political conflict and enhanced comprehensive knowledge, approval on procedures as well as general operations (Laudon & Laudon, 2012). As such, OCC could act as efficient and effective instrument to uplift the productivity of IPSS to reap the effectiveness in PBB.

Practical implication. The organizational goals were substantial components of performance management since they assured that the whole organization and their key stakeholders accepted on, possessed, comprehended, committed, and devoted to the accomplishment of the organizational goals. Therefore, all of the stages of establishing PSS should be communicated clearly and tightly cooperation between the organizational internal and external stakeholders. Pertaining to the internal stakeholder, the PSS was set up to link the objectives of each individual employee with the organizational goals. As such, organizational goal establishing would become effective when all the staff took part in setting those goals rather than just

being appointed to them. As such, the determination of training requirements and offering necessary skills for all the staff were a primary part of performance management (Popovič et al., 2018). This was because all the staff could increase their specific knowledge and skill in defined field as demanding improvement through training. Accordingly, the staff were demanded to possess essential expertise, know-how and understanding in the government (Schick, 2014) and budget preparing and planning skills (Douglas, 2000). In addition, leaders also took into consideration on involving specific training on the way to set the goals which were demonstrated in a detailed and aligned with the organizational goals (Frederiksen et al., 2020).

The widely application of PSS and training for PSS adoption among the PSO was also the other issues for the both the government and the PS leaders to take into account since PSS was proved to be appropriate with the main characteristics of PSO. In term of PSO, the suitable OCC could allow a leader to gain employees readiness to change to increase positive influence for the organization (Carver, 2012). In other words, the success of IPSS would depend largely on the OCC. As OCC were grasped mainly by means of observing organizational individuals and episodes as well as training (Lussier, 2008), the PS leaders were recommended to exert all their strength to maintain and promote the characteristics in their OCC. Alternatively, the tone should be taken into notice to be established at the beginning of PSS investigation with the service leader and the workshop administrative to emphasize the importance of openness and trust within a performance management culture based on improvement, innovation as well as learning (Moullin, 2017). Last but not least, the PS leaders should place more apprehensions on budget endorsement and approval as well as concentrated on suitable budget allocation grounded on the PBB policies.

6.2. Limitation and recommendations for future works

Notwithstanding the contributions, the present research still succumbed to several inherent limitations. The first limitation arose from the relatively small sample size. The imperfections related to such small size have comprised of statistical power reduction on investigation the small but significant effects (Loken & Gelman, 2017), lack of randomization guarantee for all demographic characteristics or possible control variables and difficulties in research population implementation for statistical analysis on numerous variables (Spencer et al., 2017). Nevertheless, with the endeavor of maximize the diversity and procure participants from a wide range of areas in the South Vietnam, the findings of this results were proved to be

statistically valid with this sample size, still, the palpable recommendation remained a replication works on revalidating the measurement scales established in this study with a larger sample size by a more systematic random sampling procedure. Alternatively, the sample of this research comprised of well-experienced accountants, there were some restrictions on the extent to which the working population could be generalized (Anderson & Stritch, 2016). As such, survey information collection from a wide range of respondents from the target participating organizations to achieve the reliability of the results findings and significant nuance. Furthermore, the context of this study took place in the specific region in Vietnam, therefore, this model has been still in need of testing in all areas in Vietnam and other economies to attain the more general fitness. Last but not least, the measurement scales for organizational culture were just put accent on the OCC instead of focusing on the two aspects of primary works of Van Muijen et al. (1999) - those were as practices and values (characteristics). Given to this point of view, the scholars and practitioners are requested to take notice in their further explorations.

7. REFERENCES

- [1] Adel Azar, M. A., Nayeri, M. D. and Bayat, B. K. (2019), "Developing a Performance-Based Budgeting Maturity Model and Constructing a DEA-Based Composite Indicator to Measure It's Score", *Industrial Engineering & Management Systems*, **18**, (1), 144-154.
- [2] Ammons, D. N. (2004) Productivity barriers in the public sector. In Marc Holzer and Seok-Hwan Lee (Ed.), *Public productivity handbook*, Marcel Dekker, New York, NY.
- [3] Anderson, D. M. and Stritch, J. M. (2016), "Goal clarity, task significance and performance: evidence from a laboratory experiment", *Journal of Public Administration Research and Theory*, **26**, (2), 211-225.
- [4] Armstrong, J. S. and Overton, T. S. (1977), "Estimating nonresponse bias in mail surveys", *Journal of Marketing Research*, **14**, (3), 396-402.
- [5] Avwokeni, A. J. (2016), "Cultural resistance, output measures, and audit practice: impact on non-implementation of program-based budgeting in Nigeria", *International Journal of Public Administration*, **39**, (12), 1-8.
- [6] Awang, Z. (2012) *A Handbook on Structural Equation Modeling Using AMOS*, Universiti Teknologi MARA Press, Malaysia.
- [7] Badaracco, J. L. and Ellsworth, R. R. (1991), "Leadership, Integrity and Conflict", *Journal of Organizational Change Management*, **4**, (4), 46-55.
- [8] Bhimani, A., & Keshtvarz, M. H. (1999), "British Management Accountants: Strategically Orientated", *Journal of Cost Management*, **13**, (2), 25-31.
- [9] Binnarsley, M. (1997), "Do You Measure Up?", *Charter*, 32-35.
- [10] Birkett, W. P. (1989), "The Demand for, and Supply of Management Accounting Education: A Delphi Study", *Task Force for Accounting Education in Australia*.
- [11] Bouckaert, G. and Halligan, J. (2008) *Managing performance: international comparisons*. Routledge, London.
- [12] Bourdeaux, C. (2008), "Integrating performance information into legislative budget processes", *Public Performance & Management Review*, **31**, (4), 547-569.
- [13] Burnett, R. D. and Hansen, D. R. (2008), "Ecoefficiency: Defining a role for environmental cost management", *Accounting, Organizations and Society*, **33**, (6), 551-581.
- [14] Byrne, B. M. (1989) *A Primer of LISREL: Basic Applications and Programming for Confirmatory Factor Analytic Models*, Springer-Verlag, New York.
- [15] Byrne, B. M. (2001) *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*, Lawrence Erlbaum Associates, Mahwah, NJ.
- [16] Carver, T. A. (2012) *The Relationship Between Organizational Culture and Readiness to Change in a US Army Organization within Japan* [dissertation], Arizona: North Central University.
- [17] Chaffey, D. (2011) *E-Business & E-Commerce Management, Strategy, Implementation, and Practice*, Prentice Hall.
- [18] Cheung, G. W. and Lau, R. S. (2008), "Testing mediation and suppression effects of latent variables: bootstrapping with structural equation models", *Organizational Research Methods*, **11**, (2), 296-325.
- [19] Chính phủ. (2015). Nghị định: 16/2015/NĐ-CP. Nghị định. Quy định cơ chế tự chủ của đơn vị sự nghiệp công lập. Truy cập từ <https://thuvienphapluat.vn/van-ban/Bo-may-hanh-chinh/Nghi-dinh-16-2015-ND-CP-co-che-tu-chu-cua-don-vi-nghiep-cong-lap-266548.aspx> [Government. (2015). Decree No. 16/2015/NĐ-CP. Stipulating the mechanism for exercising the autonomy of public administrative units. Hanoi: National Assembly. Accessed from:

- <https://thuvienphapluat.vn/van-ban/Bo-may-hanh-chinh/Nghi-dinh-16-2015-ND-CP-co-che-tu-chu-cua-don-vi-nghiep-cong-lap-266548.aspx>.
- [20] Clark, C., Menifield, C. E. and Stewart, L. M. (2018), "Policy diffusion and performance-based budgeting", *International Journal of Public Administration*, **41**, (7), 528-534.
- [21] Corbin, J. and Strauss, A. (1990), "Grounded theory research: Procedures, canons, and evaluative criteria", *Qualitative Sociology*, **13**, (1), 3-21.
- [22] DiCicco-Bloom, B. and Crabtree, B. F. (2006), "The qualitative research interview", *Medical Education*, **40**, (4), 314-321.
- [23] Douglas, J. W. (2000), "Budget reform theory: a guideline for successful budget reform", *International Journal of Public Administration*, **23**, (11), 1967-1996.
- [24] Dunn, T. J., Baguley, T. and Brunsden, V. (2013), "From alpha to omega: A practical solution to the pervasive problem of internal consistency estimation", *British Journal of Psychology*, **105**, (3), 399-412.
- [25] Dunning, D. K. (2014), "Integrated resourcing and incentive system. Internal Brief by United States Medical Command Assistant Chief of Staff", [PowerPoint slides], 1-25.
- [26] Erserim, A. (2012), "The Impacts of Organizational Culture, Firm's Characteristics and External Environment of Firms on Management Accounting Practices: An Empirical Research on Industrial Firms in Turkey", *Procedia - Social and Behavioral Sciences*, **62**, 372-376.
- [27] Fornell, C. and Larcker, D. F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, **18**, (1), 39-50.
- [28] Frederiksen, A., Kahn, L. B. and Lange, F. (2020), "Supervisors and performance management systems", *Journal of Political Economy*, **128**, (6), 1-52.
- [29] Friyani, R. and Hernando, R. (2019), "Determinants of the Effectiveness of Implementation Performance Based-Budgeting and Budget Absorption in Local Governments", *Sriwijaya international journal of dynamic economics and business*, **3**, (3), 213-226.
- [30] Goldstein, L. (2005) *College and university budgeting: An introduction for faculty and academic administrators*, NACUBO, Washington, DC.
- [31] Griffin, L. and Harrell, A. (1991), "An empirical examination of managers' motivation to implement just-intime procedures", *Journal of management accounting research*, **3**, 98-112.
- [32] Grunig, L. A., Grunig, J. E. and Dozier, D. (2002) *Excellent public relations and effective organizations: A study of communication management in three countries*, Lawrence Erlbaum Associates, Mahwah, NJ.
- [33] Gusti, W. D., Frinaldi, A. and Alhadi, Z. (2017), "The Analysis of Performance-Based Budgeting in Immigration. Advances in Social Science", *Education and Humanities Research*, **84**, 482-485.
- [34] Hackney, R. A. and McBride, N. K. (1995), "The efficacy of information systems in the public sector: issues of context and culture", *International Journal of Public Sector Management*, **8**, (6), 17-29.
- [35] Hair, J. F., Black, W. C., Babin, B. J. and Anderson, R. E. (2014) *Multivariate data analysis*, Pearson Education, New York, NY.
- [36] Hair, J. F., Ringle, C. M. and Sarstedt, M. (2011), "PLS-SEM: indeed a silver bullet", *Journal of Marketing Theory and Practice*, **19**, (2), 139-151.
- [37] Harrell, A. M. and Stahl, M. J. (1984), "Modeling managers' effort-level decisions for a within-persons examination of expectancy theory in a budget setting", *Decision sciences*, **15**, (1), 52-73.
- [38] Helmuth, U. (2010), "Better performance with performance budgeting? Analyzing cases of success and failure in public administrations", *International Public Management Journal*, **13**, (4), 408-428.
- [39] Henseler, J., Ringle, C. M. and Sarstedt, M. (2014), "A new criterion for assessing discriminant validity in variance-based structural equation modeling", *Journal of the Academy of Marketing Science*, **43**, (1), 115-135.
- [40] Hijal-Moghrabi, I. (2017), "The current practice of performance-based budgeting in u.s. largest cities: An innovation theory perspective", *Public Performance & Management Review*, **40**, (4), 652-675.
- [41] Holzer, M., Mullins, L. B., Ferreira, M. and Hoontis, P. (2016). Implementing performance budgeting at the state level: Lessons learned from New Jersey", *International Journal of Public Administration*, **39**, (2), 95-106.
- [42] Huy, P. Q. and Phuc, V. K. (2020a), "Does Strategic Corporate Social Responsibility Drive Better Organizational Performance through Integration with a Public Sector Scorecard? Empirical Evidence in a Developing Country", *Processes*, **8**, 596.

- [43] Huy, P. Q. and Phuc, V. K. (2020b), "The impact of public sector scorecard adoption on the effectiveness of accounting information systems towards the sustainable performance in public sector", *Cogent Business & Management*, **7**, 1.
- [44] Jakobsen, M. L. F. and Pallesen, T. (2016), "Performance Budgeting in Practice: the Case of Danish Hospital Management", *Public Organization Review*, **17**, (2), 255-273.
- [45] Jones, R. and Pendlebury, M. (2010) *Public sector accounting*, Prentice Hall.
- [46] Jordan, M. M. and Hackbart, M. (2005), "The goals and implementation success of state performance-based budgeting", *Journal of Public Budgeting, Accounting & Financial Management*, **17**, (4), 471-487.
- [47] Kaupa, S., & Atiku, S. O. (2020), "Challenges in the Implementation of Performance Management System in Namibian Public Sector", *International Journal of Innovation and Economic Development*, **6**, (2), 25-34.
- [48] Laudon, K. C. and Laudon, J. P. (2012) *Management Information System: Managing the Digital Firm*, PrenticeHall.
- [49] Leth, M., Jakobsen, F. and Pallesen, T. (2017), "Performance budgeting in practice: the case of Danish Hospital Management", *Public Organization Review*, **17**, (2), 255-273.
- [50] Locke, E. A. (1968), "Toward a Theory of Task Motivation and Incentives", *Organizational Behavior and Human Performance*, **3**, (2), 157-189.
- [51] Locke, E. A. and Latham, G. P. (2002), "Building a practically useful theory of goal setting and task motivation: a 35-year odyssey", *American Psychologist*, **57**, 705-717.
- [52] Locke, E. A. and Latham, G. P. (2013) *New developments in goal setting and task performance*, Routledge.
- [53] Locke, E. A. and Latham, G. P. (2019), "The development of goal setting theory: A half century retrospective", *Motivation Science*, **5**, (2), 93-105.
- [54] Loken, E. and Gelman, A. (2017), "Measurement error and the replication crisis", *Science*, **355**, (6325), 584-585.
- [55] Longoni, A. and Cagliano, R. (2016), "Human resource and customer benefits through sustainable operations", *International Journal of Operations & Production Management*, **36**, (12), 1719-1740.
- [56] Lu, H. (1998), "Performance budgeting resuscitated: why is it still inviable?", *Journal of Public Budgeting, Accounting & Financial Management*, **10**, (2), 151-172.
- [57] Lund, D. B. (2003), "Organizational Culture and Job Satisfaction", *Journal of business and industrial marketing*, **18**, 219-236.
- [58] Lussier, R. N. (2008) *Human Relations in Organizations, Applications and Skill Building*, Mc Graw-Hill.
- [59] MacCallum, R. C. and Austin, J. T. (2000), "Applications of structural equation modeling in psychological research", *Annual Review of Psychology*, **51**, (1), 201-226.
- [60] Mallinckrodt B., Abraham W. T., Wei M. and Russell D. W. (2006), "Advances in testing the statistical significance of mediation effects", *Journal of Counseling Psychology*, **53**, 372-378.
- [61] McInnes, M. and Ramakrishnan, R. T. S. (1991), "A decision-theory model of motivation and its usefulness in the diagnosis of management control systems", *Accounting, Organizations and Society*, **16**, (2), 167-184.
- [62] McNab, M. and Melese, F. (2003), "Implementing the GPRA: examining the prospects for performance budgeting in the federal government", *Public Budgeting & Finance*, **23**, (2), 73-95
- [63] Melkers, J. and Willoughby, K. (1998), "The state of the states: performance-based budgeting requirements in 47 out of 50", *Public Administration Review*, **58**, (1), 66-73.
- [64] Melkers, J. and Willoughby, K. (2005), "Models of performance-measurement use in local governments: Understanding budgeting, communication, and lasting effects", *Public Administration Review*, **65**, (2), 180-190.
- [65] Melkers, J. E. and Willoughby, K. G. (2001), "Budgeters' views of state performance budgeting systems: distinctions across branches", *Public Administration Review*, **61**, (1), 54-64.
- [66] Mikesell, J. L. and Mullins, D. R. (2011), "Reforms for improved efficiency in public budgeting and finance: improvements, disappointments, and work-in-progress", *Public Budgeting & Finance*, **31**, (4), 1-30.
- [67] Mkasiwa, T. A. and Gaspar, A. F. (2014), "Performance based budgeting or budget-based performance? A case study of the tanzanian health sector", *International Journal of Management Accounting Research*, **4**, (2), 201-231.
- [68] Moullin, M. (2017), "Improving and evaluating performance with the Public Sector Scorecard", *International Journal of Productivity and Performance Management*, **66**, (4), 442-458.

- [69] Moynihan, D. P. (2006), "Managing for results in State government: evaluating a decade of reform", *Public Administration Review*, **66**, (1), 77-89.
- [70] Nguyen, P. N., Dong, T. M. and Huy, P. Q. (2020), "Mô hình lập dự toán ngân sách trên cơ sở thành quả của đơn vị công và gợi ý cho công tác kế toán", *Tạp chí Tài chính*, **728**, 143-146. ["Performance-based budgeting model for Public sector and implications for accounting", *Review of Finance*, **728**, 143-146].
- [71] Pandey, R. and Jessica, V. M. (2019), "Sub-optimal behavioural biases and decision theory in real estate", *International Journal of Housing Markets and Analysis*, **12**, (2), 330-348.
- [72] Park, J. H. (2018), "Does Citizen Participation Matter to Performance-Based Budgeting?", *Public Performance & Management Review*, 1-25.
- [73] Peterson, R. A. (1994), "Meta-analysis of alpha cronbach 's coefficient", *Journal of Consumer Research*, **21**, 381-391.
- [74] Ponis S. T., Papanikolaou P. A., Ntalla A. C. and Xenos K. I. (2017), "Household Food Waste in Greece: A Questionnaire Survey", *Journal of Cleaner Production*, **149**, 1268-1277.
- [75] Popović, A., Hackney, R., Tassabehji, R. and Castelli, M. (2018), "The impact of big data analytics on firms' high-value business performance", *Information Systems Frontiers*, **20**, (2), 209-222.
- [76] Pratolo, S., Sofyani, H. and Anwar, M. (2020), "Performance-based budgeting implementation in higher education institutions: Determinants and impact on quality", *Cogent Business & Management*, **7**, (1).
- [77] Preacher, K. J. and Hayes, A. F. (2008), "Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models", *Behavior Research Methods*, **40**, (3), 879-891.
- [78] Robbins S. P. and Coulter, M. (2007) *Management*, Pearson Education International.
- [79] Robbins, S. P. and Judge T. A. (2011) *Organizational Behavior*, Prentice Hall.
- [80] Ronen, J. and Livingstone, J. L. (1975), "An expectancy theory approach to the motivational impacts of budgets", *Accounting review*, **50**, (4), 671-685.
- [81] Rue L. W. and Byars L. L. (2007) *Management Skills and Application*, Mc-GrawHill.
- [82] Safari, H., Ghasemi, A., Ainian, M., Pahlavani, A. and Manochehri, M. (2012) *A Comprehensive Look at Performance Measurement Systems*, Mehraban Publishing institute, (In Persian).
- [83] Schermerhorn, J.r, Osborn, R. N., Bien, M. U. and Hunt, J. G. (2012) *Organizational Behavior*, John Wiley & Sons.
- [84] Schick, A. (2014), "The metamorphoses of performance budgeting", *OECD Journal on Budgeting*, **13**, 49- 79.
- [85] Shah, A. and Shen, C. (2008) *A Primer on Performance Budgeting*, World Bank, Washington, DC.
- [86] Shankar, A. and Jebarajakirthy, C. (2019), "The influence of e-banking service quality on customer loyalty", *International Journal of Bank Marketing*.
- [87] Simons, R. (2000) *Performance Measurement and Control Systems for Implementing Strategy*, Prentice Hall, New Jersey.
- [88] Snead, K. C. and Harrell, A. M. (1994), "An application of expectancy theory to explain a manager's intention to use a decision support system", *Decision sciences*, **25**, (4), 499-513.
- [89] Sofyani, H. (2018), "Does Performance-Based Budgeting Have a Correlation with Performance Measurement System? Evidence from Local Government in Indonesia", *Foundations of Management*, **10**, (1), 163-176.
- [90] Soper, D.S. (2015), "A-priori Sample Size Calculator for Structural Equation Models [Software]", available at <https://www.danielsoper.com/statcalc/calculator.aspx?id=89> (accessed 20 September 2020).
- [91] Spencer, N. H., Lay, M. and de Lopez, L. K. (2017), "Normal enough? Tools to aid in decision-making", *International Journal of Social Research Methodology*, **20**, (2), 167-179.
- [92] Stair, R. and Reynolds, G. (2010) *Principles of Information Systems: A Managerial Approach*, Course Technology.
- [93] Sterck, M. and Scheers, B. (2006), "Trends in performance budgeting in seven OECD countries", *Public Performance and Management Review*, **30**, (1), 47-72.
- [94] Surianti, M. and Dalimunthe, A. R. (2015), "The Implementation of Performance Based Budgeting in Public Sector (Indonesia Case: A Literature Review)", *Research Journal of Finance and Accounting*, **6**, (12), 198-210.
- [95] Udo, G. J., Bagchi, K. K. and Kirs, P. J. (2010), "An assessment of customers' e-service quality perception, satisfaction and intention", *International Journal of Information Management*, **30**, (6), 481-492.
- [96] Van Muijen, J. J. (1998). Organizational culture. In P. J. D. Drenth, H. Thierry, & C. De Wolff (Eds), *Handbook of work and organizational psychology*, Psychology Press, Hove, UK.

- [97] Van Muijen, J. J. and Koopman, P. L. (1994), "The influence of national culture on organizational culture: A comparative study between 10 countries", *The European Work and Organizational Psychologist*, **4**, 367-380.
- [98] Van Muijen, J. J., and al, et. (1999), "Organizational Culture: The Focus Questionnaire", *European Journal of Work and Organizational Psychology*, **8**, (4), 551-568.
- [99] Vroom, V. H. (1964) *Work and motivation*, John Wiley, New York.
- [100] Wang, X. (1999), "Conditions to implement outcome-oriented performance budgeting: some empirical evidence", *Journal of Public Budgeting, Accounting and Financial Management*, **11**, (4), 533-552.
- [101] Xu, H., Nord, J. H., Nord, G. D. and Lin, B. (2003), "Key Issues Accounting Information Quality Management: Australian Case Studies", *Industrial Management and Data Systems*, **103**, 461-470.
- [102] Zhao, Z. (2016), "Why local governments need performance evaluation: intermediary institutions in the performance-based budgeting process in China", *Journal of Chinese Governance*, **1**, (4), 564-573.

THE MEDIATING ROLE OF MANAGEMENT ACCOUNTING SYSTEMS IN THE RELATIONSHIP BETWEEN CROSS-FUNCTIONAL COOPERATION AND FIRM PERFORMANCE: EMPIRICAL EVIDENCE FROM VIETNAM

Nguyen Phong Nguyen ^{1,*} Tu Thanh Hoai ²

^{1,2} School of Accounting, University of Economics Ho Chi Minh City, Vietnam

* Email: nguyenphongnguyen@ueh.edu.vn Email: tuthanhhoai2312@gmail.com

Abstract

Interfirm cooperation and its linkage to management accounting information are vital for organizational performance. However, the literature lacks insight into how competitive advantage emerges in the context of intrafirm cooperation via the use of management accounting systems (MAS). This study evaluates whether management accounting practices translate cooperation among different organizational functions into enhanced organizational performance. Findings from survey data from 186 large firms in Vietnam show that the use of MAS fully mediates the effects of cross-functional cooperation on organizational performance. Our study adds to the limited research examining the interface between cross-functional cooperation and MAS.

Keywords: Management accounting systems use; cross-functional cooperation; organizational performance; emerging market.

1. INTRODUCTION

In the context of interfirm relationships, management accounting information has the potential to stimulate interfirm cooperation (Caglio and Ditillo 2012). The relationship between interfirm cooperation and sharing management accounting information across partner firms is a traditional area of research in the accounting literature (e.g., Windolph and Moeller 2012; Möller, Windolph, and Isbruch 2011; Meira et al. 2010), and reflects the great research interest in the role of management accounting information in managing interfirm cooperative relationships (Dekker and Van Goor 2000).

Previous studies have claimed that management accounting information can promote interfirm cooperation by resolving conflicts arising between partners, and by supporting integrative behaviors during joint problem solving and cooperation (Essa, Dekker, and Groot 2018). Management accounting information can help to provide timely and accurate information to plan and control cooperative activities between firms (Miguel 2004). For example, in the supply-chain context, relevant cost-accounting information supports various analysis and negotiation activities between buyers and sellers, and thus promotes interfirm collaboration (Essa, Dekker, and Groot 2018). Moreover, interfirm cost-management practices (e.g., chained target costing, quality-function-price trade-offs) in the supply chain can enhance the

level of trust and resource commitment between exchange partners (Agndal and Nilsson 2009; Miguel 2004). Shared interorganizational cost data (e.g., activity-based costs) are also generated to support supply-chain management decisions (Dekker and Van Goor 2000). These interfirm accounting practices facilitated by shared accounting information may positively influence the supplier's relationship satisfaction (Windolph and Moeller 2012; Caglio and Ditillo 2012), and thus stimulate seller-buyer cooperation.

In the intrafirm context, research investigating the relationship between management accounting practices and cross-functional cooperation remains limited. Several studies in the area of activity-based-cost systems and enterprise resource planning (ERP) systems (e.g., Granlund and Malmi 2002) find that to implement such systems, firms need to develop cross-functional communication, and team-work skills because implementing management accounting practices requires a great deal of cross-functional cooperation. It can be argued that the connection between the extent of cooperation between departments is necessary to stimulate the use of management accounting systems (MAS) (Wouters and Roijmans 2011). Indeed, a lack of cooperation between different departments can result in poor information transparency, information distortion, and poor decisions. These negative consequences, in turn, can

impair the efficiency and effectiveness of MAS (Min 2003).

Cooperation between organizational functions has been examined in the areas of marketing (Nguyen et al. 2018; Luo, Slotegraaf, and Pan 2006) and new-product development more than it has been in the area of accounting. Thus, despite the pervasiveness of cross-functional collaboration in organizations, this is an underexplored area of accounting research (Rowe 2004). Although the influence of MAS on organizational performance in the context of transitional economies has been investigated in previous studies (Nguyen 2018), research has not examined how different organizational departments can exploit management accounting information during their cooperative interactions to generate positive organizational outcomes. Building on social capital theory (Nahapiet and Ghoshal 1998) and the resource-based view of the firm (Wernerfelt 1984), this study developed and tested a mediation model to examine whether the use of MAS mediates the path between cross-functional cooperation and organizational performance.

2. THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

2.1. Cross-functional cooperation and MAS

The relationship between cross-functional cooperation and MAS can be explained by considering the role of cross-functional knowledge integration in developing management accounting practices. Wouters and Roijmans (2011) argue that cross-functional knowledge integration is crucial in enabling firms' performance-measurement systems because these systems must represent knowledge from many different people, including financial specialists, accountants, and information-technology specialists, as well as staff members and managers who will use the system. Such cross-functional knowledge integration is essential for developing MAS that are tailored to the management practices of specific situations (Wouters and Roijmans 2011). Therefore, we can argue that cross-functional cooperation in relation to knowledge integration across functional boundaries is the condition for enhancing and using MAS.

The relationship between cross-functional cooperation and MAS can be explained through the social capital theory. Social capital refers to the ability of actors to extract benefits from their social structures, networks, and memberships (Davidsson and Honig 2003). Social capital has three dimensions: structural, relational, and cognitive (Tsai and Ghoshal 1998). The structural dimension is related to networking and social interactions that influence information transfer,

organizational learning, and the execution of organizational activities (Bolino, Turnley, and Bloodgood 2002). The relational dimension is related to attributes such as trust and norms that can enhance connections between employees from different functions and integrate knowledge across functional boundaries (Yen Teoh and Pan 2008). The cognitive dimension is related to shared understanding and shared language (Yen Teoh and Pan 2008).

This study argues that cross-functional cooperation represents all three of these dimensions of social capital. Specifically, cross-functional cooperation clearly reflects the structural and relational dimensions of social capital because the cross-functional cooperation indicators include frequent communication, good social relationships, informal interactions, and strong ties between departments (Bendig et al. 2018). Moreover, cross-functional cooperation involves frequent discussions of a common problem, and mutually gratifying and highly cohesive relationships between departments, thus also representing the cognitive dimension.

These above lines of reasoning suggest the relevance of cross-functional cooperation to the four following dimensions of MAS: scope, timeliness, integration, and aggregation (Chenhall and Morris 1986). Specifically, in the context of MAS, the attributes of the structural and relational dimensions of MAS (e.g. social networking and interactions, trust and norms) are useful for expanding the scope of accounting information shared across departments, and for enhancing the timeliness of this information sharing. Moreover, these attributes of the cognitive dimension of MAS (i.e., shared understanding, shared language) can also be fruitful in establishing integrated and aggregated information provided by MAS.

This study claims that MAS should install knowledge integration mechanisms to integrate knowledge across different functions. Knowledge integration across functions is necessary because knowledge about operational processes, cost-management practices, and information systems is eliminated across different departments (Wouters and Roijmans 2011). Cross-functional dissemination of knowledge requires a high level of cross-functional cooperation ability and intensity. Nguyen et al. (2018) found that cross-functional cooperation can foster cross-functional knowledge sharing, which is fruitful for using MAS across functional boundaries. According to these arguments, this study proposes the following two hypotheses:

Hypothesis 1: Cross-functional cooperative ability has a positive effect on MAS use.

Hypothesis 2: Cross-functional cooperative intensity has a positive effect on MAS use.

2.2. MAS and organizational performance

MAS can also play a decision-influencing role because managerial accounting information can be used to motivate employees (Demski & Feltham, 1976). This role of MAS can be considered the use of information to relieve decision uncertainty (Sprinkle 2003). Given the dynamic nature of the competitive business environment, the information provided by MAS can also inform various managerial decisions. Further, the use of MAS for decision-influencing purposes is intended to influence employee behaviors via the effects that monitoring, measuring, evaluating, and rewarding actions and performance have on motivation (Sprinkle 2003). Moreover, MAS can enhance managerial decision-making effectiveness via better resource allocation (Abernethy and Bouwens 2005; Baines and Langfield-Smith 2003), which can contribute to organizational performance.

The hypothesized relationship between MAS and organizational performance can also be explained through the resource-based view. The resource-based view refers to the theoretical framework describing the strategic resources an organization processes toward developing and sustaining competitive advantage (Eisenhardt and Martin 2000; Wernerfelt 1984). These resources should satisfy the valuable, rare, imperfectly imitable, and non-substitutable (VRIN) criteria (Wernerfelt 1984). According to the contingency theory, there is no way to configure a typical MAS that fits all firms (Cadez and Guilding 2008). Given that the configurations of MAS vary according to various contingent factors (e.g. structure, environmental uncertainty, competitive intensity, technology, competitive strategy, and firm size) (Nguyen 2018), the designs of MAS are firm-specific (Abdel-Kader and Luther 2008) and thus are considered inimitable.

Moreover, with MAS, market information and product/service information can be disseminated across departments before being further processed and converted into knowledge via learning (Nguyen 2018). Given that this knowledge, which is provided by MAS, can be a unique strategic resource for obtaining competitive advantage (Smith, Vasudevan, and Tanniru 1996), MAS can also satisfy the rare criterion of VRIN. Thus, management accounting information plays a critical role in generating new knowledge through enhanced organizational learning. According to the resource-based view, unique knowledge obtained from enhanced organizational learning can positively affect organizational performance (Choe 2004). Therefore, we expected a positive relationship between the use of MAS and organizational performance. Accordingly, this study proposes the following hypothesis:

Hypothesis 3: MAS use has a positive effect on organizational performance.

2.3. The mediating role of MAS

Cross-functional cooperation can generate various competitive benefits such as success in new-product development (Gemser and Leenders 2011; Song, Montoya-Weiss, and Schmidt 1997; Ernst, Hoyer, and Rübssaamen 2010), supply-chain effectiveness (Eng 2006) and overall firm performance (Nguyen et al. 2018). However, whether the use of MAS plays a mediating role in the path between cross-functional cooperation and organizational performance is yet to be explored in the literature. As stated, this study suggests a mediating effect of the use of MAS on the relationship between cross-functional cooperation and organizational performance. Accordingly, this study proposes the following two hypotheses:

Hypothesis 4a: MAS use positively mediates the relationship between cross-functional cooperative ability and organizational performance.

Hypothesis 4b: MAS use positively mediates the relationship between cross-functional cooperative intensity and organizational performance.

The proposed model and its hypotheses are presented in Figure 1.

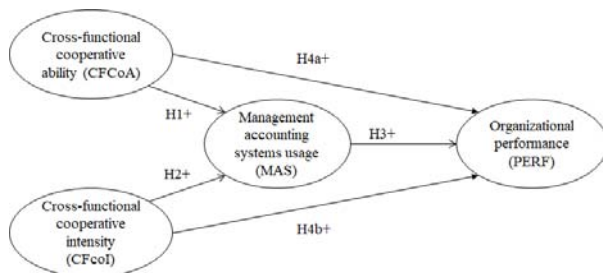


Figure 1. Proposed model.

3. METHODOLOGY

3.1. Sampling

This study was conducted in Vietnam, an emerging economy, with a dataset of 186 large firms located in Vietnam. Informant selection criteria are as follows: (1) mid-level and top-level managers; (2) working in large business organizations in Vietnam;¹ (2) at least two years of experience working in their organization. The sampling frame includes a list of LinkedIn email addresses of managers in Vietnamese business

¹ According to the Vietnamese government's Decree 56 ND-CP, a manufacturing company must have a total capital of more than VND 100 billion or more than 300 full-time-equivalent employees to be considered large. For the service industry, large firms are those that have a total capital of more than VND50 billion or more than 100 full-time-equivalent employees.

organizations obtained from our professional networks. Following the procedure suggested by Brislin (1970), we first developed the questionnaire in English and then translated it into Vietnamese using the forward-translation and back-translation approach. The survey questionnaire was then pilot tested before sending it to the potential informants' email addresses using SurveyMonkey. Of the 5,211 emails sent, 495 responses were received after two two-week interval follow-ups. We then rejected 225 incomplete responses and further eliminated 45 responses from respondents working for small firms, and 39 responses from respondents with fewer than two years of experience working in their firm. Therefore, the final sample included 186 firms, giving an overall response rate of 3.6%. As the response rate was quite low, non-response bias was examined based on all the main variables in the proposed model, using the procedure suggested by

Armstrong and Overton (1977). The procedure did not reveal any sample bias.

Table 1 presents the demographic information of the final sample. Of the respondents, 15.6% are top managers, and the rest are mid-level managers. For firm size, 74.3% of the firms had total assets of more than VND200 billion, and 66.7% had more than 200 full-time-equivalent employees. For industry type, 43.0% of firms were operate in the service industry, 34.9% operate in trading, and 22.0% operate in the manufacturing sector. The sample reflects the industrial structure of Vietnam, in which the services industry contributed to approximately 41.3% of gross domestic product (GDP) of Vietnam in 2018 (PwC 2018).

Table 1. Profiles of sample firms and respondents ($n = 186$)

Demographic information	Categories	Frequency	(%)
Industry type	Manufacturing	41	22.0
	Trading	65	34.9
	Service	80	43.0
Ownership	With foreign capital	120	64.5
	Without foreign capital	66	35.5
Firm size in terms of total assets (in VND billion)	Less than 100	27	14.5
	101 - 200	21	11.3
	201 - 500	28	15.1
	501 - 1,000	31	16.7
	More than 1,000	79	42.5
Firm size in terms of full-time employees)	Less than 200	62	33.3
	200 - 500	42	22.6
	501 - 1,000	29	15.6
	1,001 - 5,000	27	14.5
	5,001 - 10,000	15	8.1
	More than 10,000	11	5.9
Management level	Top-level manager	29	15.6
	Mid-level manager	157	84.4
Work area	Marketing	28	15.1
	Finance/accounting	20	10.8
	R&D	17	9.1
	Sales	45	24.2
	Production	28	15.1
	Others	48	25.8

3.2. Scales

The scales used in this study were adopted from previous studies. Specifically, we measured cross-functional cooperation via its elements-cross-functional cooperative ability and cross-functional cooperative intensity-following the scale adopted by Bendig et al. (2018) and Luo, Slotegraaf, and Pan (2006). MAS use was measured using 15 Likert-scale items, which were categorized into four dimensions: scope, timeliness, aggregation, and integration. This scale was first developed by Chenhall and Morris (1986), and has subsequently been used in various accounting studies (e.g., Gul 1991; Ismail and King 2006; Nguyen 2018). Following Calantone, Cavusgil, and Zhao (2002), we measured firm performance using six seven-point Likert-scale items. Informants were required to compare their company's performance, in relation to these six indicators, with major competitors within the past three years. We also followed previous studies (e.g., Baker and Sinkula 2002) in using ownership structure (1 = "with foreign capital"; 2 = "without foreign capital"), firm size in terms of total assets and

full-time-equivalent employees, and firm age as the common control variables for organizational performance. Table 2 presents the scales of the main constructs.

3.3. Evaluation of measurement models

Table 2 presents the scale items and the latent-variable evaluation. The outer loadings of the scale items of the latent variables ranged between 0.69 and 0.92, which were well above the threshold of 0.50 (Hulland 1999). The corresponding *t*-tests were from 13.39 to 71.33, which were higher than the 1.96 threshold for statistical significance. Moreover, the composite reliabilities of the latent variables were above 0.70 (ranging between 0.88 and 0.96). Finally, the average variance extracted (AVE) values were acceptable because they were above 0.50 (ranging between 0.65 and 0.82). These results indicate a high level of reliability of the measurement scales used in the model.

Table 2. Scale items and latent variable evaluation

Construct and items	Loading	<i>t</i> -test
<i>Cross-functional cooperation</i>		
Cross-functional cooperative ability (CR = 0.93; AVE = 0.70), <i>during the interdepartmental interactions, our departments have strong abilities to</i>		
Identify new and useful market knowledge transferred from other departments	0.76	20.87
Understand new and useful market knowledge transferred from other departments	0.83	31.09
Value new and useful market knowledge transferred from other departments	0.84	23.53
Assimilate new and useful market knowledge transferred from other departments	0.87	30.09
Apply new and useful market knowledge transferred from other departments	0.87	42.72
Exploit new and useful market knowledge transferred from other departments	0.82	27.27
Cross-functional cooperative intensity (CR = 0.92; AVE = 0.66)		
Departments here share communications frequently in our business	0.77	19.93
All departments frequently discuss common problems in our business	0.82	29.58
Market personnel share close ties with people in other departments	0.82	27.18
Our relationship with other departments is mutually gratifying and highly cohesive	0.83	26.31
We expect that our strong interdepartmental social relationship will exist far into the future	0.81	21.09
There is strong informal interaction among people from different departments	0.81	24.89
<i>MAS usage</i>		
Scope (CR = 0.92; AVE = 0.75)		
Information that relates to possible future events (if historical information is most useful for your needs, mark the lower end of the scale)	0.84	28.95

Non-financial information that relates to production and market information such as growth-share etc. (If you find that a financial is most useful for needs, please mark the lower end of the scale.)	0.90	49.96
Non-economic information, such as customer references, relations, attitudes of government and consumer bodies, competitive threat	0.91	51.46
Information on broad factors external to your organisation, such as economic conditions, population growth, technological developments, etc.	0.88	44.09
Timeliness (CR = 0.93; AVE = 0.77)		
Requested information arrives immediately upon request	0.89	60.52
Information supplied to you automatically upon its receipt into information systems or as soon as processing is completed	0.90	56.40
There is no delay between an event occurring and the relevant information being reported to you	0.85	22.98
Reports are provided frequently on a systematic, regular basis, e.g., daily reports, weekly reports	0.81	25.45
Aggregation (CR = 0.93; AVE = 0.82)		
Information in forms, which enable you to conduct what-if analysis	0.89	45.21
Information on the effects of events on particular periods (e.g., monthly/quarterly/annual summaries, trends, comparisons, etc.	0.91	63.27
Information in formats suitable for input into decision models (such as discounted cash flow analysis or incremental marginal analysis)	0.88	32.76
Integration (CR = 0.88; AVE = 0.65)		
Cost and price information of departments of your business unit	0.69	13.39
Presence of precise targets for each activity performed in all sections within your department	0.82	24.53
Information that relates to the impact that your decisions have on the performance of other departments	0.83	26.45
Information on the impact of your decisions throughout your business unit, and the influence of other individual's decision on your area of responsibility	0.80	19.02
Organizational performance (CR = 0.96; AVE = 0.79)		
Market share	0.81	16.58
Customer satisfaction	0.90	57.33
Customer retention	0.89	49.61
Sales growth	0.92	71.33
Sales revenue	0.92	55.45
Overall profitability	0.87	33.79

Table 3. Measurement model validity

	1	2	3	4	5	6	7
<i>Panel A: discriminant analysis</i>							
1. Cross-functional cooperative ability	<i>0.84</i>						
2. Cross-functional cooperative intensity	0.74**	<i>0.81</i>					
3. Scope (MAS)	0.31**	0.36**	<i>0.87</i>				
4. Timeliness (MAS)	0.48**	0.49**	0.68**	<i>0.88</i>			
5. Aggregation (MAS)	0.40**	0.41**	0.59**	0.75**	<i>0.90</i>		
6. Integration (MAS)	0.39**	0.43**	0.61**	0.72**	0.78**	<i>0.81</i>	
7. Organizational performance	0.33**	0.35**	0.46**	0.54**	0.49**	0.60**	<i>0.89</i>
<i>Panel B: statistics</i>							
Mean	3.49	3.56	3.63	4.09	4.16	4.00	4.91
Minimum	1.33	1.17	0.00	1.00	0.00	0.00	1.00
Maximum	5.00	5.00	6.00	6.00	6.00	6.00	7.00
Standard deviation	0.77	0.82	1.43	1.24	1.18	1.23	1.17

Notes: Panel A: MAS, Management accounting systems usage; Square root of AVE (italic diagonal); Correlations between variables (off-diagonal). *, ** Correlation is significant at the 5 and 1 per cent levels respectively (two-tailed *t*-test).

We then further utilized the procedure proposed by Fornell and Larcker (1981) to evaluate the discriminant validity of the measurements. Table 3 shows that the correlations between the latent variables (ranging between 0.81 and 0.90) were higher than all the correlations between the constructs (ranging between 0.31 and 0.78). This result indicates that discriminant validity of the measurements was achieved. In addition, we examined the corresponding variance inflation factor (VIF) values of the independent variables to detect potential multicollinearity issues (O'Brien 2007). We found that the inner VIF values for each relationship between the independent variables in the proposed model ranged between 1.00 and 1.51, which were smaller than the threshold criterion of 10 (Hair et al. 2010), thus confirming that there was no multicollinearity issue in our study.

3.4. Choice of analysis method

To test the proposed model and hypotheses, we employed the partial least squares structural equation model (PLS-SEM) using SmartPLS3. We selected PLS-SEM rather than the traditional covariance-based structural equation model (CB-SEM) because PLS-SEM tends to achieve higher levels of statistical power under the same conditions as CB-SEM, and is designed to maximize explained variance (Hair et al. 2017). Moreover, PLS-SEM does not require a large sample, and it estimates with a good deal of precision the parameters in the context of a small sample size (Hair et al. 2017). A sample size of 186 was larger than the

required minimum sample size for robust PLS-SEM estimations, which is suggested to be ten times the number of path relationships in the testing model. Moreover, PLS-SEM is a well-adopted method of analysis in recent research in management accounting (Bedford and Speklé 2018; Nitzl, Roldan, and Cepeda 2016).

4. RESULTS AND DISCUSSION

Before testing the hypotheses, the standardized root mean square residual (SRMR) value of the composite model was used to examine the model fit (Henseler et al. 2014). The SRMR is acceptable at the recommended value of 0.08 (Henseler, Hubona, and Ray 2016). To test the proposed hypotheses, we ran three models: Model 1 is the full model with MAS as the mediating model, Models 2 and 3 show the paths between cross-functional cooperative ability and cross-functional cooperative intensity, respectively, and organizational performance, without MAS as the mediating variable. The adjusted R^2 values ranged between 0.12 to 0.37, which are above the recommended level of 0.1, thus indicating adequate explanatory power of the three models.

The PLS-SEM analysis presented in Table 4 reveals that both cross-functional cooperative ability and cross-functional cooperative intensity positively and significantly influence MAS use given that the corresponding *t*-values were both significant at 2.22 and 4.05, respectively (see Model 1), thus, Hypothesis

1 and Hypothesis 2 are supported. Hypothesis 3 posits that MAS use has a positive effect on organizational performance (PERF). This hypothesis is also supported because the path between MAS and PERF is positive and significant (t -value = 7.52; see Model 1).

Following the procedure suggested by Baron and Kenny (1986) and Zhao, Lynch Jr, and Chen (2010), we then tested the two mediating hypotheses (i.e., 4a and 4b), which posit that MAS use fully mediates the relationships between cross-functional cooperative ability (CFCoA) and cross-functional cooperative intensity (CFCoI) and PERF. The results in Models 2 and 3 demonstrate that without MAS as the mediating variable, both CFCoA and CFCoI have a significant positive effect on PERF as the corresponding β -values for the paths between these variables and PERF were 0.36 and 0.40, respectively (t -values were 5.85 and 6.19, respectively). However, after including MAS as the mediating variable (see Model 1), the relationships between CFCoA and CFCoI both become insignificant (β -values were 0.38 and 0.84, respectively), suggesting a full mediation role of MAS use on the relationship between cross-functional cooperation and organizational performance.

The study also employed the bootstrapping procedure in Statistical Package for the Social Sciences (SPSS) Process Macro following the suggestion of Preacher and Hayes (2008) to further test the significance of the

mediating effects. The test was based on 5,000 bootstrap samples at a 95% confidence interval. The results indicate that the direct effect of CFCoA on PERF is insignificant ($p = 0.40$), while correlation of the indirect effect of CFCoA on PERF is significant at 0.41 ($p < 0.05$; CI ranging between 0.26 and 0.60), and Sobel statistics at 5.49 ($p < 0.01$). This result indicates that the MAS use fully mediates the influence of CFCoA on PERF, thus supporting Hypothesis 4a. Similarly, the direct effect of CFCoI on PERF is insignificant ($p = 0.28$), and the correlation of the indirect effect of CFCoI on PERF is 0.39 ($p < 0.05$; CI ranging between 0.26 and 0.57), and Sobel statistics at 5.60 ($p < 0.01$). Therefore, Hypothesis 4b is also supported.

Given that we collected and analyzed cross-sectional data using a single-informant approach, this study might suffer from common method bias (Podsakoff et al. 2003). Following Lindell and Whitney (2001), we adopt the marker-variable technique to test common method bias. In particular, we select the item “Are you confident in using computer?” as a marker variable to control for common method bias. The mean change in correlations of the key constructs ($r_U - r_A$) when partialing out the effect of r_M is 0.13 ($p = 0.24$), suggesting that common method bias is insignificant in this study.

Table 4. Findings of PLS-SEM analysis for the proposed model

Hypothesis	Dependent variable	Model 1 (with MAS as mediating variable)				Model 2		Model 3	
		MAS		PERF		PERF		PERF	
		β	t -value	β	t -value	β	t -value	B	t -value
H1, H4a	CFCoA	0.21	2.16**	0.04	0.38	0.36	5.85**		
H2, H4b	CFCoI	0.33	3.71***	0.09	0.84			0.40	6.19**
H3	MAS			0.54	7.52***				*
	<i>Control variables</i>								
	Ownership			(0.05)	0.77	(0.05)	0.63	(0.06)	0.85
	Firm size (assets)			0.02	0.22	0.01	0.14	0.01	0.06
	Firm size (employees)			0.14	1.94*	0.17	1.99**	0.18	2.14**
	Firm age			(0.02)	0.35	(0.03)	0.44	(0.05)	0.78
	Adjusted R^2	0.25		0.37		0.12		0.15	

5. IMPLICATIONS AND CONCLUSIONS

This study adds to the limited literature on the performance implications of using management accounting information in the context of transitional economies (Nguyen 2018). The results of the study agree with extant management accounting research that cross-functional cooperation promotes the development and use of accounting information in organizations (e.g., Wouters and Roijmans 2011; Granlund and Malmi 2002), and in turn, enhances organizational performance (e.g., Simons 1990; Mia and Clarke 1999). However, this study suggests that instead of directly affecting organizational performance, cross-functional cooperation generates competitive advantage via increasing levels of the use of MAS in relation to broad scope, timeliness, aggregation, and integration. Moreover, this study generally supports social capital theory (Nahapiet and Ghoshal 1998) and the resource-based view of the firms (Wernerfelt 1984) in assuming that using accounting information mediates the influence of cooperative behaviors among organizational functions (i.e., knowledge dissemination and sharing, communication, social interaction) on outcomes for organizational performance.

In relation to practical contributions, our findings suggest that business organizations should increase investment in promoting cross-functional connections through leveraging the strategic advantages of accounting information (Widener 2006; Mia and Chenhall 1994). This study demonstrates that in the context of an emerging market such as the market of Vietnam, cross-functional cooperation does not directly enhance organizational performance but indirectly enhances it via the mediating role of MAS use. In addition, the finding that MAS use directly influences organizational performance suggests that MAS use should be enabled and promoted to boost organizational performance through means other than promoting cross-functional cooperation. For example, MAS use can also be influenced by various contingent factors such as organizational structure (Otley 2016), strategic choice (Jermias and Gani 2005), and competitive intensity (Nguyen 2018).

Our study has important limitations that must be acknowledged. Given that we employed a cross-sectional design with data collection via self-report questionnaires at one point in time, our study is not entirely free from common method bias, making it challenging to conclude causality. Future research could deal with these limitations by using objective firm-performance data obtained from secondary sources such as financial statements. Moreover, a longitudinal research design in future research could help to identify the cause-effect relationships between our research variables.

6. REFERENCES

- [1] Abdel-Kader, Magdy, and Robert Luther. 2008. "The Impact of Firm Characteristics on Management Accounting Practices: A Uk-Based Empirical Analysis." *British Accounting Review* 40 (1): 2-27. doi:10.1016/j.bar.2007.11.003.
- [2] Abernethy, Margaret A, and Jan Bouwens. 2005. "Determinants of Accounting Innovation Implementation." *Abacus* 41 (3): 217-240. doi:10.1111/j.1467-6281.2005.00180.x.
- [3] Agndal, Henrik, and Ulf Nilsson. 2009. "Interorganizational Cost Management in the Exchange Process." *Management Accounting Research* 20 (2): 85-101. doi:10.1016/j.mar.2008.07.001.
- [4] Armstrong, J Scott, and Terry S Overton. 1977. "Estimating Nonresponse Bias in Mail Surveys." *Journal of marketing research* 14 (3): 396-402. doi:10.1177/002224377701400320.
- [5] Baines, Annette, and Kim Langfield-Smith. 2003. "Antecedents to Management Accounting Change: A Structural Equation Approach." *Accounting, organizations and society* 28 (7-8): 675-698. doi:10.1016/S0361-3682(02)00102-2.
- [6] Baker, William E, and James M Sinkula. 2002. "Market Orientation, Learning Orientation and Product Innovation: Delving into the Organization's Black Box." *Journal of market-focused management* 5 (1): 5-23. doi:10.1023/A:1012543911149.
- [7] Baron, Reuben M, and David A Kenny. 1986. "The Moderator – Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations." *Journal of personality and social psychology* 51 (6): 1173-1182.
- [8] Bedford, David S, and Roland F Speklé. 2018. "Construct Validity in Survey-Based Management Accounting and Control Research." *Journal of Management Accounting Research* 30 (2): 23-58. doi:10.2308/jmar-51995.
- [9] Bendig, David, Susanne Enke, Niklas Thieme, and Malte Brettel. 2018. "Performance Implications of Cross-Functional Cooperation in New Product Development: The Mediating Role of Organizational Learning." *Industrial Marketing Management* 73: 137-153. doi:10.1016/j.indmarman.2018.02.007.

- [10] Bolino, Mark C, William H Turnley, and James M Bloodgood. 2002. "Citizenship Behavior and the Creation of Social Capital in Organizations." *Academy of management review* 27 (4): 505-522. doi:10.5465/amr.2002.7566023.
- [11] Brislin, Richard W. 1970. "Back-Translation for Cross-Cultural Research." *Journal of cross-cultural psychology* 1 (3): 185-216. doi:10.1177/135910457000100301.
- [12] Cadez, Simon, and Chris Guilding. 2008. "An Exploratory Investigation of an Integrated Contingency Model of Strategic Management Accounting." *Accounting, organizations and society* 33 (7-8): 836-863. doi:10.1016/j.aos.2008.01.003.
- [13] Caglio, Ariela, and Angelo Ditillo. 2012. "Opening the Black Box of Management Accounting Information Exchanges in Buyer-Supplier Relationships." *Management Accounting Research* 23 (2): 61-78. doi:10.1016/j.mar.2012.03.001.
- [14] Calantone, Roger J, S Tamer Cavusgil, and Yushan Zhao. 2002. "Learning Orientation, Firm Innovation Capability, and Firm Performance." *Industrial Marketing Management* 31 (6): 515-524. doi:10.1016/S0019-8501(01)00203-6.
- [15] Chenhall, Robert H, and Deigan Morris. 1986. "The Impact of Structure, Environment, and Interdependence on the Perceived Usefulness of Management Accounting Systems." *Accounting Review* 61 (1): 16-35.
- [16] Choe, Jong-min. 2004. "The Relationships among Management Accounting Information, Organizational Learning and Production Performance." *The Journal of Strategic Information Systems* 13 (1): 61-85. doi:10.1016/j.jsis.2004.01.001.
- [17] Davidsson, Per, and Benson Honig. 2003. "The Role of Social and Human Capital among Nascent Entrepreneurs." *Journal of business venturing* 18 (3): 301-331. doi:10.1016/S0883-9026(02)00097-6.
- [18] Dekker, Henri C, and Ad R Van Goor. 2000. "Supply Chain Management and Management Accounting: A Case Study of Activity-Based Costing." *International Journal of Logistics* 3 (1): 41-52. doi:10.1080/13675560050006664.
- [19] Eisenhardt, Kathleen M, and Jeffrey A Martin. 2000. "Dynamic Capabilities: What Are They?." *Strategic management journal* 21 (10-11): 1105-1121. doi:10.1002/1097-0266(200010/11)21:10/11<1105::AID-SMJ133>3.0.CO;2-E.
- [20] Eng, Teck-Yong. 2006. "An Investigation into the Mediating Role of Cross-Functional Coordination on the Linkage between Organizational Norms and Scm Performance." *Industrial Marketing Management* 35 (6): 762-773. doi:10.1016/j.indmarman.2005.05.014.
- [21] Ernst, Holger, Wayne D Hoyer, and Carsten Rübstaamen. 2010. "Sales, Marketing, and Research-and-Development Cooperation across New Product Development Stages: Implications for Success." *Journal of Marketing* 74 (5): 80-92. doi:10.1509/jmkg.74.5.080.
- [22] Essa, Samy AG, Henri C Dekker, and Tom LCM Groot. 2018. "Your Gain My Pain? The Effects of Accounting Information in Uncertain Negotiations." *Management Accounting Research* In Press. doi:10.1016/j.mar.2018.02.002.
- [23] Fornell, Claes, and David F Larcker. 1981. "Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics." *Journal of Marketing Research* 18 (3): 382-388.
- [24] Gemser, Gerda, and Mark AAM Leenders. 2011. "Managing Cross-Functional Cooperation for New Product Development Success." *Long Range Planning* 44 (1): 26-41. doi:10.1016/j.lrp.2010.11.001.
- [25] Granlund, Markus, and Teemu Malmi. 2002. "Moderate Impact of Erps on Management Accounting: A Lag or Permanent Outcome?." *Management Accounting Research* 13 (3): 299-321. doi:10.1006/mare.2002.0189.
- [26] Gul, Ferdinand A. 1991. "The Effects of Management Accounting Systems and Environmental Uncertainty on Small Business Managers' Performance." *Accounting and business research* 22 (85): 57-61. doi:10.1080/00014788.1991.9729418.
- [27] Hair, J. F, G Tomas M Hult, Christian Ringle, and Marko Sarstedt. 2017. *A Primer on Partial Least Squares Structural Equation Modeling (Pls-Sem)*. 2 ed. Los Angeles: Sage Publications, Inc.
- [28] Hair, J. F., W. C. Black, B. J. Babin, and R. E. Anderson. 2010. *Multivariate Data Analysis*. 7 ed. New Jersey: Pearson Prentice Hall.
- [29] Henseler, Jörg, Theo K Dijkstra, Marko Sarstedt, Christian M Ringle, Adamantios Diamantopoulos, Detmar W Straub, David J Ketchen Jr, Joseph F Hair, G Tomas M Hult, and Roger J Calantone. 2014. "Common Beliefs and Reality About Pls: Comments on Rönkkö and Evermann (2013)." *Organizational Research Methods* 17 (2): 182-209. doi:10.1177/1094428114526928.

- [30] Henseler, Jörg, Geoffrey Hubona, and Pauline Ash Ray. 2016. "Using Pls Path Modeling in New Technology Research: Updated Guidelines." *Industrial management & data systems* 116 (1): 2-20. doi:10.1108/IMDS-09-2015-0382.
- [31] Hulland, John. 1999. "Use of Partial Least Squares (PLS) in Strategic Management Research: A Review of Four Recent Studies." *Strategic management journal* 20 (2): 195-204. doi:10.1002/(SICI)1097-0266(199902)20:2<195::AID-SMJ13>3.0.CO;2-7.
- [32] Ismail, Noor Azizi, and Malcolm King. 2006. "The Alignment of Accounting and Information Systems in Smes in Malaysia." *Journal of Global Information Technology Management* 9 (3): 24-42. doi:10.1080/1097198X.2006.10856425.
- [33] Jermias, Johnny, and Lindawati Gani. 2005. "Ownership Structure, Contingent-Fit, and Business-Unit Performance: A Research Model and Empirical Evidence." *The International Journal of Accounting* 40 (1): 65-85. doi:10.1016/j.intacc.2005.01.004.
- [34] Lindell, Michael K, and David J Whitney. 2001. "Accounting for Common Method Variance in Cross-Sectional Research Designs." *Journal of applied psychology* 86 (1): 114-121. doi:10.1037/0021-9010.86.1.114.
- [35] Luo, Xueming, Rebecca J Slotegraaf, and Xing Pan. 2006. "Cross-Functional "Coopetition": The Simultaneous Role of Cooperation and Competition within Firms." *Journal of Marketing* 70 (2): 67-80. doi:10.1509/jmkg.70.2.067.
- [36] Meira, Juliana, Nikos D. Kartalis, Mathew Tsamenyi, and John Cullen. 2010. "Management Controls and Inter-Firm Relationships: A Review." *Journal of Accounting & Organizational Change* 6 (1): 149-169. doi:10.1108/18325911011025731.
- [37] Mia, Lokman, and Robert H Chenhall. 1994. "The Usefulness of Management Accounting Systems, Functional Differentiation and Managerial Effectiveness." *Accounting, organizations and society* 19 (1): 1-13. doi:10.1016/0361-3682(94)90010-8.
- [38] Mia, Lokman, and Brian Clarke. 1999. "Market Competition, Management Accounting Systems and Business Unit Performance." *Management Accounting Research* 10 (2): 137-158. doi:10.1006/mare.1998.0097.
- [39] Miguel, Martinez Ramos. 2004. "Interaction between Management Accounting and Supply Chain Management." *Supply Chain Management: An International Journal* 9 (2): 134-138. doi:10.1108/13598540410527033.
- [40] Min, Hokey. 2003. "Selection of Management Accounting Systems in Just-in-Time and Theory of Constraints-Based Manufacturing Au - Lea, Bih-Ru." *International Journal of Production Research* 41 (13): 2879-2910. doi:10.1080/0020754031000109134.
- [41] Möller, Klaus, Melanie Windolph, and Felix Isbruch. 2011. "The Effect of Relational Factors on Open-Book Accounting and Inter-Organizational Cost Management in Buyer-Supplier Partnerships." *Journal of Purchasing and Supply Management* 17 (2): 121-131. doi:10.1016/j.pursup.2011.01.002.
- [42] Nahapiet, Janine, and Sumantra Ghoshal. 1998. "Social Capital, Intellectual Capital, and the Organizational Advantage." *Academy of management review* 23 (2): 242-266. doi:10.5465/amr.1998.533225.
- [43] Nguyen, Nguyen Phong. 2018. "Performance Implication of Market Orientation and Use of Management Accounting Systems: The Moderating Role of Accountants' Participation in Strategic Decision Making." *Journal of Asian Business and Economic Studies* 25 (1): 33-49. doi:10.1108/JABES-04-2018-0005.
- [44] Nguyen, Nguyen Phong, Liem Viet Ngo, Tania Bucic, and Nguyen Dong Phong. 2018. "Cross-Functional Knowledge Sharing, Coordination and Firm Performance: The Role of Cross-Functional Competition." *Industrial Marketing Management* 71: 123-134. doi:10.1016/j.indmarman.2017.12.014.
- [45] Nitzl, Christian, Jose L Roldan, and Gabriel Cepeda. 2016. "Mediation Analysis in Partial Least Squares Path Modeling: Helping Researchers Discuss More Sophisticated Models." *Industrial management & data systems* 116 (9): 1849-1864. doi:10.1108/IMDS-07-2015-0302.
- [46] O'brien, Robert M. 2007. "A Caution Regarding Rules of Thumb for Variance Inflation Factors." *Quality & quantity* 41 (5): 673-690. doi:10.1007/s11135-006-9018-6.
- [47] Otley, David. 2016. "The Contingency Theory of Management Accounting and Control: 1980-2014." *Management Accounting Research* 31: 45-62. doi:10.1016/j.mar.2016.02.001.
- [48] Podsakoff, Philip M, Scott B MacKenzie, Jeong-Yeon Lee, and Nathan P Podsakoff. 2003. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies." *Journal of applied*

- psychology* 88 (5): 879-903. doi:10.1037/0021-9010.88.5.879.
- [49] Preacher, Kristopher J, and Andrew F Hayes. 2008. "Asymptotic and Resampling Strategies for Assessing and Comparing Indirect Effects in Multiple Mediator Models." *Behavior research methods* 40 (3): 879-891. doi:10.3758/BRM.40.3.879.
- [50] PwC. "Doing Business in Vietnam." <https://www.pwc.com/vn/en/publications/vietnam-publications/dbg-2018.html>.
- [51] Rowe, Casey. 2004. "The Effect of Accounting Report Structure and Team Structure on Performance in Cross-Functional Teams." *Accounting Review* 79 (4): 1153-1180. doi:10.2308/accr.2004.79.4.1153.
- [52] Simons, Robert. 1990. "The Role of Management Control Systems in Creating Competitive Advantage: New Perspectives." *Accounting, organizations and society* 15 (1-2): 127-143. doi:10.1016/0361-3682(90)90018-P.
- [53] Smith, Ken A, Satish P Vasudevan, and Mohan R Tanniru. 1996. "Organizational Learning and Resource-Based Theory: An Integrative Model." *Journal of Organizational Change Management* 9 (6): 41-53. doi:10.1108/09534819610150512.
- [54] Song, X Michael, Mitzi M Montoya-Weiss, and Jeffrey B Schmidt. 1997. "Antecedents and Consequences of Cross-Functional Cooperation: A Comparison of R&D, Manufacturing, and Marketing Perspectives." *Journal of Product Innovation Management* 14 (1): 35-47. doi:10.1111/1540-5885.1410035.
- [55] Sprinkle, Geoffrey B. 2003. "Perspectives on Experimental Research in Managerial Accounting." *Accounting, organizations and society* 28 (2-3): 287-318. doi:10.1016/S0361-3682(01)00058-7.
- [56] Tsai, Wenpin, and Sumantra Ghoshal. 1998. "Social Capital and Value Creation: The Role of Intrafirm Networks." *Academy of management Journal* 41 (4): 464-476. doi:10.5465/257085.
- [57] Wernerfelt, Birger. 1984. "A Resource-Based View of the Firm." *Strategic management journal* 5 (2): 171-180. doi:10.1002/smj.4250050207.
- [58] Widener, Sally K. 2006. "Associations between Strategic Resource Importance and Performance Measure Use: The Impact on Firm Performance." *Management Accounting Research* 17 (4): 433-457. doi:10.1016/j.mar.2005.10.002.
- [59] Windolph, Melanie, and Klaus Moeller. 2012. "Open-Book Accounting: Reason for Failure of Inter-Firm Cooperation?". *Management Accounting Research* 23 (1): 47-60. doi:10.1016/j.mar.2011.07.001.
- [60] Wouters, Marc, and Diana Roijmans. 2011. "Using Prototypes to Induce Experimentation and Knowledge Integration in the Development of Enabling Accounting Information." *Contemporary Accounting Research* 28 (2): 708-736. doi:10.1111/j.1911-3846.2010.01055.x.
- [61] Yen Teoh, Say, and Shan L Pan. 2008. "Understanding the Influences of Social Integration in Enterprise Systems Use." *Journal of Enterprise Information Management* 21 (5): 493-511. doi:10.1108/17410390810904256.
- [62] Zhao, Xinshu, John G Lynch Jr, and Qimei Chen. 2010. "Reconsidering Baron and Kenny: Myths and Truths About Mediation Analysis." *Journal of consumer research* 37 (2): 197-206. doi:10.1086/651257.

DETERMINANTS OF CAPITAL STRUCTURE OF LISTED COMPANIES IN THE PHARMACEUTICAL SECTOR: EVIDENCE FROM VIETNAM

Nguyen Van Dinh¹, Nguyen Thi Kim Oanh ^{1*}, Bui Thi Minh Huyen²

¹ Vietnam National University, Hanoi - International School

² Vietnam National University, Hanoi - Vietnam Japan University

*Corresponding author: oanhntk@isvnu.vn

Abstract

This study investigates factors associated with the capital structure of pharmaceutical companies listed on Vietnam stock exchanges using secondary data from financial statements, annual reports, and management reports published from 2010 to 2019. We focus on firm characteristics (profitability, growth opportunity, tangible assets, liquidity, firm size and firm age) and corporate governance (pluralist executives). We find that profitability, tangible assets, and liquidity have negative correlations with debt ratio. Firm size, firm age and pluralist executives are negatively associated with debt ratio, but not statistically significant. In contrast, growth opportunities have a positive relationship with capital structure. The findings bring insights into capital structure of listed pharmaceutical firms in Vietnam, which would be useful for investors who are interested in pharmaceutical firms listed in Vietnam.

Keywords: Capital structure, debt ratio, leverage, firm age, pluralist executives, pharmaceutical firms.

1. INTRODUCTION

Capital structure refers to a combination of debt and equity that the firms use to finance its operations (Ross, Westerfield and Jordan, 2013; Brealey, Myers and Allen, 2010). The capital structure can be measured by debt ratio, total debt over total assets (Saeed et al., 2014; Chen, 2004; Ahmed Sheikh and Wang, 2011). It has been a puzzle for the managers to choose the right combination of equity and debt to attract investors and creditors. A right capital structure (equity-debt mix) can reduce the cost of capital and firms aim to reduce the cost of capital to create the shareholder value” (Kaur and Narang, 2010).

In recent years, the theory of modern capital structure has only been studied in developed countries but has not been paid much attention in developing countries (Mouamer, 2011). Črnigoj and Mramor (2009) suggest that differences in the capital structure of companies can be explained by modern capital structure theory for developed countries, but for developing countries, it is still a question for researchers to continue looking for answers. In Vietnam, Le and Do (2017) point out that despite the abundant theoretical and empirical literature on capital structure, the shortage of research in the Vietnamese context is obvious. Therefore, it is important to investigate the factors that influence the capital structure of Vietnamese companies.

We focus on pharmaceutical firms listed in the Vietnam stock market because of several reasons. First, pharmaceutical industry has experienced inevitable development. According to Business Monitor International Research, in 2018, Vietnam's

pharmaceutical market size reached about 5.9 billion USD, up 11.5% compared to the previous year. Vietnam has become Southeast Asia's second-largest pharmaceutical market and is among the 17 fastest growing countries in the world. Vietnam has completed the "golden population" phase from 2016, beginning its aging population from 2017. According to the Department of Population and Family Planning, Ministry of Health, by 2050, 21% of Vietnam's population has been over 65 years old, leading to high consumer demand for drugs over the next 30 years when people's income increase. Although growing rapidly, Vietnam's pharmaceutical production capacity currently meets only 53% of the domestic pharmaceutical demand, the rest is through imports. In 2018, Vietnam's pharmaceutical imports nearly 2.8 billion USD; this level continues to increase by 10% in 2019. Vietnam is also highly dependent on imported pharmaceutical raw materials, mainly from China with more than 60% of demand.

Second, prior empirical studies on determinants of capital structure used a different set of independent and dependent variables show contradictory results (Vo (2017)). Even though research on factors affecting the capital structure of pharmaceutical listed companies has been done in some developing countries (Saeed et al, 2014; Imtiaz et al., 2016), there is no study conducted on the capital structure of the pharmaceutical industry in Vietnam in recent years. Therefore, this study will investigate factors impacting capital structure of pharmaceutical listed firms in the last 10 years, from 2010 to 2019.

2. LITERATURE REVIEW AND HYPOTHESES

2.1 Theoretical background

Modigliani and Miller (1958) introduced the first theory of capital structure laying foundation for later theories. That is, all the way of combinations of equity and liabilities are the same in a perfectly competitive market with no tax. According to Bradley, Jarrell and Kim (1984) "At any financial option, whether using equity or choosing short-term or long-term debt, the value of the business is unchanged". Modigliani and Miller (1963) suggest effect of corporate tax: the value of the levered company is higher than value of unlevered company because of benefits from the tax shield.

The trade-off theory explained why companies are often financed partly by debt and partly by equity. Despite existence of a debt tax-shield benefit, companies cannot fully finance a loan because the use of debt financing generates more costs, especially bankruptcy costs including both direct and indirect costs. The trade-off theory assumes that the target debt ratio can be different among firms. Companies that have secure tangible assets and high profitability have higher debt ratios and vice versa. Companies with large tangible fixed assets will be able to pay better; firms will use more debt to take advantage of the tax shield. The higher the profitability is, the fewer bankruptcy costs are, therefore; companies will tend to use more debt to take advantage of the tax shield.

The pecking order theory indicated that there is a priority in the use of funding sources. The investment will be financed first by internal capital (mainly retained earnings), followed by new debt financing and finally new equity issuance. The order of using funding sources indicates the negative relationship between profit and debt. This theory shows that growth rates and profitability have effects on capital structure. A company with a high growth opportunity has high demand to borrow when the retained earnings are not enough to meet the firm's demand. In contrast, high profitability will allow companies to have more conditions to retain more profit, so they will use less debt.

The agency theory was completed by Jensen and Meckling (1976) and it explains the relationship between principal and agent. This theory shows the growth rate is negatively correlated with debt because shareholders often do not want to share benefits with creditors when the firm grows well. Agency theory suggest that firm size has a positive impact on the debt. Large companies choose to borrow more than small ones because the terms in the loan agreement will control managers' behaviors, which is rooted in conflicts between shareholders and managers.

The conflicts between ownership and management lead to a link between corporate governance and capital structure of the firms through the agency cost (Nazir, Aslam and Nawaz, 2012; Berger, Ofek and Yermack, 1997; Friend and Lang, 1988; Wen, Rwegasira and Bilderbeek, 2002). If CEO is the chairman of the board referred as pluralist executives or CEO duality, he will increase the power of the CEO to help make decisions quickly and ensure decisions are implemented. However, this duality causes management disfunction since the CEO will act to achieve his goals, not the shareholders'. As such, managers may not always accept leverage choices that are maximizing value for shareholders. Instead, managers may tend to select the leverage degree that maximizes their own benefits.

2.2 Research hypotheses

Profitability and Debt ratio: The pecking order theorists suggest that profitability is an essential determinant of capital structure because it shows how much earning the company retains to keep it going (Titman and Wessels, 1988). Enterprises with high profit prefer internal funding to external debt. Internal funding from retained earnings will be used first which is followed by borrowed debt and issued stock. The firms are more likely to use less debt when having high profitability (e.g. Ahmed Sheikh and Wang, 2011; Saeed et al., 2014; Titman and Wessels, 1988; Wald, 1999; Booth et al., 2001; Viviani, 2008; De Jong, Kabir and Nguyen, 2008; Serrasqueiro and Rogão, 2009; Chen, 2004; Tong and Green, 2005; Huang and Song, 2006). However, as implied in the trade-off theory, companies with high profitability should use more debt because of the tax depreciation and lower expected bankruptcy costs (Frank and Goyal, 2003; Fama and French, 2002). In Vietnam, prior studies proved that there is a negative between profitability and capital structure (Pham and Nguyen, 2015; Vo, 2017). Therefore, relationship between profitability and debt ratio is stated as follows:

H1: Profitability is negatively associated with debt ratio

Growth opportunity and Debt ratio: Based on the trade-off theory, the firms which have larger growth opportunities usually maintain a lower debt ratio because the risk level may be high with growth-oriented investment. Besides, firms with growth opportunities like holding intangible assets which cannot be collateral, so they tend to use less debt. Therefore, according to the trade-off theory, there is a negative relationship between growth opportunities and capital structure (Myers, 1984; Deesomsak, Paudyal and Pescetto, 2004). Some researches supported for this opinion are Saeed et al. (2014); Imtiaz, Mahmud and Mallik (2016). Similarly, agency theorists point out that the high growth rate also means positive business results so the shareholders do not want to share this advantage with the creditors, and then they will use less debt (Zou and Xiao, 2006; Eriotis et al., 2007).

In contrast, the pecking order theory suggest that companies with good growth opportunities have more demands for borrowing capital, especially when retained earnings are not enough for operating. In this situation, firms will have the priority to choose borrowed capital to increase the debt ratio because the cost of flotation in selling stock is more than the cost of issuing debt. The empirical studies supported for this opinion include Vo (2017); Pham and Nguyen (2015); Tran and Ramachandran (2006). The relationship between growth opportunity and debt ratio is stated as follows:

H2: Growth opportunity is positively associated with debt ratio

Firm size and Debt ratio: According to pecking-order theory, larger firms will have fewer problems related to information asymmetric, they will tend to use equity to finance firm activities. It means that firm size has a negative impact on capital structure. Chen (2004) also showed the negative relationship between firm size and long-term leverage ratio. However, agency theorists point out that due to the conflict between shareholders and managers, larger companies choose to borrow more because the terms in the loan agreement will control the behavior of the manager (e.g. Deesomsak et al., 2004; Eriotis et al., 2007; Serrasqueiro and Rogão, 2009).

As implied in trade-off theory, large-sized companies can borrow more capital than small-sized enterprises. Small-sized firms have to bear a higher cost than the large-sized ones to have external capital (Titman and Wessels, 1988). Therefore, the large firms are more convenient than the small ones to enter the capital market which shows that there is a positive relationship between debt ratio and the size of firms. Another reason is that bigger firms are more diversified and thus they will have a lower variance of profit and can get tax benefits from debt, making them able to endure a higher cost of debt than smaller firms. Besides, lenders prefer lending to larger firms because such firms are seen to have lower levels of risks (Rajan and Zingales, 1995). This opinion was supported by a lot of empirical studies in the world including Abor (2007); Ahmed Sheikh and Wang (2011); Saeed et al. (2014). In Vietnam, the positive relationship between the size of firms and capital structure was also proved in the research of Tran and Ramachandran (2006). Based on the trade-off theory and the results of previous empirical research, we hypothesize that:

H3: The size of firms is positively associated with debt ratio

Tangible assets and Debt ratio: As stated by Myers (1984), there is a link between tangible assets and financial leverage due to the fact that companies with lots of collaterals will have a low rate in the matter of asymmetric information. Frank and Goyal (2009) claimed that it is evident that if the company has

mortgage loans, the borrower's risk associated with the cost of the loan will also decrease. This argument is also supported by empirical studies (e.g. Huang and Song, 2006; Titman and Wessels, 1988). Based on trade-off theory, tangible assets have a positive relationship with capital structure because enterprises which have the larger number of tangible assets usually receive liabilities with the quite more convenient condition than the ones with the smaller number of tangible assets due to the fact that it looks like a positive sign for creditors. Tangible assets can have an influence on the decision of a company to borrow money because tangible assets are more valuable than intangible assets in case the firm is bankrupt. Besides, the level of risk will decrease when the company provides tangible assets to mortgage and creditors can require to sell these assets in case the company cannot pay. Therefore, tangible assets are good-mortgaged assets for the debt. Empirical studies supported this opinion including Saeed et al. (2014); Frank and Goyal (2009); Titman and Wessels (1988).

Agency theory, in contrast, suggest a negative relationship between tangible assets and debt ratio. Firms with fewer collateral assets can use more debt to prevent managers from the optimal levels of perquisites (e.g. Ahmed Sheikh and Wang, 2011; Booth et al., 2001; Titman and Wessels, 1988; Sayilgan et al., 2006). In Vietnam, a study from Tran and Ramachandran (2006) also found out this negative relationship. Therefore, based on the previous empirical studies as well as the trade-off theory, we hypothesize that:

H4: Tangible assets is positively associated with debt ratio.

Liquidity and Debt ratio: Liquidity ratio may have mixed effect to leverage of the firm (Vo, 2017). Based on the trade-off theory, enterprises with high liquidity usually maintain a higher debt ratio because they can ensure obligations of a contract on time, which shows a positive relationship between liquidity and capital structure. However, as implied in the pecking order theory, enterprises usually have a priority to use internal funding from retained earnings rather than external funding. Therefore, if firms are able to make higher retained earnings, their demand for external funding will not be important when their assets are enough to be used for investing. This shows that there is a negative relationship between liquidity and debt ratio. The empirical studies proved this opinion including Deesomsak et al. (2004); Ahmed Sheikh and Wang (2011); Saeed et al. (2014). Therefore, based on the pecking order theory and some empirical studies, we hypothesize that:

H5: Liquidity is negatively associated with debt ratio

Firm age and Debt ratio: Firm age refers to the number of years from the firm's initial public offering

of common stock until now (Oliner and Rudebusch, 1992). Based on the trade-off theory, the profits of younger firms may be small to pay for the cost of debt and may not be useful to utilize the tax benefits of debt, it means that they gave the research result that firm age has a positive relationship with the leverage ratio. Chen and Strange (2005) also supported this opinion. Besides, Diamond (1989) also pointed out that the older listed companies have a reputation and debt repaying history will be easier to finance their company at a lower cost. In contrast, the pecking order theory showed that older companies will use less debt than younger companies because these older companies have more time to attract, collect and accumulate funds. To support pecking order theory, researches from Hall et al. (2000); Kieschnick and Moussawi (2018) found out that firm age has a negative relationship with the leverage ratio. According to pecking order theory and previous researches, I hypothesize that:

H6: Firm age is negatively associated with debt ratio

Pluralist Executive and Debt ratio: Pluralist executive exists when a firm’s chief executive also serves as Chairman of the board of directors (Boyd, 1995). Agency theorists point out that the goal of the shareholders is to maximize the value of their business, that is, maximize the market value of their equity. Managers are aiming for short-term goals with the ability to increase profits, can bring quick results, help them increase their salaries, bonuses, and reputation. When owners and managers are independent, if the owners lose their control, the managers will operate the companies to make them profitable which may harm the benefit of the owners. On the other hand, when the CEO is also a chairman, they can impact directly the financing decisions of the firms, they usually prefer using less debt to avoid bankruptcy and loss their control. For Fosberg (2004) there is a negative relationship between pluralist executives and leverage ratio.

In contrast, some studies found out that the positive relationship between pluralist executives and the use of debt (e.g. Abor, 2007; Pindado and De La Torre, 2011). Other studies found no significant impact of CEO duality on capital structure (Jaradat, 2015; Saeed et al., 2014). In Vietnam pharmaceutical industry context, recently, many domestic and foreign investors have invested in Vietnamese pharmaceutical companies, so to fund their activities, companies will use capital from new investors and shareholders instead of using debt. Moreover, according to agency theory, shareholders do not want to share benefits with creditors, the CEO as a chairman will use less debt to avoid the risk of bankruptcy, loss of benefits, and loss of their control. we hypothesize that:

H7: Pluralist executive is negatively associated with debt ratio

3. RESEARCH MODEL, MESUREMENT AND DATA COLLECTION

3.1 Research model

This study employs linear regression model to test the hypotheses between capital structure and its determinants (Figure 3.1). The debt ratio is dependent variable. The independent variables consist of Profitability, Growth opportunity, Firm size, Tangible assets, Liquidity, Firm age, and Pluralist Executives.

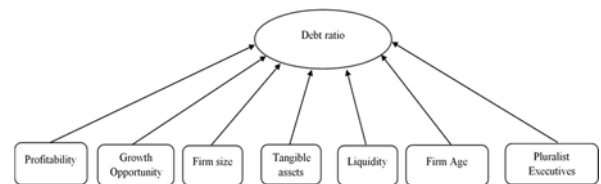


Figure 3.1: Research model

This model is expressed in the equation below:

$$TD = \alpha + \beta_1 PROF_t + \beta_2 GROW_t + \beta_3 SIZE_t + \beta_4 TANG_t + \beta_5 LIQ_t + \beta_6 AGE_t + \beta_7 PLU_t + \epsilon$$

Where TD is debt ratio, PROF is profitability, GROW is growth opportunity, SIZE is firm size, TANG is Tangible assets, LIQ is liquidity, AGE is firm age, PLU is pluralist executives.

3.2 Variable measurements

Variable measurements are estimated using book value and were adopted from prior studies (Table 3.1).

Table 3.1: Variables measurement

Variables	Measurement	References
Debt ratio (TD)	Total debt/ total debt and equity (also equals to total assets)	Saeed et al., (2014); Chen (2004); Ahmed Sheikh and Wang, (2011)
Profitability (PROF)	EBIT/ Total assets	Chen (2004); Sinha and Samanta, (2014)
Growth opportunity (GROW)	Change of percentage of total assets $GROW = \frac{\text{Total assets}_t - \text{Total assets}_{t-1}}{\text{Total assets}_{t-1}}$	Titman and Wessels, (1998); Saeed et al., (2014)
Firm size (SIZE)	Logarithm of total assets $SIZE = \ln(\text{Total assets})$	Chen (2004); Vo (2017)
Tangible assets (TANG)	Fixed assets/ Total assets	Sinha and Samanta, (2014); Chen (2004); Kayo and Kimura (2011)
Liquidity (LIQ)	Current assets/ Current liabilities	Sinha and Samanta, (2014); Ahmed Sheikh and Wang, (2011)
Firm age (AGE)	The number of years = present year – year of listing	Filatotchew, Toms and Wright, (2006); Chen and Strange, (2005)
Pluralist Executives (PLU)	1 if CEO is a chairman of the board; 0 if CEO is not a chairman of the board.	Saeed et al., (2014); Boyd (1995)

3.3 Data collection

There are 20 pharmaceutical companies listed on Vietnam's stock market, of which 9 pharmaceutical companies are listed on the Hanoi Stock Exchange (HNX) and 11 pharmaceutical companies are listed on the Ho Chi Minh City Stock Exchange (HOSE). The data were collected from financial statements of 20 listed pharmaceutical companies from 2010 to 2019. Then, the authors also used Excel to intergrade data and calculate the necessary ratios. EViews software was used to analyze the data.

4. FINDINGS AND DISCUSSIONS

4.1 Descriptive statistics

Table 4.1 shows that main funding sources for business activities are short-term debt (current liabilities) and equity. The accounts payable accounts for the largest proportion. Long-term debt accounts for only a very small proportion of the total funds of the business. Table 4.2 presents descriptive statistics of all variables.

Table 4.1: Capital structures of pharmaceutical firms

Year	CL/TC	LD/TC	TE/TC
2019	45.84%	3.06%	51.09%
2018	48.69%	3.49%	47.83%
2017	52.03%	1.79%	46.18%
2016	50.70%	1.42%	47.87%
2015	48.57%	2.85%	48.58%
2014	51.36%	2.92%	45.72%
2013	51.88%	4.14%	43.97%
2012	54.49%	2.93%	42.58%
2011	53.43%	4.12%	42.45%
2010	49.43%	3.22%	47.34%
Average	50.64%	3.00%	46.36%

Where: CL is Current Liabilities; LD is Long-term Debts; TE is Total Equities; TC is Total Capital = CL + LD + TE.

Table 4.2: Descriptive statistics of independent variables

Variables	Obs	Mean	Std. Dev	Min	Max
TD	200	0.42	0.21	0.09	0.097
PROF	200	0.13	0.08	-0.35	0.43
GROW	200	0.25	1.39	-0.21	19.33
SIZE	200	13.11	1.3	9.82	16.09
TANG	200	0.26	0.17	0.05	0.74
LIQ	200	2.35	1.47	0.87	13.33
AGE	200	4.85	3.68	0	13
PLU	200	0.38	0.49	0	1

4.2 Testing the model

Figure 4.1 shows the original regression model. R-squared is equal to 0.637594, which means that 63.7594% of the volatility of total debt is due to the independent variables including profitability, growth rate, firm size, tangible assets, liquidity, firm age, and plural executives. In other words, this regression model explains 63.7594% of the capital structure, the rest is due to errors and other factors. In addition, the regressors have impact on the regressand [$F = 46.96551 > F_{\alpha} (k-1, n-k) = F_{0.05} (7, 192) = 2.0096$; Prob (F-statistic) = 0.0000 < 0.05] (Gujarati and Porter, 2012).

Dependent Variable: TD
Method: Least Squares
Date: 03/18/20 Time: 16:15
Sample: 1 200
Included observations: 200

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.910531	0.136082	6.691059	0.0000
PROF	-0.830972	0.111648	-7.442813	0.0000
GROW	0.037339	0.007935	4.705475	0.0000
SIZE	-0.002988	0.009306	-0.321065	0.7485
TANG	-0.352823	0.074585	-4.730507	0.0000
LIQ	-0.097595	0.007739	-12.61135	0.0000
AGE	-0.002494	0.002298	-1.085320	0.2791
PLU	-0.033173	0.020866	-1.589827	0.1135
R-squared	0.631307	Mean dependent var	0.426477	
Adjusted R-squared	0.617865	S.D. dependent var	0.210458	
S.E. of regression	0.130099	Akaike info criterion	-1.201869	
Sum squared resid	3.249728	Schwarz criterion	-1.069936	
Log likelihood	128.1869	Hannan-Quinn criter.	-1.148478	
F-statistic	46.96551	Durbin-Watson stat	2.207052	
Prob(F-statistic)	0.000000			

Figure 4.1: Original regression model

Correlation between independent variables were examined. As shown in Figure 4.2, TANG and SIZE have the strongest correlation with each other (the absolute value of the correlation coefficient is 0.616202). Therefore, the regression model without one of these two variables was tested.

	TD	PROF	GROW	SIZE	TANG	LIQ	AGE	PLU
TD	1.00000	-0.483045	-0.069642	0.054299	-0.141375	-0.633861	-0.090031	-0.044357
PROF	-0.483045	1.000000	-0.017022	0.151511	-0.199908	0.264505	0.013555	-0.045527
GROW	-0.069642	-0.017022	1.000000	-0.008025	-0.114073	0.503306	0.015433	0.106640
SIZE	0.054299	0.151511	-0.008025	1.000000	-0.616202	0.053736	0.250078	-0.161072
TANG	-0.141375	-0.199908	-0.114073	-0.616202	1.000000	-0.106714	-0.131438	0.075928
LIQ	-0.633861	0.264505	0.503306	0.053736	-0.106714	1.000000	0.141022	0.020106
AGE	-0.090031	0.013555	0.015433	0.250078	-0.131438	0.141022	1.000000	-0.395179
PLU	-0.044357	-0.045527	0.106640	-0.161072	0.075928	0.020106	-0.395179	1.000000

Figure 4.2: Correlation matrix of research variables

When removing one of the two variables from the model, the results of the remaining variables remain unchanged. Therefore, it can be concluded that the strong correlation between the two variables TANG and SIZE does not affect the results of the regression model (Figure 4.3 and Figure 4.4).

Dependent Variable: TD
Method: Least Squares
Date: 04/30/20 Time: 14:10
Sample: 1 200
Included observations: 200

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.868012	0.031230	27.79392	0.0000
PROF	-0.832171	0.111325	-7.475118	0.0000
GROW	0.037541	0.007892	4.756772	0.0000
LIQ	-0.097591	0.007721	-12.64021	0.0000
TANG	-0.338436	0.059484	-5.689537	0.0000
AGE	-0.002626	0.002255	-1.164467	0.2457
PLU	-0.032809	0.020787	-1.578354	0.1161

R-squared 0.631109 Mean dependent var 0.426477
Adjusted R-squared 0.619641 S.D. dependent var 0.210458
S.E. of regression 0.129796 Akaike info criterion -1.211332
Sum squared resid 3.251473 Schwarz criterion -1.095891
Log likelihood 128.1332 Hannan-Quinn criter. -1.164615
F-statistic 55.03166 Durbin-Watson stat 2.215500
Prob(F-statistic) 0.000000

Figure 4.3: Regression model without “SIZE” variable

Dependent Variable: TD
Method: Least Squares
Date: 04/30/20 Time: 14:15
Sample: 1 200
Included observations: 200

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.460507	0.102552	4.490492	0.0000
PROF	-0.757234	0.116516	-6.498969	0.0000
GROW	0.042657	0.008279	5.152564	0.0000
LIQ	-0.098353	0.008154	-12.06157	0.0000
SIZE	0.023460	0.007840	2.992321	0.0031
AGE	-0.002726	0.002421	-1.125778	0.2617
PLU	-0.032455	0.021991	-1.475871	0.1416

R-squared 0.588336 Mean dependent var 0.426477
Adjusted R-squared 0.575538 S.D. dependent var 0.210458
S.E. of regression 0.137115 Akaike info criterion -1.101625
Sum squared resid 3.628486 Schwarz criterion -0.986184
Log likelihood 117.1625 Hannan-Quinn criter. -1.054908
F-statistic 45.97144 Durbin-Watson stat 2.365551
Prob(F-statistic) 0.000000

Figure 4.4: Regression model without “TANG” variable

Multicollinearity was examined and the result indicates no multicollinearity because all VIF values range from 1.163686 to 1.716872 which are smaller than 10 (Gujarati and Porter, 2012). Breusch-Godfrey Test and White test are used to test autocorrelation and heteroskedasticity, respectively (White, 1980). The results show that there is no serial correlation in the regression model, but the regression model has heteroskedasticity. Therefore, the standard errors model was used to overcome the heteroskedasticity of the model (White, 1980), as shown in Figure 4.5.

Dependent Variable: TD
Method: Least Squares
Date: 03/19/20 Time: 15:49
Sample: 1 200
Included observations: 200
White-Hinkley (HC1) heteroskedasticity consistent standard errors and covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.910531	0.113562	8.017943	0.0000
PROF	-0.830972	0.139938	-5.938149	0.0000
GROW	0.037339	0.007176	5.203114	0.0000
TANG	-0.352823	0.086774	-4.065990	0.0001
LIQ	-0.097595	0.013785	-7.080022	0.0000
SIZE	-0.002988	0.008581	-0.348185	0.7281
AGE	-0.002494	0.002740	-0.910028	0.3639
PLU	-0.033173	0.024203	-1.370603	0.1721

R-squared 0.631307 Mean dependent var 0.426477
Adjusted R-squared 0.617865 S.D. dependent var 0.210458
S.E. of regression 0.130099 Akaike info criterion -1.201869
Sum squared resid 3.249728 Schwarz criterion -1.069936
Log likelihood 128.1869 Hannan-Quinn criter. -1.148478
F-statistic 46.96551 Durbin-Watson stat 2.207052
Prob(F-statistic) 0.000000 Wald F-statistic 49.29740
Prob(Wald F-statistic) 0.000000

Figure 4.5: None-Heteroskedasticity regression model

The regression model is written as follow:

$$TD = 0.910531 - 0.830972*PROF + 0.037339*GROW - 0.002988*SIZE - 0.352823*TANG - 0.097595*LIQ - 0.002494*AGE - 0.033173*PLU + \epsilon$$

Figure 4.5 shows findings of hypothesis testing. H1 is confirmed: the coefficient β of profitability (PROF) is negative and statistically significant impact. This negative relationship can be explained by the pecking order theory. If a company has high profit, it will use the internal source of funding like retained earnings rather than borrowings from external sources. This result is consistent with prior studies (e.g. Titman and Wessel, 1988; Booth et al., 2001; Sayilgan et al., 2006; Tran and Ramachandran, 2006; Ahmed Sheikh and Wang, 2011; Saeed et al., 2014; Pham and Nguyen, 2015).

H2 is confirmed: the coefficient β of the growth opportunity is positive and statistically significant.

Although this correlation is contradictory with the predictions of the trade-off theory, it supports the pecking order theory explaining that the growing companies require more capital but they do not have enough retained earnings so the companies must prioritize funding from debt rather than equity. The results of this study are consistent with the results of the study of Sayilgan et al. (2006); Tran and Ramachandran (2006); Pham and Nguyen (2015); Vo (2017).

H3 is rejected: the beta coefficient of the size of the firms (SIZE) is negative associated with total debt. However, this relationship does not have statistical meaning because $P\text{-value} = 0.7281 > 0.05$. This result is suitable with the pecking order theory suggests that asymmetric information in large-sized companies is less than the small – sized ones because the big companies usually have the tendency to provide information for external investors. Therefore, they usually prefer using equity to debt (Titman and Wessel, 1988; Chen 2004).

For H4, the beta coefficient of tangible assets is negative and statistically significant impact. Therefore, H4 is not supported. Nowadays, the pharmaceutical companies in Vietnam have a higher import percentage than export one which shows that the production technology is low and pharmaceutical companies invest less tangible fixed assets like machines. They mainly invest in the inventories, however, due to the fact that account receivables have still not received, so the firms still have to borrow to finance these activities. In addition, when using debt, the company will avoid maximizing profit of managers. This result is consistent with the research results of Booth et al. (2001); Sayilgan et al. (2006); Tran and Ramachandran (2006); Ahmed Sheikh and Wang (2011); Imtiaz, Mahmud and Mallik (2016).

H5 is confirmed: the coefficient of the liquidity ratio (LIQ) is negative and statistically significant. This correlation supports the predictions of pecking order theory that when looking for capital, firms usually do a favor of internal funding by retained earnings rather than using external funding. This result is supported by the study results of Saeedi and Mahmoodi (2011), Saeed et al. (2014).

Regarding H6, the coefficient of the firm age (AGE) in the regression result is negative effect on debt ratio. The pecking order theory supports this result. Because this theory points out that older companies will use less debt because these companies have more time and more opportunities to get and collect funds from investors. Besides, this finding is suitable with the research findings of Hall et al. (2000); Kieschnick and Moussawi (2018). However, the firm age does not have

the statistical meaning in this regression model because $P\text{-value} = 0.3639 > 0.05$. Therefore, H6 is rejected.

For H7, the coefficient β of the pluralist executives (PLU) in the regression result is negative associated with debt ratio. This result is consistent with research results from Fosberg (2004). The meaning of this negative relationship is when the CEO is also a chairman in the pharmaceutical industry in Vietnam, they will prefer using lower debts to finance firm activities to avoid the risk of bankruptcy and loss of controls. In addition, nowadays, with the increasing trend of investment in Vietnam's pharmaceutical industry, according to pecking-order theory, pluralist executives can use financial resources from the company's shareholders to finance the company's operations to avoid diluting power, preserving their control. However, because $P\text{-value} = 0.1721 > 0.05$ so the plural executives do not have the statistical meaning in this regression model. Therefore, H7 is not supported.

5. CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

5.1 Conclusions

This study investigates the determinants of the capital structure using the sample of 20 listed pharmaceutical companies on Hanoi Stock Exchange and Ho Chi Minh City Stock Exchange. The OLS regression method was employed to analyze data collected from financial statement and annual report for a ten-year period (2010 - 2019). The regression model is used to test the effect of seven explanatory variables including profitability, growth opportunities, tangible asset, firm size, liquidity, firm age and pluralist executives to the ratio of total debt to total assets. Research results show that profitability, tangible assets, and liquidity have a negative correlation with capital structure. In contrast, growth opportunities have a positive relationship with capital structure. The study finds that firm size, firm age and pluralist executives negatively impact debt ratio, but not statistically significant. Overall, the results are most consistent with previous studies on capital structure.

5.2 Implications

The findings have implications for investors and policy makers. For investors, they should ask high growth opportunity companies that want to borrow capital have to provide financial situation information, present a plan for payment of its debts reasonably to demonstrate that the companies can control its finances. Investors should also assess whether the company's current assets are sufficient to cover its current or short-term debt.

Stocks listed on HOSE often have high liquidity, higher transparency in information than stocks on HNX, which is a good signal for investors, especially foreign investors, when choosing companies to invest.

Policymakers should establish a professional credit rating organization to objectively assess the prestige as well as the financial capacity of the bond issuing pharmaceutical enterprises. This will create peace of mind for investors when participating in the trading of corporate bonds. Also, there should be mechanisms to develop the secondary bond market. When this market is developing, the increased bond liquidity will help businesses easier to issue new bonds.

5.3 Limitations

Despite achievements, this study is subjected to several limitations. The number of samples is limited due to the low number of pharmaceutical companies listed on Stock Exchanges during the studied period. Another limitation of data collection and processing is the estimation of financial data generated entirely from financial statements of companies which means that asset value or debts are calculated by book value without considering their market value. This study has limitations but may suggest rooms for further researches in this area. The results of the study can be improved by adding new explanatory variables or expanding the research time period.

6. REFERENCES

- [1] Abor, J. (2007). Corporate governance and financing decisions of Ghanaian listed firms. *Corporate Governance: The international journal of business in society*, 7(1), 83-92.
- [2] Afza, T., and Hussain, A. (2011). Determinants of capital structure across selected manufacturing sectors of Pakistan. *International Journal of Humanities and Social Science*, 1(12), 254-262.
- [3] Ahmed Sheikh, N., and Wang, Z., 2011, Determinants of capital structure: An empirical study of firms in manufacturing industry of Pakistan, *Managerial Finance*, 37(2), 117-133.
- [4] Eriotis, N., Artikis, G. P., Vasiliou, D., and Ventoura-Neokosmidi, Z. (2007). How firm characteristics affect capital structure: an empirical study. *Managerial Finance*, 33(5), 321-331.
- [5] Berger, P. G., Ofek, E., and Yermack, D. L. (1997). Managerial entrenchment and capital structure decisions. *The journal of finance*, 52(4), 1411-1438.
- [6] Booth, L., Aivazian, V., Demirguc-Kunt, A., and Maksimovic, V. (2001). Capital structures in developing countries. *The journal of finance*, 56(1), 87-130.
- [7] Boyd, B. K. (1995). CEO duality and firm performance: A contingency model. *Strategic Management Journal*, 16(4), 301-312.
- [8] Bradley, M., Jarrell, G. A., and Kim, E. (1984). On the existence of an optimal capital structure: Theory and evidence. *The journal of Finance*, 39(3), 857-878.
- [9] Brealey, R. A., Myers, S. C., and Allen, F. (2010). *Principals of Corporate Finance* (tenth edition). New York: McGraw-Hill/Irwin.
- [10] Chen, J. J. (2004). Determinants of capital structure of Chinese-listed companies. *Journal of Business research*, 57(12), 1341-1351.
- [11] Chen, J., and Strange, R. (2005). The determinants of capital structure: Evidence from Chinese listed companies. *Economic change and Restructuring*, 38(1), 11-35.
- [12] Črnigoj, M., and Mramor, D. (2009). Determinants of capital structure in emerging European economies: evidence from Slovenian firms. *Emerging Markets Finance and Trade*, 45(1), 72-89.
- [13] De Jong, A., Kabir, R., and Nguyen, T. T. (2008). Capital structure around the world: The roles of firm-and country-specific determinants. *Journal of Banking and Finance*, 32(9), 1954-1969.
- [14] De Miguel, A., and Pindado, J. (2001). Determinants of capital structure: new evidence from Spanish panel data. *Journal of Corporate Finance*, 7(1), 77-99.
- [15] Deesomsak, R., Paudyal, K., and Pescetto, G. (2004). The determinants of capital structure: evidence from the Asia Pacific region. *Journal of Multinational Financial Management*, 14(4-5), 387-405.
- [16] Diamond, D. W. (1989). Reputation acquisition in debt markets. *Journal of political Economy*, 97(4), 828-862.
- [17] Fama, E. F., and French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *The review of financial studies*, 15(1), 1-33.
- [18] Filatotchev, I., Toms, S., and Wright, M. (2006). The firm's strategic dynamics and corporate governance life-cycle. *International Journal of Managerial Finance*, 2(4), 256-279.
- [19] Fosberg, R. H. (2004). Agency problems and debt financing: leadership structure effects. *Corporate Governance: The international journal of business in society*, 4(1), 31-38.
- [20] Frank, M. Z., and Goyal, V. K. (2003). Testing the pecking order theory of capital structure. *Journal of financial economics*, 67(2), 217-248.
- [21] Friend, I., and Lang, L. H. (1988). An empirical test of the impact of managerial self-interest on corporate capital structure. *The Journal of Finance*, 43(2), 271-281.
- [22] Gujarati, D. N., and Porter, D. C. (2012). *Basic Econometrics*. McGraw-Hill Education.

- [23] Hall, G., Hutchinson, P., and Michaelas, N. (2000). Industry effects of the determinants of unquoted SMEs' capital structure. *International Journal of the Economics of Business*, 7(3), 297-312.
- [24] Huang, G. and Song, F.M. (2006). The determinants of capital structure: evidence from China. *China Economic Review*, 17(1), 14-36.
- [25] Imtiaz, F., Mahmud, K., and Mallik, A. (2016). Determinants of capital structure and testing of applicable theories: Evidence from pharmaceutical firms of Bangladesh. *International Journal of Economics and Finance*, 8(3), 23-32.
- [26] Jaradat, M. S. (2015). Corporate governance practices and capital structure: A study with special reference to board size, board gender, outside director, and CEO duality. *International Journal of Economics, Commerce and Management*, 3(5), 264-273.
- [27] Jensen, M. C. and Meckling, W., 1976. Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure. *Journal of Finance Economics*, 3(4), 305 -360.
- [28] Roe, J (1990). Political and legal restraints on ownership and control of public companies. *Journal of Financial Economics*, 27, 7-41.
- [29] Kaur, M., and Narang, S. (2010). EVA disclosures in the annual reports of Indian companies: An empirical study. *Global Business Review*, 11(3), 395-420.
- [30] Kayo, E. K., and Kimura, H. (2011). Hierarchical determinants of capital structure. *Journal of Banking and Finance*, 35(2), 358-371.
- [31] Kieschnick, R., and Moussawi, R. (2018). Firm age, corporate governance, and capital structure choices. *Journal of Corporate Finance*, 48, 597-614.
- [32] Le, T. T., and Do, H. M. (2017). Determinants of capital structure: An empirical study on Vietnamese listed firms. *Serbian Journal of Management*, 12(1), 77-92.
- [33] Modigliani, F., and Miller, M. H. (1958). The Cost of Capital, Corporation Finance and The Theory of Investment. *American Economic Review*, 48(3), 261-297.
- [34] Modigliani, F., and Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. *The American economic review*, 53(3), 433-443.
- [35] Mouamer, F. M. A. (2011). The determinants of capital structure of Palestine-listed companies. *The Journal of Risk Finance*, 12(3), 226-241.
- [36] Myers, S. C. (1984). The capital structure puzzle. *The journal of finance*, 39(3), 574-592.
- [37] Nazir, M. S., Aslam, A., and Nawaz, M. M. (2012). The impact of CEO duality on capital structure: A case from non-financial sector of Pakistan. *American Journal of Scientific Research*, 56(56), 5-12.
- [38] Oliner, S. D., and Rudebusch, G. D. (1992). Sources of the financing hierarchy for business investment. *The Review of Economics and Statistics*, 643-654.
- [39] Pham, M. T., and Nguyen, D. T. (2015). Factors influencing capital structure of Vietnam's real estate enterprises: a move from static to dynamic models. *Journal of Economic Development*, 22 (4), 76-91.
- [40] Pindado, J., and De La Torre, C. (2011). Capital structure: New evidence from the ownership structure. *International Review of Finance*, 11(2), 213-226.
- [41] Ranti, U. O. (2013). The effects of board size and CEO duality on firms' capital structure: A study of selected listed firms in Nigeria. *Asian Economic and Financial Review*, 3(8), 1033.
- [42] Rajan, R. G., and Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The journal of Finance*, 50(5), 1421-1460.
- [43] Ross, S. A., Westerfield, R. W., and Jordan, B.D. (2013). *Fundamental of Corporate Finance* (tenth edition). New York: McGraw-Hill/Irwin.
- [44] Saeed, R., Munir, H. M., Lodhi, R. N., Riaz, A., and Iqbal, A. (2014). Capital structure and its determinants: Empirical evidence from Pakistan's pharmaceutical firms. *Journal of Basic and Applied Scientific Research*, 4(2), 115-125.
- [45] Saeedi, A., and Mahmoodi, I. (2011). Capital structure and firm performance: Evidence from Iranian companies. *International Research Journal of Finance and Economics*, 70, 20-29.
- [46] Sayilgan, G., Karabacak, H., and Küçükkocaoğlu, G. (2006). The firm-specific determinants of corporate capital structure: Evidence from Turkish panel data. *Investment Management and Financial Innovations*, 3(3), 125-139.
- [47] Serrasqueiro, Z. M. S., and Rogão, M. C. R. (2009). Capital structure of listed Portuguese companies. *Review of Accounting and Finance*, 8(1), 54-75.
- [48] Sinha, S., and Samanta, P. K. (2014). Non-linearity in the determinants of capital structure: Evidence from Selected Indian pharmaceutical companies. *International Conference on Business and Information Management*, 79-85.
- [49] Titman, S., and Wessels, R. (1988). The determinants of capital structure choice. *The Journal of finance*, 43(1), 1-19.
- [50] Tong, G., and Green, C. J. (2005). Pecking order or trade-off hypothesis? Evidence on the capital structure of Chinese companies. *Applied economics*, 37(19), 2179-2189.
- [51] Tran, N. D. K., and Ramachandran, N. (2006). Capital structure in small and medium-sized enterprises: the case of Vietnam. *ASEAN Economic bulletin*, 23(2), 192-211.

- [52] Viviani, J. L. (2008). Capital structure determinants: an empirical study of French companies in the wine industry. *International journal of wine business research*, 20(2), 171-194.
- [53] Vo, X. V. (2017). Determinants of capital structure in emerging markets: Evidence from Vietnam. *Research in International Business and Finance*, 40, 105-113.
- [54] Wald, J. K. (1999). How firm characteristics affect capital structure: an international comparison. *Journal of Financial research*, 22(2), 161-187.
- [55] White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica: journal of the Econometric Society*, 817-838.
- [56] Wen, Y., Rwegasira, K., and Bilderbeek, J. (2002). Corporate governance and capital structure decisions of the Chinese listed firms. *Corporate Governance: An International Review*, 10(2), 75-83.
- [57] Zou, H., and Xiao, J. Z. (2006). The financing behaviour of listed Chinese firms. *The British Accounting Review*, 38(3), 239-258.

DETERMINANTS OF THE CHOICE BETWEEN ACQUISITIONS AND JOINT VENTURES IN VIETNAM

Doan Thu Trang^{1*}, Nguyen Thi Tuyet Lan¹ and Bui Le Thuy Linh¹

¹ International School, Vietnam National University Hanoi, Vietnam

*Corresponding author: trangdt@isvnu.vn

Abstract

This research examines the determinants of the choice between two popular international entry modes, namely acquisitions and joint ventures, of investors in the Vietnamese market. We proposed seven factors at country-, industry-, and firm-levels that can have an impact on this investment decision. These factors include cultural distance, economic growth, industry relatedness, resource access speed, investing experience, deal size and target company structure. Based on a sample of 400 acquisitions and joint ventures in Vietnam between 2000 and 2018, our empirical findings suggest that acquisitions are preferred to joint ventures when (1) the culture of the host country is similar to Vietnamese culture, (2) investors already have some experiences on investing in Vietnam, and (3) the target firm is in the manufacturing, wholesale or retail industries. We also find that foreign investors are more likely to choose acquisitions when the market growth, measured by the ratio of GDP to population, is low and when the target firm is in a different industry.

Keywords: foreign direct investment, acquisitions, joint ventures, international entry modes, emerging economies.

1. INTRODUCTION

International entry modes have been the topic of great interests of scholars for decades (Canabal and White III, 2008). In general, international entry modes can be categorized into two major groups: (1) non-equity modes such as exporting, franchising, licensing, turnkey projects, and so on; and (2) equity modes, which involve joint ventures, mergers and acquisitions and greenfield (Pan and Tse, 2000). Choosing which mode to enter a foreign market is always a critical strategic decision to firms and managers because this decision can lead to far-reaching consequences on the firm's performance and survival in a foreign market.

Among the several existing entry modes, cross-border acquisitions and international joint ventures have been explored in a significant number of scientific articles (Datta, Musteen, and Herrmann, 2009; Hennart and Reddy, 1997; Kogut and Singh, 1988; Reuer and Koza, 2000). While both of these entry modes offer relatively quick access to foreign markets and their resources, they are distinctive in many aspects. Joint ventures lead to the creation of a new entity in which partner firms will share responsibilities, profits and equity. Full cross-border acquisitions imply the purchase of the whole existing firms in foreign markets, resulting in higher control over assets for acquiring firms in their host countries. Therefore, on the one hand, joint ventures can serve as a mechanism to reduce transaction costs, which are of great concerns for acquiring firms (Balakrishnan and Koza, 1993). On the other hand, firms will opt for acquisitions if they are in need of higher control over their resources (Peng, 2013).

Prior research has demonstrated many different factors that can affect the choice of firms regarding these two modes to enter foreign markets. Multiple papers have applied transaction cost theory to analyze the preference of a company on these entry modes (Balakrishnan and Koza, 1989; Cleeve, 1997; Hennart and Reddy, 1997; Pan and Tse, 2000). These papers indicate that joint ventures are superior when transaction costs and the cost of valuing and acquiring complementary assets are significant. Transaction cost theory-based research also examines the impact of cultural distance, experiences and R&D intensity on entry mode choice (Herrmann and Datta, 2006; Makino and Neupert, 2000). In addition to transaction cost theory, there is another research stream that explores determinants of choices between acquisitions and joint ventures from the resource-based view perspective. For example, Madhok (1997) states that in order to maximize their knowledge and capabilities, firms tend to expand through acquisitions. Moreover, firm with resource constraints are likely to avoid high-commitment entry mode such as acquisitions (Ripolles, Blesa and Monferrer, 2012).

Although prior literature has provided many interesting insights and understandings on determinants of entry mode choice, the majority of them were conducted in the context of developed economies. A few that focus on emerging economies investigate their hypotheses in the Eastern Europe (Meyer, 2001; Tatoglu and Glaister, 1998) or BRIC countries such as China (Sun, 1999; Tse, Pan, and Au, 1997). This generates a void in the literature that needs to be filled as emerging economies can provide a prosperous ground for research on international entry modes. Emerging countries are

becoming wealthier with growing domestic demands for international goods and services. Their labor quality improves outstandingly and political environment is less complicated. Therefore, it has been transforming global trade pattern and showing its unprecedented charm to foreign direct investment (FDI). However, emerging markets' firms (1) lack skills and abilities to manage risks associated with high resource commitments; (2) are likely to face discrimination by host country's customers and governments; and (3) experiences a lack of credibility regarding the organization. In general, they encounter legitimacy-based and capability-based disadvantages. Hence, determinants of entry modes into emerging countries should have more distinctive characteristics than those in the context of developed economies.

With an effort to provide more insights to the research stream on factors that influence international entry mode choice, particularly between acquisitions and joint ventures, we dedicate this research to investigate the case of foreign investment in Vietnam. Among the currently growing emerging economies, Vietnam provides an interesting context, as it is one of the fastest growing economies of the ASEAN region, as a result of increased foreign investment in recent years (Das and Tuen, 2016). Focusing on Vietnam, our study expects to make several theoretical and practical contributions. Since FDI activities in Vietnam have been developing dramatically, yet without a fundamental basis, this paper attempts to give foreign investors insights into choices of acquisitions and joint ventures. In addition, our paper advances previous reviews by analyzing internal factors regarding the company's structure and experience; external factors from the overall market; country-specific factors such as culture distance; and industry-specific factor such as industry match.

The remainder of this paper is organized into five sections. Section two covers the theoretical background, followed by hypotheses development on different factors that may affect the decision of foreign investors on choosing an international entry mode. Section four discusses data and methodology. Section five presents our empirical findings. The last section discusses and concludes.

2. THEORETICAL BACKGROUND

Foreign market entry modes differ in the degrees of risk they present, the control and commitment of resources they require, and the return on investment they promise. Therefore, the choice of entry mode should be based on trade-offs between risks and returns. There are two major types of entry modes, namely equity and non-equity modes (Pan and Tse, 2000). The non-equity modes category includes export and contractual agreements. The equity modes category

includes wholly owned subsidiaries and joint ventures. In the context of developing countries, most foreign investments fall in the latter section (Simonet, 2012), particularly acquisitions and joint ventures. Acquisition is a popular mode of entry thanks to its quick access to the local companies' structure and operating systems, as well as its ability to gain market power (Kenton, 2019). Many multinational companies (MNCs) exercise acquisitions by buying a competitor or supplier to gain a competitive advantage in the market. However, acquisition is not always the first choice because it is costly and complex in the integration procedure due to political, cultural and organizational differences. Meanwhile, for the purpose of performing a specific task/project, firms can pool their resources in a joint venture. A joint venture offers many advantages of risk sharing for mutual growth. In particular, foreign entities can enjoy quick and easy market entry, technology sharing, political connections and distribution channel access. However, as a joint-hand agreement, it is obvious that related parties would encounter clashes of benefits, for instance, conflict over new investment, strategic imperatives, hierarchical control and resource allocation and so on (Triantis, 1999). As both methods pose either advantages and disadvantages, the firm would rest their choice on multiple internal and external factors. Some of the most notable findings on the determinants of entry mode are: cultural distance (Agarwal, 1994; Chang and Rosenzweig, 2001; Erramilli and Rao, 1993; Lopez-Duarte and Garcia-Carnal, 2002); market potential (Brouthers, 2002; Parahad and Doz, 1987); prior experience regarding FDIs (Hoskisson et al., 2000; Kuo et al., 2012); resource availability and need for control (Cespedes, 1988).

Prior research has adopted many different theoretical perspectives to explore determinants of entry mode choice such as transaction cost theory, institutional theory, eclectic paradigm, Uppsala internationalization model, resource-based view, and organizational learning (Schellenberg, Harker and Jafari, 2017). In this paper, we draw arguments from the three commonly applied perspectives, namely the transaction cost economics (TCE), the organizational capability (OC) perspective and the institutional theory. First, TCE theory suggests that firms will choose the entry mode that minimizes the transaction costs of operating business in another country (Dunning, 1988). These costs include the costs of finding an appropriate partner, negotiating the deal, and costs of handling the operation of the transaction in the host market (Agarwal and Ramaswami, 1992; Makino and Neupert, 2000). Second, from the OC perspective, scholars argue that the choice of entry mode into a foreign market will be contingent upon whether firms will be able to continue developing and exploiting their capabilities in the host country (Kogut, 1988; Madhok, 1997). To do so, a firm's knowledge base is important as it facilitates

capability accumulation, i.e. the process of acquiring, evaluating, integrating and exploiting a new resource. Finally, institutional theory suggests that institutional factors also play a crucial role in determining market entry mode choice. Strong institutions increase the likelihood of choosing acquisitions because information regarding host country's firms is more transparent and easier to be collected (Lin, Peng, Yang & Sun, 2009).

While the majority of prior literature explores determinants of market entry mode choices from a single theoretical lens, we suggest that a combination of different theories will offer more insights in examining the focal topic. First, institutions create structure in which transactions are operated. They also define the regulations, laws, and the "rules of the game" for parties involved (Oliver, 1997; Schellenberg, Harker and Jafari, 2018). Therefore, managerial cost and uncertainty evaluation can vary depending on different institution factors, which influences firm's choices of means to enter a foreign market (Brouthers, 2002). For example, weak institutions can lead to higher costs in doing business, greater risks and lower market efficiency (Meyer and Peng, 2005). Second, a strong knowledge base on the host market can reduce costs of information collection, interpretation and absorption, thus, encourages firms to choose an entry mode with more resource commitment (Madhok, 1997). Thus, we anticipate that a combination of different perspectives will provide us a more complete understanding on factors that influence firms' choice of market entry mode.

In the next section, drawing arguments from the three theories above, we investigate determinants of foreign investors' choices on the means to enter the Vietnam market. As we stated in the introduction, emerging economies provide a fruitful context to study topics regarding foreign direct investments particularly due to their distinctive institutions compared to developed economies. Located in a fast-growing region of the world and having gained many remarkable achievements in attracting foreign direct investments in recent year, we believe that Vietnam can be a prime representation among emerging countries, especially in the ASEAN region.

3. HYPOTHESES

In this section, we explore factors in three different levels, namely country-, industry- and firm-levels. Country-specific factors include *cultural distance* and *market growth*. Industry-specific factors include *industry match* and *resource access speed*. The last group of firm-specific factors has *target company structure*, *deal size* and *investing experience*.

3.1 Cultural distance

The cultural differences between countries, also known as "cultural distance", is significant in providing

insights for MNEs to penetrate in a foreign market (Barkema et al., 1996). Cultural distance is defined as the degree to which norms and values differ from one country to another (Hofstede, 2001). Close countries may have similar languages, business regulations, legal systems, and working cultural characteristics. The greater the cultural distance between the home and host country is, the greater the uncertainty will be, and thus, the costs of collecting information and communication is also higher (Chang and Rosenzweig, 2001; Lopez-Duarte and Garcia-Carnal, 2002). According to TCE theory, when the cultural distance is large, companies may avoid using acquisitions and switch to a joint venture to minimize the management cost. Makino and Neupert (2000) states that firms prefer to establish a wholly owned subsidiary when entering a foreign market with "low uncertainty avoidance". This is consistent with Barkema et al. (1997), which indicates that a great cultural distance is associated with entry modes based on lower equity ownership. Therefore, we propose:

Hypothesis 1: Acquisition is preferred to joint venture when the cultural distance is low.

3.2 Economic growth

According to Mottaleb (2007), one percent increase in GDP growth rate will raise FDI inflow by 0.08 percent. As a market entry selection criterion, thus, the economic growth rate can be expected to be of considerable significance. Economic (or market) growth can be seen as an indicator for the market attractiveness and market potential, which leads to enhanced resource commitment in a country (Brouthers, 2002; Chang and Rosenzweig, 2001). Acquisition tends to be preferred in high growth economies, because it can avoid the opportunity costs associated with the delayed entry (Hennart and Larimo, 1998). When economic growth is high, it is more likely that the firm will commit greater resources for its development. On the contrary, in a declining economy, resource commitment and sales commitment are not guaranteed, and accordingly, the firm may choose a joint venture rather than an acquisition. From these arguments, we propose:

Hypothesis 2: Acquisition is referred to joint venture when the market growth (economic growth) is high.

3.3 Industry match

Industry match implies the relatedness or similarities in the industries of partner firms in an acquisition or a joint venture. High industry match is established when the two firms operate in the same industry or their industries that are closely related. The similarities in the two industries can facilitate the integration procedure and post-transaction activities. In contrast, firms from unrelated industries are prone to inadequate information or may require costly "help" to evaluate complementary assets (Balakrishnan and Koza, 1993).

Prior research suggests that when the industries of two firms are different, foreign investors are more likely to choose joint ventures over acquisitions because they need tacit industry-specific knowledge to reduce uncertainty and information costs (Youssef and Hoshino, 2003). Therefore, we propose:

Hypothesis 3: Acquisition is preferred to joint venture when the investor is in the same industry as the targeted firm.

3.4 Resources access speed

Resource access speed (RAS) refers to a firm's ability to quickly access local resources (Garette, Castaner, and Dussauge, 2009). In this research, we explain RAS based on types of industries. RAS can be inferred as "quick" if the industry falls in the group of manufacturing, wholesale and retail trade (Deloitte, 2014; Dougn, 2018) and as "slow" for the group of "construction and real estate" (Burke and Nguyen, 2018).

With regards to the Vietnamese market, manufacturing, wholesale and retail trade are major industries that attract acquisitions. In these industries, local companies are small, or if they are large, they contain independent divisions which can be acquired separately (Kay, Robe, and Zagnolli, 1987). In addition, the target's value depends heavily on intangible assets (e.g., human capital, brands, proprietary rights, and so on), which are easy to digest. Therefore, it minimizes the risks regarding asymmetric information, of the cost of integrating labor force and management, and maximize the effectiveness of due diligence. Vietnam is also assessed by Nielsen as a potential retail market. BMI estimates that by 2017, Vietnam's consumer-goods market value will reach about USD 120 billion, at an annual growth rate of nearly 10 percent in the 2012-2017 period. The 2016-2017 M&A report of the Research Group of Vietnam M&A Forum states that: "Leading M&A deals in the past year is retail and consumer goods, accounting for 38.46% of the total value".

Meanwhile, the industries construction and real estate seem to attract more joint ventures than acquisitions. Growing foreign direct investment and a move up the value chain means Vietnam's industrial real estate sector has a bright future, according to property consultant Savills Vietnam. However, for these industries, the capital of the host country is high, the legal barrier to own a real estate company is complicated in Vietnam, thus posing great difficulties in evaluating assets. Foreign companies, therefore, can meet better conditions as well as gain insights into the market when joining hands with the local. In return, the locals would enjoy advanced technology, expertise, and capital from the acquirer.

According to deal no. 1907187229, on 17/11/2016, Warburg Pincus LLC and VinaCapital Investment Management Ltd formed a \$300-billion-joint-venture

contract called Lodgis Hospitality to invest in the hotel industry in Vietnam. In this specialized industry, joint ventures have become popular among foreign developers who have a strong financial capacity and track record, joining forces with local developers who own land and have a strong connection with the local community (Vuong and Ha, 2015). If it were to buy a hotel operator or a real-estate company, two potential impediments are that the legal process of land-use right is constrained and the market is subject to the high transaction cost. In these cases, joint ventures allow investors to get access to the market and the human capital without having to manage the firm or deal with the local regulatory barrier. We hypothesize:

Hypothesis 4: Acquisitions is preferred to joint ventures when the resource access speed is quick.

3.5 Target company structure

This factor is specific to the Vietnamese context. According to Allens' report (2017), foreign investors choose to invest in Vietnam by acquiring a part or all of an existing enterprise, and one of the factors they need to consider before investing is the form of the target entity.

In Vietnam, Joint Stock Company and Limited Liability Company (including single member and multiple member Limited Liability Companies) are two main types of company structures (Allens, 2017). Joint Stock Company has at least three members and does not limit the number of shareholders. Besides, they can mobilize equity capital flexibly. However, the management of Joint Stock Company is more complicated, so it is time-consuming and costly to reform management structure of the company if they are acquired. Nguyen and Binh (2018) indicates that foreign investors who tend to choose the form of Joint Stock Company are more likely to select joint ventures so that they can utilize the advantages of local partners.

In a Limited Liability Company, their members are linked together by relationship and these members contribute capital to establish a company. They have limited number of members (no more than 50 people), and they are unable to mobilize capital through issuing shares. The main sources of capital in this type of company are loans, mobilization from members and annual reinvestment. Therefore, during the process of operating, capital structure of Limited Liability Company is quite stable. The management structure of this company is more simple than Joint Stock Company. For investors, when purchasing a Limited Liability Company, it is recommended to buy the whole company because the company is not too large, the number of members is not so many. It is easy for these firms to decide to sell the whole company if the price is reasonable. Hence, we suppose that foreign investors are more likely to acquire if the target is a Limited Liability Company than engage in a joint venture, and we hypothesize:

Hypothesis 5: Acquisition is preferred to joint venture when the target company is a limited liability company.

3.6 Deal size

Deal size implies levels of resource commitment, capital contribution, start-up costs, and financial risk, which may in turn affect entry mode decision (Luo, 2011). The size of the transaction has important implications both on the magnitude of the expected synergies and the complexity of the integration task (Kirchhoff and Schiereck, 2011). According to Nguyen and Binh (2018) and Tsang (2005), a large deal is accompanied with higher cost and risk. In this case, a joint venture is considered as a potential entry mode to share managerial risk and transaction cost with local firms. In addition, when the stakes are high, firm tends to enter foreign market more cautiously. Hence, a risk-and-cost sharing entry mode is preferred for big projects. On the other hand, when the investment is small, an acquisition is preferred because acquiring firms can gain full control of their company and the retain earnings (Luo, 2011). An acquisition is also likely to be chosen when the target is an independent division of large firms which can be acquired separately from the firm (Kay, Robe, and Zagnolli, 1987). Smaller deals are easier to be integrated with the acquiring firm and therefore perform better when the transaction is completed. We suggest:

Hypothesis 6: Acquisition is preferred to joint venture when the deal size is smaller

3.7 Foreign investing experience

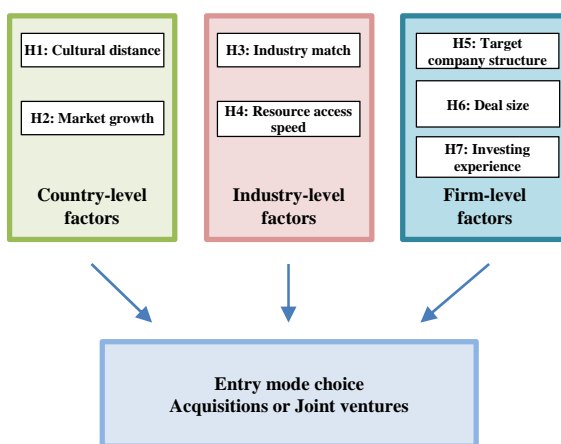
Investing experience in a foreign market, which is measured by the number of market entries already executed in that market by the focal firm, is essential in the operation control since it allows investors to develop efficient systems and processes corresponding to a specific market (Delios and Beamish, 1999). Investing experience provides a perfect source of industry-related knowledge, market's information and set-up solution for firms once they penetrate a foreign market. With more experiences, firms would perceive less uncertainty, and become more confident of their capacity to accurately assess risks and returns and oversee possible remote tasks (Davidson, 1982). Hence, firms with more investing experiences are more likely to engage in acquisitions.

In contrast, novice investors may prefer joint ventures due to several reasons. First, as they have limited knowledge of the host market and value of the desired assets, a joint venture is considered to be more efficient than an acquisition because it helps to reduce the costs of gathering information and building relation with the partner's assets (Hennart, 1997). Second, with a joint venture, the investing firm can avoid risks related to the adaptation of products and services to the local market requirements as well as the management of relationships with the workforce, suppliers, customers,

banks and local authorities (Mariotti and Piscitello, 1995). In addition, Anderson and Gatignon (1986) states that inexperienced firms are overly risk-alert, and content to let an external party be in charge of the foreign activities, while experienced firms are more confident and desirous of control. Once a firm accumulates enough experiences in a market, it would gradually apply acquisitions to get the most out of economic returns. Therefore, we propose that:

Hypothesis 7: Acquisition is preferred to joint venture when investors have more experiences in investing in the Vietnamese market.

To sum up this section, we illustrate all hypothesized relationships in the following theoretical framework:



4. DATA AND METHODOLOGY

4.1 Sample of data

Our sample of data was derived from Zephyr. It consists of 400 acquisitions and joint ventures, occurring between January 2000 and October 2018. 28.25 percent of the sample are joint ventures and 71.75 percent are acquisitions. This ratio of joint ventures to acquisitions is quite similar to those in previous research, such as Datta et al. (2009) The majority (90.25 percent) of investors in our sample come from Asian countries such as Singapore, Japan, China, and so on. Other investors are from different regions in the world such as France, US, Germany, etc.

4.2. Variables

Dependent Variable

Consistent with prior research (Datta et al., 2009; Hennart and Reddy, 1997), our dependent variable, *Entry mode choice*, is a dummy variable. It takes a value of 1 if the transaction is an acquisition and 0 if it is a joint venture.

Independent Variables

We categorize our independent variables in three groups, i.e. country-, industry-, and firm-level factors.

First, in terms of the country-level factors, *Cultural distance* was measured by Hofstede's model. Hofstede (2001) mentions six dimensions of culture including power distance, uncertainty avoidance, masculinity, individualism, long-term orientation, and indulgence. In order to calculate cultural distance, we applied the Hofstede's culture dimensions, however, excluded long-term orientation and indulgence variables due to lack of data. Regarding the calculation method, the most widely known is the Kogut-Singh index, which is based on the assumption that culture is a multi-dimensional phenomenon and cultural distance is a function of distances on separate dimensions (Kogut and Singh, 1988). The original Kogut-Singh index (KS index) is calculated as an arithmetic average of the variance-corrected squared differences in the four cultural dimensions, using the following formula:

$$CD_j = \sum_{i=1}^n \frac{\{(I_{ij} - I_{io})^2 / V_i\}}{n},$$

where CD_j stands for the index of cultural distance between the j^{th} country and the country of origin, I_{ij} is the index of the i^{th} cultural dimension for the j^{th} country, I_{io} is the index of the i^{th} cultural dimension for the country of origin, V_i indicates the variance of the index of the i^{th} cultural dimension. In our case, the country of origin is Vietnam. After having calculated 42 KS index¹ of 42 countries which have entered Vietnam in the past with the method of acquisitions or joint venture or both, we replaced directly the variable CD_j in the above equation with the KS index of the country which is mentioned in each observation in the data crunching process.

The second independent variable, which is also a country-level factor, is *Economic growth*. According to Bjork (1999), the use of the ratio of GDP to population or per-capita income is the most common way measuring the economic growth rates of nations. In order to measure *Economic growth* in the Vietnamese market, in this study, the ratio of Gross Domestic Product for the period from 2000-2018 in Vietnam was used. The data for the period from 2000 to 2018 in Vietnam were obtained from IMF Data Mapper 2018.

Second, in terms of the industry-level factors, we have two independent variables. *Industry match* is a dummy variable, equal to 1 if the two firms are from the same industry and 0 otherwise. We used the Standard

Industrial Classification SIC codes for this variable. Two industries are considered to be "the same" if they have the same US-SIC code (two digit), as recorded in Zephyr. The next industry-level independent variable is *Resource access speed (RAS)*. This variable is also a dummy variable. As hypothesized, RAS is "quick" if the targeted firms' industries are in the group of manufacturing, wholesale and retail trade. RAS is "slow" if target firms' industries are in the group of construction and real estate. *Resource Access Speed* is coded as 1 if the targeted firm industry is in the "slow" group, and 0 otherwise.

The last group of independent variables are factors at firm-level. First, *Target company structure* is a dummy variable, coded as 1 if the target firm is a Limited Liability Company, and 0 otherwise. Second, *Deal size* is measured by the natural logarithm of the deal value as recorded by Zephyr. Last, *Investing experience* was measured by the number of times the investing company engaged in an investment deal in Vietnam in five years prior to the focal deal.

4.3. Methodology

We estimated a logistic regression model to examine the effects of independent variables on the likelihood of selecting joint ventures or acquisition as an international entry mode. The relationship between the likelihood of the investor's entry mode choice and independent variables is expressed as follows:

$$\text{Logit}(P) = \alpha_0 + \alpha_1(\text{Culture Distance}) + \alpha_2(\text{Economic Growth}) + \alpha_3(\text{Target Company Structure}) + \alpha_4(\text{Industry Match}) + \alpha_5(\text{Investing Experience}) + \alpha_6(\text{Deal Size}) + \alpha_7(\text{RAS}) + \epsilon$$

In which, α_0 is the intercept, α_1 to α_7 are the regression coefficients, ϵ is the error term, and "i" refers to the i^{th} deal of 400 joint ventures and acquisition transactions taken into account.

Since some of the firms undertook more than one joint venture or acquisition transactions over the observation period, the assumption of lack of independence among the observations may be violated. To control for this within-firm correlation, we applied clustered standard errors. Our empirical analyses were processed by STATA 15.

5. RESULTS

The descriptive statistics of variables are presented in Table 1. The correlation matrix of all variables in the models is illustrated in Table 2. As can be seen from the correlation matrix, all of the correlation coefficients are well below |0.7|, which means that multicollinearity does not exist in this case. Table 3 shows the results of our logistic regression model.

¹Data for the KS index were collected from: https://www.hofstede-insights.com/product/compare-countries/?fbclid=IwAR2eYopY_wwXH6szIsP63CKHGuuvNJCgQlkZKbVMEAgvApgvqfmpkQCml8

Table 1: Descriptive statistics

Variables	Obs	Mean	S.d.	Min	Max
1. Entry Mode Choice	400	0.72	0.45	0	1
2. Cultural Distance	400	1.39	1.47	0.18	4.06
3. Economic Growth	400	6.37	0.64	5.2	7.8
4. Industry Match	400	0.76	0.43	0	1
5. Deal Size (ln)	400	8.34	2.18	0	13.82
6. Target Company Structure	400	0.73	0.45	0	1
7. Resource Access Speed	400	0.56	0.49	0	1
8. Investing Experience	400	3.05	5.24	1	23

Table 2: Correlations Matrix

Variables	1	2	3	4	5	6	7
1. Entry Mode Choice							
2. Cultural distance	-0.416*						
3. Economic growth	-0.113*	0.010					
4. Industry match	-0.196*	0.218*	-0.062				
5. Deal Size (ln)	-0.123*	-0.123*	0.010	-0.033			
6. Target Company Structure	0.102*	-0.122*	-0.142*	-0.015	-0.160*		
7. Resource Access Speed	-0.078	0.0003	0.030	-0.052	-0.182*	-0.070	
8. Investing experience	0.140*	-0.098	-0.021	-0.022	-0.021	0.100*	0.113*

* Correlation is significant at the 0.05 level (two-tailed)

Table 3: Results of logistic regression model of entry mode choices

Variables	Entry mode choice			
	Model 1	Model 2	Model 3	Model 4
Country-specific factors:				
Cultural distance	-0.610*** (0.081)			-0.547*** (0.088)
Economic Growth	-0.460* (0.208)			-0.467* (0.205)

Industry-specific factors:				
Industry match	-1.281*** (0.352)			-0.996*** (0.360)
Resource access speed	-0.418 (0.276)			-0.454* (0.273)
Firm-specific factors:				
Target company structure		0.556** (0.274)		0.252 (0.308)
Deal size (log)		0.145*** (0.054)		0.074 (0.057)
Investing experience		0.085*** (0.023)		0.076** (0.031)
Constant	4.861 (1.378)	2.214 (0.355)	-0.861 (0.532)	4.901 (1.523)
Cases in analysis	400	400	400	400
Log-pseudo likelihood	-202.35924	-227.78973	-227.671	-192.13467
Wald-chi square	59.76	16.74	18.81	67.55
Probability	0.0000	0.0002	0.0003	0.0000

* Robust standard errors in parentheses. *** p < .01, ** p < .05, * p < .1

Table 3 presents results from our empirical analysis, which show some interesting findings. We explain in more detailed below.

First, regarding country-specific variables, empirical evidences show that both *Cultural distance* and *Economic growth* have significant and negative impact on *Entry mode choice* (p < 0.01 and p < 0.1 respectively). These results support hypothesis 1 but contradict hypothesis 2.

Regarding *Hypothesis 1*, empirical finding confirms that foreign investors who come from the countries which have low cultural distance or similar culture with Vietnam prefer acquisitions to joint ventures. Acquisitions often relates to adjustments of the parent firm and host firm. Therefore, a high level of cultural distance may make this project more difficult (Kamal, 2009). In addition, Hennart (1988) states that it is costly to manage employees in the different cultures, and MNEs rarely select joint ventures to enter a market which has similar culture. This finding is also in consistent Makino and Neupert (2000), which states that firms prefer to establish a wholly owned subsidiary when entering a foreign market with "low uncertainty avoidance".

Hypothesis 2 suggests that acquisition is preferred to joint ventures when the market growth is high. However, findings from our analyses show that in the year when Vietnamese market growth is low, investors are more likely to choose acquisitions over joint

ventures. We contend that if a host country's economic growth rate is low, foreign investors may obtain their required strategic assets at low prices, and quickly capture the market share of the acquired firms. This point was also stated in Larimo (2003).

Second, in terms of industry-specific variables, both *Industry match* and *Resource access speed* have a negative and significant effect on *entry mode choice* ($p < 0.01$ and $p < 0.1$ respectively). These results imply that investors will choose acquisitions if the industry of the target company does not match the industry of acquirer company and when the resource access speed is quick. On the one hand, these findings support **Hypothesis 4**, which suggests that the choice of MNEs will depend on the industries they are or want to invest in. On the other hand, finding regarding the impact of *Industry match* is in contrast with what we proposed in **Hypothesis 3**, although it is in line with Hennart and Reddy (1997), which states that acquisitions are more likely if the partners are in different industries. In such case, there is a strong connection between diversification and acquisitions since acquisitions allow entrants to purchase going firms. It might be an expensive option but it is attractive for entrants if they want to diversify their business (Caves and Mehra, 1986). Furthermore, unrelated acquisition also opens the door for acquirers to make an internal capital market where target firm cash flows cross-subsidize acquiring firm investments. Thus, the acquisition might provide cost efficiencies.

Finally, among the three firm-specific factors, we only find evidences for a significant relationship between *Investing experience* and *entry mode choice*. The estimated coefficient of *Investing experience* is significantly positive, which strongly supports the hypothesis that the greater the investment experience of the firm, the greater the likelihood of their selection of acquisition over the joint venture. This finding is in consistent with Kamal (2009), which states that investing experience plays an important role in the choice of entry mode of foreign investors. As investors get more investing experiences, the confidence of choosing acquisition will increase in emerging economies. This finding also suggest that previous business ventures play a big role in the future of entry mode selection.

Regarding **Hypothesis 5** and **Hypothesis 6**, we did not find evidences for a significant impact of target company structure (hypothesis 5) and deal size (hypothesis 6) on entry mode choice.

In short, Table 4 summarizes all empirical findings regarding our hypothesized relationships.

Table 4: Summary of empirical findings

Hypothesis 1	Acquisition is preferred to Joint venture when...	...cultural distance is low	Supported
Hypothesis 2		...market (economic) growth is high	Rejected
Hypothesis 3		...investor is in the same industry with target firm	Rejected
Hypothesis 4		...resource access speed is quick	Supported
Hypothesis 5		...target company is a limited liability company	N/A
Hypothesis 6		...deal size is small	N/A
Hypothesis 7		...investor has more experiences in investing in Vietnam	Supported

6. DISCUSSION AND CONCLUSION

In this study, we examined determinants of foreign entry mode choices in the context of Vietnam. International entry mode choice is an important strategic decision and will have influence on both investors and host countries. Our paper expects to offer foreign investors insights into the Vietnamese market before making a move. In addition, we believe that the local business can use our study to prepare for future transactions. Applying different theoretical perspectives, we identified seven factors that can affect the entry mode choice, namely cultural distance, economic growth, target company structure, industry match, investing experience, deal size, and resource access speed. With these variables, we take into account factors at all three levels, i.e. country-, industry-, and firm-levels.

Based on a sample of 400 acquisitions and joint ventures in Vietnam between 2000 and 2018, our empirical findings indicate that cultural distance, economic growth, industry match, investing experience and resource access speed are five strong and significant variables that MNCs can rely on when making FDI entry modes in Vietnam.

As anticipated, *cultural distance* is a robust factor. “Essentially, international management is management of distance” (Zaheer, Schomaker and Nachum, 2012). Since Vietnam is a developing country with oriental tradition, it is essential that foreign investors get insights of the local working culture and its customers. As the 'developing' term involves the changing nature, risk and unexpectedness, MNCs would make joint venture movement if the distance is high to maximize comparative advantage and minimize risk of control,

meanwhile are more confident to choose acquisition if the distance is lower.

With regards to *investing experience*, the more experiences a firm has, the more likely it is to choose a full control mode (acquisition) rather than a shared control mode (joint venture). Similar to cultural distance, investing experience in an emerging market is important because MNCs may be well familiar with investment in developed markets, while alien to developing ones.

Resource access speed is highly considered as speed brings value. The shorter the speed, the more likely that firm would choose acquisitions over joint ventures. Because it would take up to six years to create a new joint culture (Erkkila and Valpola, 2011), it may put a burden on acquirer if the duration resource access is too long.

Beyond our expectation, *economic growth* is a significant, yet contradicting variable. If a host country's economic growth rate is low, the market tends to be saturated, and competition will intensify. In such a market, acquisition would be preferred because it is likely for the acquiring firms to obtain the strategic assets at low prices, and quickly capture the market share of the acquired firms (Larimo, 2003).

Comparable to the economic growth, the result of *industry match* is interestingly opposing. Hennart and Reddy (1997) states that acquisitions are more likely if the partners are in different industries because there is a strong connection between diversification and acquisitions since acquisitions allow entrants to purchase going firms. It might be an expensive option but it is attractive for entrants if they want to diversify their business (Caves and Mehra, 1986). Furthermore, unrelated acquisition also opens the door for acquirers to make an internal capital market where target firm cash flows cross-subsidize acquiring firm investments. Thus, the acquisition might provide cost efficiencies.

Although the two factors *deal size* and *target company structure* have insignificant results, it paves the way for future research to intensify the research. Each determinant will take either big or small affection to the decisions of MNCs and this study provide sufficient information of MNCs can reflect their capabilities in order to make the right decisions.

Drawing on the transaction cost economics theory, the organizational capability perspective and the institutional theory, this study proposes a new analysis to find the determinants of entry mode choice of foreign investors in Vietnam, an emerging economy. We believe that this is a valuable work that considers both internal and external determinants of entry mode choice in the Vietnamese market with a unique database from 2000 to 2018. The results contribute to the development of literature on international entry

strategies. In addition, this research also provides useful insights, important implications for investors, managers working in international business or foreign investment.

Limitation and suggestions for future research

A number of limitations in this study can be taken as opportunities for further research. First, due to missing data, our sample of data only contains 400 acquisitions and joint ventures. We encourage scholars to test these hypotheses in another sample with more observations. Furthermore, apart from quantitative research, we recommend qualitative application to gain an understanding of underlying reasons, opinions and motivations.

In addition, we suggest three approaches for further research. First, although Vietnam is a good representative of ASEAN, we suggest further research on other nations within the region and an integrated one which studies the similarity in entry mode trend among ASEAN countries. Second, due to the limitations in data, further research can utilize and gather more information to practice deeper investigation into the determinants which have contradictions in our hypothesis and which are not significant enough to strongly prove the hypothesis. Third, we believe that our conclusions regarding cultural distance, investing experience, economic growth and industry match could be used to study other phenomena such as the transfer of human resources management, the practice of technology transfer, international organizational transformation and so on.

7. REFERENCES

- [1] Agarwal, S. (1994). "Socio-cultural distance and the choice of joint ventures: A contingency perspective." *Journal of International Marketing*, 2(2): 63-80.
- [2] Agarwal, S. & Ramaswami, S.N. (1992), "Choice of foreign market entry mode: Impact of ownership, location and internalization factors", *Journal of International Business Studies*, 23, (1), 1-28.
- [3] Allens Report (2017). *Legal Guide to Investment in Vietnam* (<http://www.vietnamlaws.com/pdf/LegalGuidetoInvestmentinVietNam.pdf>)
- [4] Anand, J., and Delios, A. (1997). "Location specificity and the transferability of downstream assets to foreign subsidiaries." *Journal of International Business Studies*, 28(3): 579-603.
- [5] Anderson, E. and Gatignon, H. (1986). "Modes of Foreign Entry: A Transaction Cost Analysis and Propositions." *Journal of International Business Studies*, 17(3): 1-26.
- [6] Balakrishnan, S. and Koza, M. (1989). *Organisation costs and a theory of joint ventures*. Available at:

- https://flora.insead.edu/fichiersti_wp/Inseadwp1989/89-54.pdf
- [7] Balakrishnan, S. and Koza, M. (1993). Information asymmetry, adverse selection and joint-ventures. *Journal of Economic Behavior & Organization*, 20(1): 99-117.
- [8] Barkema, H. G., Bell, J. H. J. and Pennings, J. M. (1996). Foreign entry, cultural barriers, and learning. *Strategic Management Journal* 17: 151-166.
- [9] Bjork, Gordon J. (1999). *The Way It Worked and Why It Won't: Structural Change and the Slowdown of U.S. Economic Growth*. Westport, CT; London: Praeger, 2-67.
- [10] Brouthers, K. (2002). Institutional, Cultural and Transaction Cost Influences on Entry Mode Choice and Performance. *Journal of International Business Studies*, 33(2): 203-221.
- [11] Brouthers, K. D. (2009), "Institutional, Cultural and Transaction cost influences on Entry mode choice and performance", *Journal of International Business Studies*, 33, (2), 203-221.
- [12] Bruneel, J. and De Cock, R. (2016). Entry Mode Research and SMEs: A Review and Future Research Agenda. *Journal of Small Business Management*, 54:135-167.
- [13] Burke, R. F. and Nguyen, G. (2018). Foreigners' Right to Buy Housing in Vietnam | Insight | Baker McKenzie. Available at: https://www.bakermckenzie.com/en/insight/publications/2018/01/foreigners-right?fbclid=IwAR3b7E1OvGkbe3bJSw6tc2z0_KfVssFqxHFi4fWl32jSs-0-983v6eJvwH8
- [14] Canabal, A. and White III, G. O. (2008). Entry mode research: Past and future. *International Business Review*, 17: 267-284.
- [15] Caves, R. and Mehra, S. (1986). Entry of foreign multinationals into U.S. manufacturing industries. In M. Porter (ed.), *Competition in Global Industries*. Harvard Business School Press, Boston, MA, 449-481.
- [16] Cespedes, F. (1988). Channel Management is General Management. *California Management Review*, 31(1): 98-120.
- [17] Chang, S. and Rosenzweig, P. (2001). The choice of entry mode in sequential foreign direct investment. *Strategic Management Journal*, 22(8), pp.747-776.
- [18] Cleeve, E. (1997). The motives for joint ventures: A transaction cost analysis of Japanese MNES in the UK. *Scottish Journal of Political International Marketing*, 6(2): 28-53.
- [19] Das, I., and Tuen, A. A. (Eds.). (2016). *Naturalists, explorers and field scientists in South-East Asia and Australasia (Vol. 15)*. Cham: Springer.
- [20] Datta, D. K., Musteen, M., and Herrmann, P. (2009). Board characteristics, managerial incentives, and the choice between foreign acquisitions and international joint ventures. *Journal of Management*, 35: 928-953.
- [21] Davidson, W. H. (1983). *Global strategic management.*, Associate Professor, University of Virginia. New York: John Wiley and Sons, 1982, *The International Executive*, 25(1): 1-2.
- [22] Delios, A. and Beamish, P. (1999). Ownership strategy of Japanese firms: transactional, institutional, and experience influences. *Strategic Management Journal*, 20(10): 915-933.
- [23] Deloitte. (2014). Retail in Vietnam Emerging market, emerging growth. Retail in Vietnam. [online] Hanoi: Deloitte. Available at: http://www.iberglobal.com/files/2016/vietnam_retail.pdf?fbclid=IwAR0qk0F-FzDMkz8iBb0O_a8legxdyPGLWm_Qg1zkXofUExuG2rm-CRmTW-k
- [24] Dougn, D. (2018). Foreign car makers expand production in Vietnam due to non tariff barriers - Vietnam Insider. Vietnam Insider. Available at: https://vietnaminsider.vn/foreign-car-makers-expand-production-in-vietnam-due-to-non-tariff-barriers/?fbclid=IwAR277mn_YOFb04MdS5dSN_E6PQozawV2nf0lsFRYH7Vx18GfQTLs_WUEn_Q4E.
- [25] Dunning, J. H (1988). The eclectic paradigm of international production: A restatement and some possible extensions. *Journal of International Business Studies*, 19 (1), 1-31.
- [26] Erkkila and Valpola. 2011. *M&A Coach - Value from integration*. Copyright: Teknologiainfo Teknova Oy.
- [27] Erramilli, M. K., and Rao, C. P. (1993). Service firms' international entry-mode choice: A modified transaction-cost analysis approach. *Journal of Marketing*, 57(3): 19-38.
- [28] Garrette, B., Castaner, X., and Dussauge, P. (2009). Horizontal alliances as an alternative to autonomous production: product expansion mode choice in the worldwide aircraft industry 1945-2000. *Strategic Management Journal*, 30(8): 885-894.
- [29] Hennart, J., and Larimo, J. (1998). The Impact of Culture on the Strategy of Multinational Enterprises: Does National Origin Affect Ownership Decisions? *Journal of International Business Studies*, 29(3): 515-538.
- [30] Hennart, J.F., and Reddy, S. (1997). The choice between mergers/ acquisitions and joint ventures: The case of Japanese investors in the United States. *Strategic Management Journal*, 18:1-12.
- [31] Hennart, J. F. (1988). A transaction cost theory of equity joint ventures. *Strategic Management Journal*, 9(4): 361-374.

- [32] Herrman, P., and Datta, D. K. (2006). CEO Experiences: Effects on the choice of FDI entry mode. *Journal of Management Studies*, 43(4): 755-778.
- [33] Hofstede, G. (2001). *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*. SAGE Publications.
- [34] Hoskisson, R., Eden, L., Lau, C., and Wright, M. (2000). Strategy in emerging economies. *Academy of Management Journal*, 43(3): 249-267.
- [35] Kamal, S. (2009). Greenfield vs Acquisition: Determinants of Choice in Emerging Economies. *BRAC University Journal*, 1(2): 63-71.
- [36] Kay, N., Robe, J.-P. and Zagnoli, P. (1987). An approach to the analysis of joint ventures. Working paper, European University Institute.
- [37] Kenton, W. (2019). Acquisition Frenzy is Alive and Well. Investopedia. Available at: <https://www.investopedia.com/terms/a/acquisition.asp>
- [38] Kirchoff, M. and Schiereck, D. (2011). Determinants of M&A Success in the Pharmaceutical and Biotechnological Industry. *The IUP Journal of Business Strategy*, 8(1): 25-50.
- [39] Kogut, B. (1988). "Joint ventures: Theoretical and empirical perspectives", *Strategic Management Journal*, 9, (4), 319-332.
- [40] Kogut, B., and Singh, H. (1988). The effect of national culture on the choice of entry mode. *Journal of International Business Studies*, 19: 411-432.
- [41] Kuo, A., Kao, M., Chang, Y., and Chiu, C. (2012). The influence of international experience on entry mode choice: Difference between family and non-family firms. *European Management Journal*, 30(3): 248-263.
- [42] Larimo, J. (2003). Form of investment by Nordic firms in world markets. *Journal of Business Research*, 56(10): 791-803.
- [43] Lee, G.K. & Lieberman, M.B. (2010). Acquisition vs. internal development as mode of market entry. *Strategic Management Journal*, 31 (2), 140-158.
- [44] Lin, Z.; Peng, M.W.; Yang, H. & Sun, S.L. (2009). How do networks and learning drive M&As? An institutional comparison between China and the United States. *Strategic Management Journal*, 30 (10), 1113-1132.
- [45] Lopez-Duarte, C., & Vidal-Suarez, M. M. (2010). External uncertainty and entry mode choice: Cultural distance, political risk and language diversity. *International Business Review*, 19(6): 575-588.
- [46] Luo, Y. (2001). Determinants of Entry in an Emerging Economy: A Multilevel Approach. *Journal of Management Studies*, 38(3): 443-472.
- [47] Madhok, A. (1997). Cost, value and foreign market entry mode: The transaction and the firm. *Strategic Management Journal*, 18: 39-61.
- [48] Makino, S., and Neupert, K.E. (2000). National culture, transaction costs, and the choice between joint venture and wholly-owned subsidiary. *Journal of International Business Studies*, 31: 705-713.
- [49] Manh Chien, V. and Thanh Tu, P. (2012). Entry Mode of MNEs in Vietnam: An Eclectic Model of The Choice Between International Joint Ventures and Wholly Owned Subsidiaries. Available at: <http://www.vjol.info/index.php/KTQD/article/view/11338>
- [50] Mariotti, S. and Piscitello, L. (1995). Information Costs and Location of FDI within the Host Country: Empirical Evidence from Italy. *Journal of International Business Studies*, 26(4): 815-841.
- [51] Meyer, K. E. (2001). Institutions, transaction costs, and entry mode choice in Eastern Europe. *Journal of International Business Studies*, 32(2): 357-367.
- [52] Meyer, K. E. & Peng, M.W. (2005). Probing theoretically into central and eastern Europe: Transactions, resources, and institutions. *Journal of International Business Studies*, 36 (6), 600-621.
- [53] Mottaleb, K. A. (2007). Determinants of Foreign Direct Investment and Its Impact on Economic Growth in Developing Countries. Available at: <http://mpa.unimuenchen.de/9457/MPRA> Paper No. 9457
- [54] Nguyen, M. and Binh, Q. (2018). Entry Mode Choice of FDI Firms in Emerging Markets: An Evidence from Vietnam. *Emerging Markets Finance and Trade*, 1-9.
- [55] Oliver, C. (1997), "The influence of institutional and task environment relationships on organizational performance: The Canadian construction industry", *Journal of Management Studies*, 34, (1), 99-124.
- [56] Pan, Y. and Tse, D.K. (2000). The hierarchical model of market entry modes. *Journal of International Business Studies*, 31: 535-554.
- [57] Peng, M. W. (2013). *Global Strategy*, 3rd edition, South-Western Cengage Learning.
- [58] Prahalad, C. K. and Doz, Y. L. (1987). *The multinational mission: Balancing local demands and global vision*. New York: Free Press.
- [59] Reuer, J. J., and Koza, M. P. (2000). Asymmetric information and joint venture performance: Theory and evidence for domestic and international joint ventures. *Strategic Management Journal*, 21: 81-88.

- [60] Ripollé's, M., Blesa, A., and Monferrer, D. (2012). Factors enhancing the choice of higher resource commitment entry modes in international new ventures. *International Business Review*, 21: 648-666.
- [61] Schellenberg, M., Harker, M. J., and Jafari, A. (2017) "International market entry mode - a systematic literature review", *Journal of Strategic Marketing*, 26, (7), 601-627.
- [62] Simonet, D. (2012). Entry modes of European firms in Vietnam. *Emerging Markets Journal*, 2(2): 9-16.
- [63] Sun, H. (1999). Entry modes of multinational corporations into China's market: A socioeconomic analysis. *International Journal of Social Economics*, 26(5): 642-659.
- [64] Tatoglu, E., and Glaister, K. W. (1998). Determinants of foreign direct investment in Turkey. *Thunderbird International Business Review*, 40(4): 279-314.
- [65] Triantis, J. (1999). *Creating successful acquisition and joint venture projects*. Westport, Conn.: Quorum.
- [66] Tsang, E. (2005). Influences on foreign ownership level and entry mode choice in Vietnam. *International Business Review*, 14(4): 441-463.
- [67] Tse, D. K., Pan, Y., and Au, K. Y. (1997). How MNCs choose entry modes and form alliances: The China experience. *Journal of International Business Studies*, 28: 779-805.
- [68] Vuong K. H, and Ha H. H. (2015). Real Estate Industry Report. FPT Securities. Available at: http://fpts.com.vn/FileStore2/File/2015/07/27/FPT_S_Real-Estate-Industry-Report_04.2015.pdf
- [69] Youssef, K. B. and Hoshino, Y. (2003), "The choice between Joint ventures and Wholly owned subsidiaries: the case of Japanese direct investment in Europe", *Japanese Journal of Administrative Science*, 17, (1), 31-46.
- [70] Zaheer, S., Schomaker, M. S., and Nachum, L. (2012). "Distance without direction: Restoring credibility to a much-loved construct." *Journal of International Business Studies*, 43(1): 18-27.

EFFECT OF IFRS ADOPTION ON THE RELEVANCE OF FINANCIAL REPORTING: EVIDENCE FROM VIETNAM

Nguyen Thuc Huong Giang¹- Thai Minh Hanh¹
Pham Ngoc Uyen Nhi^{1*} - Nguyen Thu Huong - Vu Thi Lien¹

¹ School of Economics and Management, Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: nhi.pnu170604@sis.hust.edu.vn

Abstract

This paper examines the impact of voluntary International Financial Reporting Standards (IFRS) adoption on financial reporting of financial and non-financial entities in Vietnam. It analyses whether the relevance of financial information is higher under IFRS than the information provided in financial statements prepared under Vietnam accounting standards (VAS). Our research includes 6 listed companies on the Ho Chi Minh Stock Exchange (HoSE) for the period of 2012-2018. We analyze the gap between the book value and the market value of the equity under VAS and IFRS. The results show that there has been improvement in the relevance of financial reporting to local stock market operators. The conclusion of this paper will help Vietnamese standard-setters to improve the process of reforming VFRS (Vietnam Financial Reporting System) in order to ensure convergence between VAS and IFRS for all companies.

Keywords: IFRS, value relevance, accounting information, financial reporting.

1. INTRODUCTION

In the trend of global economic integration, the adoption of International Financial Reporting Standards (IFRS) has received supports from countries around the world. IFRS is being applied in 166 countries and regions around the world (PwC, 2019). There are 144 countries that have mandated IFRSs for entities with the public interest and credit institutions. The remaining 9 countries have not required the compulsory application of IFRS, including Vietnam (PwC, 2019).

From 2001 to 2006, the Ministry of Finance of Vietnam (MoF) issued 26 VASs and circulars on the basis of the International Accounting Standards Board (IASB) which guiding these standards. At the beginning, VAS is essentially the same as IASs because most of it is translated from IASs, then it was modified, supplemented in accordance with the economic conditions and management level in the country. From more than 10 years, VAS has not been adjusted and thus has revealed many limitations that some of the contents are not suitable for transactions in the market

economy. Some of the significant differences between VAS and IFRS are discussed in table 1.

On March 16, 2020, the MoF officially approved “Scheme for application for financial reporting standards in Vietnam” attached to Decision 345/QD-BTC. The scheme includes 2 main objectives. The first objective is to develop a roadmap and publish and support the application of International Financial Reporting Standards (IFRS) in Vietnam. The second objective is to issue the Vietnamese Financial Reporting Standards (VFRS). The draft roadmap divided the IFRS implementation into 3 stages. Stage 1 – IFRS readiness preparation (from 2019 to 2021). Stage 2 – IFRS pilot implementation (from 2022 to 2025). Stage 3 – IFRS compulsory implementation (from 2025 onwards). Currently, Vietnam is in stage 1, the MoF will make necessary preparations for the roadmap implementation in order to support businesses adopting IFRS from 2022 onwards. These preparations include: publishing the Vietnamese translation of IFRS standards, training, building guidelines for IFRS implementation, etc.

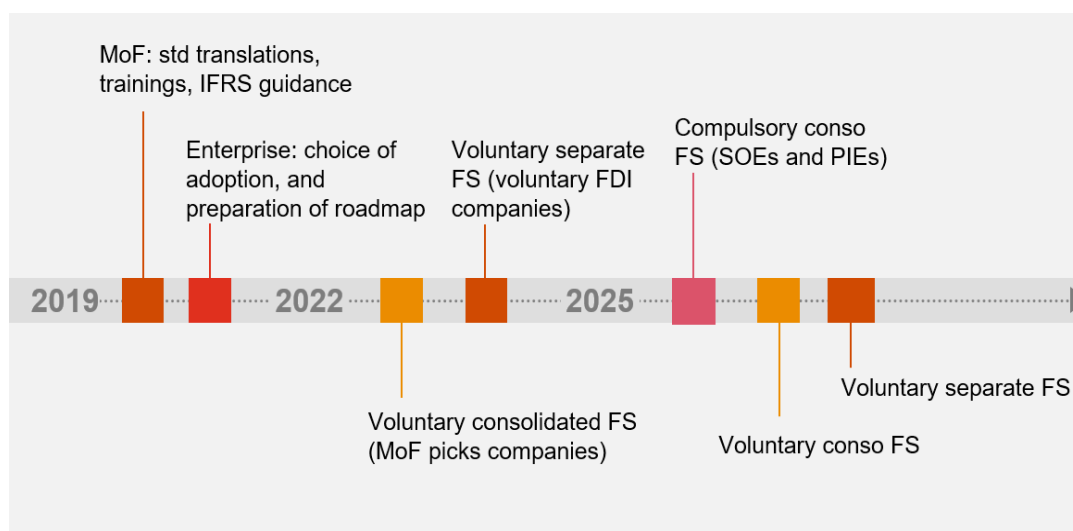


Fig 1: IFRS Implementation Roadmap

(Source: Ministry of Finance, 2020)

The table below list 8 sections as the significant differences between VAS and IFRS.

Table 1. The significant differences between VAS and IFRS

No	Section	VAS	IFRS
1	Inventory	Under VAS 02, Standard cost are not permitted	Under IAS 02, Standard cost are permitted
2	Tangible Fixed Assets	VAS 03 only allows cost model. The assets are determined according to their historical costs, accumulated depreciation and residual values.	IAS 16 allows two accounting models: cost model and revaluation model. The selected model should be applied to an entire class of property, plant and equipment.
3	Lease	Under VAS 06, Land lease (land use right) is accounted separately from building	Under IFRS 16, When a lease includes both land and buildings elements, an entity assesses the classification of each element as a finance or an operating lease separately.
4	Intangible fixed asset	VAS 4 requires two additional conditions: estimated useful life is more than 1 year and minimum historical cost for qualification as fixed assets is VND30 million).	Under IAS 38, An intangible asset shall be recognized if, and only if it is probable that the expected future economic benefits that are attributable to the asset will flow to the entity; and the cost of the asset can be reliably measured.
5	Investment property	VAS 5 only allows the cost model. Investment properties are carried out at cost less accumulated depreciation.	Under IAS 16, An entity shall choose as its accounting policy either the fair value model or the cost model and shall apply that policy to all of its investment property.

6	Presentation of Financial Statements	Under VAS 21, Companies reporting under VAS are also required to apply the VAS chart of accounts and standard financial statements format	IAS 1 sets out the overall requirements for the presentation of financial statements, guidelines for their structure and minimum requirements for their content.
7	Consolidated financial statements	VAS 25 requires the presentation of non-controlling shareholder interests outside of equity.	IFRS 10 requires that non-controlling interests are presented as a separate indicator in equity.
8	Investments in Associates	VAS 7 and VAS 8 are applied for both separate and consolidated financial statements.	IAS 28 are not applied for separate financial statements.

(Source: PwC, 2019)

The most significant difference is that VAS does not allow revaluation of assets and liabilities at fair value at the time of reporting. This reduces the fidelity and relevance of the financial statements and not in accordance with the IAS / IFRS. VAS 21 does not require the presentation of the Equity Change Report into a separate report like IAS 1, but only requires the presentation in the notes to the financial statements. In addition, the Vietnamese accounting regime requires rigid reporting formats, reducing the flexibility and diversity of the financial reporting system, while the IAS/ IFRS does not provide specific reporting formats.

According to a research of PwC, IFRS adoption makes a significant impacts to help reducing the cost of capital mobilization, improve internal governance capacity, and improving the transparency of the business, and the usefulness of financial information (PwC, 2019). In this paper, we concern about the impact of IFRS application on the useful of financial information. To be usefulness, according to IASB Framework, information must be understandable, reliable, comparable, and relevant. We focus on the effect of IFRS adoption on the relevance of financial information.

Financial reporting is relevant when it influences the economic decisions of users, whether investors, employees, lenders, suppliers, customers or other agents (Callao et al., 2007). In this paper, we choose to focus on the investors and analyze whether IFRS make financial reporting more relevant for decision making in the capital markets than the information provided in financial statements prepared under VAS. We analyze the gap between book and market value (measured by the book-to-market ratio (BtM)) to determine whether it differ depending on the measurement of book value under local or international standards.

To assess the differences on relevance of financial information between the financial statements prepared under VAS and IFRS, we choose the research sample of companies listed on Ho Chi Minh Stock Exchange (HoSE) in the period of 2012 - 2018. 6 companies

include: Vietnam Dairy Products Joint Stock Company (Vinamilk), Century Synthetic Fiber Corporation, Novaland Group, Vingroup, VP Bank, Bao Viet Holding. These are the companies with a high stock market capitalization and thus they can be considered to represent the development of the Vietnamese stock market. The results show that there has been improvement in the relevance of financial reporting to local stock market operators.

The structure of the rest of the paper is as follow: Section 2 focuses on literature review. Section 3 develops the research hypothesis. Section 4 explains research methodology and describes the sample and data. Section 5 shows results of the study in assessing the impact of IFRS adoption on relevance of financial information of the 6 Vietnamese companies listed firms chosen. Section 6 concludes the paper and offers recommendations for future research.

2. LITERATURE REVIEW

Relevance is referred to as the capability “of making a difference in the decisions made by users in their capacity as capital providers” (IASB, 2008). According to prior literature, relevance is operationalized using four items referring to predictive and confirmatory value.

The first item measures operationalized predictive value as the ability of past earnings to predict future earnings. Francis et al. (2004) examine the relation between the cost of equity capital and seven attributes of earnings which include value relevance. They characterize attributes as accounting-based and market-based because they are typically measured in using accounting information and relations between market data and accounting data. The results show the existence of the relation between cost of equity and the accounting-based attributes, in particular, accrual quality. These findings provide forward-looking statement. The forward-looking statement usually describes management’s expectations for future years of the company. For capital providers and other users

of the annual report, this information is relevant since management has access to private information to produce a forecast that is not available to other stakeholders. Callao et al. (2005) determine the relevance of financial statements for groups of joint stock companies to prepare consolidated financial statements according to IFRS standards in Spain. To address this goal, the researchers looked for differences in accounting items and financial ratios below the Spanish accounting standards and IFRS standards. The results showed that there was no significant increase in the relevance quality of financial statements of the Spanish domestic stock market due to the large gap between book value and market value when applying IFRS.

The second item measures to what extent the annual reports disclose information in terms of business opportunities and risks. Jonas and Blanchet (2000) refer to the complementation of financial information by non-financial information, when referring to predictive value, and the knowledge that can be obtained of business opportunities and risks, since it provides insight into possible future scenarios for the company.

The third item measures company's use of fair value. Prior literature usually refers to the use of fair value versus historical cost when discussing the predictive value of financial reporting information. Schipper & Vincent, (2003) discusses empirical measures used in academic research to assess earnings quality and relates these measures both to decision usefulness, from the Financial Accounting Standards Board's (FASB) Conceptual Framework, and to the economics-based definition of earnings developed by Hicks (1939). The results claim that fair value accounting provides more relevant information than historical cost because it represents the current value of assets, instead of the purchase price. Barth et al., (2001) explains that value relevance research assesses how well accounting amounts reflect information used by equity investors, and provides insights into questions of interest to standard setters. A primary focus of financial statements is equity investment. Other uses of financial statement information, such as contracting, do not diminish the importance of value relevance research. The results demonstrate that both the FASB and IASB are currently considering new standards to allow more fair value accounting to increase the relevance of financial reporting information, since they consider fair value as one of most important methods to increase relevance.

In addition to the predictive value, confirmatory value contributes to the relevance of financial reporting information. Information has confirmatory value "if it confirms or changes past (or present) expectations based on previous evaluations" (IASB, 2008). Jonas and Blanchet (2000) argue that if the information in the annual report provides feedback to the users about

previous transactions or events, this will help them to confirm or change their expectations.

In Vietnam, there are very few works evaluate the quality of financial reporting information based on the attributes of information quality, especially the relevance of financial information. Hong and Linh (2014)'s research aims to measure financial statements of Vietnamese enterprises based on the qualitative characteristics of financial statements issued by IASB; FASB. The authors conduct 137 survey samples, the scale of measurement is rank 2, consisting of 6 components: Relevance; Faithful Representation; Comparability; Verifiability; Timeliness; Understandability. The results show that the financial statements in Vietnamese enterprises have an average value of 2.79 to 3.45. In particular, the Comparability and Understandability attributes have the highest average value when the remaining attributes are evaluated to an average degree. The results demonstrate that the relevance quality is weak in case of Vietnamese enterprises. Van and Huong (2019) also determine the adoption of International accounting standards (IAS)/International financial reporting standards (IFRS), impacts on the quality of financial information based on these 6 qualitative characteristics of financial statements, same as the research of Hong and Linh. They concluded that, the quality of financial information is improved by adoption of IAS/IFRS. As mentioned, the number of researches on qualitative characteristics (or requirements) of the financial statement is quite limited, and often investigate to all of the 6 characteristics. We do not find any work focus only on the relevance quality. With this reason, in this paper, we aim to focus on the effect of IFRS adoption on the relevance of financial statement, which is a new direction to contribute to current research in Vietnam.

3. HYPOTHESIS

Financial reporting quality in terms of the fundamental and enhancing qualitative characteristics may underlie decision usefulness as defined in the IASB, 2008. The fundamental qualitative characteristics (i.e. relevance and faithful representation) are most important and determine the content of financial reporting information. Enhancing qualitative characteristics (i.e. understandability, comparability, verifiability and timeliness) can improve decision usefulness when the fundamental qualitative characteristics are established. However, they cannot determine financial reporting quality on their own (IASB, 2008).

Value relevance models measure the quality of financial reporting information by focusing on the associations between accounting figures and stock-market reactions (e.g. Barth et al., 2001; Choi et al., 1997; Wahlen et al., 2004). The stock price is assumed to represent the market value of the firm, while accounting figures represent firm value based on

accounting procedures. When both concepts are (strongly) correlated, i.e. changes in accounting information correspond to changes in market value of the firm, it is assumed that earnings information provides relevant and reliable information (Wahlen et al, 2004). The focus of book value and market value on relevance is consistent with these notions are defined as the fundamental qualitative characteristics. However, this literature does not distinguish between relevance and reliability, i.e. does not explicitly show whether or not tradeoffs have been made when constructing accounting figures. In addition, the stock market may not be completely efficient. As a consequence, stock prices may not represent the market value of the firm completely accurate (Wahlen et al, 2004).

Most studies have shown that applying IFRS increases the relevance of financial information (see for example, Bartov et al., 2005; Muller et al, 1999; Serafeim et al, 2006) while others provide evidence that adoption IFRS worsens value relevance (Chen et al, 2005; Schiebel, 2006; Callao et al, 2005), while yet others find no conclusive evidence either way (Niskanen et al., 2000). Regarding to the relevance research in Vietnam, according to Hong and Linh (2014) as mentioned above, the relevance quality is weak in Vietnam. These findings are not consistent. To test the effect of IFRS on the relevance of financial statement in case of Vietnam IFRS adoption, we apply similar method in Callao et al. (2005), and test the below hypothesis for 6 listed Vietnamese companies, both in financial and non-financial sectors.

The objective of IFRS application is to enhance the accounting information quality (IFRS, 2008). IFRS has more advantage in comparison with VAS. IFRS differs from VAS in most items of the balance sheet. Trading receivable separates from receivable from the sale of fixed or other fixed income. The finished product price is calculated according to the usual price method rather than the actual one and it does not accept the LIFO method. The biological and agricultural products harvested from the biological assets are recorded at a reasonable value (market price) at the end of each period, the difference is recorded in the undefined profit and loss on the results report. Ready-to-sell securities are also adjusted at reasonable prices at the end of the period but it is credited with an increase in equity on the balance sheet not recorded in the loss statement. Receiving dividends in shares does not record an increase in income, but merely memorizes the number of shares and reduces the unit price of capital but the total cost price is constant. IFRS requirements are more appropriate compare to VAS, transactions are recorded relevantly and logically. Therefore, accounting information of financial statement is supposed to bring more usefulness for

users, which may lead to the improvement of the relevance quality.

H1: Applying IFRS will decrease the gap between book value and market value compared to applying VAS

4. METHODOLOGY AND SAMPLE

4.1 Methodology

To analyze the effect of applying IFRS on the relevance of financial information, we evaluate the gap between market value and book value when companies apply IFRS and VAS. The closer between book value and market value, the more relevant the financial information. To make it simple, when the book value/market value ratio is asymptotic to 1, the relevance of accounting information will increase.

Book value is the accounting value of the firm and the total value of company's asset that shareholders would theoretically received if a company were liquidated. Book value is calculated as the difference between a company's total assets and total liabilities (Investopedia). Additionally, the book value is also available as shareholders' equity on the balance sheet.

$$\text{Book value of a company} = \text{Equity}$$

$$\text{Equity} = \text{Total assets} - \text{Total liabilities}$$

Market value is the current stock price of all outstanding shares (i.e. the price that the market believes the company is worth) (Corporate finance institute). We determine the market value of a business by determining the value of its shares circulating in the market. In other words, market value is the number of shares multiplied by the price of outstanding shares at the end of the fiscal year.

We analyze the gap between book value and market value (measured by the book-to-market ratio (BtM)) to based on whether it differed depending on the measurement of book value under local or international standards. The variables are:

$$\text{BtM}_{\text{VAS}} = \text{BV}_{\text{VAS}} / \text{MV}$$

$$\text{BtM}_{\text{IFRS}} = \text{BV}_{\text{IFRS}} / \text{MV}$$

Where: BtM_{VAS} is the book value / market value ratio according to VAS

BtM_{IFRS} is the book value / market value ratio according to IFRS

BV is book value; MV is market value

4.2 Sample

To assess the relevance of the information when applying the two-standard system, we choose the sample of companies listed on HOSE. Selected companies have financial statements prepared in

accordance with both Vietnamese Accounting Standards and IFRS Accounting Standards, for the period of 2012-2018.

However, in Vietnam, the application of international accounting standards IFRS is still limited. IFRS is only applied to a few large companies, mainly companies that want to access foreign investment capital. So the application of the standard is voluntary and there is no requirement that these companies publish their financial statements.

Through the process of collecting corporate financial statements, we found 6 companies that prepare financial statements according to both standard: Vingroup (VIC), Vietnam Dairy Products Joint Stock Company (Vinamilk); Century Synthetic Fiber Corporation (STK); Novaland Group (NVL); Bao Viet Holding (BVH), VP Bank (VPB). These are companies with a high stock market capitalization and thus these companies represent the development of the Vietnamese stock market.

Table 2 presented below is a summary of the information of the six companies.

For the group of non-financial companies, the assets, liabilities and business activities of the enterprise are selected according to the fair value or cost model. This makes the financial information a more realistic reflection. Firms with large investment assets, or investments will have a lot of impact when applying the IFRS system (PwC, 2019). For the group of financial companies are expected to have material changes in their financial position because Vietnam currently does not have a standard for financial instruments, but this is one of the very material standards of IFRS (PwC, 2019).

5. RESULTS

We examine the effect of applying IFRS on financial information rationale by comparing the BtM index against VAS and IFRS. The results are presented in table 3 and table 4.

Table 2. Sample of 6 companies

Group	No	Name	Industry	Stock Exchange	Capitalization (2016) millions VND	Start listed year
Non-financial companies	1	Vietnam Dairy Products Joint Stock Company (VNM)	Manufacturing and trading in dairy products.	HoSE	22,405,949	2006
	2	Vingroup (VIC)	Technology, industry and tourism trade	HoSE	45,266,395	2009
	3	Century Synthetic Fiber Corporation (STK)	Manufacturing and synthetic in silk yarn, knitting products	HoSE	695,109	2015
	4	Novaland Group (NVL)	Real estate business, owner-owned or leased land use rights	HoSE	10,046,890	2016
Financial Companies	5	Bao Viet Holding (BVH)	The main sectors are insurance, finance, securities, and banking.	HoSE	3,686,536	2009
	6	VP Bank (VPB)	Business activities in the banking and finance sector.	HoSE	17,177,528	2017

Table 3. Book-to-market ratios (BtM) according to VAS and IFRS of Non-Financial companies BtV

FIRM	YEAR	BV _{VAS}	BV _{IFRS}	MV	BTM _{VAS}	BTM _{IFRS}
VNM	2016	22.405.949	23.088.988	137.426.851	0,16304	0,16801
	2017	23.873.057	24.174.288	233.680.514	0,10216	0,10345
	2018	26.271.369	26.277.034	198.820.443	0,13214	0,13216
STK	2016	695.108	690.012	699.508	0,99371	0,98642
	2017	778.651	773.119	820.968	0,94845	0,94172
	2018	909.053	893.722	743.289	1,22301	1,20239
NVL	2016	10.046.890	9.808.831	27.459.148	0,36588	0,35722
	2017	13.256.390	13.635.401	32.412.234	0,40899	0,42069
	2018	20.460.126	21.874.618	59.731.680	0,34253	0,36621
VIC	2014	27.462.688	32.512.831	33.550.768	0,81854	0,96906
	2015	37.576.843	43.719.957	48.162.749	0,78021	0,90775
	2016	45.266.395	52.878.402	91.581.220	0,49428	0,57739

Table 3 present the number of book-to-market ratios (BtM) according to VAS and IFRS of 6 Vietnamese listed companies in different periods. Figures of Vinamilk Company, Century Synthetic Fiber Corporation, Novaland Group (VNM, STK, NVL) are collected in the period of 2016 - 2018, Vingroup (VIC) is reported between 2014 and 2016, Bao Viet Holding (BVH) is presented between 2012 and 2018, VP Bank (VPB) is indicated in 2017 and 2018. Firstly, in case of Vinamilk, it is clear that BtM according to IFRS is higher than BtM according to VAS. Specifically, in 2016, BtM is 0.16304 follow by VAS rise to 0.16801 follow by IFRS with the change by 0.00497. IFRS adoption impact on the number of BtM to increase by 0.00129 in 2017 and grow by 0.00002 in 2018. VNM results show that the application of IFRS has a positive impact on the relevance of financial statement.

Secondly, in particular, STK, in 2016 the BtM_{VAS} ratio is higher than the BtM_{IFRS} ratio by 0.00729. STK is experienced a fall in the number of BtM according to VAS and IFRS in 2017, with 0.94845 and 0.94127 respectively. In 2018, BtM decreases from 1.22301 to 1.20239 in order of VAS to IFRS, but this figure is more asymptotic to 1 when applying IFRS, so the relevance level is better. These evidences demonstrate that IFRS adoption make the relevance quality weakly in the first 2 years of the period, but in the last year following by an improvement of the relevance.

Thirdly, the BtM ratio of NVL fluctuate wildly throughout the years. Particularly, the BtM ratios difference between VAS and IFRS experience a decrease by 0.00866, while both 2017, 2018 years see a significant growth by approximately 0.02. It can be

seen that IFRS adoption has a substantial influence on the relevance in case of NVL.

Fourthly, with VIC results, the BtM ratios in accordance with both VAS and IFRS are decrease, while the numbers of book-value and market-value are increase over the period, but the value of BtM_{VAS} minus BtM_{IFRS} results do not stabilize. In 2014 and 2016, the relevance of financial statement grow significantly with the change of BtM by around 0.1 in according to IFRS adoption. The year 2015 witnesses the numbers of BtM increases sharply to 0.90775 by 0.12754, which is the highest BtM_{IFRS} in 3 years. This comparison indicates that IFRS adoption does not have an effect on the relevance in 2016.

It can be seen that in table 3 during the period of 2016-2018, in case of VNM and VIC, BtM_{IFRS} ratios are higher than BtM_{VAS} ratios. The number of BtM_{VAS} minus BtM_{IFRS} see a downward trend in VNM, while in VIC this figure reaches the highest in the year 2017. This figure has the upward trend in NVL and STK but in the first year of the period BtM is decrease when IFRS is applied, in the next 2 years the ratios rise enormously. In conclusion, the BtM ratios of non-financial companies are substantial influenced by IFRS adoption. Four non-financial companies have an advantage in accordance with IFRS adoption which is demonstrated by the gap between BtM_{VAS} and BtM_{IFRS} increase during the period.

Following 6 non-financial companies are stated above, we also examine the BtM ratios of 2 financial companies in comparison between VAS-based and IFRS-based which give informations in table 4.

Table 4. Book-to-market ratios (BtM) according to VAS and IFRS of Financial institutions

FIRM	YEAR	BV _{VAS}	BV _{IFRS}	MV	BTM _{VAS}	BTM _{IFRS}
BVH	2012	14.179.369	14.364.820	22.522.244	0,62957	0,63781
	2013	14.215.469	13.692.005	22.835.260	0,62252	0,59959
	2014	12.816.822	14.074.414	20.049.410	0,63926	0,70198
VPB	2017	29.695.710	27.227.965	50.995.068	0,58232	0,53393
	2018	34.750.069	33.386.622	48.516.715	0,71624	0,68814

The first company is BVH, the ratios of BtM_{VAS} are approximately 0.62 over the period of 2012-2014. IFRS adoption make a rise of BtM to 0.63781 during the year 2012, but in the next year 2013 experience a fall in BtM drop to over 0.59959, following by a significant climb to 0.70198 in 2014. It is apparent that in case of BVH, 2012 and 2014 years witness a positive impact of IFRS adoption on the relevance, in contrast to these years, in 2015 the relevance of accounting information is not improved.

With the other company, VPB, the relevance level declines in 2 years 2017 and 2018. Specifically, the gap between BtM_{VAS} minus BtM_{IFRS} is 0.04839 in 2017, this figure declines moderately to 0.0281 in the next year 2018. In other words, IFRS adoption impact on the relevance in 2018 is more effective than 2017.

In summary of table 4, the BtM numbers of Bao Viet Holding fluctuate throughout the years. However, the BtM ratio increases moderately in the last year of the period and reach a peak in accordance with IFRS adoption during 2012 to 2014. It is clear that the application of IFRS help BVH improve the relevance of IFRS. With the other company, VPB, adopting IFRS does not increase the relevance level in both 2017, 2018 years, but the gap between BtM_{VAS} minus BtM_{IFRS} drop considerably from 2017 to 2018, which means throughout the period, the relevance take an advance when IFRS are being adopted.

Looking at table 3 and table 4 in an overview, IFRS obviously impact positively on the relevance of financial statements. Six out of 6 companies experience an increase of the relevance when IFRS are applied. We assume that because of IFRS complex technique requirements and performs such as the implementation of estimates of fair value when there is no listed price in the market, recoverable value, loss of assets, determine the current value of future cash flows... while 6 companies also have sufficient capacity and qualifications than other companies, the IFRS adoption is difficult but take advantage of improving the relevance quality.

6. CONCLUSION

The results show that book value differs from market value under both standards. The results indicate that the book-to-market ratio change depending on the accounting standards applied. We also conclude that

applying IFRS accounting standards will increase the relevance compared to applying VAS. Based on the results, in an overview, the relevance is impacted positively in cases of 4 non-financial companies and 2 financial companies. In summary, there are 6 out of 6 companies experience an increase of the relevance when IFRS are applied, which lead to the conclusion that IFRS adoption improves the relevance of financial statement.

However, the manner in which Vietnamese firms have applied IFRS continues to provide conservative financial information. Since the observed companies applying voluntary IFRS standards with different timing of application, therefore, we increase the number of years of observations to make the forecast more accurately.

Based on the analysis of the evolution of market value and book value of 6 companies, we conclude that the figures of market value is not in line with the figures of book value, regardless of the criteria applied by the firms in the preparation of their financial information. However, the results indicate that the relevance is better in accordance to the ratio of book-to-market ratio when measured under IFRS rules rather than VAS. Considering that the period analyzed is short and that firms have only recently begun to apply IFRS, it may be expected in the medium to long-term that international standards will result in an evolution of firms' book value that is more in line with their market value.

The results will help Vietnamese standard-setters improve the process of reforming the VFRS in order to ensure convergence between VAS and IFRS for all companies. Users also could benefit from the findings because they highlight the comparability problem between firms and the increasing of improvement in relevance after the adoption of IFRS.

This study has some limitations. The number of samples is small due to difficult in access to data sources. 6 companies in the research are the firms with the highest stock market capitalization, therefore they can represent to the behaviour and evolution of the Vietnam stock market over a given period. Nevertheless, it would be worth repeating the study for other listed companies currently applying IFRS. Finally, our study does not allow quantify the direct effect of all standards on the accounting figures.

7. REFERENCES

- [1] Barth, M., Beaver, W. & Landsman, W. (2001). The relevance of the value relevance literature for financial accounting standard setting: another view. *Journal of Accounting and Economics*, 31, 77-104.
- [2] Barth, M., et al (2001), The relevance of the value relevance literature for financial accounting standard setting: another view. *Journal of Accounting and Economics*, 31 (2001) 77-104.
- [3] Bartov, E., et al (2005). Comparative value relevance among German, US and International Accounting Standards: A German stock market perspective. *Journal of Accounting Auditing & Finance*, 20(2), 95-119.
- [4] Bartov, E., Goldberg, S., and Kim, M. (2005). Comparative Value Relevance among German, U.S., and International Accounting Standards: A German Stock Market Perspective. *Journal of Accounting, Auditing and Finance*, 20(2): 95-119.
- [5] Beest, F., et al (2009), Quality of Financial Reporting: measuring qualitative characteristics. *NiCE Working Paper 09-108*.
- [6] Callao, S., et al (2007). Adoption of IFRS in Spain: Effect on the comparability and relevance of financial reporting. *Journal of International Accounting, Auditing and Taxation*, 16 (2007) 148-178.
- [7] Delvaille, P., et al (2005). International financial reporting convergence: evidence from three continental European countries. *Accounting in Europe*, 2, 137-164.
- [8] Francis, J., et al (2004), Cost of Equity and Earnings Attributes. *The Accounting Review* 79(4):967-1010
- [9] Harris, M., et al (1999). The market valuation of IAS versus US-GAAP accounting measures using Form 20-F reconciliations. *Journal of Accounting & Economics*, 26(1-3), 285-312.
- [10] Healy, P. & Wahlen, J. (1999). A review of the earnings management literature and its implications for standard settings. *Accounting Horizons*, 13(4), 365-383.
- [11] Hirst, D., Hopkins, P. & Wahlen, J. (2004). Fair Values, Income Measurement, and Bank Analysts' Risk and Valuation Judgments. *The Accounting Review*, 79(2), 453-472.
- [12] Hong NTP, Linh DTK, Perspective on quality newspaper Main reports of current Vietnamese businesses. *Magazine Accounting & Auditing Press*. 2014; 6: 32-38.
- [13] Horton, J., & Serafeim, G. (2006). Market response to and the value relevance of reconciliation adjustments from UK GAAP to IFRS GAAP: First evidence from the UK. *Review of Accounting Studies volume 15*, pages 725-751 (2010).
- [14] IASB (2008), Operationalising the Qualitative Characteristics of Financial Reporting. *International Journal of Finance and Accounting*.
- [15] J. Horton, G. Serafeim, Market reaction to and valuation of IFRS reconciliation adjustments: first evidence from the UK. *Review of Accounting Studies*, 15 (4) (2010), pp. 725-751.
- [16] Jonas, G. and Blanchet, J. (2000). Assessing Quality of Financial Reporting. *Accounting Horizons*, 14(3): 353-363.
- [17] Lin, Z. J., & Chen, F. (2005). Value relevance of international accounting standards harmonization: Evidence from A-share and B-share markets in China. *Journal of International Accounting, Auditing and Taxation*, 14(2), 79-103.
- [18] M. Harris, K. Muller. The market valuation of IAS versus US-GAAP accounting measures using Form 20-F reconciliations. *Journal of Accounting and Economics*, 26 (1) (1999), pp. 285-312.
- [19] Ministry of Finance (2020) Decision 345/QD-BTC Approving the scheme on applying financial reporting standards in Vietnam.
- [20] PwC (2019) A comparison of IFRS and Vietnamese GAAP – PwC. *Vietnam-publications*
- [21] Schiebel, A. (2006). Value relevance of German GAAP and IFRS consolidated Financial Reporting: An empirical analysis on the Frankfurt Stock Exchange. *SSRN Electronic Journal*.
- [22] Van. NTH, Huong. DTL (2019). Applying international accounting standards to improve the quality of financial reporting information. *Journal of Accounting & Auditing*, 9-2019.

PROFITABILITY OF TOURIST ACCOMMODATION SERVICE COMPANIES LISTED ON VIETNAM STOCK MARKET IN CHANGEABLE BUSINESS CONDITIONS

Nguyen Van Nam ¹, Nguyen Thi Vu Khuyen ^{2*}, Ngo Thu Giang ³

¹ National Economics University

^{2,3} School of Economics and Management, Hanoi University of Science and Technology

*Corresponding author: khuyen.nguyenthivu@hust.edu.vn

Abstract

This study investigates the impact of changes in business condition such as economy and tourism growth especially with or without crisis events on the profitability of accommodation service companies listing in Vietnam stock market. The indicators of corporate profitability under consideration are return on sales (ROS), return on assets (ROA) and return on equity (ROE). The effects of changes in the state of economy (real GDP growth rate) and tourism growth (growth rate of total foreign tourist arrivals) on the corporate profitability of the companies are then examined via panel regression tests. The crisis events such as the US-China commerce war and Sars-CoV2 epidemic are considered as dummy variable. Quaterly data from Q1 2015 to Q3 2020 of 8 accommodation service companies listing in HNX, HOSE and Upcom was collected to test the study model. The result shows that ROS of observed companies positively correlated with the growth rate of international visitors and dummy variables representing for the US-China trade war crisis and the Sars-CoV2 pandemic. Besides, ROA is also positively correlated statistically with the crisis dummy variable mentioned above.

Key words: profitability, tourism, Vietnam, business, companies.

1. INTRODUCTION

The economy is the environment in which all businesses operate. Therefore, the development of companies is closely linked with the development of the economy. The tourist accommodation industry is cyclical and highly sensitive to the business climate. The reason is that this industry typically has fixed costs that are higher than variable costs, regardless of actual productivity (Chen, 2010). With high fixed costs, accommodation businesses are very sensitive to business conditions because when the economy is in recession they cannot cut costs corresponding to revenue decrease rate. That also means hotels often require very high revenues to survive and make the expected returns. However, to maintain high sales, hotels need a source of tourists. Thus, an increase in the number of tourists can have a strong impact on the profitability of hotel businesses in the event that they save operating costs.

The paper examines the impact of economic growth and the tourism industry on the profitability of listed accommodation businesses on Vietnam's stock market. In the past decade, the tourism service industry in Vietnam has developed extremely rapidly and strongly due to the advantages of landscapes as well as diverse and unique cultures, thus making a significant

contribution to the economic development. However, this is a relatively young industry and is considered to be developing too hot, lack of synchronization and planning both in width and depth, increasing the sensitivity of businesses in the industry to business terms. Over the past years, Vietnam has always had a high economic growth rate compared to other countries in the region and the number of international visitors to Vietnam has increased significantly. This can have a positive effect on the profitability of firms in the industry studied.

The second issue that is of interest to the article is crisis events that are unfavorable for the accommodation industry such as the US-China trade war (which started in March and April 2018) and especially the ongoing epidemic covering all over the world - Sars CoV2 (booming strongly in January 2020). Crisis event dummy variables are integrated in the model beside two variables on economic growth and tourism.

2. LITERATURE REVIEW

Profitability is a number that shows the ability of a business to make a profit over a long period of time, assuming the operating conditions are constant (vietnambiz, 2020). Profitability is a measure of efficiency - and ultimately success or failure. Another definition of profitability is the ability of a firm to

generate a return on an investment based on its resources versus an alternative investment. While a company can be profitable, this doesn't necessarily mean that it has profit (Horton, 2019).

The profitability of accommodation businesses is highly dependent on the volatility of revenue caused by increased or decreased volatility in the supply and demand of the market. The demand of this market is strongly dependent on shocks, crisis events caused by a variety of factors, from natural disasters, political upheavals to changes in economic conditions such as deterioration or volatility of exchange rates (Aznae et al., 2016). Thus, in today's increasingly volatile world, it is ever more difficult to maintain good profitability of businesses.

Since the business success of hotel companies is assumed to be closely related to the economy, an analysis of the effect of aggregate economy status on firm performance in the hospitality industry is very reasonable. However, there is very little research on the link between business conditions and hotel firms' profitability in hotel and tourism literature. Regarding the factors affecting the profitability of hotels, previous studies have shown groups of external factors and internal factors. Aznae et al. (2017) cite Sainaghi's (2010) synthesis article that up to 83% of empirical studies on the factors affecting hotel profitability use internal factors to explain, the rest is to use variables from the external corporate environment. Thus, even in the world the number of experimental studies using external factors as explanatory variables is also very limited.

However, there are some studies in Sri Lanka, Taiwan, China... that have used factors belonging to the business environment such as GDP growth, tourist growth, and crisis events... as the explanatory variable for the increase or decrease of profitability of large hotel enterprises.

In a study on the interaction relationship between business conditions and financial performance of hotels listed on the Taiwan and Chinese stock exchanges, Chen (2007) showed that there is a long-term balance between business conditions and financial performance for the majority of travel agencies and for the entire travel group in both Taiwan and China. The paper also found that gross domestic product plays a more important role than industrial production in predicting variance in the financial performance of entire tourism groups in both China and Taiwan. Industrial manufacturing measuring business conditions closely monitors the manufacturing sector, while gross domestic product includes other manufacturing and services. Therefore, this finding shows that the overall financial performance of the tourism industry is closely related not only to the manufacturing sector but also with other service industries.

In another study, Chen (2010) demonstrated that the growth of international visitors to Taiwan had a positive effect on the ROA and ROE of five major hotels in the country between 1997 and 2008 and its effect is statistically significant at 5%. However, although GDP growth has a positive effect on both ROA and ROE, its effect is not statistically strong. The study also tested the role of crisis events such as earthquakes, terrorism in the US and Sars pandemic to the profitability variables of hotels, but the results showed that only the Sars pandemic had significantly negative impact on ROE.

Contrary to research by Chen (2010), research results in Sri Lanka show that GDP growth has a negative impact on ROA and ROE of hotel businesses. Weerathunga et al (2020) found that GDP growth and INFLATION, have a significantly positive relationship with ROA in the GMM model. Most of the macroeconomic variables (ie GDP, TOURIST, INTEREST and INFLATION) were statistically significant across all models. In which Δ GDP has opposite effects on ROA and ROE. This conclusion is contrary to Chen (2010), however Weerathunga et al. (2020) add more evidence of the negative effect of Δ GDP on profitability that is evident in other studies around the world. The author of the article also argues that a possible reason for this is that profitability (ROA and ROE) mainly depends on factors within the hotel such as efficiency, hotel location, ranking of customers and occupancy rates.

Thus, in the world, the issue of the impact of economic growth as well as the number of international visitors on the profitability of hotels is still controversial. In addition, in Vietnam, through the overview, the author found that there are hardly any research paper studies in detail on this issue. While it can be said that in recent years, the tourism service industry has grown too hot, bringing many opportunities for accommodation businesses to increase revenue, but besides that, it also opens up many challenges for businesses in this industry. Vietnam's economic conditions are considered to have little volatility, but are also negatively influenced by many events such as the US-China trade war and especially the Covid-19 pandemic. An open research direction is the correlation between changes in business conditions with the profitability of accommodation firms listed on the stock market of Vietnam in the past 5 years.

3. RESEARCH METHODOLOGY

3.1. Research model and analysis method

The research model is described in figure 1 below:

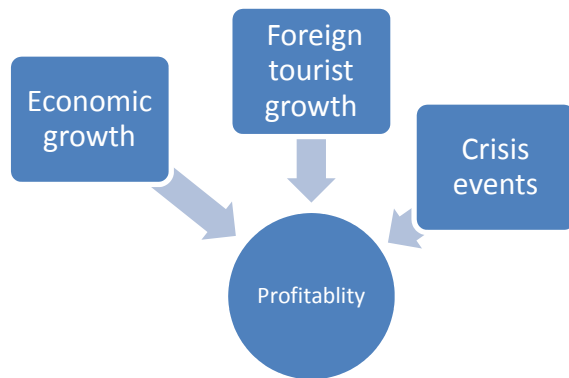


Fig. 1: Research model

The profitability of a hotel business is measured by many indicators. However, in the article, the author chooses 3 criteria: Return on Sales (ROS), Return on assets (ROA) and Return on equity (ROE). Similar studies often choose 2 indicators: ROA and ROE, but according to the author, the after-tax profit generated from revenue is an important indicator for the hotel industry because revenue can fluctuate strongly according to the market, but the way businesses manage costs is the key to survival and growth.

Change in business environment is measured by economic growth - growth in gross domestic product and growth in tourism - growth in international arrivals (Chen (2007), Chen (2010), Weerathunga and partners (2020)). In addition, when encountering crisis events, it will also affect the business operations of the tourism industry in general and the accommodation industry in particular. Therefore, the crisis event dummy variable (DCE) is included in the model to increase the model's

explanation. During the research period, there are two events that can have a great impact on the domestic tourism market: the US-China trade war and the Sars-CoV2 pandemic. The US-China trade war officially broke out on March 22nd, 2018, when US President Donald Trump announced a tax of 50 billion USD on Chinese goods exported to the US (to prevent unfair trade acts and intellectual property theft from China). In response to the US action, on April 2nd, 2018, the Chinese Ministry of Commerce imposed taxes on 128 US products... (Hoang Thi Thuy, 2019). This war affects tourism because it has a strong impact on the economies of China, the US and many other countries in the world including Vietnam. This affects the travel needs of people at home nation and abroad. However, the Sars-CoV2 pandemic is really a very heavy blow to tourism businesses, including hotels. Starting a strong outbreak in January 2020, the epidemic continues to spread and shows no signs of reduction under the autoimmune mechanism of other influenza diseases. The pandemic affected many countries' economies seriously, production stagnated, and is considered the worst in recent years. From the end of March 2020, many countries announced border closures, they had to implement policies of social distance, temporary suspension of entry for foreigners,... The tourism industry was almost "frozen". The accommodation services, restaurants, entertainment services,... are closed, limited passenger transportation, only serving urgent cases.

Thus, the variables in the model are described in detail in the table below:

Table 1: Variable description

Variables	Description	Measurement	Reference
1. Dependent variables			
ROS	Return on Sales	$ROS = \text{After tax profit} / \text{Net revenue}$	
ROA	Return on Asset	$ROA = \text{After tax profit} / \text{Average total asset}$	Chen (2007), Chen (2010), Weerathunga et al (2020)
ROE	Return on Equity	$ROE = \text{After tax profit} / \text{Average total equity}$	Chen (2007), Chen (2010), Weerathunga et al (2020)
2. Independent variables			
%GDP	Quarterly Gross Domestic Product growth rate	$\%GDP = (\text{GDP}_t - \text{GDP}_{t-1}) * 100\% / \text{GDP}_{t-1}$	Chen (2007), Chen (2010), Weerathunga et al (2020)
%TA	Quarterly foreign tourist growth rate	$\%TA = (\text{TA}_t - \text{TA}_{t-1}) * 100\% / \text{TA}_{t-1}$	Chen (2007), Chen (2010), Weerathunga et al (2020)
DCE	Crisis event dummy variable	Quarter that has crisis event date takes value 1. Quarter that does not have crisis event date takes value 0.	Chen (2007), Chen (2010)

(Source: author's work)

The analytical method used is the regression of panel data. Panel data is selected due to the following advantages:

- Panel data can control the heterogeneity of an individual company.
- Panel data provides data with more information, less community among variables, more degrees of freedom, and more efficiency.
- Panel data can better study the adjustment dynamics.
- Panel can better identify and measure effects that are simply not detectable in pure time series or pure cross-section data.

Random effect (REM) or fixed effect (FEM) regression will be selected accordingly through the Hausman test.

3.2. Research period and data

- Research period:

The tourist accommodation industry has a very clear seasonal business cycle because it is influenced by the tourism industry in general. Therefore, in order to observe the effects of business conditions fluctuation on profitability accurately and clearly, the study period must be divided by quarter (Chen (2007), Chen (2010)).

- Data:

The study uses data of 8 accommodation companies listed on HOSE, HNX and Upcom from Q3 2015 to Q2 2020. There are a total of 12 businesses in the industry listed on the 3 above-mentioned exchanges. However, these 8 businesses were selected because they have relatively sufficient quarterly data on the website: vietstock.vn. Thus, there are a total of 20 study periods during the study period and 160 observations. This

number of observations was relatively suitable to ensure the reliability of the model.

4. RESEARCH RESULT

4.1. Descriptive statistics

Descriptive statistics of the variables in the model are presented in the table 2.

- Profitability of companies in the sample:

It can be seen that the quarterly profitability of the businesses observed over the past 5 years is low. Mean of ROE is only 0.97% with 6.01% standard deviation. The value ranges from -45.85% to 21.93%. Similar to ROA with a mean of 0.57%, a standard deviation of 3.36%, and a range of values is (-25.10%, 10.8%). But the most remarkable thing is the ROS indicator with negative mean value and extremely large standard deviation (63.2%). The large fluctuation of profitability ratios over the quarters is due to the clear seasonal nature of the industry. The value of ROS by quarter of enterprises fluctuated in the range (-534.55%, 151.22%).

- Fluctuation of gross domestic product by quarter:

Average quarterly GDP growth rate in the last 5 years is 6.26% and the standard deviation is only 1.63%, showing that Vietnam has a fairly stable economy despite the worldwide economic, political and environmental situation have more and more uncertainties. This is also clearly seen in Figure 2 - a graph showing Vietnam's quarterly economic growth from Q3 2015 to Q2 2020. However, starting from the beginning of 2020, GDP growth has dropped to a low level, due to the increasing seriousness of the Sar-Cov2 epidemic. By the second quarter of 2020, the GDP growth rate will be at 0.36% - the lowest level in the past 5 years.

Table 2: Descriptive statistics

Variables	Obs	Mean	Standard Deviation	Min	Max
ROE	159	0.97	6.01	-45.85	21.93
ROA	159	0.57	3.36	-25.10	10.80
ROS	159	-0.68	63.20	-534.55	151.52
%GDP	160	6.26	1.63	0.36	7.65
%TA	160	-0.44	25.80	-98.43	21.06

(Source: Author's work from data from Vietstock, GSO, CSDL Thống kê du lịch)

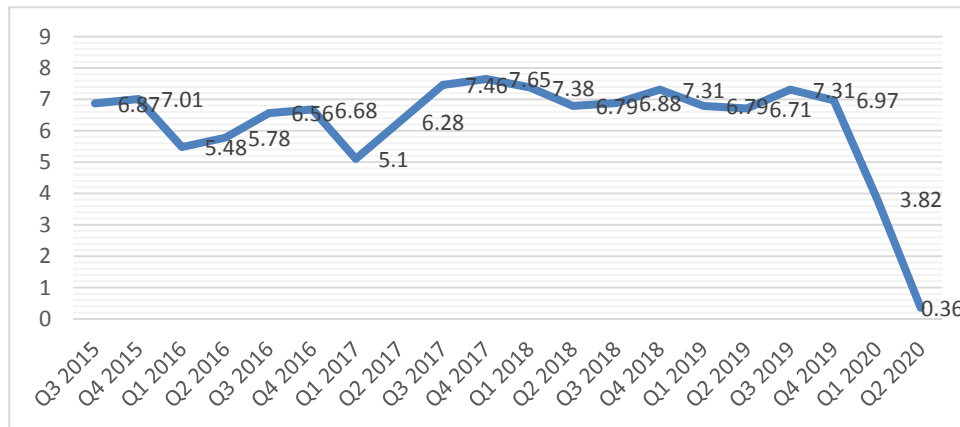


Fig. 2: Quarterly GDP growth rate

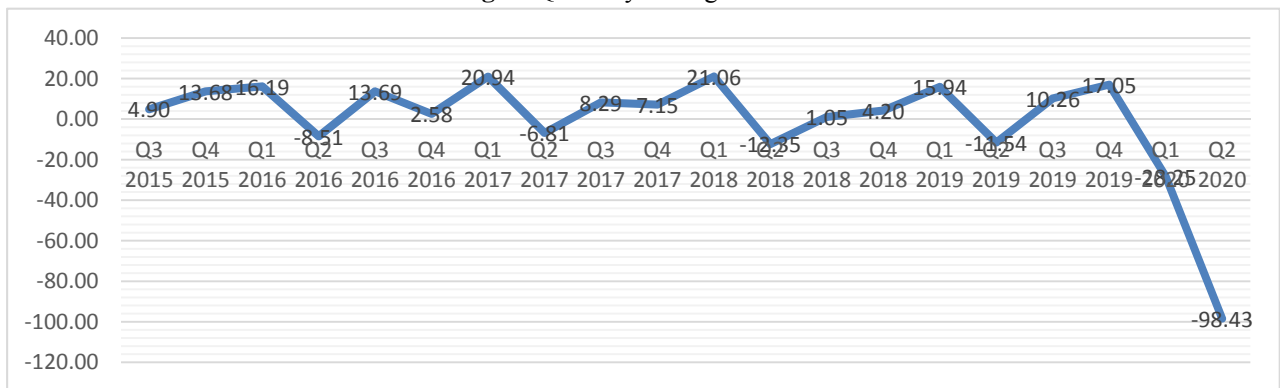


Fig. 3: Quarterly Foreign Tourist Growth rate

It is interesting that the curves of tourism growth and economic growth are quite similar, although the rate of international arrivals increases and is more pronounced because there is a standard deviation of 25.8%. This indicator has an average level of -0.44% and is in the range (-98.43%, 21.06%). Like %GDP, from Q1 2020, %TA started to decline sharply to an unprecedented level of -98.43%. The reason is that the pandemic makes the entry of foreigners extremely restricted and controlled.

4.2. Model testing result

To choose a suitable model, the author conducted the Hausman test. Results give p-value < 0.05, so we choose the fixed effects model (FEM). The results of running FEM model for 3 dependent variables ROS, ROE and ROA with independent variables on business environment are shown in Table 3 below.

Table 3: Fixed-effect modeling results

Variables	ROS	ROE	ROA
%GDP	-0.722	-0.071	0.099
%TA	0.761*	0.049	0.027
DCE	39.223*	2.697	1.803*
Obbs	159	159	159
Number of companies	8	8	8
R-squared	0.041	0.019	0.03

*** p < 0.01, ** p < 0.05, * p < 0.1

(Source: Author's work)

The model results show that the business environment factor has a rather weak impact on the profitability of the accommodation companies listed on the stock market of Vietnam. Especially, none of the dependent variables had a statistically significant impact on ROE. For ROA, only the DCE - crisis event dummy variable has a statistically significant effect (p-value < 0.1) and this effect is in the same direction. For quarters with crisis events, ROA tends to increase. Similarly, the relationship between DCE and ROS was also positive and p-value statistically significant < 0.1. This seems to contradict the conventional wisdom that when there is a crisis, profitability is often lower, while in reality for Vietnamese accommodation companies the opposite true is proved. In Taiwan, for example, the impact of crises such as earthquakes, Sars outbreaks, and terrorism on hotel profitability is negative with strong statistical significance. It can be explained that, when there is a crisis, Vietnamese enterprises have taken quite effective measures to promote profitability by maximizing cost savings. Crisis may affect revenue, but the rate of cost reduction is stronger than the rate of decline, leading to increased profitability of businesses.

ROS and international arrivals growth %TA arrived also positively correlated with p-value < 0.1. That means when %TA increases, ROS will also increase. The increase in international arrivals leads to increased revenue, but in addition, Vietnamese accommodation

companies manage production costs quite well, leading to higher after-tax profit growth than revenue growth collection. %TA also had positive effects on ROA and ROE but was not statistically significant.

%GDP did not have a statistically significant impact on the profitability of accommodation businesses. But the impact dimension also has an interesting point. While %GDP negatively affects ROS and ROE, it positively affects ROA. This conclusion is different from the study in Sri Lanka (2020) and Taiwan (2009). In Sri Lanka both ROE and ROA are negatively correlated with % GDP, while in Taiwan both ROE and ROA are positively correlated with % GDP. Meanwhile in Vietnam, there is inconsistency in relation to the % GDP of ROA and ROE. When the economy grows, the ROE decreases, while the ROA increases. The numerator - after-tax profit, is the same, a different denominator shows that when the economy grows, businesses tend to increase equity capital and decrease total assets, leading to a decrease in ROE and increase in ROA.

5. CONCLUSIONS AND RECOMMENDATIONS

Research has shown that fluctuations in business conditions (economic growth, international arrivals growth and crisis events) have a rather weak effect on the profitability of the accommodation service companies listed on Vietnam's stock market. However, ROS of observed companies positively correlated with the growth rate of international visitors and dummy variables representing for the US-China trade war crisis and the Sars-CoV2 pandemic. Besides, ROA is also positively correlated statistically with the crisis dummy variable mentioned above. From there, we can conclude that the companies studied have relatively effective management strategies, helping businesses not be negatively affected by fluctuations in factors in the business environment. Large hotel businesses often have very large fixed costs so the key issue is cost management. Revenue may increase or decrease depending on customer supply, but if costs are saved and operational management is good, a profit can still be made.

Since then, the author gives the following recommendations to accommodation service companies as follows:

- To State management agencies

Research has shown the correlation between the number of international visitors to the profitability of businesses that provide accommodation services to tourists. Moreover, economic growth has a great correlation with tourism development. This can be seen clearly in the recent years, when Vietnam's tourism industry has contributed greatly to GDP. The direct contribution of tourism to GDP is also increasing. From 2015 to 2019, this ratio were 6.3%; 6.9%; 7.9%; 8.3%

and 9.2% respectively (Tourism Information Center, 2020). In other words, economic development and tourism growth can motivate each other. Since both economic growth and tourism expansion can have a significant impact on the tourist accommodation business, state authorities should use a strategic tourism plan to develop the tourism market, thereby stimulating the economy and business activity in the tourist accommodation industry.

During the epidemic raging epidemic, the State management agencies need to actively support the tourism industry in general and the accommodation service industry in particular. Financial support programs such as tax reduction, preferential banking credit packages, grace repayment, etc will be a lifesaver for businesses in difficult times. In addition, the increase in the promotion of Vietnamese tourism to attract international tourists, especially tourists from regions not affected by the epidemic, while focusing on strong domestic tourism development regions of the country are essential.

- To businesses in accommodation services for tourists:

- + Cost management: Companies need to continue to offer effective and consistent cost management policies with extremely unfavorable developments caused by epidemics. This is a vital factor to help businesses maintain operations.

- + Operations management: hotel companies provide many services that tourists demand. Those services include accommodation, food, beverages and laundry, swimming pools, and conference facilities. The quality of these services, not hotel size, may be a more important factor in firm performance in the hospitality industry (Chen, 2009).

- + Business portfolio diversification: Tourism regulators and hotel managers need to know that sales and profits in the hospitality industry will suffer in times of unstable demand or low travel. To address this problem, tourism policy makers and hotel managers can use business diversification to minimize the business risks posed. Currently most researched businesses have main revenue from their traditional service provision. Only a few companies have additional business in real estate or retail such as Dong A Hotel Group Company, Dien Luc Investment - Trading - Service Joint Stock Company, OHC Hotel and Service Joint Stock Company. During the epidemic, the revenue structures of these companies were all about selling and providing other services. This is also the reason that general profitability is not negatively affected by the crisis event.

6. REFERENCES

- [1] Aznar J. P., Sayeras J. M., Rocafort A., Galiana J. (2017), "The irruption of Airbnb and its effects on hotel profitability: An analysis of Barcelona's hotel sector", *Intangible Capital*, 2017 – 13(1), 147-159.
- [2] Chen M. H. (2007), "Interactions between business conditions and financial performance of tourism firms: Evidence from China and Taiwan", *Tourism Management*, 28 (2007), 188-203.
- [3] Chen M. H. (2010), "The economy, tourism growth and corporate performance in the Taiwanese hotel industry", *Tourism Management*, 31 (5), 665-675.
- [4] CSDL Thống kê du lịch, Số liệu thống kê khách quốc tế đến Việt Nam, Retrieved on August 15th 2020, from <http://thongke.tourism.vn/index.php/statistic/sub/6>
- [5] Hoàng Thị T (2019), "Chiến tranh thương mại Mỹ - Trung và vấn đề đặt ra đối với kinh tế Việt Nam", Tạp chí Tài chính vol 1 – 10/2019, retrieved on August 26th 2020, from <http://tapchitaichinh.vn/su-kien-noi-bat/chien-tranh-thuong-mai-my-trung-va-van-de-dat-ra-doi-voi-kinh-te-viet-nam-314677.html>
- [6] Horton M. (2019), *The Difference Between Profitability and Profit*, retrieved on August 26th 2020, from <https://www.investopedia.com/ask/answers/012715/what-difference-between-profitability-and-profit.asp>
- [7] *Khả năng sinh lợi (Earnings Power) là gì? Hạn chế khi tính khả năng sinh lợi* (2020), retrieved on August 26th 2020, from <https://vietnambiz.vn/kha-nang-sinh-loi-earnings-power-la-gi-han-che-khi-tinh-kha-nang-sinh-loi-20200317141553272.htm>
- [8] Tổng cục Thống kê (n.d.), Thống kê tình hình kinh tế - xã hội, Retrieved on August 15th 2020, from <https://www.gso.gov.vn/default.aspx?tabid=621>
- [9] Trung tâm thông tin du lịch (2020), *Tốc độ tăng trưởng khách cao, đóng góp quan trọng vào phát triển kinh tế - xã hội*, retrieved on August 26th 2020, from <http://www.vietnamtourism.gov.vn/index.php/items/32527>
- [10] Vietstock (n.d.), Doanh nghiệp A-Z, Retrieved on August 15th 2020, from <https://finance.vietstock.vn/doanh-nghiep-a-z?page=1>
- [11] Weerathunga P.R., Xiaofang C., Samarathunga W.H.M.S. (2020), "The Relative Effect of Growth of Economy, Industry Expansion, and Firm-Specific Factors on Corporate Hotel Performance in Sri Lanka", *SAGE Open*, April – June 2020, 1-21.

A LITERATURE REVIEW ON THE EFFECTS OF CSR ON AUDIT EFFORTS AND AUDIT QUALITY IN VIETNAM

Thai Minh Hanh^{1*}, Dao Thanh Binh¹ and Nguyen Thuc Huong Giang¹

¹Department of Financial Management, School of Economics and Management, Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: hanh.thaiminh@hust.edu.vn

Abstract

Audit quality and audit efforts has drawn attention of firms, investors and the audit firms themselves. Corporate social responsibility (CSR) may be signals of earning management or signals of risk, which can lead to different perception of auditors when auditing financial statements. Therefore, there is controversy in relationship between corporate social responsibility and audit efforts and audit quality. This relationship is interesting to investigate in an emerging country and a unique setting like Vietnam. We discuss characteristics of CSR and financial statement auditing in Vietnam, possibilities of impacts of CSR on audit quality and efforts and recommendations for both firms and auditors.

Keywords: Corporate social responsibility, audit effort, audit quality, Vietnam, emerging country.

1. INTRODUCTION

Audit quality has drawn attention of practitioners and regulators around the world after the collapse of one of Big 5 companies, Arthur Andersen (2001) and several audit scandals such as Enron (2001), Worldcom (2002), GE (2018), Carillion (2018) and Wirecard (2020). Despite the existence of Sarbanes-Oxley, which passed after the 2002 Enron scandal sank Arthur Andersen and was supposed to strengthen accounting controls at public companies, there are still a lot of concerns on audit quality. Sarbanes-Oxley helped establish the Public Company Accounting Oversight Board (PCAOB), a nonprofit corporation that is supposed to ensure audit quality. A September 2019 investigation by the Project on Government Oversight, a Washington, D.C., watchdog group, revealed that when the PCAOB has inspected Big Four audits, it found frighteningly high failure rates. In the most recent figures available, inspectors found Deloitte got one in five audits wrong, PwC botched 23.6%, EY screwed up 27.3%, and KPMG flopped fully 50% of the time (Kahn, 2020).

Besides the reasons related to auditors' responsibilities and auditing system, the quality of the audit needs to be addressed. Auditors must be more careful to minimize audit risk. The risk-based audit approach leads to the needs of risk assessment. To decrease audit risk when there is high inherent risk and control risk leads to greater audit efforts. This is important because the auditing companies need to balance the gain and cost of the audit while still keep audit quality and low audit risk. CSR is one of factors influencing the assessment of inherent risk and control risk of firms.

CSR also relates to inherent risk and control risk of firms. In some specific industry, CSR has relationship with consumers' attitude, such as food processing industry (Nguyen *et al.*, 2014). This is a part of inherent risk that the auditors need to assess. According to Low and Ang (2012), Asian countries have been influenced historically in one way or another by the Confucianism and its form and style of leadership. The authors interpret and present Confucian leadership and business lessons derived from the wisdom of Confucius. From Confucian leadership come the emphasis on positive business dealings and harmonious relationships as well as the value of learning and education; and these bring many benefits and good practices including good business management and corporate social responsibility. Hoang *et al.* (2018) find a significantly positive relation between demographic diversity among directors within a board (diversity-in-boards) and both the quantity and quality of corporate social disclosures while structural diversity among boards (diversity-of-boards) has no effect on both the quantity and quality of corporate social disclosures. These affect the control environment and risk assessment of firms, which are components of internal control that the auditors need to evaluate.

In an emerging country like Vietnam, where regulations controlling auditing activities still need to be improved, audit quality and audit efforts become more significant. Independent auditing has appeared in Vietnam since 1991. Vietnam has issued 41 Vietnam Auditing Standards with the Circular 214/2012/TT-BTC, Decision 03/2005/QĐ-BTC, Decision 195/2003/QĐ-BTC to regulate auditing activities. Vietnam has reforms to auditing in 2011. Recently,

Vietnam has a plan to adopt IFRS with 3 phases: preparation phase (2019-2020), change phase (2021-2024) and mandatory adoption phase (from 2025). With the issuance of regulation on internal auditing (2019, 2020), these plans urge for the improvement of audit quality for financial statements.

Therefore, the relationship between CSR and audit efforts and audit quality is interesting to investigate.

This study contributes to the literature in several ways. First, it discusses the relationship between CSR and audit efforts and audit quality in an emerging country. Second, it differs from previous study on China, which study the negative impact of CSR. Our study discusses CSR in general which combined both positive and negative impact.

Our paper has the following sections. Section 2 discusses the current situation of information in Vietnam for both non-financial information (CSR) and financial information (audited financial information). Section 3 review the definition, components and measures of audit efforts and audit quality. Section 4 present the hypothesis development for the relationship between CSR and audit efforts and audit quality in Vietnam. Section 5 discusses and proposes recommendations for firms and auditors in decision making.

2. INFORMATION DISCLOSURE IN VIETNAM: CSR AND AUDITED FINANCIAL INFORMATION

This section discusses the disclosure regulation of CSR and financial information in Vietnam.

2.1. Audited financial information disclosure

In Vietnam, the regulations on financial information disclosure are different between listed and non-listed firms. With non-listed private companies, limited companies and joint stock companies, they have to submit the annual financial report to the tax authorities, business registration agency, and statistic agency (Circular 200/2014/TT-BTC and Circular 133/2016/TT-BTC). According to the Law on Enterprises No.59/2020/QH14, Non-listed joint stock companies also have to disclose their annual report approved by the General Meeting of Shareholders in their website. For listed companies, financial information disclosure requirements are more strictly. All listed firms have to disclose semi-annual and annual audited financial statements attached with the audit report.

According to the Law of Independent Audit in 2011, the audit report is “a document made by practicing auditors, audit firms, branches of foreign audit firms in Vietnam after completing the audit work, to provide opinion on financial reports and other information audited under the audit contract”. The main type of

auditing is financial statement audit, which aims to evaluate the truthfulness and reasonableness of the financial statements, in accordance with accounting standards, accounting regulations. The audit reports are useful for different stakeholders, including the shareholders, investors, joint ventures, associates, customers and other organizations or individuals with direct or related interests to the audited entity for resolving related obligations and rights; the state agencies for management and control tasks; and the audited entity itself for detecting, handling and preventing errors and weaknesses in the operation of the entity. The audit report should including the object of the audit, responsibilities of the entity audited and audit firm, branch of audit firm, scope and base of the audit, location and time of the audit report, audit opinions on the financial statement audited and other content in accordance with the auditing standards. Audit report disclosure means disclosing the financial statement audited attached with the audit report for the entity.

The Law of Independent Audit regulates on the entities that are obliged to be audited, including FDI companies, credit institutions, financial institutions, public companies, state owned enterprises, important projects, audit firms... Recently, audit works have helped a lot to enhance the transparency of businesses' financial information. For example, for the financial year of 2019, many listed companies have been announced to be adjusted the financial reports after audited, such as the cases of Hoang Anh Gia Lai, Hung Vuong Seafoods, Nafoods Group, Technical Infrastructure Investment Joint-stock Company. After the requirements of the independent auditors, those companies have to adjust or sales revenue, costs of goods sold, other expenses..., thus increase the loss and decrease the profit of the companies. The audit reports hence help to reduce frauds and errors, improve management effectiveness of functional agencies, and strengthen the trust of investors and other related stakeholders on financial information.

For the financial report audited of one company, there are 4 possibilities: (1) the report is completed, truthful or after the auditors discovered the accounting errors, the report has been adjusted accordingly, and the auditors can provide the fully accepted opinion; (2) among recommendations of the auditors, there are numbers of recommendations that the company do not approve or adjust, the auditors then give an exception opinion; (3) if the financial statements contain many material errors, the auditor's opinion is not acceptable; (4) if the accounting invoices or accounting documents or accounting books are missing, or the audit time is too rush, the auditors may refuse to give an opinion. Thus, even though the financial statements have been audited, the auditor may not accept or refuse to provide opinion, but if the company only disclose its financial reports

with the remark that the reports have been audited without attached the audit report, then the investors, the management authorities, or other stakeholders do not know what type of auditor's opinion is. And in some cases, when an audit firm refused to provide positive opinion to a company, this company often invited another auditing company. This fact may influence to the financial information disclosure quality of the company, thus affect to the users of financial statements such as investors, managers, customers and other stakeholders.

2.2. CSR disclosure

Vietnam is an emerging country and CSR regulation is in early stage of CSR disclosure, unlike the US or EU countries where CSR standards are high. The economic development often comes with constraints in social and environmental issues while the regulation has still not yet developed. There are scandals such as Thi Vai river pollution (2008), Formosa water pollution (2016), or Nike factories with violations of labor standards (2016).

Vietnam has a culture affected by both China (Confucianism) and from Western cultures like France and US. As a neighbor of a big country like China, Vietnam has influenced by its neighbor but also has a strong tendency to be independent from China. Therefore, it has different characteristics towards CSR in comparison with Western countries and China. These national cultural characteristics explain partly the attitudes of customers and managers towards CSR. In a global consumer survey, Vietnam belongs to the highest group of Southeast Asian countries with 86% of respondents stating their willingness to pay extra for products and services that come from companies committed to positive social and environmental impact¹. Hieu (2011) finds that a large proportion of managers express a highly positive attitude towards CSR.

As an emerging economy, Vietnam is viewed as one of the most promising countries in East Asia with GDP growth rate among the fastest in the world². The stock exchanges still need to improve regulations and implementation to create a transparent environment and attract foreign investors. Although voluntary CSR information disclosed by Vietnamese listed firms is still at a low level, the stock exchanges are trying to

motivate listed firms for more transparency, especially to disclose CSR information.

Until recently, CSR disclosure has been put into significant consideration through Decree 81/2015/NĐ-CP and Circular 155/2015/TT-BTC. Decree No. 81/2015/NĐ-CP dated 18 September 2015 about information disclosure of state-owned enterprises and Circular 155/2015/TT-BTC dated 6 October 2015 about information disclosure of listed companies had specific guidelines for CSR disclosure.³

According to Decree 81/2015/NĐ-CP, listed firms need to disclose CSR information on their annual reports, on their website and send report to the Ministry of Planning and Investment. The required CSR information includes responsibilities on environment, community, suppliers, customers, employees and stockholders. Circular 155/2015/TT-BTC provide more details and guidelines for Report related impact of the Company on the environment and society (management of raw materials, energy consumption, water consumption, compliance with the law on environmental protection, policies related to employees, report on responsibility for local community, green capital market activities). Firms are encourage to set up a separate Sustainability Development Report.

3. OVERVIEW OF AUDIT EFFORTS AND AUDIT QUALITY

3.1. Audit efforts

Appropriate audit effort is not only important to the auditor fulfilling the audit contract, but also to the allocation of infrastructure to identify material misstatements (Cao, 2015). According to Cao (2015), to reduce the level of audit risk, auditors need to increase their effort in key areas and reduce their effort in non-priority areas, rendering the overall audit effort allocation more rational, saving overall effort and improving the efficiency of resource allocation. Using risk – based approach, auditors need to assess business risks, control risks to define their efforts. For business risks, auditors need to collect all the relevant information needed to assess their clients' economic and regulatory environment, industry, etc. For control risk, auditors need to assess client's litigation and reputation risks and internal control risks. The higher the risk, the lower the acceptable threshold, and the more efforts auditors are required to put into the auditing process (Chen *et al.*, 2012). Clients' CSR

¹ AC Nielsen Global Survey of Corporate Social Responsibility and Sustainability, 2015, <http://www.nielsen.com/sg/en/press-room/2015/sustainability-continues-to-gain-momentum-among-singaporeans-and-southeast-asian-consumers.html>

²According to 2016 World Bank report, following the implementation of the policy change to market economy, Vietnam's GDP growth rate increased by an average of 5.5% per year since 1990, 6.4% per year in 2000s and 6.27% in 2015.

³The stock exchanges in Vietnam have organized Annual Report Awards since 2008 to motivate listed firms for further transparency. Started from 2013, they introduced Sustainability Report Award, which referred to Global Reporting Initiatives 4 (GRI4). In 2015, there was regulation which requires listed firms to disclose CSR in their annual reports.

performance is one type of information auditors need to pay attention to. If clients' CSR performance is determined to be poor, it will necessarily increase clients' regulatory, litigation and reputation risks (Kim *et al.*, 2012; Kim *et al.*, 2014). It increases both business risks and internal control risks, which make auditors put more efforts on audit work.

PCAOB Auditing Standard number 1101 (AS 1101) indicates that an audit failure is a function of inherent risks, control risks, and detection risks (PCAOB, 2010). The auditor assesses and documents the level of both control and inherent risk (typically encompassing a client's business risks) on the basis of an evaluation of the client (Bell *et al.*, 2001; Knechel, 2001). The combination of inherent and control risk constitutes the risk of material misstatements in the financial statements. When this risk is high, auditors must reduce detection risk to lower the audit risk. Auditors do this by increasing their effort. Thus, a higher risk of material misstatements should lead to greater audit effort (Bell *et al.*, 2001).

The literature defines audit effort as the number of days spent by the audit team (e.g., Caramanis and Lennox, 2008; Palmrose, 1984; Davidson and Gist, 1996). Audit days refer to the number of days taken to complete the entire audit process, including audit planning, fieldwork and review. The research data in most overseas work in this area are obtained through questionnaires covering the entire audit process. Audit effort in Cao *et al.* (2015) is defined as the log of the product of the number of audit fieldwork days and audit team size. In Asante-Apiah (2019), audit effort is measured by audit report lag.

3.2. Audit quality

According to DeAngelo (1981), audit quality refers to the joint probability of a material misstatement in a client's financial statements being found and reported by the auditor and the auditor's ability to detect such a misstatement due to professional competence, including audit experience, audit mode (method) and audit effort.

According to the International Auditing and Assurance Standards Board (IAASB) Framework for Audit Quality (2014), a quality audit is likely to have been achieved by an engagement team that: exhibited appropriate values, ethics and attitudes; was sufficiently knowledgeable, skilled, and experienced and had sufficient time allocated to perform the audit work; applied a rigorous audit process and quality control procedures that complied with law, regulation and applicable standards; provided useful and timely reports; and interacted appropriately with relevant stakeholders.

The Framework distinguishes the following elements:

(a) Inputs (the values, ethics and attitudes of auditors, which in turn, are influenced by the culture prevailing within the audit firm; and the knowledge, skills, and experience of auditors and the time allocated for them to perform the audit).

(b) Process (the rigor of the audit process and quality control procedures impact audit quality).

(c) Outputs (include reports and information that are formally prepared and presented by one party to another, as well as outputs that arise from the auditing process that are generally not visible to those outside the audited organization).

(d) Key Interactions within the Financial Reporting Supply Chain (while each separate stakeholder in the financial reporting supply chain plays an important role in supporting high-quality financial reporting, the way in which the stakeholders interact can have a particular impact on audit quality).

(e) Contextual Factors (such as laws and regulations and corporate governance, which have the potential to impact the nature and quality of financial reporting and, directly or indirectly, audit quality).

According to DeFond and Zhang (2014), audit quality is difficult to measure because the amount of assurance auditors provide is unobservable. There are two ways of measuring audit quality: (i) Output-based such as going - concern opinions or financial reporting quality. Output-based proxies are appealing because they attempt to measure the level of audit quality actually delivered. (ii) Input-based such as auditor size and audit fees. Input-based proxies are appealing because clients must choose audit quality based on observable inputs.

For the output-based measure, there are several proxies including (i) material misstatements (restatements and Accounting and Auditing Enforcement Releases (AAERs)); (ii) auditor communication (going-concern opinion); (iii) financial reporting quality characteristics (DAC, Meet/beat, Accrual quality, Conservatism); (iv) Perception-based (Market reaction, Cost of capital, Change in market share, PCAOB inspections). For the input-based measure, there are several proxies including (i) Auditor characteristics (Big N, Industry specialization); (ii) Auditor-client contracting features (Audit fees, Change in fees) (DeFond and Zhang, 2014).

Besides, Hillegeist (1999) and Shibano (1990) posit that higher audit effort translates to higher quality, which is supported by post-SOX evidence (e.g., Blankley *et al.*, 2012; Kinney *et al.*, 2004; Lobo and Zhao, 2013). This body of evidence and the audit risk model suggest that, when clients exhibit heightened risks, auditors will design tests to gather additional audit evidence, with the idea being that greater effort will increase the chances of detecting material

misstatements (e.g., Bell *et al.*, 2008; Bell *et al.*, 2001; Lyon and Maher, 2005). As such, higher audit effort should lead to higher quality financial statements.

4. HYPOTHESIS DEVELOPMENT

Higher CSR implies that firms have less risk, which can lead to less audit efforts. Firms have better CSR have less control risk. Auditors can base on lower control risk to reduce professional skepticism, to reduce the workload and reduce the volume of substantive tests and audit period. CSR information also provide more additional non- financial information to support financial information that needs to be audited. Therefore, the audit resource allocation of audit efforts will be less.

Higher CSR implies that firms have less risk for several reasons. Firms with higher CSR levels have lower financial distress risk, suggesting that a better CSR performance makes firms more creditworthy and have better access to financing, which is rewarded with less financial defaults (Boubaker *et al.*, 2020). According to Asante-Appiah (2019), in recent years, investors have begun to value companies' reputations through their environmental, social, and governance (ESG) practices. ESG risk can affect business processes and controls and can heighten financial risk and threaten a firm's survival. Empirical support for the positive association between firms' CSR orientation and financial reporting quality is presented by Chih *et al.* (2008), Kim *et al.* (2012), Dhaliwal *et al.* (2012) and Kim *et al.* (2014). The theoretical intuition is that firms genuinely embracing CSR are stakeholder-oriented. These firms not only provide more transparent and reliable financial information to shareholders, but also expand their effort and resources in implementing CSR practices to meet the ethical expectations of stakeholders.

On the other hand, higher CSR implies higher risk, which lead to more audit efforts. Firms have higher CSR have higher control risk. Auditors will then increase professional skepticism, increase the workload and increase the volume of substantive tests and audit period in order to reduce the audit risk. It will lead to higher audit resource allocation or higher audit efforts.

Higher CSR implies higher control risk for several reasons. Carey *et al.* (2017) find a positive association between voluntary corporate social responsibility reporting and audit fees in China. In contrast to prior research from the US, CSR reporting in China is associated with greater earnings management. Results suggest that Chinese firms use CSR reporting as a strategic device for window dressing, and that auditors charge higher fees in response to heightened audit risk and greater audit effort. Furthermore, this study finds firms with more highly rated CSR reports and longer CSR reports are associated with lower audit fees and less earnings management, but these results apply only

in non-SOEs. Research finds that politically connected firms are less likely to use philanthropy to divert public attention from their environmental misconduct (Du, 2015). Therefore, politically connected firms are less likely than non-politically connected firms to window dress their CSR reports in the pursuit of legitimacy, and therefore present a lower audit risk. Asante-Appiah (2019) find that auditors manage the higher expected engagement risk conveyed by tainted ESG reputation by applying higher audit effort.

In Vietnam, according to Hoang *et al.* (2018), earning quality is associate with CSR. Vietnamese culture also supports CSR activities. Although CSR can affect audit efforts in both ways (negative or positive), empirical evidence of Vietnam shows supports for the negative association between CSR and audit efforts. Therefore, we propose the following hypothesis:

H1: There is a negative association between CSR and audit efforts

Higher CSR can lead to higher audit quality. CSR implies lower control risk. It also relates to the firms' capacity in providing firm information, which includes both financial and non-financial information. The information firms provide is more reliable. Therefore, it may result in higher audit quality. Cao *et al.* (2012) document that highly reputable firms have higher audit quality.

However, lower CSR can also bring high audit quality, Because the auditors consider lower CSR as lower control risk, they may decide to put more audit efforts, which results in higher audit quality. Asante-Appiah (2019) show that firms with bad reputations can also have higher audit quality, because their auditors spend more time on their financial statement. Hillegeist (1999) and Shibano (1990) posit that higher audit effort translates to higher quality, which is supported by post-SOX evidence (e.g., Blankley *et al.*, 2012; Kinney *et al.*, 2004; Lobo and Zhao, 2013). This body of evidence and the audit risk model suggest that, when clients exhibit heightened risks, auditors will design tests to gather additional audit evidence, with the idea being that greater effort will increase the chances of detecting material misstatements (e.g., Bell *et al.*, 2008; Bell *et al.*, 2001; Lyon and Maher, 2005). As such, both higher or lower CSR should lead to higher quality financial statements.

Previous studies on auditing in Vietnam show the important role of auditing on financial information. Hung *et al.* (2018) find that auditor witnessed as a unique factor had a negative relationship with earning management. However, there are still concerns of audit quality, especially non-Big 4 audit firms. Nguyen and Kend (2019) indicate that there still exist business risks for foreign companies that pursue trade and commerce in communist Vietnam, particularly where non-Big 4

audit firms are involved in the external audit function. Pham *et al.* (2017) show that Big 4 auditors in Vietnam provide high audit quality than non-Big 4 auditors. Interestingly, in Vietnam context, except for the audit firms in the Big 4 group, the findings suggest that smaller audit firms provide better audit quality.

According to the State Securities Commission, now Vietnam has 193 auditing companies qualified for providing auditing services, however, only 34 companies among these were eligible to provide audit services for listed companies. Through the annual control of the State Securities Commission, their reports shown that almost the biggest companies provide good audit quality, such as Big 4 (EY, PwC, Deloitte, KPMG), AASC, A&C..., other controlled companies only achieved the level of accepted (State Securities Commission reports, 2014 to 2019). Ngoc *et al.* (2017) also found similar issues and concluded that the Big 4 auditors have higher quality than the non-Big 4, and the non-Big 4 companies' s audit quality is still a big issue. Some of the principal limits for those firms are not update the regulation related, the system of quality control still have shortcomings, the auditing procedure still sketchy, the audit opinion still not relevant. All of these will influence the quality of the audit report disclosure.

To improve audit quality means to better address earning management in audits of financial statements. Prior studies show various characteristics of firms that have relationship with earning management in Vietnam. Essa *et al.* (2016) find that board size, state ownership and foreign ownership are effective to mitigate earning management. Nguyen and Bui (2019) find that dividend payers have higher earnings quality than dividend non-payers, thus, dividends are an indicator of earnings quality. Vo and Chu (2019) find that firms with greater foreign shareholdings are aligned with higher quality of financial disclosure. Besides other firms' characteristics, CSR also have relationship on earnings management. A study of Hoang *et al.* (2018) finds that earnings quality has a significant and positive effect on corporate social disclosure, which suggests that stakeholder theory (long term perspective argument) explains better than agency theory (managers' opportunistic incentives argument) about the effect of earnings quality on corporate social disclosure of Vietnamese listed firms.

Previous studies show both direction of impacts of CSR on audit quality. Therefore, we propose the following hypothesis:

H2: There is a positive (negative) association between CSR and audit quality

4. POLICY DISCUSSION

CSR affects firm performance and financial position, which then affect the information transparency, audit efforts and audit quality. First, it can have positive effects because CSR is a strategic tool which help firms increase sustainability, reputation, customers' credibility. These leads to increase of business scale, revenue and firm value. CSR helps firms reduce operating risks and build good reputation, which increase financial and *non*-financial information transparency. CSR activities and CSR disclosure help firms control risks. This influences auditors on evaluation inherent risk and control risk when auditing financial statements. Auditors and audit firms use CSR information to add to Notes to Financial Statements in preliminary analysis to judge control risk and audit risk, planning audit program appropriately. It reduces the quantity and the details of the audit, which is audit efforts while still minimize audit risk. Audit quality will be increased at the same time of reducing audit efforts.

Second, it can have negative effects because firms can use CSR just to increase reputation and hide its earning management. Consequently, there will be frauds and errors in financial statements (e.g. reduce earnings through increase expenses and reduce corporate income tax). When conducting financial statement audits for these firms, in order to assure audit quality and reduce detection risk, auditors will be more conservative, implement preliminary with more assumptions and have more control tests and substantive tests. Audit efforts will be increased by longer audit period and more lagged time for audit report issuance. Consequently, audit fee and audit risk can increase.

However, audit efforts and audit quality depend on other factors of firms such as firm size, industry, ownership, control and management skills and factors of audit firms such as competencies, experience, ethics and audit environment (auditing standards, regulations and framework from audit association). These will be our next steps in empirical study to provide further evidence on the relationship between CSR and audit efforts and audit quality from the view of firms, auditors and policy makers.

Because CSR information is important to audit quality and audit efforts, there should be requirement for auditing CSR information disclosure. The Sustainability Reporting Guidelines of the Global Reporting Initiative (GRI) advocate for raising sustainability reporting practices to a level equivalent to that of financial reporting. The GRI guidelines also recommend that ESG disclosures be audited (Willis, 2003). Given investors growing interest in CSR information, the policy makers may want to revisit the disclosure requirements and auditing standard setters

could consider incorporating components of CSR risks into their risk assessment standards.

6. ACKNOWLEDGEMENT

The authors gratefully acknowledge the sponsor of Hanoi University of Science and Technology for the Research Code T2020-PC-053.

7. REFERENCES

- [1] Asante-Apiyah, B., 2020, Does the severity of a client's negative environmental, social and governance reputation affect audit effort and audit quality?, *Journal of Accounting and Public Policy*, Available online 15 January 2020, 106713.
- [2] Bell, T. B., Doogar, R., Solomon, I., 2008. Audit labor usage and fees under business risk auditing. *J. Account. Res.* 46 (4), 729-760.
- [3] Bell, T. B., Landsman, W. R., Shackelford, D. A., 2001. Auditors' perceived business risk and audit fees: analysis and evidence. *J. Account. Res.* 39 (1), 35-43.
- [4] Blankley, A. I., Hurtt, D. N., MacGregor, J. E., 2012. Abnormal audit fees and restatements. *Audit. J. Pract. Theory* 31 (1), 79-96.
- [5] Boubaker, S., Cellier, A., Manita, R., Saeed, A., 2020, Does corporate social responsibility reduce financial distress risk?, *Economic Modelling*, doi: <https://doi.org/10.1016/j.econmod.2020.05.012>.
- [6] Caramanis, C., Lennox, C., 2008. Audit effort and earnings management. *J. Account. Econ.* 45, 116-138.
- [7] Carey, P., Liu, L., Qu, W., 2017, Voluntary corporate social responsibility reporting and financial statement auditing in China, *Journal of Contemporary Accounting & Economics*, Vol. 13, pp. 244-262.
- [8] Chen, L., Srinidhi, B., Tsang, A., Yu, W., 2012. Corporate social responsibility, audit fees, and audit opinions, SSRN, Elibrary.
- [9] Chih, H. L., Shen, C. H., Kang, F. C., 2008. Corporate social responsibility, investor protection, and earnings management: Some international evidence. *Journal of Business Ethics* 79, 179-198.
- [10] Davidson, R. A., Gist, W. E., 1996. Empirical evidence on the functional relation between audit planning and total audit effort. *Journal of Accounting Review*, 34 (1), 111-124.
- [11] DeAngelo, L.E., 1981. Auditor size and audit quality. *J. Account. Econ.* 3 (3), 183-199.
- [12] DeFond, M., Zhang, J., 2014, A review of archival auditing research, *Journal of Accounting and Economics*, Vol. 58, pp. 275-326.
- [13] Dhaliwal, D. S., Radhakrishnan, S., Tsang, A., Yong, G. Y., 2012. Nonfinancial disclosure and analyst forecast accuracy: International evidence on corporate social responsibility disclosure. *Accounting Review* 87, 723-759.
- [14] Du, X. Q., 2015. Is corporate philanthropy used as environmental misconduct dressing? Evidence from Chinese family-owned firms. *Journal of Business Ethics* 129, 341-361.
- [15] Essa, S, Kabir, R., Nguyen, H. T., 2016, Does corporate governance affect earnings management? Evidence from Vietnam, Working paper.
- [16] Favere-Marchesi, M., 2000, Audit quality in ASEAN, *The International Journal of Accounting*, Vol. 35, pp. 121-149.
- [17] Hieu, P. D., 2011, Corporate social responsibility: A study on awareness of managers and consumers in Vietnam, *Journal of Accounting and Taxation*, Vol. 3, pp. 162-170.
- [18] Hillegeist, S. A., 1999. Financial reporting and auditing under alternative damage apportionment rules. *Account. Rev.* 74 (3), 347-369.
- [19] Hoang, T. C., Abeysekera, I., Ma, S., 2018, Earnings quality and corporate social disclosure: The moderating role of state and foreign ownership in Vietnamese listed firms, *Emerging Markets Finance and Trade*, DOI:10.1080/1540496X.2018.1521801
- [20] Hoang, T. C., Abeysekera, I., Ma, S., Board diversity and corporate social disclosure: Evidence from Vietnam, *Journal of Business Ethics*, Vol.151, pp. 833-852.
- [21] Hung, D., N., Linh, D. H., Hoa, T. T. V., Dung, T. M., Ha, H. T. V., 2018, Factors influencing accrual earnings management and real earnings management: The case of Vietnam, *Proceedings of 14th International Conference on Humanities and Social Sciences*.
- [22] IAASB, 2014, A framework for audit quality elements that create an environment for audit quality.
- [23] Kahn, J., 2020, Wirecard shows auditing is broken. Here's why-and how to fix it, *Fortune*.
- [24] Kim, Y., Li, H. D., Li, S. Q., 2014. Corporate social responsibility and stock price crash risk, *Journal of Banking and Finance* 43, 1-13.
- [25] Kim, Y., Park, M. S., Wier, B., 2012. Is earnings quality associated with corporate social responsibility?, *Accounting Review* 87, 761-796.

- [26] Kinney Jr, W.R., Palmrose, Z.V., Scholz, S., 2004. Auditor independence, non-audit services, and restatements: Was the US government right?. *J. Account. Res.*, Vol. 42 (3), 561–588.
- [27] Knechel, W. R., 2001. *Auditing: Assurance and Risk*. South-Western College Publishing, Cincinnati, OH.
- [28] Li, W., Zhang, L., 2015, Audit mode change, corporate governance and audit effort, *China Journal of Accounting Research*, Vol. 8, Pages 315-335.
- [29] Lobo, G. J., Zhao, Y., 2013. Relation between audit effort and financial report misstatements: evidence from quarterly and annual restatements. *The Account. Rev.* 88 (4), 1385-1412.
- [30] Low, K. C. P., Ang, S. L., 2012, Confucian leadership and corporate social responsibility (CSR), the way forward, *Asian Journal of Business Research*, Vol. 2, pp. 85-108.
- [31] Lyon, J. D., Maher, M. W., 2005. The importance of business risk in setting audit fees: evidence from cases of client misconduct. *J. Account. Res.* 43 (1), 133-151.
- [32] Nguyen, T. T. N., Bui, P. K., 2019, Dividend policy and earnings quality in Vietnam, *Journal of Asian Business and Economic Studies*, Vol. 26, pp. 301-312.
- [33] Nguyen, P. T., Kend, M., 2019, An examination of the Vietnamese emerging market economy: understanding how and why auditors have responded to the audit law reforms, *Accounting & Finance*, Vol. 59, pp. 1553-1583.
- [34] Nguyen, X. H., Trinh, H. T., 2020, Corporate social responsibility and the non-linear effect on audit opinion for energy firms in Vietnam, *Cogent Business & Management*, 7: 1757841. <https://doi.org/10.1080/23311975.2020.1757841>
- [35] Nguyen, P. M., Vo, N. D., Nguyen, N. P., Cho, Y., 2019, Corporate social responsibilities of food processing companies in Vietnam from consumer perspective, *Sustainability*.
- [36] Palmrose, Z., 1984. The demand for quality-differentiate audit services in an agency-cost setting: An empirical investigation. In: *Auditing Research, Symposium*, pp. 229-252.
- [37] Pham, N. K., Duong, H. N., Quang, T. P., Thuy, N. H. T., 2017, Audit Firm Size, Audit Fee, Audit Reputation and Audit Quality: The Case of Listed Companies in Vietnam, *Asian Journal of Finance & Accounting*, Vol. 9, pp. 429-447.
- [38] Public Company Accounting Oversight Board (PCAOB), 2010, *Audit risk, PCAOB Auditing Standard No. 1101*. Washington, D.C.: PCAOB.
- [39] Shibano, T., 1990. Assessing audit risk from errors and irregularities. *J. Account. Res.*, 110-140.
- [40] Vo & Chu, 2019, Do foreign shareholders improve corporate earnings quality in emerging markets? Evidence from Vietnam, *Cogent Economics & Finance*, 7: 1698940 <https://doi.org/10.1080/23322039.2019.1698940>

THE CURRENT DEVELOPMENT OF MANAGEMENT ACCOUNTING PRACTICES AT VIETCOMBANK

Nguyen Thi Phuong Dung ^{1*} and Dao Thanh Binh ²

^{1,2} Department of Financial Management, School of Economics and Management, Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: dung.ntp@hust.edu.vn/ phuongdung2311@gmail.com

Abstract

In Vietnam, commercial banks are coping with problems of enhancing internal management and risk control systems. Meanwhile, international integration requirements presses the banks to operate in line with international practices. Building and operating a modern management accounting system is an urgent requirement for Vietnamese commercial banks. At present, there is a severe lack of research on management accounting system in Vietnamese banks. Therefore, the objective of this study is to study the current development of management accounting practices in Vietcombank, one of the leading banks in Vietnam. We would like to find out the most widely adopted management accounting practices and the level of development in management accounting in Vietcombank based on the IFAC model.

Keywords: commercial banks, Vietnam, management accounting practices, Vietcombank.

1. INTRODUCTION

The banking is an extremely significant sector in any economies. In Vietnam, this sector have become increasingly competitive since the Vietnam deep integration into the global economy, international organizations like WTO, EVFTA and many Free Trade Agreements. Vietnamese commercial banks must compete not only with each other but also with foreign banks (Le & Le, 2016). Management accounting is concerned with providing both financial and non-financial information that will help managers to make relevant decisions. The information provided by management accounting is helpful in making policies and strategies, budgeting, as well as forecasting future, making comparisons and evaluating performance of the management. For banking sector, management accounting is even more significant than other sectors in the economy because majority of decisions of bank leaders depend on data which obtained from financial information analysis and implementing their strategies. In addition, international integration for banking sector requires Vietnamese commercial banks to operate in accordance with international practices. Building and operating a modern management accounting system is an urgent requirement for Vietnamese commercial banks.

At present, there is a severe lack of research on the current situation of management accounting practices (MAPs) in Vietnamese commercial banks. It is hard to find previous studies about the characteristics of

management accounting systems in Vietnamese commercial banks. There is almost no marco level research on the development of MAPs for Vietnamese banks. There are numerous questions for answering such as What is the development level of management accounting practices in Vietnamese commercial banks in comparison to the world? What are the widely adopted MAPs in the Vietnamese banks?

Vietcombank is considered as the biggest commercial bank in Vietnam with a long tradition established since 1955. In 2019, Vietcombank achieved impressive breakthroughs and new records, becoming the first Vietnamese bank to reach USD 01 billion in profit and to be listed in the Global Top 200 profitable financial and banking groups. According to information obtained from the General Department of Taxation, Vietcombank continued to be the biggest corporate income tax payer amongst banks in Vietnam for 2019 and one of two biggest corporate income tax payer amongst all enterprises. Also, in 2019, Vietcombank's Representative Office was officially launched in New York under the approval of the U.S. Federal Reserve System, making Vietcombank the first Vietnamese bank to fulfill strict requirements to be present in the US market.

In the scope of this article, we would like to study the current development of MAPs in Vietcombank The characteristics of management systems, the widely adopted MAPs, the estimated level of the development

of MAPs in Vietcombank will be analyzed in this study.

2. LITERATURE REVIEW ON THE DEVELOPMENT OF MANAGEMENT ACCOUNTING PRACTICES IN COMMERCIAL BANKS

The nature of banking sector is increasingly changing by financial innovations, deregulation, securitization, globalization and information technology. Saunders and Cornett (2008) points out that the financial organizations and banks should identify the products which have market advantages and provide customer services different from its competitors. However, in management accounting research field, banks and other financial organizations are a relatively under-researched. Meanwhile, when crisis happened, banks always suffered perhaps the hardest. In comparison to other industries, banks and financial companies are likely to especially face more extensive disclosures stress and high risk performance evaluation. The impacts of poor corporate governance, risk management, and incentive system designs arguably are more consequential (Van de Stede, 2011). For example, during the 2008-2009 financial crisis, it is noted that the “new order” of corporate governance, such as provisioned in the Sarbanes-Oxley Act of 2003 in the United States, which has become the norm around the world to some extent, is not quite as robust as the banks claim. Several banks reported the financial crisis much better than others: Citigroup and UBS experienced severe losses whereas JPMorgan Chase and Credit Suisse (also in America and Switzerland, respectively) suffered far less damage. Interestingly, before the crisis, Citigroup was a model of good corporate governance. The researchers summerized that one should not expect too much from corporate governance or management systems because they cannot protect companies from taking excessive risks or crisis failitures. Reformers should consider spending less time drawing up ‘ideal constitutions’ and more time thinking about ‘intangible things’ such as firms’ values, traditions and culture which may be more difficult to measure, but more effective in restricting financial crisis consequences.

Carenys and Sales (2008) analyzed that deregulation can be considered as the general standard in the financial sector in the future. Deregulation means that financial organizations have a higher degree of freedom in pricing and product mix that they offer. They also supposed that banks would witness the disappearance of the protectionist environment of regulated prices and the appearance of new competitors while these banks have been faced with both threats and opportunities. Therefore, the management systems of banks need a comprehensive knowledge of markets, customers, products and must search for new competitive

advantages for development. The management system of a bank is attached to the management accounting function, need to apply modern MAPs to remain competitiveness in their banking industry. The management accounting function has the responsibility to develop strategies that may enable a bank to exploit financial innovations in creating a sustainable competitive advantage as well as to reduce disadvantages caused by deregulation and globalization.

Sliehat et al. (2012) studied the utilization of MAPs and the level of development of the management accounting system of the Jordanian financial services industry, which includes banks, insurance companies, and real estate companies. A survey was administered to the head of the financial accounting function for 95 financial services companies. The response rate was 67.3 percent, which yielded 64 usable responses. The results indicated that a majority, 59.4 percent, of financial services firms had a management accounting function. Of the 38 management accounting practices studied, 27 practices were used at least Sometimes by most of the firms. Five of the seven costing systems practices, six of the seven budgeting practices, four of six performance evaluation measures, nine of ten decision making practices, and three of eight strategic analysis practices were used by most firms. The most important roles of management accounting were cost determination and financial control (Stage 1 of IFAC model) and information for management planning and control (Stage 2). Most firms, 64.1 percent, were in Stage 1 of the IFAC model, with 29.7 percent of the firms in Stage 2. Only a small percentage, 6.2 percent, of firms were in Stage 3 and Stage 4, with an equal amount in each stage. Neither the life cycle stage of the firm nor the specific industry field of the firm (banking, insurance, real estate, or diversified financial institution) had any significant impact on the IFAC Stage of the firm, since only a few firms were at the advanced stages. However, the life cycle stage did have many firms in Stage 4.

Gooneratne and Hoque (2013) reviewed the previous research on management control in the banking sector. They found that there is a dearth of in-depth research on control issues and detailed management control practices deployed in the banking sector. The previous research focused on the several specific topics including long-range planning practices, activity-based techniques like ABC/ABM, performance measurement like BSC and management accounting change in banks. The content of previous research have not covered the practices such as customer or product profitability which are considered as important in the banking sector. Especially, the studies just focus on brief commentaries rather than in- depth analysis and single level. Regarding the settings, the previous studies focus on banks in developed countries in the West such as the

UK, the USA, Italy, Finland, Sweden or Japan rather than developing countries and other areas in the world. This brings opportunities for researchers in studying management control issues in less developed countries or branches of banks in other countries. Therefore, there is a need of future research on design, operation and use of modern MAPs such as BSC in real case studies and survey research in especially developing countries.

Messner (2016) studied how industry context effect the MAPs which organizations applied. The author found that the core organizational practices and industry specifics influence on the types of MAPS in companies. Based on the core organizational practices that are used, costing systems are different between manufacturing and services industry. In banking industry, the core organizational practices is lending money and the risks related to this practice, so credit assessment practice (particular risk calculation) is the widely adopted MAPs. Also, the Basel regulations had significant impacts on MAPs and risk management in banking industry.

Thabet and Alaeddin (2018) studied the impact of the management accounting system on credit risk management practices in Palestinian banks. Using panel data from 2008-2014 from 11 commercial banks in Palestine, they found that four variables (capital adequacy, credit monitoring, income diversification, and operational efficiency) were statistically significant predictors of organization performance when measured by return on equity. However, only credit monitoring and operational efficiency were statistically significant predictors of organizational performance when measured by return on assets. To the effect of management accounting practices on the four variable, correlation analysis was conducted. However, there were no significant correlations between MAPs for costing, budgeting, decision making, and performance evaluation with capital adequacy, In testing for correlations between management accounting practices and capital adequacy, credit monitoring, income diversification, and operational efficiency. They further tested these relationships by conducting moderated regression analysis using an interactive effect for management accounting practices and the four variables. They found statistically significant predictive effects on the organizational financial performance for the interaction between management accounting practices and the four variables. Correlation analysis found a significant correlation between costing system and budgeting with credit risk management policies. Moderated regression analysis found a significant interactive effect between credit risk management policies and costing system on organizational financial performance.

The above previous studies provide a picture of the development of MAPs in countries around the world.

The modern practices are applied in these countries in main functions of management accounting namely, costing, budgeting, performance measurement, decision making, and strategic techniques.

At present, there is a severe lack of study on the current development of MAPs in Vietnamese commercial banks. Several significant previous documents such as Tran et al. (2013), Vien et al. (2018), and SBV (2018). These studies mainly focus on the characteristics of financial accounting in banks, risk management and internal control system. It is hard to find previous studies about the detailed characteristics of management accounting systems in Vietnamese commercial banks. There is almost no marco level research on the development of management accounting practices in the Vietnamese banks.

In March 1998, International Federation of Accountants (IFAC) released a framework to explain the historical development of management accounting. The IFAC describes the history of management accounting as a four-stage evolution framework. The IFAC model concentrates on explaining the evolution of management accounting in United States and European countries (Abdel-Kader and Luther, 2006).

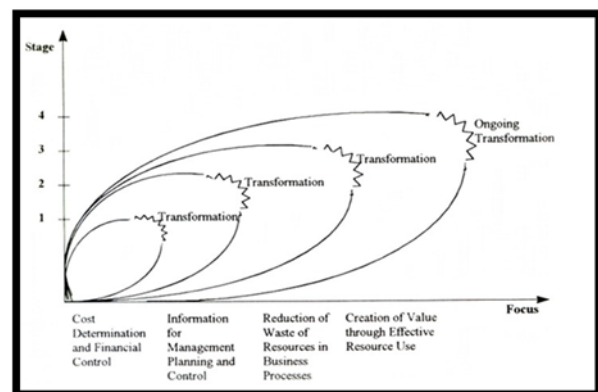


Fig. 1: The Evolution of Management Accounting (IFAC, 1998)

According to IFAC model (Fig. 1), management accounting in the first stage (prior to 1950) primarily focused on the determination of product cost and internal financial control. Simple budgeting and cost accounting tools were widely adopted in this period. In the second stage from 1960 to 1965, the attention of management accounting was the provision of information for planning and control purposes. Such techniques as decision analysis, responsibility accounting, and many kinds of budgeting were widely adopted at this stage. Next is the third stage which was from 1965 to 1985. In this stage, the focus of management accounting shifted to waste reduction in using business resources. The widely adopted techniques were process analysis and cost management

tools such as activity-based costing, sensitivity analysis, and quality cost analysis. The fourth stage or the current evolutionary stage of management accounting had been developed by 1995. The focus of management accounting in this stage moved to the value creation through the effective use of resources and technologies which address customer value, shareholder benefit, and organizational innovation. The widely adopted techniques were target costing, benchmarking, value chain analysis, total quality management, environmental management accounting and so on. It is necessary to state that the four stages in IFAC model are not mutually exclusive. Each stage successively includes the concepts of the previous stages and complements additional characteristics that occurred due to the new requirements of business management.

Numerous previous studies used the IFAC model to analyze the development of management accounting practices in organizations, namely Abdel-Kader and Luther (2008), Slihat et al. (2012). Nguyen. T. P. D (2018), Terdpaopong et al. (2018) Nguyen and Aoki (2014). Based on the IFAC model and previous research on the development of management accounting practices in organizations, we would like to propose a framework of management accounting practices can be used to evaluate the development of management accounting practices in Vietnamese commercial banks. To analyze the development level of MAPs in Vietnamese commercial banks could provide a macro picture for the bank supervisory agencies and the whole commercial banks to understand their development level in comparison to an international measure, the IFAC model, and the widely adopted management accounting practices in Vietnamese banks.

At present, the ambiguity of financial information makes Vietnamese commercial banks difficult to assess operational quality and risk; also, the diversity of beneficiaries makes it difficult to manage commercial banks. Due to the high risks, short-term debts, various strict and detailed regulations from national, regional and international financial management and supervision agencies, it may lead Vietnamese commercial banks to large crisis or even bankruptcy in the future.

Regarding the governmental regulations on management accounting in Vietnamese banking sector, apart from financial statements which are compulsorily established and audited annually, many Vietnamese commercial banks may not have transparent reporting and disclosure mechanism for management information (financial and non-financial). The management information systems of commercial banks have many inadequacies that hinder the process of sharing and updating the information between the functional departments within commercial banks. The systems also are not suitable for providing information between

commercial banks and SBV as well as between commercial banks and national financial safety supervisory agencies. In addition, another issue of management accounting information in many Vietnamese commercial banks is the model of distributed management information system or the formation of excessive levels and decentralization (between the head office and branches or transaction offices). This model makes branches become sub-banks, increasing the risks for commercial banks while the scale of commercial banks continues to expand at a fast pace and the capacity to control risks of headquarters is limited due to the lack of risk management system and effective management and reporting system. It also can be supposed that the management accounting information in commercial bank in Vietnam have not kept up with the overheating development of the banking sector (Nguyen Huy Cuong, 2018).

In order to increase the transparency and management capacity of the whole banking system, SBV (2018) has promulgated mechanisms and policies that directly affected accounting, reports and statistical systems at all levels of banks. Circular No. 13/2018-TT-NHNN dated May 18th, 2018 (Circular 13) and Circular No. 11 /VBHN-NHNN might have greatly influenced the development of accounting and management information systems in all commercial banks and branches, branches of foreign commercial banks in Vietnam in the future.

Circular 13 stipulates the detailed guidance on the internal control system of commercial banks in improving the effectiveness of the internal control system, completing the third lines model of independent protection in banking activities, changing culture of control, risk management and internal assessment under pillar 2 of Basel II.

Circular 13 created new and stricter standards in Vietnamese banking system. First, it provides regulations on the organizational structure for senior management in improving governance capacity, ensuring good control of operational quality through the internal control system. Each credit institution must set up high-level supervisory councils from the Board of Directors to the executive level to ensure specific provisions on the operation mechanism, components, professional capacity of the Board of Directors, policies and procedures. Second, Circular 13 promotes banks to develop and complete the database system. In parallel with standards of risk management, the database system is a barrier for most Vietnamese banks when setting up calculation tools and risk management models. Third, Circular 13 strengthens supervision and management ability of banking inspection and supervision agencies through specific reports, details of capital indicators, assessment of capital adequacy, compliance status and internal regulations. Fourth, this

is a compulsory requirement that commercial banks have to face at present time, especially the database. Circular 13 requires commercial banks to ensure sufficient and accurate data base to meet risk management requirements, information security and have backup systems. Therefore, commercial banks must invest in upgrading and updating information technology systems regularly to obtain accurate databases which are suitable to the scale, structure and complexity of their operations.

3. RESEARCH METHODOLOGY

Case study is a typical method used in social sciences. In management accounting field and business management generally, case studies are widely used in various enterprises. Therefore, we use case study as the main method to research the development of MAPs in Vietcombank. The information is gathered from a variety of sources and by using different methods like observations, interviews, and analysis. The data are in both qualitative and quantitative forms. A good case study should make clear which information is factual description and which is an inference or the opinion of the researchers. During September 2020, the in-depth interviews by questionnaires were sent to selected departments in Vietcombank. We collected 11 answers from various departments in charges of branches in Vietcombank, namely, 08 respondents from finance division, 01 respondents from operation division, and 02 respondents from internal inspection division.

4. ANALYSIS ON THE CURRENT DEVELOPMENT OF MANAGEMENT ACCOUNTING PRACTICES IN VIETCOMBANK

4.1. Overview of Vietcombank

Name in Vietnamese: NGÂN HÀNG THƯƠNG MẠI CỔ PHẦN NGOẠI THƯƠNG VIỆT NAM.

Name in English: JOINT STOCK COMMERCIAL BANK FOR FOREIGN TRADE OF VIET NAM.

Trading name: VIETCOMBANK.

Vietcombank was originally the Foreign Exchange Bureau under the National Bank of Vietnam established according to Decree No.443/TTg dated January 20th, 1955 of the Prime Minister. In 1961, the Foreign Exchange Bureau was renamed Foreign Exchange Department under The State Bank of Vietnam pursuant to Decree No.171/CP dated October 26th, 1961 of the Council of Ministers. On October 30th, 1962, conforming to international practices on foreign banking operations, the Council of Ministers issued Decree No. 115/CP on the establishment of the Bank for Foreign Trade of Vietnam - tasked with

foreign exchange trading, international payments, international credit, and foreign trade loans. On April 1st, 1963, Bank for foreign trade of Vietnam was officially introduced and put into operation as a banking entity specialized in foreign trade. Vietcombank has always followed its well-defined goal to develop a standard bank adhering to legal regulations and promptly updating international best practices for safe and sustainable operations. From a state-owned organization, in 2007, Vietcombank was a pioneer in capitalizing banking system by IPO. In 2008, Vietcombank officially became a joint stock commercial bank listed on HOSE. As at December 31, 2019, Vietcombank has 111 branches and 472 transaction offices, operating in 53/63 provinces and cities across the country: 23 branches in the North (20.7%); 15 branches in Ha Noi (13.5%); 14 branches in Northern- Central region (12.6%); 12 branches in the Southern-Central and Highland Regions (10.8%); 18 branches in Ho Chi Minh City (16.2%); 14 branches in Eastern-Southern Region (12.6%); and 15 branches in the Western-Southern Region (13.5%). Vietcombank established and maintained financial relationships of 1,316 correspondent banks in 102 countries and territories around the world. 01 Representative Office in Singapore; 01 Representative Office in the US; 01 Representative Office in the South of Vietnam and 02 overseas subsidiaries (Vinafco Hongkong, VCB Money Inc.). 03 Non-business units (Cash Treatment Center in Ha Noi, Cash Treatment Center in HCMC, Human Resource Development and Training School). 01 Subsidiary bank in Laos. 04 other joint ventures and associates. The management structure of Vietcombank is shown in Appendix 01.

Risk Management Committee assists Board of Directors (BOD) in approving appropriate policies and directions with regard to various types of risks (credit risk, market risk, operational risk, etc.) in each period, including defining ratios, limits/ restrictions and risk appetite of the Bank. Supervisory Board supervised BOD and Board of Management (BOM) in the implementation of business orientations and objectives of Vietcombank, which were approved by Shareholders' General Meeting, supervising the compliance with the laws and the Bank's Charter in management and governance. Performing regulations on internal governance of Vietcombank, Supervisory Board attends regular/ periodic meetings of BOD and monthly meetings of BOM. Supervisory Board is also fully provided with information and documents about management, governance and business activities of the Bank to serve its supervisory activity. The Supervisory Board, in coordination with BOD and BOM, reviewed the regulations on internal governance (Vietcombank's Charter on organization and operation, the BOD's Regulations on organization and operation, the Regulations on internal governance, the Supervisory Board's Regulations on organization and operation,

etc.) to ensure the compliance with the provisions of Circular No.13 and Circular No. 40/2018/TTNHN dated December 28th, 2018 on the internal governance system of commercial banks and their foreign branches. The Supervisory Board worked closely with BOD and BOM in carrying out the assigned functions and tasks and supervising audit activities of the bank. Through its activities, the Supervisory Board has proposed opinions and suggestions to BOD and BOM for risk management enhancement, risk minimization, and compliance with the law, the Company's Charter, and internal regulations, in order to improve the operational quality and efficiency of the Bank.

In 2019, Vietcombank continued to have impressive achievements of becoming the first Vietnamese bank to reach USD 01 billion in profit and to be listed in the Global Top 200 profitable financial and banking groups. These achievements proves that Vietcombank is on the successful track with its strategy that focuses on 3 key pillars: Retail, services and investment (treasury) to achieve the goals of high quality of growth, safety, efficiency, and sustainable development. In 2019, Vietcombank's Representative Office was officially launched in New York under the approval of the U.S. Federal Reserve System, making Vietcombank the first Vietnamese bank to fulfill strict requirements to be present in the US market. Vietcombank is the first large bank to put a Digital Banking Center in to operations in Vietnam. According to the General Department of Taxation, Vietcombank continued to be the biggest corporate income tax payer amongst banks in Vietnam for 2019 and one of two biggest corporate income tax payer amongst all enterprises. This result recognized important contributions of Vietcombank to the State budget.

To achieve the goal of becoming a Green bank, Vietcombank co-organized the program "For a Green Vietnam". This program was aimed to raise the awareness, responsibility and promote the determination and creativity of officers, unionists, and adolescents nationwide in planting, caring, and protecting trees for the purposes of environmental protection, climate change response and sustainable development. In 2019, Vietcombank was the first bank to be granted the credit line of USD 200 million by JBIC to support renewable energy, green energy, and environmental protection projects in Vietnam.

In 2019, Vietcombank was honored to be the only bank in Vietnam awarded the "Best Bank in Vietnam" by Euromoney, which is the world's most prestigious award in the banking and finance sector in 100 countries worldwide. Total assets reached VND 1,222,719 billion, up 13.8% from the level in 2018. Shareholder's equity reached VND 80,883 billion, up 30.1% from 2018, in which undistributed earnings were VND 26,055 billion (VND 16,139 billion in 2018). Total deposits reached VND 1,039,086 billion,

up 14.1% over 2018. In particular, customer deposits (including valuable paper issuance) reached VND 949,835 billion, increasing by 15.4% compared to 2018. Demand deposit ratio accounted for 30.1% of Deposit inflows from the economy (2018: 29.5%). Outstanding loans reached VND 741,387 billion, increasing by 15.9% compared to 2018, and fulfilling 100% of the plan. Retail credit accounted for 51.8% of the total outstanding loans, much greater than the wholesale credit. Loans classified under Group 2 reached VND 2,561 billion; Group 2 loans ratio was at 0.35%, decreasing from 0.59% at the end of 2018. Non-performing loans reached VND 5,804 billion with the NPL ratio of 0.78%, a drop from 0.97% at the end of 2018. Loan loss provision of outstanding loans to the economy amounted to VND 10,417 billion. Loan loss provision coverage ratio was at a high level (182.0%). Recovery of written-off loans reached VND 3,179 billion, fulfilling the assigned plan. The market share of international payment and trade finance increased compared to 2018 (from 16.23% to 16.52%). International payment and trade finance turnover reached USD 85.4 billion, up 9.03% compared to 2018.

Separated profit before tax reached VND 22,717 billion, increasing by 26.1% compared to 2018. Consolidated profit before tax reached VND 23,122 billion, increasing by 26.6% compared to 2018. Non-interest income accounted for 39.2% of the business income. Noticeably, net income from foreign exchange increased by 49.2% over the last year and contributed 42.3% to the non-interest income. ROAA, ROAE were 1.61% and 25.90% respectively, significantly higher than those figures in 2018 as well as those of the market average.

Proactively deployed projects for improving management and operational skill. Many projects were gradually applied in practice: (i) Basel II program: SBV recognized VCB as the first bank to meet Basel II standards in Vietnam in accordance with Circular No. 41, one year earlier than required. (ii) CTOM program: Continued to implement 17 initiatives of which 7 initiatives were completed. Since June 2019, CTOM Model was officially launched at Head Office and branches. (iii) Projects in Retail Division: In 2019, Retail Division proactively carried out their transformation projects, including RTOM, Retail CRM and RLOS; (iv) IT Development Roadmap to 2020: Implemented the Project with 54 IT projects to support the bank's operations; Built and upgraded infrastructure, steadily modernizing the IT system. There are 14 key projects were implemented such as investment projects for innovations of Core Banking, Trade Finance, ERP, MPA, SOA, etc. Upgrading IT systems to meet business requirements, ensuring the high availability as well as safe and secure operations; managing the IT systems under international standards.

4.2. The current state of management accounting practices in Vietcombank

In order to become a bank with the best risk management in Vietnam, Vietcombank proactively enhances the risk management culture, pioneers in researching and applying modern credit risk management measures and models in conformity with international standards, orientations of regulatory authorities, as well as internal management needs. In terms of organization and risk management, Vietcombank regularly reviews and consolidates its risk management apparatus in line with 3 Lines of Defense: (i) the first line is to identify, control and mitigate risks; (ii) the second line is to develop risk management policy, internal regulations on risk management, measurement, monitoring in compliance with the law and (iii) the third line is for internal auditing.

At the same time, the bank strengthens and enhances role and activities of Committees, Councils and Departments in risk management, such as Risk Management Committee, Risk Council, Risk Management Department, Compliance Department and Internal Audit Department. Thereby, improving efficiency of risk control, while proactively supporting business operations to achieve the best business efficiency. Vietcombank's documents, regulations, guidelines on risk management are periodically reviewed and updated, meeting requirements and following orientations of regulatory authorities, as well as operational status of Vietcombank.

Vietcombank also focused on investment in developing risk measurement tools and models utilizing advanced methods. Credit risk quantification model was developed, covering most of the bank portfolio, namely: Probability of default model (PD model) according to Basel II standard; Loss given default model (LGD model); Exposure at default (EAD model) for both Wholesale and Retail portfolios. Besides, the information technology systems were also regularly upgraded to meet the governance requirements the best. The quality and completeness of the data continue to be improved as an important foundation for the Bank's risk management. Regarding the Basel II Program, following the positive result in 2018 of being recognized as the first bank to meet Basel II standards in Vietnam under Circular No. 41 when achieving the capital adequacy ratio one year earlier than required, in 2019, Vietcombank continued to promote the implementation of ICAAP and other contents by advanced methods. At present, necessary conditions to meet Basel Standards are basically completed under the advanced methodology. Vietcombank completed the financial system with modern principles with norms, business plans, budgets, profit management, deregulation to help BOD, BOM and committees to make suitable decisions.

The management accounting function in Vietcombank is built based on a combination of focus and disintergration. The Risk Management Committee is in charge of building policies for the whole bank from the BOD, BOM to the lower committees, divisions and branches. The Central Credit Committee, ALCO, Risk Committee will be in charge of specifying the policies in detailed plans and processes.

The management system help Vietcombank inspected all branches in the Bank network, 04 Departments/Divisions/Centers at the Head Office, 02 Subsidiaries. Also, 22 audit and inspection schemes were performed monthly at systemwide scale. Inspected operational risks at branches to timely prevent and report potential risks, propose solutions to operation issues found at branch level. Promoting internal inspection and audit while closely supervising the results of implementing inspection and auditing proposals and remotely monitoring business activities of branches/subsidiaries in Vietcombank. Continuing to improve risk management capacity through the implementation of transformation projects and initiatives under the Basel II Program. Upgrading operational risk management.

Besides, Vietcombank are using multi-dimensioned management reports which specifying divisions/customers types/products. The bank renewed salary systems based on business efficiency, IDs and KPIs for talents and key people. Vietcombank are using three line model in risk management. Vietcombank is using various softwares for management namely: ERP, T4S, and Signature. The bank restructured the sales and servicing models at all branches following the RTOM projects, reformed and reorganized the salary mechanism, as well as business efficiency and labor productivity. VCB also is developing and issuing a set of criteria for selecting talented staff; capacity framework, training roadmap; reviewing JDs and KPIs. The bank also increased the average number of training sessions, tests/skill competitions compared to 2019 while improving the training quality. VCB is preparing necessary conditions for financial statement according to international standards.

We asked the respondents to evaluate the roles of management accounting in VCB. The 5-point Likert scale was used where 1 means Not important; 2 – Low important; 3 – Average; 4 – Important; and 5 – Very important. Table 1 shows the results. According to the respondents, management accounting play an very important role in many aspects of Vietcombank (Means over than 4.0). The most important roles of management accounting are to support for financial reporting, to Building monthly/quarterly/yearly plans/budgets for risk management, Evaluating profits, credits, capital mobilization for the whole bank and branches, and to make decisions on business activities/investment.

Table 1. Roles of management accounting in Vietcombank

Roles	Mean	Std
1. Identifying, analyzing variances between Vietcombank and SBV in interests/ prices and products.	4.45	0.93
2. Building monthly/quarterly/yearly plans/budgets for risk management.	4.55	0.52
3. Evaluating profits, credits, capital mobilization for the whole bank and branches.	4.55	0.52
4. Supports for making decisions in widening and renewing branches, networks, programs/products/ services	4.55	0.52
5. Supports for preparing financial statements	4.64	0.67
6. Using for saving costs, eliminating wastes	4.36	0.92
7. Enhancing efficiency of using assets, labor forces and management abilities	4.45	0.69
8. Making core values for the bank	4.27	0.79
9. Enhancing competitiveness for other banks	4.36	0.81

Sources: Investigated by the author

To identify the current state of management accounting practices in Vietcombank, we summarize the rates of management accounting practices as shown in Table 2. Then we examine these practices based on the IFAC model as presented in the literature review section. The question for investigating the adoption rates of management accounting practices in the Vietnamese enterprises is constructed based on a 5 level Likert scale where 1 means Never; 2 – Almost Never; 3 – Occasionally; 4 – Often; 5 – Always. The practices are classified based on the study of Chenhall and Langfield-Smith (1998) and Abdel-Kader and Luther (2008) where five classifications are distinguished - i) costing system, ii) budgeting, iii) performance evaluation, iv) information for decision making, and v) strategic management accounting.

Regarding the costing system, the most widely adopted practices in Vietcombank is “Costing by operations costs, administrative costs and tax costs.” (mean equals to 4.36). As previous studies, this costing method is used commonly in banks. This technique is identified in Vietcombank financial regulations from the head quarter to branches. Based on this costing method, Vietcombank built KPIs for the whole system. Following are “Classifying costs based on cost behavior” and “Target costing” (mean equals to 4.18). These practices are in line with 3 bottom line internal control system used in Vietcombank. The lowest adoption rate are “NIM costing” and “Standard costing” (mean equals to 4.09). In summary, Vietcombank already applied modern costing practices of the Stage 3 and Stage 4 in the IFAC model.

Regarding the budgeting practices, the highest adoption rates practices are Budgeting for revenue/sales,

Budgeting for financial statements, and Budgeting for product cost controlling with the means equal to 4.45. These adoption rates are higher than the above costing practices. The management accounting systems of Vietcombank focused on planning and controlling practices. The budget systems of VCB are built from the head quarter and then divided to branches and lower organizations but they are still flexible with non-operating expenses. Most of costs in VCB are mixed costs which have flexible norms. Budgeting for financial statements are prepared by the head quarter and branches just prepare budgeting for costs, revenues, and cash flows. At the branch level, sensitivity analysis is almost not in usage. Terdpaopong et al. (2018) also found that Budgeting for product cost controlling is the most widely adopted among the budgeting practices in the Thai companies. The lowest adoption rates are flexible budgeting, sensitivity analysis, and zero-based budgeting which are the modern budgeting practices in the IFAC model. This finding may be explained that the ERP system in Vietcombank is strong enough to cover the activities so Vietcombank do not pay much attention to the budgeting system.

With regards to the performance evaluation methods, using financial ratios analysis is the most widely adopted practice in Vietcombank (mean equals to= 4.36). The second highest adoption rate is benchmarking which help Vietcombank compare their performance with other banks in the same system. The Balanced scorecard (BSC) is used at lower rate than the above practices while the KPIs is used at a higher rates. This finding may indicate that the bank just focus on KPIs in details and do not focus on communicating the whole bank BSC for all divisions. In addition, the

modern practices such as Balanced scorecard and non-financial measurements related to operations, innovations and employees are adopted at rather low rates in Vietcombank. Responsibility accounting and residual income analysis are applied at lower rates in branches.

Regarding the information for decision making practices, most of the practices are widely adopted in Vietcombank. Of which, Profitability ratio analysis, Customer profitability analysis, and KPI for the whole bank/or divisions are the most widely adopted method (mean equal to 4.55).

On the topic of strategic management accounting practices, the adoption rates of these practices are much lower than the above costing, budgeting, performance evaluation, information for decision making practices (with all the means less than 4.0). In general, Vietcombank have used but still not focus on strategic accounting management practices. In addition, a separate sustainability report or integrated report based on international regulation are one of the most important report for organizations expressing their sustainable development and their contributions to the

society. However, VCB have not published sustainability reports or integrated reports.

It can be concluded that the adoption rates of management accounting practices of Stage 3 and 4 of the IFAC model are higher than Stage 1 and Stage 2 in Vietcombank. The modern management accounting practices in decision making and budgeting such as Profitability ratio analysis, Customer profitability analysis, Using KPIs for the bank/divisions, Budgeting for revenue/sales, costs controlling, budgeting for financial statements are the most widely applied practices in the bank. This finding is suitable with the nature of banking system which focus on information for making decision, and budgeting than costing practices. In Vietcombank, the roles of budgeting is very important is risk management, evaluation profits, capital mobilization in the whole bank and each division for widening networks, investments portfolio, programs/products. This finding showed that the level of management accounting practices at VCB is higher than some previous research in other countries such as the study of Sliehat et al. (2012) about Jordanian banks.

Table 2: The adoption rates of management accounting practices in Vietcombank

Practices	Mean	Std
1.1 Classifying costs based on cost behavior	4.18	0.98
1.2 Standard costing	4.09	0.83
1.3 ABC- Activity based costing	4.18	0.75
1.4 Target costing	4.27	0.65
1.5 Quality cost analysis	4.18	0.87
1.6. NIM costing	4.09	1.04
1.7. Costing by operations costs, administrative costs and tax costs	4.36	0.67
Practices	Mean	Std
2.1. Budgeting for revenue/ sales	4.45	0.52
2.2. Budgeting for cost controlling	4.45	0.52
2.3. Budgeting for cash flow planning	4.09	0.70
2.4. Budgeting of Financial Statements	4.45	0.52
2.5. Flexible budget	3.91	0.70
2.6. Sensitivity analysis	4.00	0.63
2.7. Zero-based budgeting	3.82	0.75
Practices	Mean	Std
3.1. Balanced scorecard	4.00	0.77
3.2. Financial ratios analysis	4.36	0.50
3.3. Non-financial measurements related to customers – customer satisfaction	4.18	0.87
3.4. Non-financial measurements related to operation and innovation such as patent, certificates, awards	4.00	0.77
3.5. Non- financial measurements related to employees such as employee satisfaction, staff – turnover	4.18	0.87

Practices	Mean	Std
3.6. Benchmarking	4.27	0.65
3.7. Residual income	4.00	0.77
3.8 Responsibility accounting	3.82	0.75
Practices	Mean	Std
4.1. Cost – volume – profit Analysis	4.45	0.69
4.2 Profitability analysis	4.55	0.52
4.3 Profit analysis of products	4.45	0.69
4.4 Customer profitability analysis	4.55	0.52
4.5 Using KPI for the whole bank/or divisions	4.55	0.52
4.6. Evaluation of capital investment based on discounted cash flow method	4.45	0.69
4.7. Evaluation of capital investments based on payback period and/or accounting rate of return	4.27	0.65
Practices	Mean	Std
5.1 Value chain analysis	3.91	0.70
5.2 Shareholder value analysis	3.82	0.75
5.3 Life cycle analysis	3.91	0.70
5.4 Target Costing Management	3.82	0.75
5.5 Environmental management accounting-EMA	3.73	0.65
5.6 Total quality management	3.73	0.65
5.7 Lean accounting	3.64	0.81
5.8 Long-range forecasting	3.91	0.70

Sources: Investigated by the authors

The Fig. 2 show the stage of MAPs in Vietcombank by the adoption rates of each MAP. It can be seen that MAPs in Vietcombank is in Stage 3 and near Stage 4 in the IFAC model.

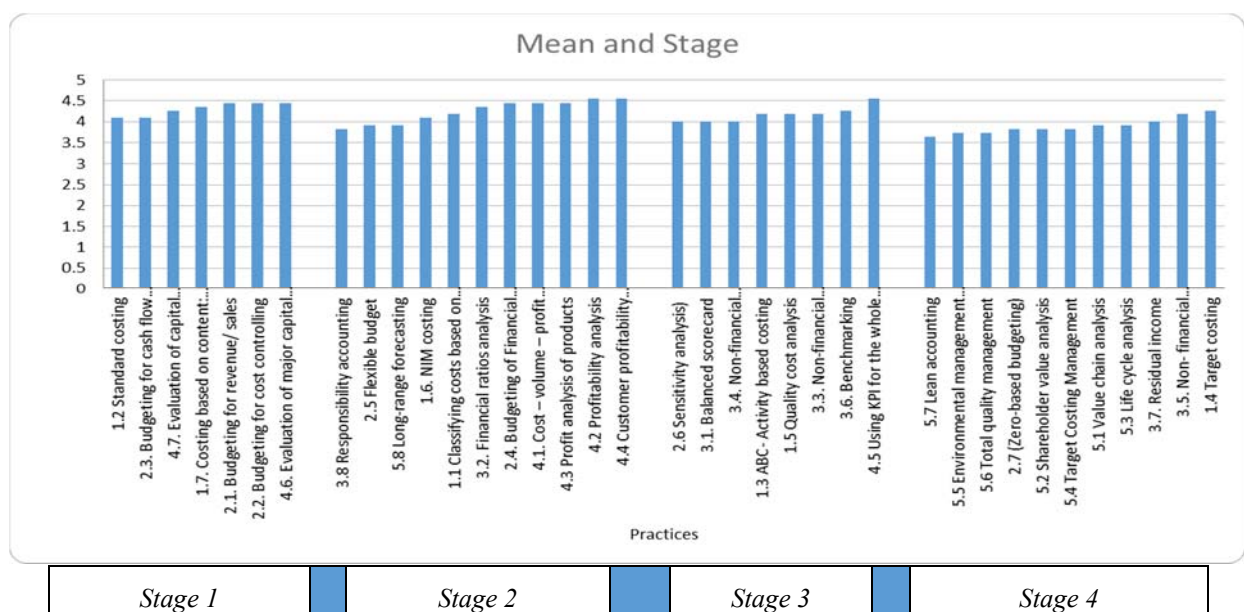


Fig. 2: The stages of MAPs in Vietcombank (Source: summarized by the authors)

5. CONCLUSION

The studies on management accounting practices in banking sector in Vietnam at present are in severe lack. The previous studies showed that the adoption of modern management accounting practices is a significant competitive advantage for commercial bank in the changing environment. Therefore, it is an urgent need to conduct studies to evaluate the development of MAPs in this sector in order to identify the management accounting practices which are suitable to Vietnamese banks.

This study is a preliminary research to analyze the previous research on management accounting practices in Vietcombank which is one of the best bank in Vietnam based on the criteria of sustainable development, business results, risk management, information technology, efficient governance, and contributions to the domestic banking and financial market.

The findings indicate that the level of MAPs in Vietcombank is in the highest stage of IFAC model for the development of management accounting. At branches, Vietcombank have widely used modern management accounting practices such as Profitability ratio analysis, Customer profitability analysis, Using KPIs for the bank/divisions, and Budgeting for revenue/sales, costs controlling. These management accounting practices helped the bank to continue to be leader in the banking system, controlling operations, meeting the information disclosure requirements of SBV and the securities market, to be able to integrating to the world banking system.

However, due to the unique characteristics of the banking industry, there may be differences between management levels (such as headquarter and branches, policy division and operational division), we would like to improve our research methods by deep interviewing with high level managers and various divisions in VCB in the future.

6. ACKNOWLEDGEMENTS

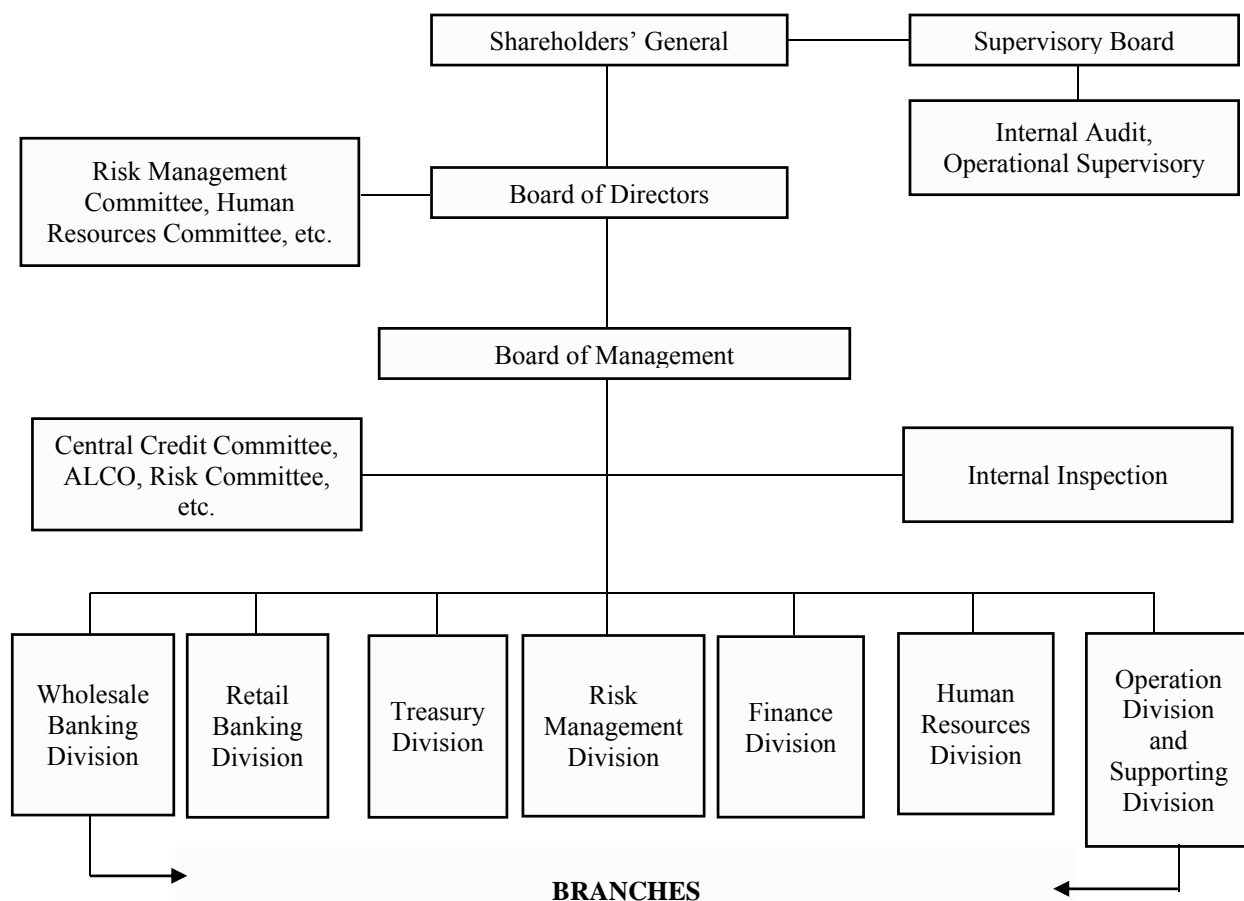
The research financed by Hanoi University of Science and Technology under the project number T2020-PC-042. The author acknowledges with gratitude.

7. REFERENCES

- [1] Abdul Rasid, S. Z, Abdul Rahim, A. R., & Wan Ismail, W. K. (2011). Management accounting and risk management in Malaysian financial institutions: An exploratory study. *Managerial Auditing Journal*, 26(7), 566-585. <https://doi.org/10.1108/02686901111151314>
- [2] Abdel-Kader, M.G., & Luther, R. (2008). The impact of firm characteristics on management accounting practices: A UK based empirical analysis, *British Accounting Review*, 40 (1): pp 2-27.
- [3] Aude Deville, Gary D. Ferrier, HervéLeleu. (2014). Measuring the Performance of Hierarchical Organizations: An Application To Bank Efficiency At The Regional And Branch Levels, *Management Accounting Research*. <http://dx.doi.org/10.1016/j.mar.2013.07.001>
- [4] Carens J. and Sales, X. (2008). *Costing the Banking Services: A Management Accounting Approach*. *Journal of Money, Investment and Banking*, 6(1), 8-9.
- [5] Le, T. K. N, & Le, N. L. (2016). Cơ hội và thách thức đối với các ngân hàng thương mại Việt Nam trong giai đoạn hội nhập sâu vào AEC và TPP. Available at: <https://www.sbv.gov.vn>
- [6] Nguyen Huy Cuong. (2018). Available at: <https://tinnhanhchungkhoan.vn/tien-te/thong-tu-13-se-giup-giam-bot-cac-dai-an-ngan-hang-232219.html>
- [7] Nguyen. T. P. D. (2018). The evolutionary stages of management accounting practices in Vietnamese manufacturing and commercial enterprises. *International Journal of Business, Economics and Law*, Vol. 16, Issue 5 (August), p 216-224.
- [8] Nguyen, T. P. D., & Aoki.M. (2014). The Evolution of Management Accounting Practices in Vietnam: a Survey Research on Vietnamese Food and Beverage Enterprises. *The Keizai Gaku, Annual Report of the Economic Society, Tohoku University*. 74 (4), March 3/2014: pp 167-184.
- [9] Oboh, C. S. & Ajibolade, S. O. (2017). Strategic management accounting and decision making: A survey of the Nigerian banks. *Future Business Journal*, 3(2), 119-137. <https://doi.org/10.1016/j.fbj.2017.05.004>
- [10] Saunders, A. and Cornett, M.M. (2008). *Financial Institutions Management: A Risk Management Approach*. 6th edition. Singapore: McGraw Hill.
- [11] Simmonds, K. (1981). Strategic management accounting systems. *Management Accounting (UK)*, 59(4), 26-29.
- [12] Sliehat, N., Al-Nimer, M. & Almahamid, S. (2012). An exploratory study of the level of sophistication of management accounting practices in Jordan. *International Business Research*, 5(9), 217-234. <http://dx.doi.org/10.5539/ibr.v5n9p217>
- [13] State Bank of Vietnam (SBV). (2018). Circular No. 13/2018/TT-NHNN on internal control system of commercial banks, branches of foreign banks in Vietnam.

- [14] State Bank of Vietnam (SBV). (2018). Circular No. 11 /VBHN-NHNN on regulations on report systems of credit institutes, branches of foreign banks in Vietnam.
- [15] Thabet, A. & Alaeddin, O. (2018). Management accounting systems and credit risk management policies and practices towards organizational performance in Palestinian commercial banks. *International Journal of Engineering & Technology*, 7(3.25), 626-632.
- [16] Terdpaopong, K., & Visedsun. N., & Nitirojtanad. K., & Sandhu. K. (2018). *The Advancement of Management Accounting Practices of The Large Thai Manufacturing Companies*. Proceedings of Asia-Pacific Management Accounting Association (APMAA) 2018 Conference, Waseda University, Tokyo, Japan, 29 October- 1 November 2018.
- [17] Martin, Messner. (2016). Does industry matter? How industry context shapes management accounting practice. *Management Accounting Research*. Volume 31, June 2016, Pages 103-111. <https://doi.org/10.1016/j.mar.2015.09.001>.
- [18] Tharusha, N., & Gooneratne, Z. H. Management control research in the banking sector: A critical review and directions for future research. *Qualitative Research in Accounting & Management*. Vol. 10 No. 2, 2013 pp. 144-171. DOI 10.1108/QRAM-10-2012-0045.

Appendix 01: Management structure of Vietcombank (Vietcombank Annual Report, 2019)



THE IMPACT OF FINANCIAL STATEMENT COMPARABILITY ON EARNINGS MANAGEMENT: EVIDENCE FROM FRONTIER MARKETS

¹* Wil Martens, ²Prem Yapa, ²Maryam Safari

¹*RMIT University, Hanoi, Vietnam

²RMIT University, Melbourne, Australia

*Corresponding author: wil.martens@rmit.edu.vn

Abstract

This paper aims to examine whether financial statement comparability constrains opportunistic earnings management in frontier market countries. From a large sample of 19 frontier market countries, across several accounting standards, results show that enhanced financial comparability constrains accruals earnings management (AEM). Contrary to developed markets and novel to this study, a significant relationship between financial comparability and real earnings management (REM) was not found. AEM and REM were also tested on both International Financial Reporting Standards (IFRS) adopting and non-adopting countries for greater robustness. Results suggest a common accounting standard constrains AEM, yet exhibited no impact on constraining REM. When combined, the results suggest that frontier markets engage in less REM than expected. Also noted is that the legal roots (civil vs. common law) play a significant role in constraining earnings management. Common law countries exhibited lower AEM when comparability increased; this significance was not found in countries rooted in civil law.

Keywords: Accounting comparability, Accruals Earnings Management, Real Earnings Management, Frontier Markets.

1. INTRODUCTION

Comparability in financial reporting enables investors to make sound financial decisions (Chauhan and Kumar, 2019). From a regulatory perspective, comparability facilitates proper interpretation of financial measures and the development of policy responses (Hasan et al., 2020; Nouy, 2014). However, little is known on the linkages between financial statement comparability on earnings management (EM) in frontier markets - a market too small and generally less accessible to be considered an emerging market. As such, this study aims to explore the impact of financial statement comparability on EM in frontier market countries.

Comparability is defined as a qualitative characteristic that allows users to identify and understand similarities and differences among items (FASB, 2010), as well as financial performance across firms (Kim et al., 2016). Greater accounting comparability enhances a firms' information quality, as rational investing and lending decisions require comparative information (Chen, 2016). The enhanced firm information environment that stems from greater comparability leads to better decision making, and thus the need for comparability is particularly strong. Gross and Perotti (2017) note that comparability is positively associated with analyst forecast accuracy and enhances the information environment. Accounting parallels should endure across firms despite the discretionary flexibility afforded to managers under International Financial

Reporting Standards (IFRS) (DeFond et al., 2011). It follows that firms having similar accruals quality, earnings predictability, earnings smoothness, and similar loss reporting will also exhibit greater comparability (De Franco et al., 2011).

Accruals earnings management (AEM) is the selection and interpretation of accounting policies from a set of acceptable policies to achieve earnings objectives¹ (Zang, 2012), and firms with greater financial statement comparability tend to engage in less of it (Kiya, 2017; Sohn, 2016). However, firms with greater comparability are also under greater public scrutiny, subject to closer monitoring, and under increased pressure to meet earnings targets. As a consequence, such firms are expected to employ more real earnings management (REM) (Cohen et al., 2008; Braam et al., 2015) - defined as actions undertaken that alter the timing or structure of operations from normal business practices. Shen and Chih (2005) note that incentives to manage earnings vary across countries, yet if stakeholder's preference is universally consistent with prospect theory,² then a manager has an incentive to manage earnings to accomplish the desired outcome.

¹ Goodwill impairment or deferred tax assets and liabilities recognition are areas where interpretation may be applied.

² Prospect theory suggests that individuals derive value from gains from a reference point, rather than absolute levels (Tversky and Kahneman, 1992).

This study extends Sohn (2016)'s US-based study on the constraint effects of financial statement comparability on EM into frontier markets using a broad cross-country sample. Novel to this study, is the application of a model that maps the accounting comparability of a firm based on its economic performance, bench-marked using a counter-country model across a variety of accounting standards. Benchmarking allows for both a longitudinal perspective for a single firm and a cross-sectional perspective of multiple firms.

Following a systematic analysis of financial statements of 2,475 firms across 19 countries during 2001 - 2017, it was found that greater financial statement comparability results in lower AEM scores. This finding was in line with the study's hypothesis. It is argued, however, that decreased AEM results in increased REM activity. For greater robustness, several additional statistical tests were performed on subsections of the data. Robustness test highlight that common law countries were less apt to engage in AEM, and that firms change their EM practices after IFRS adoption. The results underscore the uniqueness of frontier market countries and provide insights into EM methods applied therein. This study also hereby provides information gains that investors rely on.

The remainder of this paper is organised as follows: Section 2 reviews the prior literature and develops the study's hypotheses. Section 3 explains the research design and describes the data. Section 4 presents and discusses the empirical results. Section 5 provides findings from additional sensitivity tests. Section 6 concludes with key observations, finding implications, and suggested directions for future research.

2. RELATED RESEARCH AND HYPOTHESIS DEVELOPMENT

In this section, the literature on frontier market markets, financial statement comparability, earnings management, and institutional settings, is reviewed. These examined areas provide the framework for developing the study's working hypothesis.

2.1. Frontier market countries

The term frontier market is commonly used to describe smaller, economically immature countries with limited capitalisation (Cuervo Valledor et al., 2016). The homogeneity of the frontier market is its classification in having "some" openness to foreign ownership, "partial" ease of capital flows, and "modest" operational efficiency (MSCI, 2020). With an aggregate value slightly more than USD 100 billion,³ frontier markets account for less than 0.3 per cent of global developed markets, but more than 20 per cent

³ Based on the MSCI Frontier Market Index companies.

of the global population (Stereńczak et al., 2020). Frontier markets exhibit a low correlation (0.395) with developed markets,⁴ and also a low correlation among themselves (Gregoriou and Wu, 2016). Integration of frontier markets with global markets remains low (Blackburn and Cakici, 2017; Zaremba and Maydybura, 2019) as cross-listing of companies from developed and emerging markets in frontier markets is atypical. In examining the ownership concentration in a frontier market, Tran and Le (2020) and Darmadi (2016) note that frontier equity markets are characterised by high ownership concentration and weak investor protection, unlike the more dispersed ownership form commonly found in developed markets. As diversification into frontier markets can ameliorate portfolio risk (Thomas et al., 2017; Ali et al., 2020), investors and researchers alike can be better informed of company performance and management activity via financial statement comparability.

2.2. Comparability

Financial disclosure is at the forefront of international standard setters' agenda and occurs when firms with similar economic outcomes report similar accounting outcomes (Gross and Perotti, 2017). The international standardisation of accounting standards,⁵ has led to higher financial comparability. Lemma et al. (2018) find that firms in less competitive industries appear to engage in higher levels of EM as a consequence of weakly disciplined environments. DeFond et al. (2011) found that increased comparability occurs following IFRS adoption, as it contributed to reduced information acquisition costs and improved forecast accuracy. Young and Zeng (2015) and Gross and Perotti (2017) find greater evaluation accuracy a benefit from greater comparability.

Findings in several prior studies provide evidence consistent with the view that comparability increases transparency. Healy and Palepu (2001) found that, on average, firms with enhanced transparency experience fewer issues with mutual agency, and were less likely to undertake opportunistic EM. Improved firm transparency and manager forthrightness has also been associated with comparability (Zhang, 2018). De Franco et al. (2015) find that analysts are more likely to use the same industry sector benchmarks for comparability as comparability between peer groups increases. Barth et al. (2012) state that the comparability effects are stronger when IFRS adoption is mandatory, and for firms operating in common law

⁴ Based on weekly data of MSCI Frontier Market and MSCI Developed market index from 2015 to 2020. Source: Thomson Datastream.

⁵ As evidenced by the EU members requirement to adopt IFRS, and the United States, Japan, and China, the choice to converge with IFRS (Lin et al., 2019).

countries. Hail et al. (2010) found that increased comparability (due to IFRS harmonisation) resulted in increased market liquidity and reduced capital costs. Greater comparability among firms is also associated with lower bond spreads (Kim et al., 2013), and is inversely associated with crash risk (Kim et al., 2016). Bond-rating agencies provide fewer divergent ratings for firms when firm financial comparability increases (Kim et al., 2013). Firms with greater comparability were less likely to have overly favourable earnings surprises nor issue overvalued equity (Shane et al., 2014). Greater comparability was also found to decrease the size and volatility of related-party transactions (Lee et al., 2016), increase firm acquisition decisions, and reduce post-acquisition goodwill impairments (Chen et al., 2018).

The International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) both list comparability as a desirable property (Framework, 2018). Since the comparability concept is neither an absolute nor independent trait (Sohn, 2016), a mismatch between financial reports from different countries create difficulties in performing empirical tests for comparability.

Comparability's value lies in its cost-effectiveness and simplification of cross-firm comparisons (Sohn, 2016). Recognising comparability's value, accounting bodies⁶ seek greater comparability in financial reports, as noted by the 2002 Norwalk Agreement on developing common standards (Hughes and Larson, 2017). Subjective interpretation of accounting standards between managers may be common (Bartov et al., 2002), and further underscores comparability's importance. Standards are particularly important in less developed markets where attenuated analyst coverage results in more laborious firm comparability.

2.3. Earnings Management

As firms compete globally for capital, those with superior resources enjoy advantages over rivals (Clemons, 2019). To secure advantages,⁷ firms may opportunistically manage earnings to uphold or exceed earnings targets. Howard et al. (2019) note that headline earnings may not be a true representation of performance as earnings may have been managed. Earning management is the process by which a company's actual financial performance is distorted (Klein, 2002). While EM may or may not in itself be opportunistic, firms in less developed markets have been found to manage earnings to a greater degree than those in developed economies (Li et al., 2011, 2014).

To manage earnings, a firm can employ multiple EM strategies, ie. AEM and REM.

2.3.1. Accruals Earnings Management

The accrual component of earnings is increasingly viewed as a proxy for firm performance.⁸ The reversing nature of accruals limits a manager's ability to make biased estimates during one period and once again in subsequent periods (Abarbanell and Lehavy, 2003). Despite inherent limitations, a manager may still engage in opportunistic AEM. Studies on the factors that constrain AEM are prodigious (see Barth (2008); DeFond et al. (2011); Francis et al. (2014); Sohn (2016)), yet literature linking comparability's ability to constrain EM in frontier markets is sparse.

2.3.2. Real Earnings Management

REM provides managers with an alternative method of EM via actual business activities manipulation (Roychowdhury, 2006). REM may arise through manipulation of cash flow, production, or discretionary expenses (Roychowdhury, 2006; Braam et al., 2015). and is not without costs. As a risk-increasing factor, REM requires higher bond premiums (Ge and Kim, 2014), negatively impacts on the corporate image (Rodriguez-Ariza et al., 2016), adversely affects future firm financial performance (Tabassum et al., 2015), and is positively associated and more pronounced in countries with greater political stability (Lemma et al., 2019). As REM masks true financial performance, financial transparency is diminished (Sohn, 2016).

2.4. Institutional Factors

Institutional factors have shown an ability to constrain EM in mixed market studies (Ruddock et al., 2006; Salehi et al., 2018). La Porta et al. (1997) and Leuz et al. (2003) each find a robust negative correlation between ownership concentration and investor protection. La Porta et al. (1997) demonstrates that countries governed by civil law systems provide investors with weaker legal rights relative to those governed by common law. Research from Leuz et al. (2003) and Enomoto et al. (2015) has shown that strong minority investor rights limit insiders' ability to acquire private control benefits. Hutchison (2002) points out that a robust system of legal enforcement could substitute for weak rules, as effective and well-functioning courts provide recourse for investors abused by management. Firms that employ a high-quality auditor (Houque et al., 2017), or firms with greater analysts following (Enomoto et al., 2015), experienced lower EM levels. The factors aforementioned constrain opportunistic EM and aid in increasing financial report transparency.

⁶ Financial Accounting and Standards Board (FASB), and the International Accounting Standards Board (IASB).

⁷ Advantages may be market share dominance and or profitability above the industry average.

⁸ As opposed to earnings composed of cash.

2.5. AEM and REM trade-off decisions

As EM approaches are not without costs, managers interchange EM methods as a function of its costs (Cohen and Zarowin, 2010; Zang, 2011; Abernathy et al., 2014). The costlier and more constraints to an EM strategy, the greater the likelihood a firm will engage in an alternative. REM constraints include increased tax rates, poorer financial conditions, and lower industry market share (Joosten, 2012). Constraints on AEM include the engagement of a large auditor with longer firm tenure, lower accounting flexibility, and the presence of an audit committee (Ebraheem Saleem, 2019).

To gain the greatest financial reporting benefit, managers may employ a coordinated approach (complementary AEM and REM). Research shows that managers complement AEM and REM in nations with a relatively low accounting disclosure environment, weaker investment protection regulations, and low litigation costs (Knapp, 1991; Gramling and Myers, 2003; Chen et al., 2010; Zhou et al., 2017). Firms tend to substitute AEM with REM strategies under more stringent regulatory environments (Ewert and Wagenhofer, 2005), or when AEM becomes more costly (Cohen et al., 2008; Cohen and Zarowin, 2010; Durnev et al., 2017). Taken together, the above results suggest managers often consider the cost of different EM methods before engaging in them.

As comparability brings about transparency, AEM is lower in firms with transparent disclosures (Hail et al., 2010; Cassell et al., 2015). Moreover, as comparability reduces information asymmetry between managers and shareholders, it is expected that AEM constraints will result in increased reliance on REM for opportunistic accounting.

By enabling firm comparisons across countries and accounting standards,⁹ this study predicts that REM will increase as AEM decreases. Accordingly, it is expected that greater cross-border firm comparability will constrain a managers' ability to manipulate reported accounting performance when using AEM. Greater comparability allows outsiders increased access to performance information on other firms, allowing for better true performance evaluation. Increased transparency, however, does not necessarily allow greater visibility of REM activities, and thus REM is expected to increase.

Prior studies provide an understanding on how comparability improves the utilisation of accounting information (e.g. Bradshaw et al. (2009); Lang et al. (2010); Yu and Wahid (2014); Zhang (2018); Chircop et

al. (2020)), yet the linkages between comparability and EM has not been widely examined. This study is motivated by the limited published research on the relationship between financial reporting comparability, EM, and frontier markets.

Based on the above discussions on the current literature, the study's hypotheses are formally stated as H1 and H2:

Ceteris paribus:

H1 increased comparability results in decreased AEM

H2 decreased AEM results in increased REM

3. RESEARCH DESIGN

3.1. Comparability Measures

In financial accounting literature, De Franco et al. (2011)'s comparability research can be seen as most influential. De Franco et al. (2011)'s comparability method uses time-series regression of quarterly earnings onto stock returns to capture within industry comparability, yet focuses exclusively on US data without regard to accounting standards. Barth et al. (2012) modified this measure to assess firms using US GAAP and IFRS accounting systems within a cross-sectional industry setting.

Given the limited availability of quarterly financial data for frontier market companies and the various accounting standards companies may employ, this study applies Conaway (2017)'s adaption of De Franco et al. (2011) and Barth et al. (2012)'s comparability method. This model provides a more comprehensive comparability measure since firms may produce multiple counter-samples based on country-industry specific factors, despite having distinct accounting systems. The five steps to compute the comparability measure follow.

Step one uses all available firm data. A relationship estimate is calculated between economic outcomes and earnings within each country-industry-year. Each country-industry-year must include a minimum of 10 firms. Step one is formulated as per Eq.(1).

$$RET_{it}^{Cj} = \beta_{0,t}^{Cj} + \beta_{1,t}^{Cj} \left[\frac{NI_{it}}{P_{it-1}} \right] + \beta_{2,t}^{Cj} \left[\frac{\Delta NI_{it}}{P_{it-1}} \right] + \beta_{3,t}^{Cj} \text{Loss}_{it} \\ + \beta_{4,t}^{Cj} \text{Loss}_{it} \left[\frac{NI_{it}}{P_{it-1}} \right] + \beta_{5,t}^{Cj} \text{Loss}_{it} \left[\frac{\Delta NI_{it}}{P_{it-1}} \right] + \epsilon_{it}$$

where superscript C_j denotes the pricing multiples relating to the accounting system for country C in industry j ; and therefore, each β varies across each country-industry-year in the sample. Δ is the change agent. NI is the net income before extraordinary items per share. Firm and year-end are denoted as i and t , respectively. P is the share price, and RET is the buy-

⁹ Whether it is local accounting standards, International Financial Reporting Standards (IFRS), or Generally Accepted Accounting Principles GAAP)

and-hold stock return beginning nine months before and ending three months after year-end. *Loss* is an indicator variable equal to 1 if *NI* is negative and zero otherwise, allowing the accounting system models to differ for loss-making firms. All variables are measured in nominal US dollars.

Step two estimates a firms' fitted stock return using the country model, as expressed by Eq. (2).

$$\widehat{RET}_{i,t}^{cj,cj} = \hat{\beta}_{0,t}^{cj} + \hat{\beta}_{1,t}^{cj} \left[\frac{NI_{it}}{P_{it-1}} \right] + \hat{\beta}_{2,t}^{cj} \left[\frac{\Delta NI_{it}}{P_{it-1}} \right] + \hat{\beta}_{3,t}^{cj} Loss_{it} + \hat{\beta}_{4,t}^{cj} Loss_{it} \left[\frac{NI_{it}}{P_{it-1}} \right] + \hat{\beta}_{5,t}^{cj} \left[\frac{\Delta NI_{it}}{P_{it-1}} \right] + \epsilon_{it}$$

Step three calculates the fitted stock return under each counter-sample model for each firm¹⁰ as expressed by Eq. (3)

$$\begin{aligned} \widehat{RET}_{i,t}^{cj,cj^n} &= \hat{\beta}^{cj^n} + \hat{\beta}_{1,t}^{cj^n} \left[\frac{NI_{it}}{P_{it-1}} \right] + \hat{\beta}_{2,t}^{cj^n} \left[\frac{\Delta NI_{it}}{P_{it-1}} \right] \\ &+ \hat{\beta}_{3,t}^{cj^n} Loss_{it} \\ &+ \hat{\beta}_{4,t}^{cj^n} Loss_{it} \left[\frac{NI_{it}}{P_{it-1}} \right] \\ &+ \hat{\beta}_{5,t}^{cj^n} \left[\frac{\Delta NI_{it}}{P_{it-1}} \right] + \epsilon_{it} \end{aligned}$$

Step four calculates the absolute value of the difference between the within-sample and counter-sample fitted stock prices for each firm. This is represented by *DIFF* as expressed by Eq. (4).

$$DIFF_{i,t}^{cj,cj^n} = \left| \widehat{RET}_{i,t}^{cj,cj} - \widehat{RET}_{i,t}^{cj,cj^n} \right|$$

Step five calculates the median absolute difference between the within-sample and counter-samples' fitted stock prices multiplied by the negative natural log. The resultant value represents the firm's comparability measure with those of the counter-sample. The greater the score, the greater the comparability. This quantity is expressed by Eq. (5).

$$CompScore_{it} = -\ln \left[\text{Median} \left(DIFF_{i,t}^{cj,cj^n} \right) \right]$$

Note that firms *i* and *k* are from different countries, but share the same two-digit SIC industry code. Thus *CompScore* is estimated using time-series regression and captures accounting comparability between two firms across countries. Figure 1 in the Appendix provides an illustration of the comparison method.

3.2. Accruals Manipulation

¹⁰ A minimum of two countries with sufficient firms in each industry-year is required

To measure the degree of AEM, we follow Leuz et al. (2003) and calculate a composite measure of AEM to indicate the extent of earnings management via accruals. We first introduce the method of calculating accruals as per Eq (1)

Accruals = ($\Delta CA - ACash$) - ($\Delta CL - \Delta STD - \Delta TP$) - Dep (1) where *CA* is total current asset. *Cash* is cash/cash equivalents;

CL is total current liabilities; *STD* is short term debt; *TP* is taxes payable; and *Dep* is depreciation and amortisation expense.

We then introduce the three measures of AEM as per Eq. (7)- Eq. (9)

$$AEM1 = \frac{\sigma(EBIT)}{\sigma(CFO)}$$

where *AEM1* is the ratio of the standard deviation of earnings before interest and tax to standard deviation of net operating operating cash flows. The smaller the *AEM1*, the greater the likelihood a manger uses accruals to reduce operating cash flow variation.

$$AEM2 = \rho(\Delta Acc, \Delta CFO)$$

where *AEM2* is the Spearman correlation between changes in accruals and changes in net operating cash flow. Operating cash flow is the result of operating earnings less accruals.

$$AEM3 = \frac{|Acc|}{|CFO|}$$

where *AEM3* is the ratio of the absolute value of accruals to the net absolute value of operating cash flow. A firm-level composite of AEM is calculated by averaging the scaled firm rankings from each of the three individual AEM measures.

3.3. Real Activities Manipulation

Construction of the REM proxy follows prior research (Roy-chowdhury, 2006; Cohen and Zarowin, 2010; Zang, 2012; Lin et al., 2016), and examines the degree to which firms manipulate real activities through three measures: abnormal cash flow from operations (*CFO*), abnormal production costs (*PROD*), and abnormal discretionary expenses (*DISX*). *CFO* manipulation arises as a result of accelerated sales using aggressive price discounts or lenient credit terms. *DISX* manipulation arises via the reduction of advertising, R&D, and SG&A expenses. *PROD* manipulation results in a lower cost of goods sold (*COGS*) via overproduction to spread fixed costs over many units.

They are estimated respectively by Eq. (10-12). To determine a composite REM score, firm scores are ranked each year such that a higher score equates with greater REM. This is repeated for each of the three measures, and the average firm scaled rank becomes the composite.

$$\frac{CFO_{it}}{A_{it-1}} = \alpha_1 \left(\frac{1}{A_{it-1}} \right) + \alpha_2 \left(\frac{REV_{it}}{A_{it-1}} \right) + \alpha_3 \left(\frac{\Delta REV_{it}}{A_{it-1}} \right) + \epsilon_{it}$$

$$\frac{DISX_{it}}{A_{it-1}} = \alpha_1 \left(\frac{1}{A_{it-1}} \right) + \alpha_2 \left(\frac{REV_{it-1}}{A_{it-1}} \right) + \epsilon_{it}$$

$$\frac{PROD_t}{A_{t-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{t-1}} \right) + \alpha_2 \left(\frac{REV_t}{A_{t-1}} \right) + \alpha_3 \left(\frac{\Delta REV_t}{A_{t-1}} \right) + \alpha_4 \left(\frac{\Delta REV_{t-1}}{A_{t-1}} \right) + \epsilon$$

Where *REV* represents sales revenue; *DISX* is the sum of R&D, advertising, and SG&A activity; *PROD* is the aggregate of the COGS and changes in inventory during the year.

3.4. Regression Specification

This section describes the empirical model that analyses the effects of comparability on EM. This study follows Sohn (2016) using the mean value of the firm-pair comparability scores as the firm-specific financial statement comparability measure for target firm *i*'s. This measure captures target firm *i*'s financial statement comparability relative to its peers with the same 2-digit SIC code, which is more likely to be the broad bench-mark sample of comparable firms used by acquisition analysts to compare and contrast a potential target's accounting information. Eq 13 presents the regression constructed to test hypothesis H1 and H2:

$$AEM_{it}, REM_{it} = \alpha_0 + \alpha_1 \text{CompScore}_{it} + \alpha_2 \text{Size}_{it} + \alpha_3 \text{BM}_{it} + \alpha_4 \text{ROA}_{it} + \alpha_5 |\text{ROA}_{it}| + \alpha_6 \text{LEV}_{it} + \alpha_7 \text{OPERCYCLE}_{it} + \alpha_8 \text{SD_Sales}_{it} + \alpha_9 \text{CFOA}_{it} + \alpha_{10} |\text{CFOA}_{it}| + \alpha_{11} \text{RET}_{it} + \alpha_{12} \text{ANALY}_{it} + \alpha_{13} \text{LOSS}_{it} + \alpha_{14} \text{BIG_N}_{it} + \sum_t \gamma_1 \text{IND} + \sum_t \gamma_2 \text{YEAR}_t + \epsilon_{it}$$

Where *AEM_{it}* and *REM_{it}* are the accruals and real earnings management variables variable of firm *i* at time *t*, respectively. This study includes the following control variables routinely included in prior studies (Ashbaugh et al., 2003; Haw et al., 2004). These are firm size (*Size*), which is proportional to the natural logarithm an equity's market value, and book to market value (*BM*). Also included are return on assets (*ROA*), the absolute value of *ROA* (*ROA*), firm leverage ratio (*LEV*), operating cycle (*OPERCYCLE*) standard deviation of sales (*SD Sales*) cash flow from operations scaled by total assets (*CFOA*), the absolute value of scaled CFO (*CFOA*), return (*RET*), and analyst following (*ANALY*). Dummy variables employed are: *LOSS* if the company incurred a loss; and *BIG N* if the firm used a Big 4 (or Big 5 auditor). Dummy variables to control for industry and year effects, denoted as *IND* and *YEAR*, respectively, are also included.

4. RESULTS

4.1. Study sample, data sources, descriptive statistics, and descriptive statistics

Data was collected on all listed firms in 19 frontier countries from Datastream. Subsequently, financial and insurance firms were excluded from the sample due to their unique operating properties and regulations. Also removed were firms whose fiscal year-end is not March, June, September, or December, and those country/industries firms not meeting the minimum comparability requirement. Firms that remain are displayed in Table 2. Panel A lists the number of included firms by year. Panel B lists firms and observations by country, while Panel C provides industry data and two-digit SIC codes. The final total consists of 2,475 firms in the 2001 - 2017 time frame with a total of 27,549 observations across 11 industries.

Table 2: Composition of Sample by Calendar Year By Country, and by Industry

Panel A			Panel B				Panel C			
Sample by Calendar Year			Sample by Country of Listing				Sample by Industry			
year	n	%	Country	n	Freq.	%	SIC	Industry	Freq.	%
2001	568.0	23.0	Argentina	92.0	692.0	2	13	Oil & Gas	1,297	4.7
2002	90.0	3.6	Bangladesh	25.0	1286.0	7	20	Food Products	1,825	6.6
2003	122.0	4.9	Bulgaria	235.0	2488.0	8.7	24	Paper and paper products	2,926	10.6
2004	48.0	1.9	Croatia	305.0	1033.0	3.9	28	Chemical Products	1,280	4.7
2005	67.0	2.7	Jordan	134.0	1489.0	4.4	30	Manufacturing	13,413	48.7
2006	124.0	5.0	Kazakhstan	15.0	174.0	1.5	37	Transportation	314	1.1
2007	290.0	11.7	Kenya	150.0	166.0	0.4	46	Scientific instruments	181	0.7
2008	395.0	16.0	Kuwait	91.0	1229.0	3.9	48	Communications	1,080	3.9
2009	180.0	7.3	Mauritius	38.0	387.0	1.5	50	Durable goods	1,248	4.5
2010	101.0	4.1	Morocco	143.0	281.0	0.9	58	Eating and drinking establishments	3,883	14.1
2011	135.0	5.5	Nigeria	5.0	1221.0	3.7	80	Health	102	0.4
2012	76.0	3.1	Oman	18.0	940.0	2.6				
2013	54.0	2.2	Pakistan	82.0	3510.0	9.2				
2014	40.0	1.6	Romania	57.0	3241.0	11.9				
2015	53.0	2.1	Serbia	158.0	4221.0	18.7				
2016	81.0	3.3	Slovenia	92.0	115.0	0.4				
2017	51.0	2.1	Sri Lanka	271.0	2840.0	7.9				
			Tunisia	370.0	78.0	0.4				
			Vietnam	608.0	2158.0	11.1				
Total	2,475	100	Total	2,475	27,549	100	Total		27,549	100

¹ Where the firm-year accounting standard is known, the break down is as follows: IFRS 44.29%, US GAPP 0.03%, and local standard 55.68%. Argentina, Morocco, Pakistan, Tunisia, and Vietnam are non-IFRS adhering countries.

Table 3 reports the descriptive statistics for key variables in the study. The mean and median value for the comparison score *CompScore*, respectively is 0.632 and 0.394, with a standard deviation of 1.116. These values are in line with Conaway (2017) and suggest the comparison scores are reasonably distributed. The mean values for *AEM* for REM are 0.089 and 0.247, respectively, and are largely consistent with those reported by Sohn (2016) and Cohen et al. (2008). The large standard deviations for *AEM* and *REM* (0.110 and 0.341, respectively), are indications of *AEM* and *REM* practices that vary widely.

The mean annual stock return (*RET*) for the sample exhibits considerable variation with a mean of -98.89

per cent and a median of 0. This variation persists despite winsorization of the data at 1 per cent in the tails, indicating outliers remain. The quartile descriptive values for *RET* are more normally distributed at -9.07 and 8.99, respectively.

The mean value for control variables shows similarities and divergence from Sohn (2016)'s US-based. Mean values showing similarities are *ROA*, *LEV*, *Loss*, and *Analy*, with the following respective scores: 0.0447, 0.4882, 0.1509, and 2.776, respectively. Variables that show divergence are *Big4*, *Size*, and *BM* with the following respective scores: 0.3281, 16.7624, and 2.4516. *Big4* and *Size* are lower, while the mean *BM* value is higher.

Table 3: Descriptive Statistics

	AEM	REM	CompScore	Size	BM	ROA	ROA	LEV	OpCycle	CFOA	CFOA	RET	Analyst
Mean	0.089	0.247	0.632	16.7624	2.4516	0.045	0.085	0.482	58834	0.046	0.105	-100.99	1.777
Std. Dev	0.110	0.341	1.116	2.1449	24.2593	0.262	0.252	0.428	1416160	0.527	0.519	21784	1.086
Q1	0.023	0.057	0.142	15.4784	0.5204	0.000	0.018	0.246	2649	-0.005	0.020	-9.068	0.941
Median	0.055	0.145	0.394	16.7479	1.0049	0.029	0.049	0.455	4895	0.033	0.061	0.000	1.279
Q3	0.115	0.306	1.637	18.1932	1.8490	0.082	0.103	0.661	10281	0.106	0.129	8.991	2.660

Table 4: Pairwise Correlation Matrix

	AEM	REM	CompScore	SIZE	BM	ROA	LEV	OpCycle	SD_Sales	CFOA	RET	Analyst	Loss	Big4
AEM	1	0.292	0.041	0.053	0.029	0.324	-0.115	-0.085	-0.015	-0.556	0.035	-0.025	-0.205	-0.011
REM	0.222	1	-0.019	-0.095	0.072	-0.110	0.213	-0.070	0.111	-0.423	-0.045	-0.023	0.046	-0.027
CompScore	0.015	-0.011	1	-0.066	0.002	0.038	-0.091	-0.033	-0.098	-0.005	-0.023	0.367	-0.172	-0.254
SIZE	0.061	-0.041	-0.069	1	-0.406	0.383	0.012	0.129	0.606	0.297	0.145	-0.325	-0.207	0.164
BM	0.005	-0.002	-0.00214	-0.143	1	-0.261	-0.224	-0.151	-0.148	-0.200	-0.236	0.196	0.053	-0.065
ROA	0.259	0.015	0.005	0.131	-0.003	1	-0.191	0.177	0.203	0.437	0.225	-0.246	-0.518	0.087
LEV	-0.111	0.109	-0.073	-0.043	-0.043	-0.097	1	-0.0207	0.342	-0.057	-0.010	-0.207	0.082	0.032
OpCycle	0.008	0.002	-0.0109	0.006	0.000	0.006	0.000	1	0.108	0.244	0.075	-0.122	-0.055	0.075
SD_Sales	-0.022	0.0112	-0.092	0.284	-0.018	0.030	0.073	-0.00378	1	0.161	0.086	-0.323	-0.125	0.127
CFOA	-0.234	-0.145	-0.003	0.069	-0.004	-0.124	-0.0146	0.002	0.0153	1	0.128	-0.169	-0.201	0.093
RET	-0.004	0.008	-0.0102	0.028	-0.002	0.001	-0.002	-0.001	0.0015	0.0018	1	-0.061	-0.074	0.014
Analyst	-0.018	-0.003	0.475	-0.257	0.037	-0.047	-0.022	-0.0124	-0.067	-0.036	-0.0028	1	-0.003	-0.199
Loss	-0.250	0.004	-0.275	-0.301	-0.008	-0.273	0.151	-0.00838	-0.062	-0.047	0.0009	-0.113	1	0.061
Big4	-0.004	-0.022	-0.310	0.168	-0.018	0.013	0.017	-0.00840	0.066	0.020	0.00133	-0.271	0.121	1

[1] This table presents Pearson correlation in the bottom left and Spearman correlation in the top right. [2] Significance is identified at three levels: 0.05, 0.01, 0.001, by italics, bold-face, bold-faced italics, respectively.

Table 4 presents the results of pair-wise correlation between the main variables used in Eq (13). *CompScore* is significantly positively correlated with *AEM* (Spearman coefficient of 0.041, Pearson coefficient of 0.015). When *CompScore* is compared with *REM*, the coefficient is negative (Pearson -0.0106, Spearman -0.011). The variables *Size*, *LEV*, *SD Sales*, *Loss*, *RET*, and *Big4* auditors were all found to be significant and negatively correlated with *CompScore*. Analysts following was also significant, yet exhibited a positive correlation with firm comparison scores. The significance scores point to the appropriateness of the variables for continued use in the following analysis.

4.2. Discussion of the results

Prior studies commonly test EM linkages with comparability via pooled ordinary least squares (OLS) estimation. In Table 5, we present regression results of both AEM and REM variables firms, supplemented by four different methods: Pooled OLS, Fixed effects, Between effects, and quantile regression.¹¹ Application of the fixed effects models follows that the model addresses some statistical concerns not addressed by an OLS estimation, such as controlling for any unobservable firm-specific heterogeneities over time that is likely constant (Gerged et al., 2020; Glass et al., 2016) The random effects model varies from the fixed effects model in that intercepts based on cross-section vary randomly, instead of a fixed manner (Gujarati, 2009). Quantile regression method is used to more fully understand the various relationships financial comparability and EM with the additional benefit of mitigating problems such as non-Gaussian error distribution and sensitivity to outliers (Barnes and Hughes, 2002; Chi et al., 2020).

Consistent with prior OLS research (Frankel et al., 2002; Ashbaugh et al., 2003; Sohn, 2016), *AEM* is negatively correlated with *CompScore*. This finding holds true under all four tested models, indicating that greater comparability decreases AEM. *LOSS* and *Big4* were also negative and significant, suggesting an inverse relationship with AEM engagement. Examination of *REM* finds a negative relationship with *Size*, *Big4*, and *Loss* and a positive relationship with absolute *ROA*, and *CFOA* variables. The results suggest larger firms, and those with greater leverage, are more likely to engage in REM. *LEV* exhibits a positive relationship with AEM and REM (consistent with Beatty and Weber (2003) and Jelinek (2007)), suggesting that firms with high leverage engage in more EM. Contrary to developed market studies, the book-to-market valuation metric (*BM*) correlated negatively with REM under the OLS, Between Effects, and Quantile estimation methods. The book portion of the BM ratio contains two components: retained earnings and contributed capital. As contributed capital contains no predictive power, the variation rests in the retained earnings. The inverse relationship between retained earnings and a company's growth opportunities (Asgari et al., 2015) aligns with (Li and Kuo, 2017) in that firms with greater growth opportunities are less likely to manipulate earnings. Our findings further support that managers manipulate earnings due to a lack of growth opportunities. *ROA*, a measure of resource efficiency, also diverged from results found in developed market studies as both AEM and REM correlated negatively with the performance measure. When combined, both firm performance measures of *BM* and *ROA* suggest management may be transferring future gains to the present for improved reporting results at the expense of future performance.

¹¹The Hausman test for fixed vs. random-effects models returns a chi-squared value of 51.87, which is significant at the 0.01% level, indicating that the fixed-effects model is appropriate

4.3. The endogeneity issue

Managerial discretion may raise concerns of a potential endogeneity bias as the application of AEM and REM is decided at the managerial level. When loss-making, or loss-avoiding firms seek to avoid market consequences, a manager may employ changes in accounting techniques or real business practices. These changes may fundamentally impact the firm's financial performance.

Two additional tests are conducted to address a possible bias. The first test is a two-stage regression, whereby *CompScore* is first regressed on the control variables. Subsequently, the predicted comparison score (*CompScore*) is regressed on the EM variables. The second test incorporates a lagged variable of the comparison score. Test results provide additional insight into the robustness of the findings presented in Appendix 1.

Table 5 presents the results of the two-stage regression. Stage 1 of this regression includes the following control variables: standard deviation of return on assets (*SD ROA*), *Size*, *BM*, *Oper-Cycle*, *LEV*, the capital intensity ratio (*CapitalIntensity*), and intangible intensity

(*Intangible*). Regression results indicate that firm size, leverage, and capital intensity are significantly negatively correlated with *CompScore*. Regression coefficients are -0.021, -0.324, and -0.265 for size, leverage, and capital intensity. Stage 2 finds both EM values significant and positively correlated with the predicted firm comparison score, with a score of 0.158 and 0.838 for *AEM* and *REM*. These results differ from earlier findings and those of developed markets, suggesting increased firm comparability fails to constrain *AEM* or *REM*.

As stated above, a lag of the comparison score (*L.CompScore*) is introduced to test reverse causality between comparability and AEM. The thought here is that AEM may be so pervasive that REM is not required. Table 6 presents the results of Eq (13) on the *L.CompScore* variable. Consistent with earlier results, the comparability score is significant and continues to be negative with *AEM*. *REM* remains insignificant and positive with the comparison score under all but the between effects method. Results again support earlier results in that AEM is inversely related to *CompScore*, *Size*, *ROA*, *Loss*, and *Big4*, and positively related to firm *LEV*, *CFOA*, and *RET*.

Table 5: Earnings management variables regressed on firm comparison score

Variable	Stage 1	Variable	Stage 2	
	CompScore		AEM	REM
EM		<i>CompScore</i>	0.158** (19.54)	0.838*** (29.63)
Std_ROA	-0.189 (-1.89)	Std_ROA	-0.032* (-2.25)	-0.073 (-1.48)
Size	-0.021*** (-4.74)	Size	0.003*** (4.47)	-0.005* (-2.47)
BM	-0.001 (-1.57)	BM	0.000 (0.02)	0.000 (0.27)
OperCycle	0.008 (1.13)	OperCycle	-0.006*** (-5.74)	-0.015*** (-4.61)
LEV	-0.324*** (-10.84)	LEV	0.139*** (-9.88)	0.639*** (12.03)
Intangible	-0.051 (-0.97)	Intangible	-0.010 (-1.34)	-0.028 (-0.87)
CapitalIntensity	-0.265*** (-6.90)			
Intercept	2.085*** (10.05)	Intercept	0.080 (1.77)	0.916*** (6.18)
Industry Dummies	Included	Industry Dummies	Included	Included
N	10511	N	10847	10343
adj. R-sq	0.084	adj. R-sq	0.073	0.126

¹ Regression coefficient reported on the top line; t-statistic reported in parenthesis. Significance is identified at three levels: 0.05*, 0.01**, 0.001***. The results are based on fixed effects panel data regression with standard errors corrected for firm-level clustering. Each column presents the results for a different dependent variable, whose name appears at the top of the respective columns.

Table 6: Lag comparison score

	Pooled OLS		Fixed Effects		Between Effects	
	AEM	REM	AEM	REM	AEM	REM
L.CompScore	-0.001* (-2.22)	0.002 (0.81)	-0.000 (-0.62)	0.002 (1.15)	-0.002 (-1.95)	-0.002 (-0.36)
Size	-0.003*** (-3.76)	-0.011*** (-3.70)	0.005* (2.11)	0.011 (1.61)	-0.004** (-3.15)	-0.019*** (-3.31)
BM	0.000 (0.18)	-0.001 (-1.00)	0.001* (2.05)	0.002* (2.17)	0.000 (0.08)	-0.007* (-2.39)
ROA	-0.262*** (-16.57)	-0.069 (-1.17)	-0.223*** (-12.55)	-0.041 (-0.79)	-0.347*** (-11.70)	-0.099 (-0.68)
ROA	0.294*** (18.55)	0.171** (2.89)	0.254*** (14.24)	0.150** (2.86)	0.373*** (12.90)	0.129 (0.91)
LEV	0.019*** (4.07)	0.123*** (6.94)	0.015 (1.75)	0.077** (3.01)	0.012 (1.68)	0.081* (2.34)
Big4	-0.024*** (-5.06)	-0.122*** (-6.83)	0.000 (0.00)	0.000 (0.00)	-0.024*** (-3.61)	-0.071* (-2.17)
CFOA	0.052*** (8.55)	0.139*** (6.20)	0.050*** (7.11)	0.050* (2.43)	0.043** (3.18)	0.188** (2.94)
CFOA	0.083*** (12.66)	0.188*** (7.87)	0.076*** (10.17)	0.091*** (4.20)	0.134*** (8.88)	0.308*** (4.34)
Loss	-0.025*** (-6.11)	-0.051** (-3.22)	-0.021*** (-4.41)	-0.009 (-0.64)	-0.041*** (-5.27)	-0.109** (-2.88)
RET	0.002** (2.95)	-0.001 (-0.25)	0.003** (2.94)	0.004 (1.40)	0.000 (0.13)	-0.004 (-0.92)
Intercept	21.991** (3.06)	4.645 (0.14)	-20.732 (-1.70)	-16.935 (-0.48)	1.979 (0.04)	198.921 (0.62)
Industry	Included	Included	Included	Included	Included	Included
Year	Included	Included	Included	Included	Included	Included
N	10960	10718	10960	10718	10960	10718
Adj R-sq	0.179	0.338	0.103	0.237	0.276	0.292

¹Regression coefficient reported on the top line; t-statistic reported in parenthesis. Significance is identified at three levels: 0.05*, 0.01**, and 0.001***. ²Model 1 is pooled OLS. Model 2 is fixed effects. Model 3 is between effects. ³Results are based on panel data regression with standard errors corrected for firm-level clustering. Each column presents the results for a different dependant variable, whose name appears at the top of the respective columns.

5. SENSITIVITY TESTS

While the robustness checks above suggest that a firm's financial statement comparability is exogenous to its managers, we also examine other concerns. Specifically, we examine the individual REM measures, the impact of mandatory IFRS adoption in the European Union (EU), and the impact of country's legal system (civil and common law).

5.1. Individual REM measures

Aggregated REM measure may distort standard errors by eliminating individual variation and create misleading impressions with artificial clustering. Since a manager may rely on a combination of the three REM methods, and to increase the power of the test, Panel A in Table 8 illustrates the results of the

individual REM measures. The explanatory power of these tests is, however, relatively low (adjusted coefficient of determination across industry-years is 0.141, 0.183 and 0.204 for *CFO*, *DISX*, and *ProdCosts*, respectively). The results from the individual REM proxies are also quantitatively similar when tested collectively. Abnormal discretionary expenses show weak significance (0.001) with *CompSore*. Therefore, the overall linkage between individual REM activity and a firm's comparability score is inconclusive.

Table 7: IFRS and non-IFRS adhering countries

Variable	IFRS Only		No IFRS	
	AEM	REM	AEM	REM
CompScore	-0.005** (-3.13)	0.004 (0.96)	-0.004 (-1.22)	0.006 (0.52)
Size	-0.000 (-0.00)	0.006 (0.72)	-0.003 (-0.65)	0.004 (0.24)
BM	0.001 (1.81)	0.003* (2.48)	-0.003 (-1.36)	0.002 (0.17)
ROA	0.304*** (13.98)	0.093 (1.46)	0.054 (1.07)	0.600*** (3.31)
ROA	-0.275*** (-12.65)	0.018 (0.29)	-0.021 (-0.45)	-0.362* (-2.15)
LEV	0.009 (0.76)	0.059 (1.75)	-0.017 (-1.04)	0.176** (2.87)
Big4	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
CFOA	0.019*** (6.54)	0.033*** (3.83)	0.380*** (18.06)	0.391*** (5.06)
Loss	-0.027*** (-4.83)	0.011 (0.68)	0.007 (0.64)	-0.079 (-1.91)
RET	0.002 (1.91)	0.007 (1.84)	0.003 (1.25)	-0.002 (-0.27)
Intercept	-22.914 (-1.48)	3.998 (0.09)	-23.432 (-1.32)	-27.772 (-0.44)
Industry	Included	Included	Included	Included
Year	Included	Included	Included	Included
N	2957	2921	1812	1828
adj. R-sq	-0.085	-0.208	-0.054	-0.293

¹ Regression coefficient reported on the top line; t-statistic reported in parenthesis. Significance is identified at three levels: 0.05*, 0.01**, 0.001***. The results are based on fixed effects panel data regression with standard errors corrected for firm-level clustering. Each column presents the results for a different dependent variable, whose name appears at the top of the respective columns. IFRS adhering countries include: Bahrain Bulgaria, Croatia, Estonia, Jordan, Kazakhstan, Kenya, Kuwait, Lebanon, Mauritius, Oman, Romania Serbia, Slovenia Sri Lanka, and Tunisia ² Year from 2007 to 2017

5.2. Earnings management to avoid reported diminished earnings and losses

Burgstahler and Dichev (1997) offer evidence for the strong incentive for firms to avoid reporting diminished earnings. As the amount of time reported earnings remains positive, the incentive to manipulate financial results increases. The researchers also found an unusually low frequency of small decreases in earnings and small losses. Beatty et al. (2002) suggest the existence of an asymmetric pattern of more small earnings increases than small earnings decreases, is attributable to EM. In examining diminished earnings and small increases, we follow Gunny (2010) and define firms with small profits as those with net income (scaled by lagged total assets), in the interval between 0 and 0.01. Similarly, firms with small earnings increases are defined as those with an annual change in net income (scaled by total assets) greater than 0 but less than 0.01. Panel B in Table 8 reports the results of small profits and small increases. Contrary to results reported in Appendix 1. *CompScore* is positively related to AEM and negatively with *REM*. For the small-profit firm subset, we fail to show a significant

relationship between *REM* and *CompScore*. Our findings suggest that firms with small profits have a greater tendency to engage in AEM.^{12,13}

5.3. IFRS adoption in Europe

In 2005, EU firms were obligated to report financial statements in compliance with IFRS (Giner and Rees, 2005).¹⁴ Cross-country transparency, greater comparability (Barth et al., 2012), and reduced EM pervasiveness were reported improvements due to the common global financial reporting language. Cai and Wong (2010) found higher global capital markets integration after IFRS adoption. To evaluate the relative importance of cross-country accounting comparability, and EU IFRS adoption, EM between two periods of time were also examined. Years 2005 - 2006 (pre-IFRS adoption in the EU) and 2007 - 2009 (post-IFRS adoption). Table 8 Panel C, depicts both *AEM* and *REM* decreasing post-IFRS adoption, indicating that greater comparability after IFRS adoption leads to decreased EM.

5.4. Legal System

Greater shareholder protection improves the effectiveness of accrual accounting (Hung, 2000). A proxy for shareholder protection is a country's legal system, often classified as common law or civil law. Hung (2000) states that common law countries are likely to exhibit greater shareholder protection. Dayanandan et al. (2016) explain the presence of greater shareholder protection in common law countries by suggesting that common law countries possess stricter law enforcement and exhibit higher financial disclosure levels. As strong shareholder protections in the marketplace should attenuate management opportunism (Hölmstrom, 1979; Bao and Lewellyn, 2017), we reexamine Eq. (13) with a dichotomous variable for common and civil law countries to ascertain whether comparability and EM differ between the two legal systems. Results are reported in Panel D of Table 8. Both *civil* and *common* law countries show an inverse relationship between *AEM* and *CompScore*, with common law countries showing significance at the 0.01 per cent level. This finding is consistent with

¹² Wooldridge test for autocorrelation in panel data finds an F-statistic of 1786.826, which is significant at the 0.01% level for the lag comparable score value.

¹³ Breusch-Pagan/Cook-Weisberg test for heteroskedasticity score is 96.46, which is significant at the 0.01% level.

¹⁴ Prior to 2005, EU listed companies followed a variety of country-specific accounting principles.

earlier findings. While not statistically significant, *REM* exhibits an inverse relationship with *CompScore* in common law countries. However, an endogenous link between corporate governance and the quality of reported earnings is inconclusive from the single shareholder protection metric.

5.5. IFRS Adhering Countries

A portion of the countries in our study adopted IFRS, either voluntarily or as a EU membership requirement. We conjecture that the implementation of the standardised accounting systems limits the level of EM. Accordingly, we retest Eq (13) on IFRS and non-IFRS adhering countries separately for 2007 - 2017. This time frame is post EU IFRS adoption. *CompScore* was found to be both negative and significant in IFRS adhering countries. The results support earlier findings that link greater comparability with reduced AEM, and that the use of IFRS increased comparability and reduced AEM activity. Conversely, REM was found to be both positive and not significant in IFRS and non-IFRS adhering countries. These findings add robustness to earlier findings where greater comparability failed to reduce REM activity.

6. CONCLUSIONS

Using a comparability technique that maps accounting comparability based on a firm's financial statements and its economic performance for cross-country sampling, we examined 19 countries from 2001 to 2017. The results are robust after controlling for firm and country effects and employing several regression estimates. Our results contribute to the earnings management literature by showing the effects of increased comparability muted AEM activity, yet failed to influence REM activity. The departure of the second finding from the literature on developed markets casts doubts on the pervasive of REM in frontier markets. Given REM's adverse impact on long-term profitability and competitive advantage (Cohen and Zarowin, 2010; Wang and D'Souza, 2006), managers in frontier markets may be more attuned to

REM's costs and consequently engage in less of it. Study results also show firms operating in common law environments were less apt to engage in AEM as comparability increases, suggesting that judicial systems influence EM activity. Additionally, the relationship between comparability and REM changes from positive to negative after IFRS adoption in the EU, yet this was not supported when IFRS and non-IFRS adhering countries were tested independently. Inference from this finding leads us to believe that the adoption of IFRS leads firms to alter their application of EM application choices.

Taken together, results herein have several important implications for accounting standards-setting bodies, auditors, and investors. First, findings provide useful insight into frontier markets firms and their unique operating properties. The conduct divergence from that which is often found in developed markets suggests that values and norms differ and that findings from other markets may not be universally applicable.

From this, future studies may seek to further frontier market EM activity with an examination of classification shifting as a substitute for AEM and REM. Second, capital markets require integrity in financial reporting, and that convergence towards a single accounting system or harmonisation of existing systems is an ideal to be supported, as noted by the increased comparability score when IFRS adhering countries are studied in isolation. Third, increased comparability facilitates transnational information transfer, the result of which is stimulated enterprise competitiveness.

While our results are robust, future research may be interested to build upon the firm and country level control variables that are unique to frontier markets. It is hard to preclude that REM results are not influenced by the omission of such variables. Should the inclusion of such control variables yield similar results, analysts can be assured that the REM results are not biased.

Appendix 1: Earnings Management Tested on Financial Comparability

Pooled OLS AEM	Fixed Effects		Between Effects		Quantile			
	REM	AEM	REM	AEM	REM	AEM	REM	
CompScore	-0.002*** (-3.99)	0.002 (0.79)	-0.002* (-2.45)	0.002 (0.73)	-0.002* (-2.11)	0.007 (1.36)	-0.002* (-2.39)	0.003 (1.75)
Size	-0.003*** (-4.12)	-0.010*** (-3.64)	0.006** (2.62)	0.013* (2.00)	-0.004*** (-3.75)	-0.018** (-3.20)	-0.001 (-1.13)	-0.001 (-0.51)
BM	0.000 (0.54)	-0.001 (-0.97)	0.001** (2.91)	0.002* (2.42)	-0.000 (-0.15)	-0.007* (-2.32)	0.000 (0.80)	-0.001 (-1.03)
ROA	-0.253*** (-16.36)	-0.071 (-1.23)	-0.222*** (-13.05)	-0.048 (-0.95)	-0.329*** (-10.65)	-0.085 (-0.57)	-0.292*** (-17.42)	0.041 (1.08)
/ROA /	0.288*** (18.65)	0.172** (2.97)	0.257*** (15.00)	0.157** (3.06)	0.367*** (12.19)	0.110 (0.74)	0.334*** (19.91)	0.046 (1.21)
LEV	0.019*** 0.074*** (4.14)	0.130*** (7.62)	0.018* (2.16)	0.085*** (3.44)	0.010 (1.35)	0.085* (2.47)	0.015** (3.00)	(6.62)
Big4	-0.028*** (-5.90)	-0.120*** (-7.04)	0.000 (0.00)	0.000 (0.00)	-0.023*** (-3.50)	-0.074* (-2.34)	-0.015** (-2.87)	-0.046*** (-4.10)
CFOA	0.054*** (9.29)	0.137*** (6.53)	0.055*** (8.29)	0.054** (2.86)	0.032* (2.33)	0.194** (3.05)	-0.233*** (-36.84)	0.009 (0.62)
/CFOA /	0.086*** (13.81)	0.192*** (8.53)	0.082*** (11.66)	0.100*** (4.96)	0.129*** (8.36)	0.332*** (4.64)	0.444*** (65.72)	0.595*** (40.28)
Loss	-0.026*** (-6.37)	-0.052*** (-3.42)	-0.021*** (-4.46)	-0.012 (-0.85)	-0.046*** (-5.75)	-0.101** (-2.66)	-0.016*** (-3.55)	-0.020* (-2.01)
RET	0.002** (2.94)	0.000 (0.24)	0.002* (2.30)	0.004 (1.19)	0.000 (0.21)	-0.003 (-0.56)	0.001 (1.46)	0.002 (1.10)
Intercept	3.232 (1.34)	-11.688 (-1.01)	-18.989 (-1.52)	-9.706 (-0.28)	14.687 (0.96)	-44.985 (-0.51)	-12.823 (-0.95)	-17.299 (-0.59)
Industry	Included	Included	Included	Included	Included	Included	Included	Included
Year	Included	Included	Included	Included	Included	Included	Included	Included
Observations	12026	11600	12026	11600	12026	11600	12026	11600
Adj R-sq	0.188	0.090	0.065	0.198	0.268	0.095	0.359	0.136

¹ Regression coefficient reported on the top line; t-statistic reported in parenthesis. Significance is identified at three levels: 0.05*, 0.01**, and 0.001***. The results are based on fixed effects data regression with standard errors corrected for firm-level clustering. Each column presents the results for a different dependant variable, whose name appears at the top of the respective columns.

Table 8: Sensitivity Tests

Panel A				Panel B				Panel C				Panel D			
Individual REM proxies				Small Profit		Small Increase		2005-2006		2007-2009		Civil		Common	
CFO	DISC	ProdCosts	AEM	REM	AEM	REM	AEM	REM	AEM	REM	AEM	REM	AEM	REM	CompScore
0.000		0.001*	0.002	0.004*	-0.007	0.003	0.006	-0.001	0.003	-0.007**	-0.003	-0.001	0.004	-0.007**	-0.005
(-0.65)		(2.47)	(0.90)	(1.98)	(-0.83)	(1.01)	(0.50)	(-0.87)	(0.85)	(-2.75)	(-0.34)	(-0.89)	(1.10)	(-2.88)	(-0.55)
Size	0.006***	-0.002*	0.013*	0.007	0.007	-0.017**	-0.007	-0.003	-0.015	-0.005**	-0.010	-0.004***	-0.013***	-0.005**	-0.012*
(3.39)		(-2.29)	(2.06)	(1.44)	(0.34)	(-3.13)	(-0.30)	(-0.85)	(-1.16)	(-2.68)	(-1.56)	(-4.28)	(-3.65)	(-2.76)	(-1.97)
BM	0.001***	0.000	0.003**	0.001	-0.000	-0.001	-0.004	-0.001*	-0.001	-0.001	-0.009	0.000	-0.001	-0.001	-0.011*
(3.51)		(0.19)	(3.20)	(1.67)	(-0.18)	(-1.73)	(-0.81)	(-2.04)	(-0.70)	(-0.47)	(-1.76)	(0.84)	(-0.89)	(-0.45)	(-2.08)
ROA	-0.020	-0.016*	-0.016	1.073	6.512	0.522	-2.841***	-0.095	-0.086	-0.212***	0.086	-0.245***	0.038	-0.207***	0.031
(-1.43)		(-1.97)	(-0.33)	(1.24)	(1.96)	(1.75)	(-4.77)	(-1.50)	(-0.64)	(-6.59)	(0.86)	(-14.26)	(0.56)	(-6.48)	(0.28)
CFOA	0.018	0.028***	0.140**	0.000	0.000	-0.037	3.382***	0.325***	-0.035	0.319***	0.135	0.273***	0.070	0.315***	0.173
(1.27)		(3.37)	(2.86)	(0.00)	(0.00)	(-0.13)	(6.79)	(5.46)	(-0.28)	(9.91)	(1.33)	(15.89)	(1.04)	(9.84)	(1.56)
LEV	0.016*	0.002	0.062**	0.025	0.161	0.098***	0.073	0.022	0.077	-0.004	0.156***	0.019***	0.135***	-0.004	0.161***
(2.27)		(0.60)	(2.62)	(1.06)	(1.56)	(3.34)	(0.63)	(0.91)	(1.00)	(-0.42)	(4.28)	(3.49)	(6.38)	(-0.35)	(4.54)
Big4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.032	-0.003	-0.026*	-0.135**	-0.060***	-0.170***	-0.026*	-0.118**
(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(-1.59)	(-0.04)	(-2.18)	(-3.11)	(-7.76)	(-5.88)	(-2.25)	(-3.00)
CFOA	0.213***	0.014***	-0.019	-0.077*	-0.381**	-0.243***	-0.477***	-0.157**	-0.336*	-0.082***	-0.086	0.056***	0.103***	-0.083***	-0.101
(39.13)		(8.29)	(-1.07)	(-2.60)	(-3.13)	(-9.50)	(-4.62)	(-2.73)	(-2.00)	(-5.15)	(-1.71)	(7.96)	(3.95)	(-5.23)	(-1.87)
CFOA	0.251***	0.019***	-0.018	0.854***	0.937***	0.623***	0.479***	0.303***	0.892***	0.283***	0.562***	0.084***	0.143***	0.287***	0.626***
(43.58)		(10.43)	(-0.92)	(21.90)	(5.76)	(19.90)	(3.77)	(3.91)	(4.98)	(14.55)	(9.13)	(11.18)	(5.15)	(14.89)	(9.39)
Loss	-0.002	-0.006*	-0.008	0.004	-0.174	0.012	-0.125	-0.026*	-0.115**	-0.020*	-0.004	-0.022***	-0.054**	-0.020*	-0.027
(-0.47)		(-2.57)	(-0.56)	(0.12)	(-1.19)	(0.66)	(-1.80)	(-1.97)	(-2.80)	(-2.12)	(-0.12)	(-4.70)	(-3.05)	(-2.08)	(-0.82)
RET	0.001	0.001*	0.003	-0.002	0.001	0.000	-0.011	-0.000	-0.002	0.003*	0.002	0.003***	0.005	0.003*	0.004
(0.90)		(2.48)	(0.91)	(-0.87)	(0.13)	(0.15)	(-1.34)	(-0.30)	(-0.25)	(2.34)	(0.51)	(3.77)	(1.75)	(2.47)	(0.84)
Intercept	-7.463	-1.062	8.205	24.728	-130.239	-46.596	17.482	29.927	0.568*	48.719*	13.789	7.650	-22.001	45.211*	2.418
(-0.73)		(-0.18)	(0.25)	(1.18)	(-1.54)	(-1.90)	(0.18)	(1.58)	(2.42)	(2.36)	(0.22)	(1.59)	(-1.15)	(2.18)	(0.03)
Dummy Industry Year	- Included	- Included	- Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
N	10960	10960	10960	1333	1308	1785	1760	1382	1238	2368	2322	2764	2476	2862	2757
Adj R-sq	0.141	0.183	0.204	0.026	0.097	0.073	0.132	0.392	0.104	0.103	0.34	0.179	0.086	0.454	0.153

¹ Regression coefficient reported on the top line; t-statistic reported in parenthesis. Significance is identified at three levels: 0.05*, 0.01**, 0.001***. The results are based on fixed effects panel data regression with standard errors corrected for firm-level clustering. Each column presents the results for a different dependent variable, whose name appears at the top of the respective columns. Civil law countries: Bahrain, Bangladesh, Kenya, Kuwait, Nigeria, and Pakistan. Common law countries: Argentina, Bulgaria, Croatia, Estonia, Jordan, Kazakhstan, Lebanon, Lithuania, Mauritius, Morocco, Romania, Serbia, Slovenia, Sri Lanka, Tunisia, and Vietnam.

Appendices

Variable	Definition
<i>A</i>	= Total assets, sum of current and non-current assets. Source: Datastream.
<i>AEM</i>	= Accruals earnings management score, calculated using the Leuz et al. (2003) model.
<i>Analy</i>	= Analyst following, calculated by taking the natural log of one plus the number of analysts following a stock. Data source: Datastream.
<i>BM</i>	= Book to market, calculated by dividing book value of by equity market value.
<i>Big4</i>	= Big 4 or 5 auditor, dummy variable, set to 1 if yes. No otherwise. Source: Datastream
<i>CA</i>	= Total current assets, as stated on the balance sheet. Source: Datastream.
<i>CapitalIntensity</i>	= Capital intensity, calculated by dividing net PPE by total assets
<i>Cash</i>	= Cash as stated on the balance sheet. Source: Datastream.
<i>CFOA</i>	= Cash flow from operations divided by total assets at the start of the year.
<i> CFOA </i>	= Absolute value of CFOA.
<i>CL</i>	= Current liability. Source: Datastream.
<i>COGS</i>	= Cost of goods sold as stated on the balance sheet. Source: Datastream.
<i>CompScore</i>	= Firm-year level accounting comparability for the combination for firm <i>i</i> and other firms in the same two-digit SIC in a given year calculated as per Conaway (2017)
<i>DEP</i>	= Depreciation and amortisation. Source: Datastream.
<i>DISX</i>	= Abnormal discretionary expenses, estimated by discretionary expenses divided by lagged asset. Source: Datastream.
<i>EXP</i>	= Sales and General Admin expenses. Source: Datastream.
<i>Intangible</i>	= Intangible intensity, calculated as the sum of advertising and R&D expenses divided by sales
<i>INV</i>	= Inventory. Source: Datastream.
<i>NI</i>	= Net income before extraordinary items. Source: Datastream
<i>P</i>	= Price, annual share price at year end. Source: Datastream
<i>LEV</i>	= Leverage, calculated by dividing total assets by total liabilities
<i>LOSS</i>	= Loss, a dummy variable of 1 if dummy if loss generated (Net Income before extraordinary items < 0) as per Barth et al. (2012)
<i>OperCycle</i>	= Operating cycle, measured by natural logarithm of the sum of days receivables (365/(sales/accounts receivable)) and days inventory (365/(ales/ INV))
<i>PAY</i>	= Payable, net accounts payable. Source: Datastream
<i>PEN</i>	= Pension and retirement Expenses. Source: Datastream.
<i>PPE</i>	= Property, plant and equipment. Source: Datastream.
<i>REC</i>	= Receivables, total receivables. Source: Datastream.
<i>REM</i>	= Real earnings management score, calculated using the Roychowdhury (2006) model.
<i>RET</i>	= Return, the buy and hold stock return beginning nine months before and ending three months after year-end.
<i>ROA</i>	= Net income before extraordinary items divided by divided by total assets at the start of the year.
<i> ROA </i>	= Absolute value of cash flow from operations divided by total assets at the start of the year.
<i>REV</i>	= Revenue, net sales. Source: Datastream.
<i>SD ROA</i>	= Standard deviation of ROA for the previous five years at maximum
<i>SD Sales</i>	= Standard deviation of sales, calculated on the previous 5 years of revenue divided by total assets at the start of the year.
<i>Size</i>	= Firm size as calculated using the natural logarithm of market value of equity.
<i>STD</i>	= Short term debt. Source: Datastream.

Table 9: Comparison statistics by industry

Industry Code	Industry	Mean	St	p25	Median	p75
13	Oil & Gas	0.675688	1.168768	-0.066618	0.482174	1.590968
20	Food Products	0.605875	1.110439	-0.19555	0.31896	1.63655
24	Paper and paper products	0.501877	0.942295	-0.143579	0.271035	1.148677
28	Chemical Products	0.579586	0.975116	-0.072821	0.305981	1.352917
30	Manufacturing	0.686949	1.040302	-0.074995	0.408874	1.63655
37	Transportation	0.535878	1.201013	-0.281128	0.403475	1.610309
46	Scientific instruments	0.541757	1.008466	-0.101431	0.227001	1.485157
48	Communications	0.94091	1.038662	0.103156	0.800769	1.945861
50	Durable goods	0.423259	0.944788	-0.194386	0.211982	0.904411
58	Eating and drinking establishments	0.747424	1.00025	-0.032264	0.437514	1.63655
80	Health	1.003957	1.182698	0.031	1.448939	1.94591

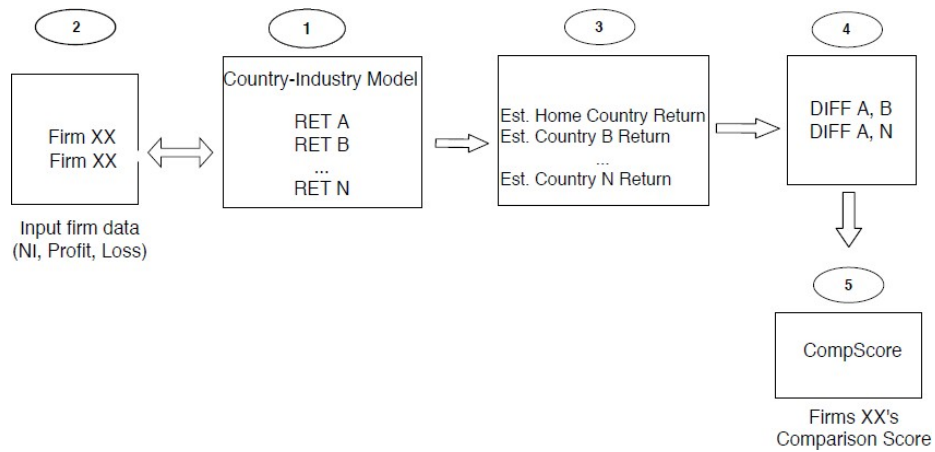


Figure 1: Comparison Score Method Illustrated

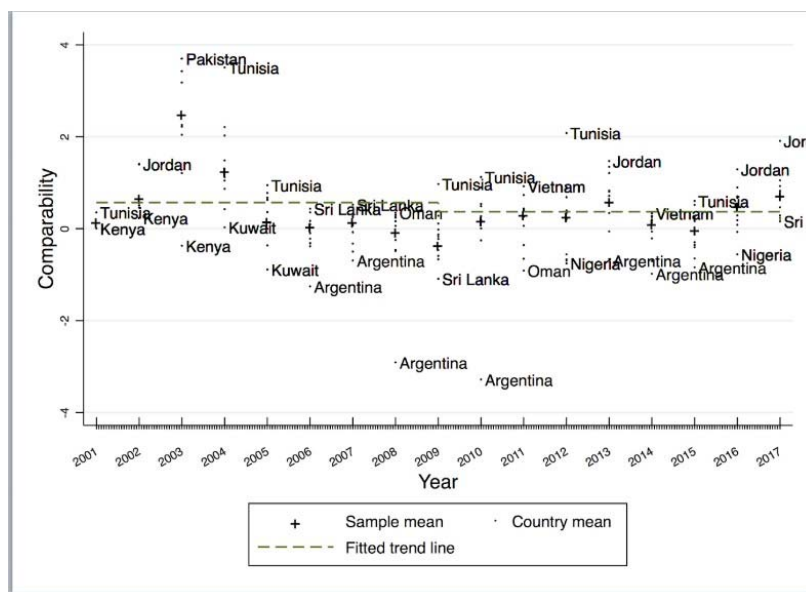


Figure 2: Comparison Trend

7. REFERENCES

- [1] Abarbanell, J., Lehavy, R., 2003. Biased forecasts or biased earnings? The role of reported earnings in explaining apparent bias and over/underreaction in analysts' earnings forecasts. *Journal of Accounting and Economics* 36, 105-146.
- [2] Abernathy, J. L., Beyer, B., Rapley, E. T., 2014. Earnings management constraints and classification shifting. *Journal of Business Finance & Accounting* 41, 600-626.
- [3] Ali, S., Bouri, E., Czudaj, R. L., Shahzad, S. J. H., 2020. Revisiting the valuable roles of commodities for international stock markets. *Resources Policy* 66, 101603.
- [4] Asgari, M. R., Pour, A. A. S., Zadeh, R. A., Pahlavan, S., 2015. The relationship between firm's growth opportunities and firm size on changes ratio in retained earnings of listed companies in tehran stock exchange. *International Journal of Innovation and Applied Studies* 10, 923.
- [5] Ashbaugh, H., LaFond, R., Mayhew, B. W., 2003. Do nonaudit services compromise auditor independence? further evidence. *The Accounting Review* 78, 611-639.
- [6] Bao, S. R., Lewellyn, K. B., 2017. Ownership structure and earnings management in emerging markets – an institutionalized agency perspective. *International Business Review* 26, 828-838.
- [7] Barnes, M. L., Hughes, A. T. W., 2002. A quantile regression analysis of the cross section of stock market returns .
- [8] Barth, M. E., 2008. Global financial reporting: Implications for us academics. *The Accounting Review* 83, 1159-1179.
- [9] Barth, M. E., Landsman, W. R., Lang, M., Williams, C., 2012. Are ifrs-based and us gaap-based accounting amounts comparable? *Journal of Accounting and Economics* 54, 68-93.
- [10] Bartov, E., Givoly, D., Hayn, C., 2002. The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics* 33, 173-204.
- [11] Beatty, A., Weber, J., 2003. The effects of debt contracting on voluntary accounting method changes. *The Accounting Review* 78, 119-142.
- [12] Beatty, A. L., Ke, B., Petroni, K. R., 2002. Earnings management to avoid earnings declines across publicly and privately held banks. *The Accounting Review* 77, 547-570.
- [13] Blackburn, D. W., Cakici, N., 2017. Overreaction and the cross-section of returns: International evidence. *Journal of Empirical Finance* 42, 1-14.
- [14] Braam, G., Nandy, M., Weitzel, U., Lodh, S., 2015. Accrual-based and real earnings management and political connections. *The International Journal of Accounting* 50, 111-141.
- [15] Bradshaw, M. T., Miller, G. S., Serafeim, G., et al., 2009. Accounting method heterogeneity and analysts' forecasts. Unpublished paper, University of Chicago, University of Michigan, and Harvard University.
- [16] Burgstahler, D., Dichev, I., 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics* 24, 99-126.
- [17] Cai, F., Wong, H., 2010. The effect of ifrs adoption on global market integration. *International Business and Economics Research Journal* 9, 25-34.
- [18] Cassell, C. A., Myers, L. A., Seidel, T. A., 2015. Disclosure transparency about activity in valuation allowance and reserve accounts and accruals-based earnings management. *Accounting, Organizations and Society* 46, 23-38.
- [19] Chauhan, Y., Kumar, S. B., 2019. Does accounting comparability alleviate the informational disadvantage of foreign investors? *International Review of Economics & Finance*.
- [20] Chen, A., 2016. Does comparability restrict opportunistic accounting?.
- [21] Chen, C. W., Collins, D. W., Kravet, T. D., Mergenthaler, R. D., 2018. Financial statement comparability and the efficiency of acquisition decisions. *Contemporary Accounting Research* 35, 164-202.
- [22] Chen, J. Z., Rees, L. L., Sivaramakrishnan, S., 2010. On the use of accounting vs. real earnings management to meet earnings expectations-a market analysis .
- [23] Chi, C. W., Hung, K., Liu, S., 2020. Corporate governance and earnings management in taiwan: A quantile regression approach. *Journal of Accounting and Finance* 20.
- [24] Chircop, J., Collins, D. W., Hass, L. H., Nguyen, N. N. Q., 2020. Accounting comparability and corporate innovative efficiency. *The Accounting Review* 95, 127-151.
- [25] Clemons, E. K., 2019. Resources, platforms, and sustainable competitive advantage: How to win and keep on winning, in: *New Patterns of Power and Profit*. Springer, pp. 93-104.
- [26] Cohen, D. A., Dey, A., Lys, T. Z., 2008. Real and accrual-based earnings management in the pre- and post-sarbanes-oxley periods. *The Accounting Review* 83, 757-787.
- [27] Cohen, D. A., Zarowin, P., 2010. Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics* 50, 2-19.

- [28] Conaway, J., 2017. Has global financial reporting comparability improved?
- [29] Ph.D. thesis. Cuervo Valledor, Á, Pérez Mena, A., Vicente Lo'pez, M., Calvo Clúa, R., 2016. Estudio de las posibilidades de inversión en los mercados frontera .
- [30] Darmadi, S., 2016. Ownership concentration, family control, and auditor choice. *Asian Review of Accounting* 24, 19-42. URL: <http://ezproxy.its.rmit.edu.au/login?url=https://search-proquest-com.ezproxy.lib.rmit.edu.au/docview/2080878050?accountid=13552>. name - International Bank for Reconstruction Development-World Bank; Copyright - Emerald Group Publishing Limited 2016; Last updated - 2019-09-06 - Malaysia; Indonesia.
- [31] Dayanandan, A., Donker, H., Ivanof, M., Karahan, G., 2016. Ifrs and accounting quality: legal origin, regional, and disclosure impacts. *International Journal of Accounting and Information Management* .
- [32] De Franco, G., Hope, O. K., Larocque, S., 2015. Analysts' choice of peer companies. *Review of Accounting Studies* 20, 82-109.
- [33] De Franco, G., Kothari, S. P., Verdi, R. S., 2011. The benefits of financial statement comparability. *Journal of Accounting Research* 49, 895-931.
- [34] DeFond, M., Hu, X., Hung, M., Li, S., 2011. The impact of mandatory ifrs adoption on foreign mutual fund ownership: The role of comparability. *Journal of Accounting and Economics* 51, 240-258.
- [35] Durnev, A., Li, T., Magnan, M., 2017. Beyond tax avoidance: Offshore firms' institutional environment and financial reporting quality. *Journal of Business Finance & Accounting* 44, 646-696.
- [36] Ebraheem Saleem, S. A., 2019. Audit committee, internal audit function and earnings management: evidence from Jordan. *Meditari Accountancy Research* 28, 72-90.
- [37] Enomoto, M., Kimura, F., Yamaguchi, T., 2015. Accrual-based and real earnings management: An international comparison for investor protection. *Journal of Contemporary Accounting & Economics* 11, 183-198.
- [38] Ewert, R., Wagenhofer, A., 2005. Economic effects of tightening accounting standards to restrict earnings management. *The Accounting Review* 80, 1101-1124.
- [39] FASB, 2010. Conceptual framework for financial reporting: Concepts statement no. 8 (Accessed on 09/13/2020).
- [40] Framework, C., 2018. Conceptual framework for financial reporting. IFRS Foundation.
- [41] Francis, J. R., Pinnuck, M. L., Watanabe, O., 2014. Auditor style and financial statement comparability. *The Accounting Review* 89, 605-633.
- [42] Frankel, R. M., Johnson, M. F., Nelson, K. K., 2002. The relation between auditors' fees for nonaudit services and earnings management. *The Accounting Review* 77, 71-105.
- [43] Ge, W., Kim, J. B., 2014. Real earnings management and the cost of new corporate bonds. *Journal of Business Research* 67, 641-647.
- [44] Gerged, A. M., Al-Haddad, L. M., Al-Hajri, M. O., 2020. Is earnings management associated with corporate environmental disclosure? *Accounting Research Journal* .
- [45] Giner, B., Rees, B., 2005. The introduction of international financial reporting standards in the European Union. *European Accounting Review* 14, 35-52.
- [46] Glass, C., Cook, A., Ingersoll, A. R., 2016. Do women leaders promote sustainability? analyzing the effect of corporate governance composition on environmental performance. *Business Strategy and the Environment* 25, 495-511.
- [47] Gramling, A. A., Myers, P. M., 2003. Internal auditors' assessment of fraud warning signs: Implications for external auditors. *The CPA Journal* 73, 20. Gregoriou, G., Wu, M., 2016. An application of style analysis to middle east and north african (mena) hedge funds, in: *Handbook of Frontier Markets*. Elsevier, pp. 19-31.
- [48] Gross, C., Perotti, P., 2017. Output-based measurement of accounting comparability: A survey of empirical proxies. *Journal of Accounting Literature* 39, 1-22.
- [49] Gujarati, D. N., 2009. *Basic econometrics*. Tata McGraw-Hill Education. Gunny, K. A., 2010. The relation between earnings management using real activities manipulation and future performance: Evidence from meeting earnings benchmarks. *Contemporary Accounting Research* 27, 855-888.
- [50] Hail, L., Leuz, C., Wysocki, P., 2010. Global accounting convergence and the potential adoption of ifrs by the us (part i): Conceptual underpinnings and economic analysis. *Accounting Horizons* 24, 355-394.
- [51] Hasan, M. M., Taylor, G., et al., 2020. Financial statement comparability and bank risk-taking. *Journal of Contemporary Accounting & Economics* , 100206.
- [52] Haw, I. M., Hu, B., Hwang, L. S., Wu, W., 2004. Ultimate ownership, income management, and legal and extra-legal institutions. *Journal of Accounting Review* 42, 423-462.

- [53] Healy, P. M., Palepu, K. G., 2001. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics* 31, 405-440.
- [54] Hölmstrom, B., 1979. Moral hazard and observability. *The Bell Journal of Economics* , 74-91.
- [55] Houqe, M.N., Ahmed, K., van Zijl, T., 2017. Audit quality, earnings management, and cost of equity capital: Evidence from india. *International Journal of Auditing* 21, 177-189.
- [56] Howard, M., Warren, M., Garnett, R., 2019. Misuse of non-mandatory earnings reporting by companies. *Meditari Accountancy Research* 28, 125-146.
URL:
<http://ezproxy.its.rmit.edu.au/login?url=https://search-proquest-com.ezproxy.lib.rmit.edu.au/docview/2182490449?accountid=13552>. copyright - Emerald Publishing Limited 2019; Last updated - 2019-09-06; South Africa.
- [57] Hughes, S., Larson, Robert, S. G. X., 2017. Difficulties converging us gaap and ifrs through joint projects: The case of business combinations. *Advances in accounting* 39, 1-20.
- [58] Hung, M., 2000. Accounting standards and value relevance of financial statements: An international analysis. *Journal of Accounting and Economics* 30, 401-420.
- [59] Hutchison, M. M., 2002. European banking distress and emu: institutional and macroeconomic risks. *Scandinavian Journal of Economics* 104, 365-389.
- [60] Jelinek, K., 2007. The effect of leverage increases on earnings management. *The Journal of Business and Economic Studies* 13, 24.
- [61] Joosten, C., 2012. Real earnings management and accrual-based earnings management as substitutes. *Tilburg University, Tilburg* , 52.
- [62] Kim, J. B., Li, L., Lu, L. Y., Yu, Y., 2016. Financial statement comparability and expected crash risk. *Journal of Accounting and Economics* 61, 294-312.
- [63] Kim, S., Kraft, P., Ryan, S. G., 2013. Financial statement comparability and credit risk. *Review of Accounting Studies* 18, 783-823.
- [64] Kiya, Ali, S.G., 2017. Financial statement comparability, accruals-based earnings management, real earnings management. an empirical test of tehran stock exchange. *Journal of Financial Accounting Knowledge* 26.
- [65] Klein, A., 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics* 33, 375-400.
- [66] Knapp, M.C., 1991. Factors that audit committee members use as surrogates for audit quality. *Auditing-A Journal of Practice & Theory* 10, 35-52.
- [67] La Porta, R., Lopez-de Silanes, F., Shleifer, A., Vishny, R.W., 1997. Legal determinants of external finance. *The Journal of Finance* 52, 1131-1150.
- [68] Lang, M. H., Maffett, M. G., Owens, E., 2010. Earnings comovement and accounting comparability: The effects of mandatory ifrs adoption .
- [69] Lee, M. G., Kang, M., Lee, H. Y., Park, J. C., 2016. Related-party transactions and financial statement comparability: evidence from south korea. *Asia- Pacific Journal of Accounting & Economics* 23, 224-252.
- [70] Lemma, T. T., Lulseged, A., Mlilo, M., Negash, M., 2019. Political stability, political rights and earnings management: some international evidence. *Accounting Research Journal*.
- [71] Lemma, T. T., Negash, M., Mlilo, M., Lulseged, A., 2018. Institutional ownership, product market competition, and earnings management: Some evidence from international data. *Journal of Business Research* 90, 151-163.
- [72] Leuz, C., Nanda, D., Wysocki, P. D., 2003. Earnings management and investor protection: an international comparison. *Journal of Financial Economics* 69, 505-527.
- [73] Li, L., Kuo, C. S., 2017. Ceo equity compensation and earnings management: The role of growth opportunities. *Finance Research Letters* 20, 289-295.
- [74] Li, S., Ho Park, S., Shuji Bao, R., 2014. How much can we trust the financial report? earnings management in emerging economies. *International Journal of Emerging Markets* 9, 33-53.
- [75] Li, S., Selover, D. D., Stein, M., 2011. "Keep silent and make money?": Institutional patterns of earnings management in china. *Journal of Asian Economics* 22, 369-382.
- [76] Lin, H. W. W., Lo, H. C., Wu, R. S., 2016. Modeling default prediction with earnings management. *Pacific-Basin Finance Journal* 40, 306-322.
- [77] Lin, S., Riccardi, W. N., Wang, C., Hopkins, P. E., Kabureck, G., 2019. Relative effects of ifrs adoption and ifrs convergence on financial statement comparability. *Contemporary Accounting Research* 36, 588-628.
- [78] MSCI, 2020. Msci market classification framework. https://www.msci.com/documents/1296102/1330218/MSCI_Global_Market_Framework_2019.pdf/57f021bc-a41b-f6a6-c482-8d4881b759bf. (Accessed on 04/28/2020).
- [79] Nouy, D., 2014. Regulatory and financial reporting essential for effective banking supervision and financial stability.

- <https://www.bankingsupervision.europa.eu/press/speeches/date/2014/html/se140603.en.html>. (Accessed on 09/13/2020).
- [80] Rodriguez-Ariza, L., Martínez-Ferrero, J., Bermejo-Sánchez, M., 2016. Consequences of earnings management for corporate reputation: Evidence from family firms. *Accounting Research Journal* 29, 457-474.
- [81] Roychowdhury, S., 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics* 42, 335-370.
- [82] Ruddock, C., Taylor, S. J., Taylor, S. L., 2006. Nonaudit services and earnings conservatism: Is auditor independence impaired? *Contemporary Accounting Research* 23, 701-746.
- [83] Salehi, M., Tarighi, H., Safdari, S., 2018. The relation between corporate governance mechanisms, executive compensation and audit fees: Evidence from Iran. *Management Research Review* 41, 939-967.
- [84] Shane, P., Smith, D., Zhang, S., 2014. Financial statement comparability and valuation of seasoned equity offerings.
- [85] Shen, C. H., Chih, H. L., 2005. Investor protection, prospect theory, and earnings management: An international comparison of the banking industry. *Journal of Banking & Finance* 29, 2675-2697.
- [86] Sohn, B. C., 2016. The effect of accounting comparability on the accrual-based and real earnings management. *Journal of Accounting and Public Policy* 35, 513-539.
- [87] Stereńczak, S., Zaremba, A., Umar, Z., 2020. Is there an illiquidity premium in frontier markets? *Emerging Markets Review* 42, 100673.
- [88] Tabassum, N., Kaleem, A., Nazir, M. S., 2015. Real earnings management and future performance. *Global Business Review* 16, 21-34.
- [89] Thomas, N. M., Kashiramka, S., Yadav, S. S., 2017. Dynamic linkages among developed, emerging and frontier capital markets of Asia-Pacific region. *Journal of Advances in Management Research* 14, 332-351.
- [90] Tran, N. H., Le, C. D., 2020. Ownership concentration, corporate risk-taking and performance: Evidence from Vietnamese listed firms. *Cogent Economics & Finance* 8, 219-238.
- [91] Tversky, A., Kahneman, D., 1992. Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk Uncertainty* 5, 297- 323.
URL:
<http://search.ebscohost.com.ezproxy.lib.rmit.edu.au/login.aspx?direct=true&db=bth&AN=16619060&site=ehost-live&authtype=sso&custid=s5445732>.
- [92] Wang, S., D'Souza, J., 2006. Earnings management: The effect of accounting flexibility on R&D investment choices .
- [93] Young, S., Zeng, Y., 2015. Accounting comparability and the accuracy of peer-based valuation models. *The Accounting Review* 90, 2571-2601.
- [94] Yu, G., Wahid, A. S., 2014. Accounting standards and international portfolio holdings. *The Accounting Review* 89, 1895-1930.
- [95] Zang, A. Y., 2011. Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *The Accounting Review* 87, 675-703.
- [96] Zang, A. Y., 2012. Evidence on the trade-off between real activities manipulation and accrual-based earnings management 87, 675-703.
- [97] Zaremba, A., Maydybura, A., 2019. The cross-section of returns in frontier equity markets: Integrated or segmented pricing? *Emerging Markets Review* 38, 219-238.
- [98] Zhang, J. H., 2018. Accounting comparability, audit effort, and audit outcomes. *Contemporary Accounting Research* 35, 245-276.
- [99] Zhou, Z., Ma, J., Geng, Y., 2017. Does tenure location impact governance role of independent directors? empirical evidence from the earnings management perspective. *Journal of Accounting and Economics*, 3.

INFLUENCES OF ITEMS ON CASH FLOW STATEMENT ON INVESTORS' DECISION IN SECURITIES MARKET: EVIDENCE IN VIETNAM

Nguyen Duc Dung ^{1*}

School of Accounting and Auditing, National Economics University, Hanoi, Vietnam

*Corresponding author: dungnd2141@gmail.com

Abstract

Financial statement is the key tool providing important information that users are based on to give out decisions, serve for direct benefits of investors, and assist managers to execute their business activities. Some studies show that the cash flow statement was introduced after the balance sheet and income statement so financial statement users evaluate a company mainly through its balance sheet and income statement but rarely through its cash flow statement. This writing of studies on influences of cash flow statement on investors is about comparison with the balance sheet and income statement. The writers find about the importance of items mentioned in financial statements, especially grand items in cash flow statement, to the decision of 145 investors in Vietnam securities market. The results of the studies indicate that investors do not have a high evaluation of the role of the items in cash flow statement like the ones in income statement and balance sheet. For this reason, the writers propose that investors should pay more attention to the information provided in cash flow statement basing on which to issue more effective and precise decisions. Moreover, company should present cash flow per share in cash flow statement so as to provide information to investors.

Keywords: cash flow statement, cash flow from operating activities, cash flow per share, investors.

1. INTRODUCTION

Cash flow statement is a statement of cash receipts, cash payments, and net cash changes in operating, investment, and financing activities of Companies during their accounting period. Cash flow statement supports users to evaluate each side of the companies' activities. Cash flow statement performs income-spending flow through 3 activity types: operating activities, investment activities, and financing activities. Cash flow statement assists users to evaluate if the operating activities are successful or not (Cash flow from operating activities), how companies invest in their operating infrastructure, equipment (Cash flow from investment activities), and which source of capital the companies mobilize for the investment activities (Cash flow from financing activities). The belief in these two financial statements has been severely depressed as WT Grant Company fell into bankruptcy while profits from business operations were good, with annual profits reaching over \$ 40 million. This is explained by the researchers that the amount of money paid by the firm was not enough to cover its expenses to cause negative cash flow for five consecutive years. When it does not meet the demand for the business pre-collapse, it is only the matter of time. In Vietnam, before 2003, Cash flow statement was not a type of mandatory financial statements, thus, it was not paid

much attention in the aspect of information provision. However, as the accounting system is being gradually improved to meet with global common practices, we are also laying more and more interest on the financial reporting system, especially cash flow statement. Today, the establishment of cash flow statement is not just formalistic. In reverse, are grand items in cash flow statement paid as much attention as the ones in business and financial reports? And how do investors evaluate items in cash flow statements?

2 . LITERATURE REVIEW

As cash flow statement appears, there is a common way of study, that is comparing and evaluating the usefulness, in the aspect of information provision, of cash flow statement and other financial reports, especially business reports.

Cash flow statement was first officially applied in the United States of America. Scientists have had a comparison of information provision in cash flow statement and in financial situation change reports before. Epstein et.al (1992) affirm the necessity of replacing financial situation change report by cash flow statement. The main purpose of cash flow statement is to provide financial report users with information related to cash and cash equivalents instead of changes

in working capital. Cash flow statement will help readers discover the relationship with income statement, the role of using cash or not using cash in corporate transactions. The writers all evaluate that cash flow statement is more evident, easier to understand, and more useful than corporate financial situation change report. Alaraini et.al (2003): the establishment of cash flow statement supplies more useful information to securities market. This study considers the differences of added information in cash flow around the issue of annual reports in periods 1986-1987 (before SFAS 95) and 1989-1990 (after SFAS 95). Generally, examinations show that SFAS 95 helps improve the quality and content of accounting information, evaluate companies better, and ascertain companies' stock price more exactly.

A recent aspect of study related to cash flow statement is the comparison of the role of information provision between this type of statement and the others, especially income statement. The Wampler et.al (2009) about business efficiency evaluation of companies with income statement gives a more specific result about cash flow statement. Many researchers agree with the above judgment but in a transparent information environment. After a lot of violations in stock market, many problems in income statement have arisen. Accounting tricks are used to modify the report, or the report provides information that is not entirely correct. Therefore, the writers indicate that cash flow statement provides valuable information in supplementation of business report. They assume that cash flow statement plays an especially important role in evaluating payment ability of companies, a very useful information for creditors. Besides, cash flow statement can also measure payable dividends and liabilities of companies. However, the writers yet deeply analyze scientific researches in order to enhance persuasiveness of the study, and they just either give out usefulness of cash flow statement to creditors but not other objects. Kwok (2002) directs creditors to cash flow statement and recommends them to base on this statement but not the others to decide to supply or not supply loans to companies. Cash flow statement will help creditors consider if borrowers have the ability to pay their debts in general, and how borrowers use and manage their loans during the term. He uses quantitative methods to points out clearly the efficiency of using cash flow statement, indicating the efficiency of corporate cash flow in evaluating solvency, development competence of companies is higher than EBIT and EBITDA which securities analysts usually use. To creditors, companies' solvency, especially in the short term, is a very important factor in loan or investment decision. Clinch et.al (2000) show a very noticeable point of view, that is, a declination of cash flow from operating activities is a sign of a decrease in companies' profit right in the years after. The Jackman (2011) continues this point of view and presents analyses of companies

in a period of about 18 years, from 1988 to 2005, to evaluate how financial problems of companies are predicted through information provided in cash flow statement. He also considers the relationship between details in cash flow statement themselves in predicting financial situation of the United States of America's companies. There are also ideas not recommending to compare the information provision role between these reports. The Kallunki and Paakki (2006) admits that there are relations between stock price and cash flow and profit. The writers, through surveys at 165 companies in 19 European countries, indicate that it is impossible to affirm that information in cash flow statement or income statement (which supports each other and together support stock price) have major influences on companies' stock price, or to measure development prospects of the companies. Meanwhile, Debra (2005) states that it is incorrect to analyze any financial statement independently while not using information in other financial statements. Income statement and Balance sheet are not suitable if just using these reports to give out decisions. Cash flow statement cannot either provides information to users separately. The decision to be given out is most precise just when considering information from all three types of important statements.

Although cash flow statement is beneficial, it requires users to have knowledge of information in the statement. The Mautz and Angell (2009) suppose that information in cash flow statement is not like revenues, spendings or profit in income statement. Information in cash flow statement is not necessarily about good or bad news for investors and creditors. For example, huge cash flow for buying equipment decreases cash balance of a company but it shows prediction about revenue growth in the future. Similarly, significant cash flow from capital issue is explained in a positive or negative way depending on capital structure, efficiency and prospect of the company. For this reason, cash flow statement is not appropriate to summarize statistics such as earnings per share, debt-to-equity ratio, etc. The items can be computed in the balance sheet and income statement. Cash flow statement must be understood and analyzed more specifically.

3. RESEARCH METHODS

The issue writers want to find out is the items that investors consider most important in analyzing companies. The questionnaire is designed based on the analysis of important items commonly used in stock market. Survey questions were sent directly or via email to a number of investors in securities companies such as Rong Viet Securities Corporation, Vietcombank Securities Company, BIDV Securities Company.

The question was put out for investors so as to choose 5 most important items numbered following levels of importance, simultaneously options were given out for the investors to select. The writers sent the survey to 200 investors in stock market, but the number of responses collected back was just 145. 63% of respondents were male. 57% of respondents had more than 5 years of experience in securities market, 23% of respondents had from 3-5 years of experience, and just 20% had less than 3 years of experience.

Through researches of securities companies in Vietnam, the writers gave out 16 items for the investors to choose, following levels of importance, in evaluating companies in which they would invest. This study is about investors with cash flow statement, thus, there are two among the items that the investors can just base on cash flow statement to provide information, they are cash flow from operating activities and cash flow per share. The more the investors use these items to analyze companies, the more important role cash flow statement plays in financial statements. In addition, to avoid missing important information, the writers left spaces for the investors to fill in statistics that they consider important in their decisions, in case these statistics were not mentioned in the survey. Items following levels of importance to analyze companies are in table 1.

In order to have a clearer view of the role of the items in the investors' evaluation, the writers suppose the investors to choose 5 marks for the most important item, 4 marks for the second most important item, 3 marks for the third most important item, 2 marks for the fourth most important item, and one mark for the fifth most important item. The better marks the items gain, the higher role in giving out investors' decisions the items play.

Table 1: Items to be chosen following levels of importance

Earnings per share <input type="checkbox"/>	Short-term assets <input type="checkbox"/>	Cash flow from operating activities <input type="checkbox"/>
Current liabilities <input type="checkbox"/>	Gross profit ratio <input type="checkbox"/>	Cash flow per share <input type="checkbox"/>
Long-term liabilities <input type="checkbox"/>	Pretax profit <input type="checkbox"/>	Stock price <input type="checkbox"/>
Profit from operating activities <input type="checkbox"/>	Debt to equity ratio <input type="checkbox"/>	P/E <input type="checkbox"/>
ROE <input type="checkbox"/>	Shareholders' capital <input type="checkbox"/>	Current ratio <input type="checkbox"/>
Total assets <input type="checkbox"/>	Other items (view in detail)	

4. RESULTS AND DISCUSSION

To evaluating items for investment decision. A very important element to evaluate investors' recognition of cash flow statement is also showed through the question about evaluation of the choice of key items for analysis to give out investment decision. Through the items, we can identify the ones in which statements that the investors pay most attention to. If the investors care more about EPS, pretax profit, then they pay higher attention to income statement. If they care more about cash flow from operating activities, cash flow per share, then they pay higher attention to cash flow statement. In the above table, there are many other items that according to experts, investors usually use to carry out basic analyses on companies. The survey results from the investors are viewed in table 2 and table 3.

Table 2: The investors' evaluation of items following levels of importance for analyzing companies

No.	Items	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5
1	Earnings per share (EPS)	28 (1)	21 (2)	16	10	15
2	Current liabilities	2	3	5	15	12
3	Short-term asset	1	2	2	9	7
4	Long-term liabilities	1	1	6	11	12
5	Profit from operating activities	12	18 (3)	9	1	13
6	Gross profit ratio	5	12	2	17	9
7	Pretax profit	21 (2)	24 (1)	19	18	9
8	Debt to equity ratio	13	8	32	15	8
9	Cash flow from operating activities	12	16	15	5	21
10	Cash flow per share	8	5	7	5	7

11	Stock price	2	6	6	13	8
12	P/E	16 (3)	9	6	15	11
13	ROE	7	8	5	2	0
14	Shareholders' capital	2	2	5	0	5
15	Current ratio	10	7	8	6	8
16	Total asset	1	0	2	3	0
17	Other items	4	3	0	0	0
Total		145	145	145	145	145

(1): Chosen most by the investors among levels of importance

(2): Chosen second most by the investors among levels of importance

(3): Chosen third most by the investors among levels of importance

Most important: 5 marks

Second most important: 4 marks

Third most important: 3 marks

Fourth most important: 2 marks

Fifth most important: 1 marks

(Source – Results collected by the writers)

Table 3: The total mark of the investors' evaluation of items following levels of importance for analyzing companies

No.	Items	Total marks
1	Earnings per share (EPS)	307 (1)
2	Current liabilities	79 (12)
3	Short-term asset	44 (14)
4	Long-term liabilities	61 (13)
5	Profit from operating activities	174 (6)
6	Gross profit ratio	122 (7)

7	Pretax profit	303 (2)
8	Debt to equity ratio	231 (3)
9	Cash flow from operating activities	185 (4)
10	Cash flow per share	98 (9)
11	Stock price	86 (10)
12	P/E	175 (5)
13	ROE	86 (10)
14	Shareholders' capital	38 (15)
15	Current ratio	122 (7)
16	Total asset	17 (16)
17	Other items	32
Total		

The items with higher marks are the ones receiving higher evaluation from the investors. Two items from income statement, earnings per share and pretax profit, have the total marks of 307 and 303. Next to them is the item computed from balance sheet, debt-to-equity ratio, with the total marks of 231. Cash flow from operating activities and P/E have the total marks much less than the above items, 185 and 175 marks. The cash flow per share item gains just 98 marks. So, the items from cash flow statement do receive attention but at a fairly much lower level than the ones from income statement.

Analyzing more specifically the investors' evaluation of the *most important items* among 145 survey papers, the two items chosen most belong to income statement, they are EPS (earnings per share) with 28 votes, and pretax profit with 21 votes, equivalent to 19.3% and 14.5% of the total votes. Ranking third among the most important items is cash flow from operating activities and P/E with 16 votes. Just 12 investors, occupying 8.2%, choose cash flow from operating activities, and just 8 investors choose cash flow per share, 5.5%. When being asked about the *second most important items*, 3 items chosen most by the investors are pretax profit with 24 votes, earnings per share with 21 votes, and net profit from operating activities with 18 votes, alternately similar to 16.55%, 14.5%, and 12.4%. Cash

flow from operating activities is ranked below these targets with 16 votes, and cash flow per share receives 5 votes with the rate of 3.4%.

To the *third most important items*, cash flow from operating activities is just ranked 4th with 15 votes, below debt-to-equity ratio, pretax profit, and earning per share. Cash flow from operating activities occupies approximately 10% of total votes. To the *fourth most important items*, cash flow from operating activities remains just 5 votes, equal to the votes from the investors for cash flow per share.

In the *fifth most important items* category, cash flow from operating activities gains the highest attention with 21 votes. To the investors, this statistic is the one they should consider, not the one that has much influence on their investment decision.

The investors also mention other options besides the items given out by the writers such as ROA (Return on total assets) and book value per share. Although cash flow per share is not among three most chosen items in all levels of importance, the number of votes for it is not low as a item not provided in cash flow statement. In the most important items category, it is voted by 8 investors, even higher than a very important capital item investment ROE (7 votes). So, there are investors paying attention to this item also it is not provided directly in cash flow statement.

5. CONCLUSION

Through the evaluation table of the importance of the items we can see that the investors actually and mainly pay attention to the ones provided in income statement. However, reality proves that paying less attention to cash flow from operating activities causes a lot of damages to investors, even in Vietnam or in the world.

Researches prove that investors dominantly care about income statement which reflects profit of companies while having less interest in cash flow statement or in the cash flow usually mentioned most in the statement, cash flow from operating activities. When companies' profit is positive, growth is stable, then investors make decisions that are not influenced by information provided in cash flow statement. The investors just pay attention to cash flow statement when the companies' profit is not as expected. This is a mistake of investors in decision making. As profit receives high attention, making high profit will help companies attract big investments easily. Thus, companies' profit is often modified by managers before it cannot be edited anymore. Cash flow provided in cash flow statement of companies usually reflects weak condition of companies earlier than income statement. If investors want to have long-term investments, they should care more about information in cash flow statement. Vietnam stock market is considered as an ineffective

information market because information is less transparent. In emerging markets, taking reference of information from transparent, honest reports which are not influenced by accounting estimates like cash flow statement is necessary.

This is presented clearly when collating with financial statements of listed companies in Vietnam stock market. Cash flow from operating activities usually predicts business declination of companies ahead of items in income statement. According to data from Hanoi Stock Exchange, Cavico Vietnam Mining and Construcion JSC was delisted on May 11th, 2012 saw a declination of business in two consecutive years 2011 and 2012. But in 2010, profit of the company was still positive, reported at 6,944,905,961, contrary to its cash flow from operating activity, decreasing to 19,102,362,945 in 2009 (by 32,693,910,301) in 2010. Similarly, BacViet Steel JSC was delisted on May 21st, 2015 for business losses in 3 consecutive years. The company witnessed fairly positive profit in 2010 and 2011 but its cash flow statement reflected that the company could not create enough cash flow from its key operation as cash flow from operating activities was continuously negative. Huu Lien Asia Corporation (HLA), MT Gas (MTG), etc. were either lack of cash flow from operating activities. MT Gas (MTG) had to delist all 12 million shares on June 5th, 2015 because the company saw profit in the previous years but its cash flow from operating activities was negative. The company did not have to delist for losses in 3 years, but when delisting, it witnessed a loss of over VND34 billion in 2014, while its audit company refused to state about its financial report. Financial reports of listed companies disclosed to the public on Hanoi Stock Exchange and Ho Chi Minh City Stock Exchanges are a secondary data source to evaluate financial status of companies.

To *cash flow per share*, this item is similar to EPS, thus, investors will find it hard to compute this item if just basing on information provided in cash flow statement. Therefore, investors expect to be provided with more information about this item in cash flow statement of companies. In the survey on the most important items in investment decision making, 8 investors choose cash flow per share when being asked to give out the most important item for basic analysis in making investment decisions. Although the voting rate of this item is not high, it is worthy to be paid attention because while there are several items to analyze, this item does not appear in financial statements. EPS item has been put into income statement for long, so now, it is time to present cash flow per share item in cash flow statement so as to provide information to investors.

6. REFERENCES

- [1] Alaraini, S. A., Healy, J. P and Ray G. Stephens, R.G. (2003), "SFAS 95 Cash flow information and securities valuation", *Research in Accounting Regulation*, **16**, 243-255.
[https://doi.org/10.1016/S1052-0457\(02\)16015-2](https://doi.org/10.1016/S1052-0457(02)16015-2)
- [2] Clinch, G., Sidhu, B., and Sin, S. (2002) , "The Usefulness of Direct and Indirect Cash Flow Disclosures", *Review of Accountings*, **7**(4), 383.
- [3] Debra, C. J. (2005), "Using the Statement of Cash Flows"; *Commercial Lending Review*; **20**(4), 3-45.
- [4] Epstein, Marc, J. P, Moses, L. (1992), "How Useful is the Statement of Cash Flows?", *Management Accounting*; **74** (1), 52 -55.
- [5] International Accounting Standards Board (1992), IAS 07 "Statement of Cash Flows".
- [6] Kallunki, P. J, and Paakki, E. (2006), "Stock market response to IFRS/IAS cash flows", accessed on November 12th, 2014, from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=871029.
- [7] Kwok, H. (2002), "The effect of cash flow statement format on lenders' decisions", *The International Journal of Accounting*, **37**(3), 347-362.
- [8] Jackman, T. A. (2011), *Corporate Bankruptcy and Prediction: An Analysis of Multi-discriminant, Logit and Survival Models Using the Statement of Cash Flows*, University of Nebraska.
- [9] Mautz, R. D., and Angell, R. J. (2009), "Reading the Statement of Cash Flows", *Comercial lending review*, **24**(3), 15-20.
- [10] Wampler, B; Harold C. (Carl) Smolinski, H.C., and Vines, T. (2009). "Making Stronger Statements: Cash Flow and Income", *Strategic Finance*, **91**(4), 43-49.

FINTECH FOR PAYMENT – A LITERATURE REVIEW

Nguyen Dang Tue ^{1*} and Hua Phuong Linh²

¹ Department of Financial Management, School of Economics and Management,
Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: tue.nguyendang@hust.edu.vn

² University of Language and International Studies, Vietnam National University, Hanoi, Vietnam

Abstract

Fintech is a rising phenomenon that has been attracting the attention of both academia and practitioners in recent years. There was a radical transformation in the financial area brought about by disruptive characteristics of Fintech. In the financial services sector, four sub-categories are considered encompassing payment, wealth management, P2P lending, and insurance. Aiming to demonstrate the effect of Fintech especially in payment service, a systematic literature review is performed, deploying findings of past researches according to our framework. The results show that fintech has the potential to remove all obstacles to financial accessibility and causes a profound transformation in the financial services sector. However, to develop Fintech for payment in Vietnam, it is necessary to promote a Fintech ecosystem as well as remove barriers for Fintech development such as limited access to information, incomplete legal framework, and customers' hesitance in Fintech adoption.

Keywords: Fintech, development, payment, service.

1. INTRODUCTION

Fintech is a relatively new concept which is attracting attention of many academics, researchers, and policymakers. There have been a quite number of studies about Fintech. However, there has not been any comprehensive literature review about Fintech for payment. In this article, the authors conducted a literature review on Fintech for payment to answer the following research questions:

What does Fintech for payment means and what are the implications of Fintech for payment development?

What is the current situation of Fintech for payment in Vietnam and worldwide?

Which factors are driving Fintech development in payment services?

To answer these questions, the authors applied the research methods of systematic literature review, applying bibliometric and content analysis, through a coding schema and network analysis. A systematic literature review is a rigorous methodological review of research results, whose objective is not only to group existing works on this subject but also meant to develop evidence-based guidance for the professionals involved. The results of this systematic literature review will identify the state of the art with respect to the research questions and provide researchers and practitioners with a structured, categorized view of what has been produced in the literature on fintech for payment from 2000 to the present (i.e. August 2020).

The structure of this article will be as follows. Following the introduction section, the authors review key definitions related to Fintech. The next section presents some facts about Fintech for payment in Vietnam and in the world. The subsequent sections provide reviews about which factors determine Fintech for payment development. The final section concludes the article with some concluding remarks.

2. BASIC CONCEPTS ABOUT FINTECH AND FINTECH FOR PAYMENT

2.1. Fintech and technology

From a technological perspective, Fintech is a concept used to refer to the application of new technologies and techniques such as cloud computing, big data analysis, artificial intelligence. Arner et al. (2016) argued that Fintech includes all applications and digital technology to provide financial solutions. Fintech can also be used to refer *businesses* applying innovative and modern technology to the financial sector, pay attention to interactions between the customer, payment services, investment & financing, insurance. Fintech aims to provide its customers with products and services similar to the fields that commercial banks have done so far such as payment, investment savings, credit. From a financial perspective, Chuen & Teo (2015) reasoned that FinTech was the products/services of financial service companies created by the innovation and innovation of information technology. Ernst & Young (2018) considers Fintech to be an innovation in the financial services industry thanks to the push of information technology. Freedman (2006)

views Fintech as building systems to model, value, and deliver financial products. Lee & Teo (2015) explained that Fintech is a business that uses software and hardware to provide financial services. As such, Fintech is a term that reflects the cross between technology and finance. It is not merely the digitalization of financial transactions but aims to provide innovative and breakthrough financial services thanks to the extensive and powerful application of information technology.

According to the WEF World Economic Forum (2017), Fintech's main areas of activity include (1) Payment; (2) Capital mobilization; (3) Loans; (4) Investment and asset management; (5) Insurance; (6) Blockchain and applications; (7) Technologies that support financial and banking activities (Electronic customer identification (e-KYC), information/credit rating). Fintech products are often divided into two categories by user: products that serve the final consumer (including technologies that help improve the way individuals borrow, manage money, talents, etc. funding), technological products that support the operations of Fintech and financial institutions. In this study, Fintech for payment refers to businesses and applications that apply financial technology to provide payment services. Fintech companies that focus on payments can quickly get customers at lower costs and are one of the fastest steps in innovation and acquiring new solvency. The object of these companies is consumers, retailers, and wholesale payment for businesses. Payment is one of the most used retail financial services every day, as well as one of the least regulated financial services. According to BNY Mellon, Fintech for payment provided services for consumers and retailers including e-wallets, mobile payments, forex and money transfers, instant payments, and digital money solutions. These services improve the experience of customers, who seek seamless payment experience for speed, convenience, and multi-channel access.

2.2. The implications of Fintech development

Fintech's coverage is more current and widespread than traditional commercial bank's products and services, using innovative and modern technologies to the financial sector to provide customers with transparent, efficient, and convenient financial solutions with lower costs than those of other financial institutions' traditional financial services.

Fintech companies tend to erase the boundaries between banking and non-banking financial institutions through a combination of various financial services on the same technology platform. In the long run, the combination and parallel activities will create the trend of financial intermediary institutions and change the market share and the role of traditional financial

institutions in the current economy (Navaretti & Pozzolo, 2017).

Fintech companies contribute to the promotion of financial inclusion based on technological advantages that enable users to have instant, affordable, safer access to diverse distribution channels and high productivity. The appearance of Fintech payment companies has been changing the way, places, and times consumers make payments, as well as creating favorable conditions for consumers to access various types of financial services. major, contributing to narrowing the gap between social strata. Fintech can bring service to users at any place and any time they need it. In terms of cost, Fintech allows providing effective financial services, helping financial services reach even low-income customers so that many people in need will have easier access. Fintech promotes the implementation of payment transactions of non-cash, mobile payments, helping financial services will become more transparent and safer for anyone to use payment solutions. Fintech for payment can combine multiple technologies such as tools for data analysis from core banking, credit institutions, electronic wallet, and mobile phones and apply algorithms to present customers' credit scores or reliability to provide fraud prevention measures.

3. THE DEVELOPMENT OF FINTECH FOR PAYMENT

3.1. The development of Fintech for payment in the world

In traditional financial markets, the connecting role is played by financial intermediaries. These intermediaries not only play dominant roles in the primary market, but also shape and impact the structure of the secondary market through a network connecting a large, diverse, and are interwoven, complex much more than production or distribution (Zhu et al., 2004). The application of information technology to the financial sector made it easier to organize, interact, and perform tasks (Bouwman et al., 2005). In 2008, together with the digital technology explosion, Fintech in general and Fintech for payment in particular became a phenomenon in the financial market. According to Alt & Puschmann (2012), there are some key reasons for this shift. The first is the spread of information technology solutions. In addition to traditional products, a collection of digital services, planning & consulting, payment, investment, funding, and cross-cutting support has shown Fintech's wide application in the banking industry. Next came the boom of the startup wave in the financial services sector. After the 2008 economic crisis, the wave of startups in the financial services industry increased. CBinsights (2018) pointed out that the total size of Fintech's venture capital increased from \$3.7 billion in 2013 to \$ 16.5 billion in 2017. The third is the change in behavior of existing customers for

online banking and interbank interaction. The explosion of personal electronic and digital devices allows customers to have unlimited access to financial information. In addition, digital technology assumed the work of the bank's consulting department. This reduced customer loyalty as well as increases the choice of service providers. In Germany, more than 50% of retail banking customers use services from other suppliers and are willing to use financial products of technology companies (du Toit & Burns, 2017). Finally, it is required to separate the retail and investment functions of the banking system, minimize fraud, and increase capital adequacy because of the global financial crisis in 2007. These increasingly stringent regulations have put pressure on traditional financial service providers. Consequently, Fintech has become a part of the financial industry, focusing on new applications, processes, products, or business models with some or more additional financial services, in the form of a direct process between service suppliers and customers via the Internet. Fintech's development prospects are clear through the information about investment capital in this field increased over the years. In 2018, investment capital in the financial technology industry was 111.8 billion USD, about 6 times higher than the total investment in 2013 (KPMG International, 2019).

The payment sector is the most prosperous one for Fintech development. Fintech for payment aims at people who make many low-value payments. Fintech offered new payment solutions based on mobile payment systems or mobile internet with e-money, payment via QR code, or money transfer based on peer-to-peer networks (i.e. peer to peer payment) to replace traditional payment services that require opening a payment account at a bank. New payment solutions have been created to help people pay more conveniently and quickly, reducing people's cash payment habits. The explosion of Bitcoin virtual currency has shown the strong development of Fintech's Blockchain technology. Bitcoin blockchain as a ledger for transactions automatically managed by the owner. Bitcoin is considered as the first digital currency to solve the problem of fraudulent spending when using a double amount of money. Blockchain technology is highly regarded for its security because data will be recorded on the encrypted technical ledger, transaction information is confidential and cannot be interfered by outside. At the same time, the transaction time is also faster when there is no intermediary, no manual processing as normal transactions, thereby contributing to reducing costs in transactions.

It can be seen that the areas of Fintech are not unfamiliar to customers, but the products and services they provide combined with modern science and technology have made a huge difference compared to the traditional transaction of commercial banks. The

first advantage of Fintech is that their products can launch in a very short time, the applicability of those products is very high, with proximity to customers. Second, Fintech companies are more innovative than commercial banks in providing products and services because they are not governed by legal barriers like commercial banks. Fintech can apply the newest, most advanced scientific technology (e.g. technology automation, artificial intelligence, distributed data analysis social networks, etc.) to bring to its customers better experience than the traditional inherent products of commercial banks. Finally, Fintech companies accept wide-ranging risks with high levels of risk. They are willing to take risks during operation. That is the reason why they can have access to those who have never been commercial bank customers.

Fintech has developed in many countries around the world, earliest in the UK, USA, and most strongly developed in China. In the UK, the Bank of England and the Financial Regulatory Authority (FCA) have long been strong supporters of financial technology. The UK has become a global leader in regulatory technology, providing fertile ground for many startups. FCA's innovation program supports new Fintech Companies and regulators who are considering creating robot manuals to speed up the resolution of specific issues in regulated entities. In Asia, regulators also recognize the need to raise technology awareness to assess the next generation of technology products and their regulatory implications. More and more managers are actively engaged in industry dialogues with market participants such as financial institutions, technology companies, training institutions to understand financial technology innovation and assess whether current rules, policies, and guidelines restrict technological solutions and innovation.

3.2. Fintech for payment development in Vietnam

Vietnam market is considered to have great potential for the development of Fintech for payment in both the number of businesses and revenue scale. Many factors are considered development advantages of Fintech for payment in Vietnam such as the widespread coverage of internet and smartphones commonly used in urban centers, increased income and consumption, and developed commerce, which have contributed to promoting Fintech growth potential in Vietnam. In addition, the number of startup incubation programs, startup promotion, and entrepreneurship promotion programs ranks second in the ASEAN region (Solidiance, 2017). The domestic population at a young age with high connectivity needs, along with the convenience of smartphones become a strong base for Fintech companies to soon develop and gain their market share.

Fintech payment companies in Vietnam provide e-wallet services (e.g. Moca, Payoo, VinaPay, Momo,

etc.) or provide POS/mPOS4 digital payment solutions (e.g. Hottab, SoftPay). Fintech companies for e-wallets provide consumers with online payment tools or provide digital payment solutions based on technology. Since 2008, the State Bank has allowed many non-banks to provide payment services. Up to now, after the promulgation of more complete legal regulations, the State Bank has licensed official operation for payment intermediary service providers. As of 2019, more than 29 non-bank payment service providers are licensed to provide intermediary payment services, many of them are Fintech startups.

The ratio of population ratio using non-cash payment methods is reaching a higher level. The proportion of people using various forms of digital payment reaching 22.7% while the proportion using of commercial bank accounts for payment stays at only 2.9%. This is a favorable condition for Fintech payment in Vietnam to thrive, especially electronic wallets (Bui Thi Men, 2019).

Many Vietnamese commercial banks decided to cooperate with Fintech companies instead of becoming their rivals. Approximately 72% of the Fintech companies in Vietnam set up cooperation activities with banks and business service providers. This partnership is expected to be the premise to contribute to improving Fintech payment services in Vietnam. For example, Military joint-stock commercial bank (MB) has developed a digital bank based on the cooperation with strategic partner Viettel, or as a model of cooperation between Vietcombank and M_Service Company in remittance payment. VIB International has also cooperated with Fintech Weezi to launch MyVIB Keyboard, a social networking money transfer application. Techcombank has together with Fastacash introduced F@st Mobile feature, fast money transfer method via Facebook and Google+.

Several Vietnamese commercial banks contribute capital to Fintech payment companies and become their major shareholders. Fintech payment products and services are used by commercial banks such as Momo e-wallet, Payoo, 123 Pay, Finsom for retail customer payment services, money transfer, and most recently QR code checkout. Fintech payment's role is to assist commercial banks in providing banking products and services to those who do not have an account with banks or small and medium-sized businesses. In addition to payment products and services, commercial banks also provide their customers with Smart banking applications with non-banking products and services. Through Smart banking, customers of commercial banks can book airline tickets, buy movie tickets online, book hotels, shopping online, or track the portfolio of its securities, money transfer via the phone number, virtual assistant features,... By the end of 2019, most of 93 commercial banks in Vietnam provided

mobile banking and internet banking services for their customers.

Among Vietnamese commercial banks, BIDV was quite successful in cooperating with Fintech. Thanks to Fintech's products and services, BIDV has supplemented its traditional payment system with cards with new forms of payment, such as online payment on websites, mobile payments. (QR codes, Samsungpay, electronic wallets,...). Another strong case for Fintech payment development is TP Bank. Products from TPBank that help customers withdraw money by fingerprint at LiveBank, withdraw by QR Code on both LiveBank and ATM. In addition, TPBank also has TPBank mPOS, a card payment solution; TPBank mPOS Plus, accepts card, ATM, Visa, Master Card payments, runs independently by 3G or Wi-Fi SIM card; TPBank QuickPay is a mobile and tablet application running iOS and Android operating systems that allow payment and transfer of money easily and quickly via QR code. TPBank has released QuickPay with unique and friendly features. Installing TPBank QuickPay application on the phone, users will own a high-tech wallet, without having to carry a wallet or bank card. TPBank has issued a Livebank system which allows opening payment accounts, open savings accounts, deposit/withdraw money with TPBank accounts or other bank accounts with ID cards and passports at any time, contributing to bringing full utilities of a traditional branch to LiveBank - Automatic Banking 24/7. Another typical case is ABBANK launching a trial version of a new financial services application with the reference name Wee @ ABBANK at the forum "Open Innovation, Fintech: Multi-piece pie". This is the first financial application in Vietnam to use the Payment Solution for Facial Recognition. ABBank also developed a digital banking system for convenient and quick online transactions, customers can open online cards, borrow online capital, online payment, electronic customs tax payment 24/7 for businesses. To bring customers more utilities and a variety of financial tools, ABBANK has deployed TrueMoney e-wallet. For this service, customers can get many utilities such as Bill payment: postpaid mobile, insurance, television, Internet, phone cards, game cards, recharge prepaid phone networks; giving gifts, donate money to friends and relatives with many privileges. Saigon Commercial Joint Stock Bank (SCB) also implemented a project to change the transaction model and to make payment simpler. Following the successful implementation of SCB QR Easy-payment method via QR code on Mobile Banking application with money from payment account or SCB Mastercard international credit card, from August 20, 2018, SCB officially expanded the payment method with SCB Visa credit card. Also, it is developing a contactless payment function. Specifically, with the above technology, customers do not need to give the card to the seller to scan through the POS like the traditional

method, but just a touch or flick the card in front of the POS screen to be able to perform payment. Not only simple, fast, but contactless payment technology will increase the safety and security for customers when they can manage their own cards while making transactions, avoiding lost cases, making fake cards, or copied information. Currently, more than 3,000 suppliers of goods and services accept this form of payment such as CoopMart, AEON Citimart, Big C, Wall Street English, Nguyen Kim, KFC.

4. WHICH FACTORS ARE DRIVING FINTECH FOR PAYMENT DEVELOPMENT

4.1. Fintech ecosystem

Fintech companies have been promoting key innovations in the areas of payments, asset management, lending, capital mobilization, capital markets, and insurance by reducing operating costs, target niche markets, and provide more personalized services than traditional financial companies. Consumers, instead of relying on a single financial institution to meet their needs, are beginning to choose the services they want from different companies. Venture capitalists and private equity funds support and benefit from the creation of startups in the Fintech sector. Meanwhile, technology developers provide digital platforms such as social networks, big data analytics, cloud computing, artificial intelligence, smartphones, and mobile services, etc. technology developers create a favorable environment for startups to deploy innovative services quickly. Analyzing large data can be used to provide services personalized for customers and cloud computing can be used to support the startups Fintech lack of money to deploy services web-based services with an internal infrastructure development cost. The trading algorithm can be used as the basis for the service financial advisory automatically lower cost than the asset management services communications system. Social networks create conditions for community development when mobilizing capital from the community. Promoting the development of elements of the Fintech ecosystem is creating sufficient conditions to promote the development of Fintech companies, thereby promoting access and use of official financial services appropriately at an affordable price.

Lee's analysis (2018) of the Fintech business model and ecosystem shows that the Fintech ecosystem consists of 5 main components: Fintech startups; technology developers; Government; financial services customers and traditional financial institutions.

(Gai et al., 2018) showed that the critical section of FinTech is mostly data-related, from using data for value creations to formulating data trading mechanisms, from designing data mining algorithms to developing financial privacy protection methods. This phenomenon is associated with the feature of the

financial industry, which is broadly offering electronic financial services in which data provide service representations with content sources.

(Drasch et al., 2018) suggest structuring and describing bank-fintech cooperation through 13 dimensions and 6 clusters of cooperation patterns. Fintech in payment is suitable in Cluster 1: in which banks invest in fintech to form an alliance and access the fintech's ecosystem. It encompasses cooperation in which primarily branch-oriented banks invest in fintech so as to access fintech-centered ecosystems and Cluster 2 where banks acquire and integrate channel solutions and interaction platform innovation. The prevailing pattern in cluster 2 can be illustrated as cooperation between branch-oriented banks seeking CS and IP technologies. The banks in this cluster acquire a fintech, restrict the ecosystem, and integrate the innovation to become its holder.

(Iman, 2018) argued that mobile payment systems will result in divergent trajectories. Their development is a product of the previous and current configuration of the market or the industry, particularly the attributes of the structure (e.g., the type of economic actors, market competition, the relationships of power) as well as corporate strategy. (Kang, 2018) showed that unlike traditional payment services, payment services can be used with a simple password or biometric authentication, and by independently providing payment services without the need for different payment services for each financial service, it has enabled mobile payment through a single payment service. Especially, it provides simplicity to the online/offline store that sells the goods, rather than providing services only considering the payment users.

4.2. Barriers to the development of Fintech

Reflecting on the Fintech ecosystem mentioned in the previous section, in its development process, Fintech for payment must face obstacles that it can hardly overcome on its own. The two biggest barriers are access to data sources and legal barriers.

4.2.1 Barriers to information access

Data sources are one of the biggest obstacles for financial technology companies. For regulatory reasons, banks are often reluctant to share data with outside companies. The regulator plays a key role in promoting cooperation between Fintech Companies and banks. This is because regulators can establish a framework, including restrictions on financial technology products and services. If managers require financial market innovation, they must provide an environment that allows participants to eliminate anxiety and have policies that support innovation. Regulators can promote cooperation with a positive impact by creating a regulatory Sandbox environment that allows financial institutions to test new ideas

among real consumers over a period and with no strict legal constraints. This also creates opportunities for existing financial institutions to partner with financial technology companies.

In Vietnam today, in the field of operation of commercial banks and Fintech have similarities and complementary to each other very well. As commercial banks only focus on the customer in the city is primarily the Fintech episode centered on the individual customer, the customer has no account of commercial banks or customers with the drooping High risk, small and medium enterprises or micro-enterprises have difficulty accessing capital of commercial banks. On the other hand, Fintech can assist commercial banks in the application of high-tech scientific services in payment, money transfer, investment, etc. The technological revolution 4.0 has created an environment facilitate the combination of Fintech and commercial banks. Many products and services are provided to customers in this context, such as building and deploying customer care via chatbot when using AI; from big data analytics help forecast consumer demand, thereby helping to offer appropriate credit, credit card, overdraft, and fast payment products; perform credit rating through data analysis and customer behavior through social networks (Facebook, Viber,...); automation of customer identification process, customer care, providing customer transaction needs at the counter and online; Cloud computing helps commercial banks save infrastructure investment costs from storage to processing, backup, disaster backup. Due to the disadvantages of both commercial banks and Fintech, the model of cooperation between these two entities to overcome their weaknesses in the operation process has become an inevitable trend in the coming time. This combination helped the commercial banks in increasing transparency and efficiency with modern technology solutions alternative to the products and services of traditional banks. On the other hand, based on information from the core banking of commercial banks, Fintech can research and apply Open API solution to establish an interactive interface without having to connect directly. It is easy to see that the model of cooperation between commercial banks and Fintech will ensure the right to manage the integrity of customer information, while helping Fintech have enough information to process transactions for customers. customers of the bank.

4.2.2. Legal framework for the development of Fintech

In terms of the legal framework, along with the policy to support the startup ecosystem under Decision 844/QD-TTg, since 2016, the State Bank has allowed testing a few cooperation models between the bank and other Fintech company.

The State Bank of Vietnam issued Circular No. 39/2014/TT-NHNN dated December 11, 2014, providing intermediary payment services including provision of electronic payment infrastructure services and payment service support. In March 2017, the Governor of the State Bank also established a Steering Committee in the field of Fintech, in which the State Bank Payment Department was assigned to be the Standing Agency, assisting the Steering Committee. The Steering Committee has the following tasks: To submit to the Governor of the State Bank for approval annual programs and plans; advising and proposing to the Governor solutions to improve the ecosystem, including completing the legal framework to facilitate Fintech enterprises in Vietnam to develop, in line with the Government's policy and orientation. covered; submit to the Governor for the decision on important contents related to Fintech such as Fintech development strategy in Vietnam.

Currently, for financial technology to contribute to the promotion of financial inclusion, the State Bank has initially implemented several Fintech fields, serving as a basis for formulating appropriate and encouraging policies. innovation, while ensuring the harmonious development of Fintech and the bank, controlling risks, protecting the interests of consumers. However, the regulation for Fintech for payment is not yet integrated with other electronic commercial activities such as buying and selling online.

4.2.3. Potential customers' hesitance in new payment method adoption

Although Fintech for payment has great potential to attract customers with products and services that are more user-friendly, efficient, transparent, and automated than those currently available, new customers especially those who are not acquainted with new forms of payment and information technology may find it difficult to adopt Fintech. For example, (Iman, 2018) showed that although mobile phones have provided such an enormous opportunity for financial development, and are anticipated to become a common tool for carrying out various financial transactions hundreds of mobile payment services introduced across the globe have failed.

(Jünger & Mietzner, 2020) argued that a household's level of trust and comfort with new technologies, financial literacy, and overall transparency impact its propensity to switch to a FinTech. Specifically, households with low levels of trust, good financial education, and preference for transparency are characterized by a higher probability of adopting FinTech. In contrast, household price perceptions do not appear to significantly impact switching probability. (Lee et al., 2019) suggested that an integrated model in which user perception and retailer

perception influences each other's demand from the perspective of the two-sided market.

(Hyun-Sun, 2018) reveal that legal risk had the most negative effect on the Fintech continuance intention, while convenience had the strongest positive effect. The author also found that differences in specific benefits and risk impacts are found between early and late adopters.

In short, Fintech for payment businesses should analyze and understand thoroughly their current and potential customers so that they can retain and attract more of them.

5. CONCLUSION REMARKS

Fintech has a strong impact on the financial-banking ecosystem, including supply, demand, support systems, and the legal framework. Fintech creates new ways of providing products and services and can change the financial system in which the traditional banking system is most affected, both in terms of business and management. The impact of Fintech can be seen from a positive and negative perspective. Currently, in Vietnam, Fintech is developing most strongly in payment-related services. To grow stronger, Fintech needs to overcome legal barriers and access to information. Besides, to make Fintech for payment develop, it is essential for Fintech companies to understand the potential customers' behavior especially when Fintech for payment was still new to them. Fintech companies should seek to know the factors affecting its adoption.

6. REFERENCES

- [1] Allen, F., Demirgüç-Kunt, A., Klapper, L., Peria, M. (2012). The Foundations of Financial Inclusion: Understanding Ownership and Use of Formal Accounts. World Bank Policy Research Paper 6290, World Bank.
- [2] Alt, Rainer & Puschmann, Thomas (2012). *The rise of customer-oriented banking: electronic markets are paving the way for change in the financial industry*. Electronic Markets, 22 (4). 203-215. ISSN 1019-6781.
- [3] Arner, D. W., Barberis, J., & Buckley, R. P. (2016). The evolution of Fintech: A new post-crisis paradigm? Georgetown Journal of International Law, 47(4), 1271-1319.
- [4] Bouwman, H., den Hooff, V., van de Wijngaert, L., & van Dijk, J. (2005). Information and communication technology in organizations: Adoption, implementation, use and effects. Sage Publications. \Alt, R. & Beck, R. & Smits, M. T. (2018), Fintech and the transformation of Finance Industry. Electronic Markets, 28:235-243.
- [5] Buchak, G., Matvos, G., Piskorski, T., & Seru, A. (2018). Fintech, regulatory arbitrage, and the rise of shadow banks. Journal of Financial Economics, 130(3), 453-483
- [6] Bùi Thị Mến (2019). Fintech đối với thúc đẩy tài chính toàn diện ở Việt Nam. Hội thảo khoa học Quốc gia Thúc đẩy phát triển tài chính toàn diện tại Việt Nam: Vai trò của các tổ chức tài chính và ứng dụng CNTT trong thúc đẩy phát triển tài chính toàn diện tại Việt Nam. Hà Nội: Nhà xuất bản Tài chính.
- [7] CBInsights (2018). Global Fintech report Q1 2018. <https://www.cbinsights.com/research/report/fintech-trends-q1-2018/>
- [8] Digital Banking, WEF (2017) The future of financial services 84-104.
- [9] Drasch, B. J., Schweizer, A., & Urbach, N. (2018). Integrating the 'Troublemakers': A taxonomy for cooperation between banks and fintechs. Journal of Economics and Business, 100, 26-42. <https://doi.org/10.1016/j.jeconbus.2018.04.002>
- [10] Du Toit, Gerard & Burns, Maureen (2017) Evolving the customer experience in banking, Bain & Company.
- [11] Ernst & Young (2014) Mobile money-the next wave of growth. Available at: [http://www.ey.com/Publication/vwLUAssets/EY_-_Mobile_money_-_the_next_wave_of_growth_in_telecoms/\\$FILE/EY-mobile-money-the-next-wave.pdf](http://www.ey.com/Publication/vwLUAssets/EY_-_Mobile_money_-_the_next_wave_of_growth_in_telecoms/$FILE/EY-mobile-money-the-next-wave.pdf)
- [12] Ernst & Young, (2018), Unleashing the potential of Fintech in banking.
- [13] Freedman, R. S. (2006) Introduction to financial technology, Academic Press.
- [14] Gai, K., Qiu, M., & Sun, X. (2018). A survey on FinTech. Journal of Network and Computer Applications, 103, 262-273. <https://doi.org/10.1016/j.jnca.2017.10.011>
- [15] Haddad, C., & Hornuf, L. (2019). The emergence of the global Fintech market: Economic and technological determinants. Small Business Economics, 53(1), 81-105.
- [16] Hannan TH, McDowell JM (1984) The Determinants of Technology Adoption: The Case of the Banking Firm. The RAND Journal of Economics: 328-335.
- [17] Hyun-Sun, R. (2018). What makes users willing or hesitant to use Fintech? The moderating effect of user type. Industrial Management & Data Systems, 118(3), 541-569. ProQuest Central. <https://doi.org/10.1108/IMDS-07-2017-0325>.
- [18] Iman, N. (2018). Is mobile payment still relevant in the fintech era? Electronic Commerce Research and Applications, 30, 72-82. <https://doi.org/10.1016/j.elerap.2018.05.009>

- [19] Jünger, M., & Mietzner, M. (2020). Banking goes digital: The adoption of FinTech services by German households. *Finance Research Letters*, 34, 101260.
<https://doi.org/10.1016/j.frl.2019.08.008>
- [20] Kang, J. (2018). Mobile payment in Fintech environment: Trends, security challenges, and services. *Human-Centric Computing and Information Sciences; Heidelberg*, 8(1), 1-16.
<http://dx.doi.org/10.1186/s13673-018-0155-4>
- [21] KPMG (2016) *The Pulse of Fintech, 2015 in Review*. KPMG, London.
- [22] Kuo Chuen, David Lee and Teo, Ernie G. S., *Emergence of Fintech and the Lasic Principles* (September 30, 2015). Available at SSRN: <https://ssrn.com/abstract=2668049> or <http://dx.doi.org/10.2139/ssrn.2668049>
- [23] Laven M, Bruggink D (2016) How Fintech is transforming the way money moves around the world: An interview with Mike Laven. *Journal of Payments Strategy & Systems*:6-12.
- [24] Lee, J., Ryu, M. H., & Lee, D. (2019). A study on the reciprocal relationship between user perception and retailer perception on platform-based mobile payment service. *Journal of Retailing and Consumer Services*, 48, 7-15.
<https://doi.org/10.1016/j.jretconser.2019.01.007>
- [25] Li, Y., Spigt, R., & Swinkels, L. (2017). The impact of Fintech start-ups on incumbent retail banks' share prices. *Financial Innovation*, 3(1), 26.
- [26] Navaretti, G., & Pozzolo, A. (2017). Fintech and Banks: Friends or Foes. *European Economy*, 2, 9-30
- [27] Peters, G. W., & Panayi, E. (2015, November 18). Understanding Modern Banking Ledgers Through Blockchain Technologies: Future of Transaction Processing and Smart Contracts on the Internet of Money. Retrieved from Social Science Research Network:
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2692487
- [28] PwC (2016) *Blurred lines: How Fintech is shaping Financial Services*. PwC, London
- [29] Románova, I., Kudinska, M. (2016). Banking and Fintech: a challenge or opportunity? In *Contemporary issues in finance: Current challenges from across Europe* (pp. 21-35). Emerald Group Publishing Limited.
- [30] Ryu, Hyun-Sun (2018), Understanding Benefit and Risk Framework of Fintech Adoption: Comparison of Early Adopters and Late Adopters, *Proceedings of the 51st Hawaii International Conference on System Sciences*, 3864-3873.
- [31] Sorkin, A. (2016). Fintech Firms Are Taking on the Big Banks, but Can They Win? *The New York Times*.
- [32] Wood G., Buchanan A. (2015) Advancing Egalitarianism. In: Lee Kuo D (ed) Chuen, Handbook of Digital Currency: Bitcoin, Innovation, Financial Instruments, and Big Data. Elsevier, London, pp 385-401
- [33] Zhu, K., Kraemer, K. L., Xu, S., & Dedrick, J. (2004). Information technology payoff in E-business environments: An international perspective on value creation of E-business in the financial services industry. *Journal of Management Information Systems*, 21(1), 17-54.

LINKING CORPORATE GOVERNANCE QUALITY AND FIRM PERFORMANCE: LITERATURE REVIEW AND IMPLICATIONS FOR STATE-OWNED ENTERPRISES IN VIETNAM

Luu Thi Minh Ngoc¹, Dang Thi Huong¹, Nguyen Thi Trang Nhung², Chu Dinh Dong³, Vo Nam D.⁴,
and Nguyen Phuong Mai^{5,*}

¹ University of Economics and Business, Vietnam National University Hanoi, Vietnam

² Hanoi University of Industry, Hanoi, Vietnam

³ Party Committee of Central Business Sector, Hanoi, Vietnam

⁴ University of Danang, Danang, Vietnam

⁵ International School, Vietnam National University Hanoi, Vietnam

*Corresponding author: mainp@vnu.edu.vn

Abstract

In recent years, corporate governance (CG) in developing economies has become an important issue, especially in the sense of the transformation of state-owned enterprises. In Vietnam, however, studies on CG in the public sector are limited, although it is undeniable that both developed and developing nations still have state-owned enterprises (SOEs). This paper summarized the literature on the linkage between the corporate governance quality (CGQ) and firm performance in both developed and developing countries, and then we suggested the need to apply this information into the Vietnamese context. In transition economies, including Vietnam, we also highlighted some CG problems, then proposed areas for further studies on CGQ and the Vietnamese SOEs' firm performance.

Keywords: corporate governance, corporate governance quality, corporate governance index, state-owned enterprises, Vietnam

1. INTRODUCTION

Corporate governance (CG) has drawn the attention of various stakeholders in society, including academia, businesses, government bodies, and international organizations. Studies on CG have been developing in decades that address different aspects of the issue. Several studies focus on the concepts and structure of CG models in the world. These studies contribute to the development of CG theories (Clarke, 2004; Kaen, 2003; Tricker & Tricker, 2015). Some major theories include agency theory, stewardship theory, stakeholder theory, resource dependence theory, social contract theory, and legitimacy theory. These theories discuss the role and responsibilities of the Board of Directors (BoD), shareholders, and managers in the relationship with CG schemes. Based on the theoretical issues, the one-tier and two-tier CG models have been developed to ensure good CG practices in the harmony of stakeholders' benefits, and other related issues are discussed further. For example, (McGee, 2009b) discussed the components of CG model in developing countries that mentioned the issues of the role of BoD, capital structure, etc. In addition, (Green, 2005) focused on the articles of Sarbanes-Oxley Law and the

BoD to suggest good CG practices for execution. Despite the fact that various studies have been done addressing different aspects of CG, previous studies mostly focus on the private sector. There is still a lack of studies on CG in state-owned enterprises (SOEs).

In this study, we summarized the literature on the linkage between the corporate governance quality (CGQ) and firm performance in both developed and developing countries, and then we discussed the need to apply this knowledge into the Vietnamese context. We also highlighted some CG issues in transition economies, including Vietnam, then proposed areas for further studies on CGQ and firm performances of the Vietnamese SOEs.

This paper is organized as follows. Section 1 is the introduction to the topic. Section 2 presents a review of existing literature on CG quality and firm performance. Section 3 summarizes the studies on CG and the current issues of state-owned enterprises (SOEs) in Vietnam, then proposes some implications for further research on CG in SOEs. Section 4 concludes the paper.

2. CORPORATE GOVERNANCE QUALITY AND FIRM PERFORMANCE

2.1. Corporate governance and corporate governance quality

The term “corporate governance” (CG) can be defined in a narrow or a broad sense. A narrow definition is often concerned with (i) corporate management structure issues: the board's issues and relationships between the board and managers, shareholders; and (ii) interest or objectives of a corporate participant group. Furthermore, “corporate governance deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment” (Milosevic, Andrei, & Vishny, 2015; Shleifer & Vishny, 1997).

Moreover, CG is also defined as “the mechanisms by which stakeholders of a corporation exercise control over corporate insiders and management such that their interests are protected (John & Senbet, 1998). According to (OECD, 2004), CG involves “a set of relationships between a company’s management, its board, its shareholders and other stakeholders”. CG also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined. CG refers to the structures and processes for the direction and control of companies. It defines the role of the management, board of directors, controlling shareholders, minority shareholders, and other stakeholders (Bollaert & Dilé, 2009). Effective

CG enhances the performance of companies, increases access to outside capital, and contributes to sustainable economic development (Minh & Walker, 2008). CG involves a system of rules which are formulated to administer corporate governance relationships (Hai, 2006).

Corporate governance quality (CGQ) is a broad concept that requires the use of different indices to measure. Researchers have put a lot of effort into identifying the components of CGQ and developing a CG index to measure CGQ. Nevertheless, different results of how to measure CGQ still exist in the literature review.

(Klapper & Love, 2004) indicate three main potential determinants of CGQ at the firm level: the utility of corporate governance, the nature of the firm’s operations, and the firm’s size. First, because the main goal of CG is to reduce the firm’s cost of capital by improving investors’ confidence about earning a proper return on their investment, we should expect that firms in greater need of future funding (firms with better future growth prospects) will perceive a greater utility in adopting better CG practices, as compared to firms with poor prospects for raising money from external investors. According to the literature, four dimensions that are considered necessary in the assessment of CGQ include disclosure, board structure and operation; ethics and conflicts of interest; and shareholder rights. Table 1 demonstrates the common ways to measure CGQ.

Table 1: Common Ways to Measure Corporate Governance Quality

Criteria		
Type	Single Governance Component (board size, board characteristics, board composition, CEO duality, CEO compensation, shareholder responsiveness, ...)	Composite Governance Component
Governance Characteristics	Internal Corporate Governance	External Corporate Governance
Sources of Information	- Company by-laws and charter provisions - Firm's Disclosure Environment - Corporate Governance Databases	- Survey of Firms (interview, questionnaire survey, etc....) - Proprietary Indices by Rating Agencies (Standard and Poor Corporate Governance Score, Credit Lyonnais Securities Asia, Center for International Financial Analysis and Research, Investor Responsibility Research Center, Governance Metrics International, etc....)
Weighting Scheme	Unweighted Composite Measure (G-Index, Gov-Score, CGI, SEECGAN index, etc...)	Weighted Composite Measure (index from rating agencies)
Data Reduction Techniques	- Principal Components Analysis (PCA) - Discrete Principal Components Analysis (DPCA)	- Recursive Partitioning - Other Techniques

(Source: Authors summarized from previous studies)

2.2 Corporate governance challenges in developing and transition economies

In developed countries, there has been great and gradual efforts to build a CG system through centuries, and today that CG system can be defined as a complex mosaic consisting of laws, regulations, politics, public institutions, professional associations and ethic codes (Babic, 2003). Unfortunately, in transition economies, a lot of details of the mosaic are still missing (Babic, 2003).

From the existing literature, several similar CG issues have been found in transition and developing countries. Research on corporate governance in these countries shows that governance inadequacy is the cause of low financial firm performance, equity loss, and failure to protect the rights of small shareholders. Moreover, information is not transparent, and there is no clear standard for evaluating CGQ (McGee, 2009b; Tricker & Tricker, 2015). In all countries, no matter how the level of development is, companies seem to face similar problems in corporate governance. However, transition economies have to face additional barriers due to the inexperienced board of directors. They also have to confront with specific challenges that more developed countries do not have. For example, the internal CG mechanisms in developing and transition countries, which deal with the relationship among owners, BoD, and managers, differ significantly in comparison to that of the developed market economies (Babic, 2003).

First, the concept of ownership itself is problematic (Babic, 2001). Ownership of post-socialist enterprises was often shared between the state, public corporate bodies, banks, municipal bodies, managers, employees, other state or private companies, private individuals and foreign individuals and corporations (Roche, 2005). The absence of “real owners” leads to neglect of the interests of capital itself and thus to degradation in the quality of the capital, damaging the long-term interests of the firm (Babic, 2001).

Second, the boards of directors fail to exercise a true monitoring role. Because the state is the key stockholder, there is a misbalance of power among the various stockholders. The members of the board of directors are usually the representatives of the state, the ruling party, public corporate bodies or even the banks (Roche, 2005). For individual board members the motivation to act is inhibited by their dependence on management for benefits such as lucrative appointments to boards of directors. Even if they have the motivation to exercise direct control over managers, they lack the knowledge to make managerial decisions. As a consequence, the role of the board of directors is reduced to financial control, which assumes maximization of the short-term results and evaluation of the managers' performance retroactively (McGee,

2009a; Roche, 2005). Consequently, common constraints in transition and developing countries CG system are lack of commitment on the part of BoD, lack of adherence to the regulatory framework, weak enforcement and monitoring system, and lack of transparency and disclosure (Okpara, 2011).

Third, the upper “echelon” of managers acquired their knowledge and skills in a business environment which did not require the development of the skills of transformational or strategic leadership (Babic, 2001). So, transition countries have an archaic cadre of managers who do not possess a capacity for strategic thinking, vision creation, team work, risk taking and change management (McGee, 2008; Roche, 2005). Potentially new managers and leaders are facing a new challenge which comes from the Western countries in the form of ready-made solutions, but they are also facing a challenge to respond to specific requirements of the business environment encountered in particular countries. Another problem is related to the nonexistence of a market for management talent and the difficulty of evaluating managers in an impartial manner (Babic, 2001).

2.3 Firm performance

Firm performance is a controversial concept that can be viewed as a set of information about achievements of varying significance to different stakeholders (Boubakri, Cosset, & Saffar, 2012; Bouckaert & Halligan, 2008). Dimensions of performance include measures of output quantity, output quality, efficiency, effectiveness, accountability, equity, probity, democracy and impact (Boyne, Meier, Meier, O'Toole Jr, & Walker, 2006). Firm performance in CG studies is mainly measured using either market-based measures or accounting-based ones. Some popular measurements include return on asset (ROA), return on equity (ROE), market-to-book value ratios (Epps & Cereola, 2008). (Lang & Stulz, 1994), (Mehran, 1995), (Himmelberg, Hubbard, & Palia, 1999) used Tobin's Q as an operating performance indicator. However, there is no consensus as to which measures are more efficient (Epps & Cereola, 2008).

2.4 Relationship between corporate governance quality and firm performance

Many studies tested the link between components of the CG scheme or the total CGQ and firm performance. Numerous studies have used different CG indices to evaluate CGQ in listed companies in the stock market. The popular CG indices are G-Index developed by GIM group in 2003, CGI published by FTSE and ISS in 2004, Gov-Score developed by Lawrence D. Brown and Marcus L. Caylor, and the most recent one is SEECGAN index formulated in 2014 by the South East Europe Corporate Governance Academic Network. In other words, the 15 recent years witnessed the emergence and development of a series of CG

evaluation/rating schemes that the latter was built on the previous ones.

Using different CG indices, a number of studies have tested the impact of CG quality or components of CG structures such as the board independence and the CGQ, ownership, CEO compensation, and the board interconnectedness on both the short and long-term financial performance, or studies on the relationship among the CG components themselves.

(Renders, Gaeremynck, & Sercu, 2010) used the data of companies in 12 European countries, which are listed in FTSEuroFirst 300 to test the relationship between CGQ and firm performance criteria, including firm market value, ROA, and ROE. This research showed the positive relationship between CG quality and firm performance, but the strength of the correlation depends on the institutional environments of different nations.

Similarly, (Ertugrul & Hegde, 2009) examined the corporate governance ratings provided by three premier US rating agencies and found that summary scores are generally poor predictors of primary and secondary measures of future firm performance. However, some component sub-ratings provide more positive and reliable evidence of their information in predicting the multiple dimensions of firm performance.

In addition to studies on CG system in countries that have a clear and long history of CG like the U.S. or the UK, some studies on the relationship between CG quality and firm performance have been conducted in transition economies (Estonia, Brazil, China, Malaysia,...) or less developed countries in Africa (Nigeria, Tunisia, Lybia, Kenya,...). Research results in different political, legal, and economic systems show the inconsistency in the relationship between CGQ and firm performance.

For example, (Otuya, Donwa, & Egware, 2017) used data from annual reports of manufacturing companies listed in the Nigeria Stock Exchange to test the relationship between earnings management and the quality of CG in Nigeria. Using descriptive and correlation statistics and regression analysis, the authors showed that the quality of CG had a significant effect in reducing earnings manipulations, which, by extension, improves the quality of financial reporting. In the meantime, (Djokić & Duh, 2015) used SEECGAN to evaluate the transparency and its relationship with firms' information disclosure in the Slovenian market.

While using the t-test to explore which CG variables influence company performance from the database of 30 Lybian companies, Abdulhafid et al. (2015) confirmed that BoD compensation and characteristics were two main factors that need improvement to increase firm performance.

(Jiraporn, Kim, Kim, & Kitsabunnarat, 2012) studied the impact of CGQ, which is measured in a composite index issued by ISS, on a firm's capital structure. Research results showed that there is a negative relationship between CG quality and firms' leverage ratio. Low CGQ companies seem to use more financial leverage. Furthermore, (Jiraporn, Chatjuthamard, Tong, & Kim, 2015) continued to study the impact of CGQ on firm risk-taking. The study results showed that companies with good CGQ had less risky strategies than those with a low-quality CG system.

(Al-Rahahleh, 2016) used OLS regression to measure the impact of CGQ on the cash conversion cycle in Jordan companies listed in the Amman Stock Exchange during the 2009 – 2013 period. Results revealed that the cash conversion cycle is affected negatively by corporate governance quality, which provides an implication to industrial companies to boost their compliance with corporate governance code in order to improve their working capital management. This research also fills in a gap in the existing literature by studying the quality of CG by using the context-dependent approach. Abbadi et al. (2016) analyzed the link between CGQ and profit in Jordan. The research result showed that good CG quality led to higher profit.

(Luo & Salterio, 2014) tested the relationship between CGQ measured by a composite index and firm value measured by return on equity ratio (ROE). However, only a weak association was revealed from data analysis. Moreover, some other studies confirmed that there is no relationship between CG structure and firm performance measured by ROA and ROE (Epps & Cereola, 2008; Klein, Shapiro, & Young, 2005).

(Ramly, 2012) in the research on the Malaysia Stock Exchange, listed companies showed that those companies with higher corporate governance quality in terms of (1) internal control system and (2) stockholder empowerment enjoyed a lower cost of equity. This research also suggested that those companies in emerging markets that have higher quality CG suffer from fewer agency conflicts and asymmetries, then they obtain significant economic benefits.

(Lokman, Cotter, & Mula, 2012) in a study of publicly listed firms in Malaysia, proved that high CGQ is positively related to a greater extent of voluntary disclosure. Stock-based compensation significantly influences the relationship between CG quality and voluntary disclosures. Similarly, (Lu, Zhong, & Kong, 2009) used CGI to measure CG quality in 100 largest listed companies in China and revealed that two high score criteria including transparency and voluntary disclosures, while two low score criteria were BoD quality and role of shareholders.

In another study of China market, (Cheung, Jiang, Limpaphayom, & Lu, 2010) also used CGI as the tool to measure CGQ and explore its relationship with firm

market value. The data analysis from 100 largest publicly listed companies in China during the 2004 – 2006 period shows that they have made significant progress in CG evaluation criteria.

In conclusion, our investigation shows that although existing literature may use different CG indices to examine the relationship between CGQ and firm performance, they share several similarities in research approach and results. Firstly, most studies focus on listed companies in the stock exchange markets. Secondly, regression analysis is the popular method to test the relationship among CGQ and firm performance. Thirdly, the positive relationship between CGQ and firm performance has been confirmed in both developed and developing and transition markets.

3. CORPORATE GOVERNANCE AND IMPLICATIONS FOR STATE-OWNED ENTERPRISES IN VIETNAM

3.1 Corporate governance in Vietnam

In Vietnam, CG is still a new concept and can be translated differently into Vietnamese. It seems to be impossible to find in the Vietnamese language an equivalent term to “corporate governance” as understood in advanced economies (Hai, 2006). Terms which refer to directing, controlling, and managing a company or an enterprise used in Vietnamese literature are often the so-called “quản trị công ty”, “điều hành công ty”, “quản trị doanh nghiệp” may be understood as company management, and the next Vietnamese terms as controlling and managing a company, enterprise management, and business management respectively (Hai, 2006). In other words, these terms in the Vietnamese language may be understood as a narrow conception of CG, because they seem to refer to only corporate management.

It is necessary to understand the CG law regimes to explain the existing Vietnamese CG situation. The CG law regimes in Vietnam are mainly based on the Enterprise Law 2005, which was developed from the Enterprise Law 1999 then this law was amended several times. The most current amendment was approved and came into effect in 2020. Relying on the former company statutes and borrowing increasingly corporate legal rules from Western jurisdictions, especially Anglo-American law, the Enterprises Law 1999 provided various forms of business associations. The implementation of this Law was much more successful than the former laws as, for example, shown by the increased number of companies registered. There are, however, certain problems with the CG regime provided by this Law, such as the inflexible CG structures, unclear functions of the management board and the managing directors, and “poor” investor protection mechanisms. Another corporate statute

subsequently replaced the Enterprise Law 1999 after just six years of implementation.

Under the *Đổi Mới* policies of the Communist Party, in order to upgrade the law on business associations and create a convenient legal environment for investors in the context of international economic integration, especially the WTO’s accession, in November 2005, the National Assembly of Vietnam enacted the new Enterprise Law. This Law came in force on 1st July 2006 to replace the Enterprise Law 1999, the State Enterprise Law 2003, and provisions on the management organization and operation of FDI (foreign direct investment) companies in the Law on Foreign Investment in Vietnam 1996. Even though the Enterprise Law 2005 is largely based on the Enterprise Law 1999, it also contains other legal principles borrowed from Anglo-American law. This Law is the most important corporate legislation and forms the foundation of the Vietnamese corporate governance system. Although the framework for corporate governance in Vietnam - especially as regards listed companies, is in the early stages of development, the Enterprise Law 2005 and its regulations provide the fundamental regulatory framework for CG of listed companies.

In Vietnam, the topic of CG has emerged in recent years, so that there is still little research in this field. Some studies synthesized theoretical issues, and preliminarily evaluated the situation of CG in listed companies, which are (Hải & Liên, 2012), (Hai & Nuno, 2008), (Minh & Walker, 2008), or discussed the role of BoD and firm performance (Cao Thi Van Anh & Le Cong Hoa, 2014). There are few studies on CGQ and its association with firm performance in Vietnam. (Hải & Liên, 2012) used Gov-Score Index to evaluate the CG quality of 396 listed companies in the Hanoi Stock Exchange (HNX), then suggested to adopt the Gov-Score to the Vietnamese business environment by reducing the number of criteria from 51 to 39. In a study on CG in the banking industry, (Tú, 2015) measured the relationship between total CGI score and components of CGI and the performance of Vietnamese commercial banks. Thus, some suggestions were proposed to improve a set of criteria to evaluate the governance ability of BoD in Vietnamese commercial banks by adopting and adapting the CG index.

(Vo & Nguyen, 2014) tested the impact of components of the CG scheme on firm performance of 177 listed companies in Vietnam based on the published data during the 2008 - 2012 period. Results showed that even though there was not enough evidence to confirm the positive relationship between board size and firm performance, other variables such as CEO duality role or capital structure positively impacted firm performance.

Moreover, another effort to measure CGQ in Vietnam is the issuance of the Report on Corporate Governance Scorecard conducted by the International Finance Corporation (IFC) and Global Corporate Governance Forum in collaboration with the State Securities Commission of Vietnam in 2009. This report checks and evaluates the compliance level of the 100 largest listed companies in the Hanoi Stock Exchange (HNX) and Ho Chi Minh Stock Exchange (HSX) based on the CG quality index created by OECD. The results of this report can be used to compare CG quality among ASEAN countries as the same CG index is utilized for measurement. Table 2 shows the summary of studies on CG and CG quality and its impact on firm performance in Vietnam (see the Appendix).

As shown in Table 2, the number of studies on CG in Vietnam is still minimal. Some studies discussed the theoretical and practical issues in the Vietnamese CG topic. These studies mainly use qualitative methods. Several recent studies have put more effort into examining CG quality's impact on firm performance by using a single governance component rather than a composite CG index. Moreover, existing studies on CG topic in Vietnam also focus on the private sector with the research unit is listed companies. Empirical studies have also been conducted to examine the relationship between CGQ and firm performance. Results of these studies showed that CGQ, either is measured by a single component criterion or a composite CGQ index, does not have a consistent relationship with firm performance. Notably, there seems to be no study that measures CGQ in SOEs.

3.2 Vietnamese state-owned enterprises and their corporate governance issues

At the beginning of Doi Moi in 1986, Vietnam had around 12,300 SOEs, many of which were unprofitable and exhibited signs of substantial inefficiency. Then, the Vietnamese Government has pursued the reform of SOEs through several key measures. First is the reform in the management of SOEs. In 1987, the Council of Ministers enacted Decree 217/1987/HDBT to "create the conditions for increased enterprise autonomy by dismantling some of the institutions of state subsidy and control" (Painter, 2003). Following this Decree, a large number of SOEs experienced difficulties and incurred losses. A concerted effort to attack this problem commenced in 1989 with the dissolution of many unprofitable SOEs and the rearrangement of others. In 1991, Decree 388/HDBT was issued, which forced an SOE to be dissolved or merged with another "if they were judged to be inefficient or lacking capital or technology or did not have sufficient market demand for their outputs" (Ngu, 2002). As a result, by the beginning of the privatization process, which commenced in 1992, the number of SOEs in Vietnam had declined to around 6,500 enterprises (Nguyen & Crase, 2011). The SOE sector was further reorganized

with the issuance of Decisions 90 and 91 in 1994, which regulate the establishment of General Corporations, so-called General Corporations 90 and 91, respectively (Ngu, 2002). This second measure was aimed at reducing "the power of line agencies to interfere in business management and capture profits and rents" (Painter, 2003). The result of these decisions is that General Corporations 90 and 91 have a Board of Management and a Board of Control, respectively. While the Board of Management is to be appointed by and ownership rights remain with the establishing authority, the management functions are vested in the board (Painter, 2003).

Although many changes have been made in the reform process, Vietnamese SOEs are still weak, ineffective, and have many problems in management. Inefficiencies in the Vietnamese SOEs are partly due to weak corporate governance. According to a recent report submitted to the Central Government by the Steering Committee for Enterprise Innovation and Development, the main reasons for the inefficiencies in the Vietnamese SOEs include the lack of an adequate CG scheme, the overlap of the authority of steering organization and corporate owners, lack of controlling system and information transparency, poor competencies of owner's representatives, lack of control and accountability imposing mechanisms.

In the current context, the focus of enterprises renovation is on maximizing the advantages of enterprises, creating the competitiveness of SOEs in the market mechanism, while attracting foreign investment. Investors, business owners have also seen the role of corporate governance in the search for capital, increased marketing, and trading capabilities, and reducing risks. On the other hand, foreign companies only invest in companies with clear and effective governance systems. Therefore, the requirement of good CG practices is one of the key issues that the state concerned and directed closely with the government's policy of SOEs reform and a focus on the equitization of the SOEs. The central government assigned the State Capital Holdings Committee in collaboration with the Ministry of Finance and other ministries to study and develop a CG guideline and scheme for the SOEs. However, this kind of guideline has not been issued yet.

3.3 Discussion and implications

Corporate governance has become an important topic in developing economies in recent years, especially in the context of transforming subsidized state-owned enterprises into market mechanisms. In Vietnam, for more than a decade, with the transformation of the model of 90 and 91 General Corporations into an economic group model to promote the equitization of state-owned enterprises (SOEs), corporate governance is considered as the weakest area that constraints the

firm performance, and the cause of owner's equity losses and lack of information transparency.

However, studies on CG in the public sector are scarce, while it is undeniable that state-owned enterprises (SOEs) still exist in both developed and developing countries. In Europe, countries like Sweden, Finland, Norway, Germany, or Italy, SOEs mainly concentrate on providing municipal services (Krause, 2013). Even in transition economies like India, China, or Brazil, or a developing country like Vietnam, the number of SOEs is still large and plays a major role in key industries.

According to Krause (2013), the lack of studies on CG in SOEs is explained by their specific characteristics such as (1) the majority of public enterprises are operating in highly regulated sectors; (2) many of SOEs are monopolies; (3) performance criteria for SOEs are ambiguous as they are not only business but also public entities with public service obligations and a large number of different stakeholders; (4) legal form of the enterprises differs and impacts on formal autonomy from core administration. Furthermore, CG in SOEs is also more sophisticated than that in the private sector. According to IFC (2010), the biggest challenge of CG in SOEs is to find the balance between functioning the state ownership authority, i.e., appointing and voting for the Board of Directors, and not involving too much in the operation management of SOEs. Another challenge is to create an even playing field in the market so that private companies are free to compete with SOEs and to ensure that the government is not going to distort competition by using governmental control authority.

Furthermore, as suggested in previous studies in literature review, it is also necessary for developing countries like Vietnam to set up a principle-based CG scheme, which is the opposite of a relationship-based one. In this CG scheme, the pyramid ownership structure is eliminated so that it hinders the managers from withdrawing money from the SOEs because their direct stock ownership is limited. Other benefits of this new CG scheme may include the followings: (1) tightening the collaboration between the bank and the SOEs in the cross-stock ownership regime, (2) creating a clear asset ownership structure, which defines the state's authority and responsibilities, (3) depoliticizing the decision making process and building up the firewall between the government and the management in SOEs that the state is the main shareholder, (4) protecting and actualizing the rights of small shareholders, (5) preventing the loss of asset when the company enters the initial public offering (IPO) process, (6) seeking for the experienced owners and managers while the owner is expanding (CIPE, 2002).

A review of related works suggests areas for future studies on CG issues of SOEs in Vietnam. Firstly, as there are a number of international CG schemes and indices to measure CGQ but they have been mainly

used in studies of listed companies in the private sector. Thus, the research questions might include the followings. Is it essential to develop a proper CG index for developing countries to evaluate CGQ of SOEs? Can the current CG indices of developed countries be applicable for developing countries when we consider the differences in political, socio-economic contexts? Secondly, future research might also consider the effectiveness and rationality of using an integrated CG quality index or component indicators to reflect the actual quality of corporate governance. Thirdly, it is questionable whether the CGQ index should be adjusted in accordance with the specific type of enterprises such as SOEs due to the participation of the state in the operation of enterprises, the operational objectives and control mechanisms will be changed compared to the private sector. As a result, future research might consider the differences between SOEs and private companies to select a proper CGQ index.

4. CONCLUSION

Effective corporate governance, resulting from a distinction of ownership and power, is supposed to minimize organization costs and intelligence asymmetry. Efficient supervision and disciplining processes that can avoid top management's opportunistic actions and provide a basis for the defense of shareholder interests are distinguished by sound corporate governance. It facilitates excellence and the best utilization of resources available, leading to increased results of the company. Since corporate governance is essential for all types of companies, particularly SOEs, it is crucial to understand how CG activities are being carried out and what can be done to enhance CG in companies. This paper summarized the literature on the relationship between the consistency of corporate governance (CGQ) and corporate success in both developed and developing countries and then discussed the need to investigate the case of Vietnamese SOEs. It is suggested that implementing an appropriate CG index can help define the shortcomings of the CG framework and quantify its effect on business performance.

5. ACKNOWLEDGMENTS

This research is funded by Vietnam National Foundation for Science and Technology Development (NAFOSTED) under grant number 502.02-2019.320.

6. REFERENCES

- [1] Abdulhafid, I. E., Hudec, O., Urbancikova, N. (2015). "Corporate Governance Structure and Firm Performance: The Case of Libya". *Proceedings of the 6th GCMRM*. 15-31.
- [2] Al-Rahahleh, A. S. (2016). Corporate governance quality and cash conversion cycle: evidence from Jordan. *International Business Research*, 9(10), 140-150.

- [3] Babic, V. (2001). The key aspects of the corporate governance restructuring in the transition process. *Ekonomist*, 3, 3.
- [4] Babic, V. (2003). *Corporate governance problems in transition economies*. Paper presented at the Winston-Salem: Wake Forest University, Social Science Research Seminar.
- [5] Bollaert, H., & Dilé, A. (2009). Changes in corporate governance quality in Estonia between 1999 and 2007. *Post-Communist Economies*, 21(1), 65-84.
- [6] Boubakri, N., Cosset, J. C., & Saffar, W. (2012). The impact of political connections on firms' operating performance and financing decisions *Journal of Financial Research*, 35(3), 397-423.
- [7] Bouckaert, G., & Halligan, J. (2008). Comparing performance across public sectors *Performance Information in the Public Sector* (pp. 72-93): Springer.
- [8] Boyne, G. A., Meier, K. J., Meier, K. J., O'Toole Jr, L. J., & Walker, R. M. (2006). *Public service performance: Perspectives on measurement and management*: Cambridge University Press.
- [9] Cheung, Y. L., Jiang, P., Limpaphayom, P., & Lu, T. (2010). Corporate governance in China: A step forward. *European Financial Management*, 16(1), 94-123.
- [10] CIPE. (2002). Instituting corporate governance in developing, emerging and transitional economies: A handbook. *The Center for International Private Enterprise*.
- [11] Clarke, T. (2004). Theories of corporate governance. *The Philosophical Foundations of Corporate Governance*, Oxon.
- [12] Djokić, D., & Duh, M. (2015). *Measuring transparency of the corporate governance in Slovenia*. Univerza na Primorskem, Fakulteta za management.
- [13] Epps, R. W., & Cereola, S. J. (2008). Do institutional shareholder services (ISS) corporate governance ratings reflect a company's operating performance? *Critical Perspectives on Accounting*, 19(8), 1135-1148.
- [14] Ertugrul, M., & Hegde, S. (2009). Corporate governance ratings and firm performance. *Financial Management*, 38(1), 139-160.
- [15] Green, S. (2005). *Sarbanes-Oxley and the board of directors: Techniques and best practices for corporate governance*: John Wiley & Sons.
- [16] Hai, B. X. (2006). Vietnamese Company Law: The development and corporate governance issues. *Bond L. Rev.*, 18, i.
- [17] Hai, B. X., & Nuno, C. (2008). Corporate governance in Vietnam: A system in transition. *Hitotsubashi journal of commerce and management*, 42(1 (42)), 45-65.
- [18] Hải, H. V., & Liên, T. T. H. (2012). Chất lượng quản trị công ty theo bộ tiêu chuẩn Gov-Score: Nghiên cứu điển hình các doanh nghiệp niêm yết trên Sở Giao dịch Chứng khoán Hà Nội. *VNU Journal of Science: Economics and Business*, 28(1).
- [19] Himmelberg, C. P., Hubbard, R. G., & Palia, D. (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of financial economics*, 53(3), 353-384.
- [20] Jiraporn, P., Chatjuthamard, P., Tong, S., & Kim, Y. S. (2015). Does corporate governance influence corporate risk-taking? Evidence from the Institutional Shareholders Services (ISS). *Finance Research Letters*, 13, 105-112.
- [21] Jiraporn, P., Kim, J.-C., Kim, Y. S., & Kitsabunnarat, P. (2012). Capital structure and corporate governance quality: Evidence from the Institutional Shareholder Services (ISS). *International Review of Economics & Finance*, 22(1), 208-221.
- [22] John, K., & Senbet, L. W. (1998). Corporate governance and board effectiveness. *Journal of banking & Finance*, 22(4), 371-403.
- [23] Kaen, F. (2003). *A blueprint for Corporate Governance: Strategy, accountability, and the preservation of shareholder value*: Amacom.
- [24] Klapper, L. F., & Love, I. (2004). Corporate governance, investor protection, and performance in emerging markets. *Journal of corporate Finance*, 10(5), 703-728.
- [25] Klein, P., Shapiro, D., & Young, J. (2005). Corporate governance, family ownership and firm value: the Canadian evidence. *Corporate Governance: An International Review*, 13(6), 769-784.
- [26] Lang, L. H., & Stulz, R. M. (1994). Tobin's q, corporate diversification, and firm performance. *Journal of political economy*, 102(6), 1248-1280.
- [27] Lokman, N., Cotter, J., & Mula, J. (2012). Corporate governance quality, incentive factors and voluntary corporate governance disclosures in annual reports of Malaysian publicly listed companies. *Corporate Ownership and Control*, 10(1), 329-352.
- [28] Lu, T., Zhong, J., & Kong, J. (2009). How good is corporate governance in China? *China & World Economy*, 17(1), 83-100.

- [29] Luo, Y., & Salterio, S. E. (2014). Governance quality in a “comply or explain” governance disclosure regime. *Corporate Governance: An International Review*, 22(6), 460-481.
- [30] McGee, R. W. (2008). Corporate governance in Asia: Eight case studies. Available at SSRN 1081954.
- [31] McGee, R. W. (2009a). Corporate governance in Asia: A comparative study *Corporate governance in developing economies* (pp. 135-141): Springer.
- [32] McGee, R. W. (2009b). Corporate governance in developing economies *Corporate Governance in Developing Economies* (pp. 3-22): Springer.
- [33] Mehran, H. (1995). Executive compensation structure, ownership, and firm performance. *Journal of financial economics*, 38(2), 163-184.
- [34] Milosevic, D., Andrei, S., & Vishny, R. W. (2015). A survey of corporate governance. *The journal of finance*, 52, 737-783.
- [35] Minh, T. L., & Walker, G. (2008). Corporate governance of listed companies in Vietnam. *Bond L. Rev.*, 20, i.
- [36] Ngu, V. Q. (2002). *The state-owned enterprise reform in Vietnam: process and achievements*: Citeseer.
- [37] Nguyen, P., & Crase, L. (2011). Vietnam's state-owned enterprise reform. *Asia Pacific Journal of Marketing and Logistics*.
- [38] OECD, O. (2004). The OECD principles of corporate governance. *Contaduría y Administración* (216).
- [39] Okpara, J. O. (2011). Corporate governance in a developing economy: barriers, issues, and implications for firms. *Corporate Governance: The international journal of business in society*.
- [40] Otuya, S., Donwa, P., & Egware, N. (2017). Earnings management and quality of corporate governance in Nigeria: A review of executive compensation and audit committee characteristics. *Journal of Accounting and Financial Management*, 3(3), 49-63.
- [41] Painter, M. (2003). The politics of economic restructuring in Vietnam: the case of state-owned enterprise "reform". *Contemporary Southeast Asia*, 20-43.
- [42] Ramly, Z. (2012). Impact of corporate governance quality on the cost of equity capital in an emerging market: Evidence from Malaysian listed firms. *African Journal of Business Management*, 6(4), 1733-1748.
- [43] Renders, A., Gaeremynck, A., & Sercu, P. (2010). Corporate-governance ratings and company performance: A cross-European study. *Corporate Governance*, 18(2), 87-106.
- [44] Roche, J. (2005). *Corporate governance in Asia*: Routledge.
- [45] Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The journal of finance*, 52(2), 737-783.
- [46] Tricker, R. B., & Tricker, R. I. (2015). *Corporate governance: Principles, policies, and practices*: Oxford University Press, USA.
- [47] Tú, T. T. T. (2015). Xây dựng bộ chỉ số đánh giá năng lực quản trị điều hành của các NHTM Việt nam.
- [48] Vo, D. H., & Nguyen, T. M. (2014). The impact of corporate governance on firm performance: Empirical study in Vietnam. *International Journal of Economics and Finance*, 6(6), 1-13.

APPENDIX

Table 2: Some Studies of Corporate Governance in Vietnam

Author(s)	Topic/Scope	Sample	Methodology/ Approach	Results/Findings
Bui Xuan Hai (2006)	Examine the development of company law including its CG regimes		Literature review	There is no CG code of practice for companies in Vietnam; As stated in the Enterprise Law, governance structure of shareholding company is more complicated than other company types; Disclosure and transparency index is very low compared to region average.
Le Minh Thang (2008)	Analyze the legal framework for CG in Vietnam	4 listed companies: FPT, Tuong An, VIPCO, Bong Bach Tuyet	Literature review Quantitative (Case studies)	Legal framework for CG in Vietnam is still at the embryonic stage; CG has not received adequate consideration of BoD in listed companies.
Bui Xuan Hai and Chihiro (2008)	Review of CG schemes evolution in Vietnam		Literature review	Vietnam has a poor CG regulation framework CG in Vietnamese SoEs and family-run companies is a insider-based system
Le Minh Toan and Gordon Walker (2008)	Examine the corporate governance of listed companies	3 listed companies: FPT, Bibica, VIPCO	Literature review Quantitative (Case studies)	Listed companies need to improve their corporate governance to ensure market transparency, investor protection and effective management in order to ensure better development of the securities market.
Nguyen Hoa Nhan (2011)	Propose the solutions to overcome weaknesses in CG scheme of commercial banks in Vietnam		Literature review	CG should be improved in Vietnamese commercial banks to respond to rapid changes of the business environment due to globalization and technological revolution.
Hoang Van Hai and Tran Thi Hong Lien (2013)	Describe the evolution of listed companies in Vietnam and CG characteristics		Literature review	CG in Vietnam has been led by the State and international organizations; Vietnamese firms have been inactive in applying CG schemes.
Hoang Van Hai and Tran Thi Hong Lien (2012)	Evaluate CGQ using Gov-Score index	396 listed companies in Hanoi Stock Exchange (HNX)	Quantitative	Quality of CG in HNX companies can be improved by enhancing the CG schemes and training CG concepts and framework for stakeholders.
Luu Trong Tuan (2013)	Test three-layer model of CG which includes Emotional Intelligence-Trust-CSR	382 middle-level managers from 128 chemical companies	Quantitative (SEM analysis)	Emotional Intelligence (EI) is the start of the organization's journey towards strong CG; CG is found to positively correspond to ethical CSR, while legal CSR and economic CSR do not facilitate CG.

Author(s)	Topic/Scope	Sample	Methodology/ Approach	Results/Findings
Vo Hong Duc and Phan Bui Gia Thuy (2013)	Measure the relationship between CG and firm performance	77 listed companies in Ho Chi Minh Stock Exchange (HOSE)	Quantitative (Regression analysis)	Gender of board members, BoD compensation and experience, CEO duality have positive impact on firm performance; Firm size negatively influence firm performance; The volume of equity owned by the BoD has a non-linear relationship with firm performance.
Cao Thi Van Anh and Le Cong Hoa (2014)	Analyze the relationship between CG and firm performance		Literature review	CGQ should be enhanced by raising awareness of CG issues of BoD; A local CG index should be developed for Vietnam.
Tran Thi Thanh Tu et al. (2014)	Measure CGQ using the CGI developed by T.N.Thang (2010)	1 commercial bank	Quantitative	Transparency and disclosure is the weakest in CGI of the bank; CG in the bank just observed half of OECD guidelines, Basel principles and the Central Bank's regulations.
Vo Hong Duc and Nguyen Minh Tri (2014)	Test the impact of CG on firm performance	177 listed firms in Ho Chi Minh Stock Exchange (HOSE)	Quantitative (Regression analysis)	Duality role of CEO, managerial ownership, board independence positively influence firm performance.
Doan Ngoc Phuc and Le Van Thong (2014)	Evaluate the impact of CG on equitized firm performance	217 listed firms in Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX)	Quantitative (Regression analysis)	Board independence has a significant positive impact on firm performance; Board ownership and board experience have a significant negative impact on firm performance.
Nguyen Dinh Khoi (2018)	Measure the impact of CG practices on financial firm performance	263 listed companies in Ho Chi Minh Stock Exchange (HOSE)	Quantitative (Regression analysis)	The total CG index has positive impact on firm performance in 1 or 2 years ahead; Stockholder fairness has a negative impact on Tobin's Q; There is no evidence of the relationship between changes in CG practices and changes in financial firm performance over a period of 3 years from 2013 to 2015.
Nguyen Tan Vinh (2020)	Measure the impact of CEO characteristics, firm size and leverage on dividend payout policy	372 listed enterprises in Ho Chi Minh Stock Exchange (HOSE)	Quantitative (Regression analysis)	Firm size has a positive impact on dividend payout but CEO characteristics and leverage have a negative impact.
Note: BoD: Board of Directors; CG: Corporate Governance; CGQ: Corporate Governance Quality; CEO: Chief Executive Officer				
<i>(Source: Author summarized from existing literature)</i>				

RESEARCH FACTORS AFFECTING THE APPLICATION OF IFRS FOR VIETNAMESE SMES

Nguyen Duc Dung^{1*}

School of Accounting and Auditing, National Economics University, Hanoi, Vietnam

*Corresponding author: dungnd2141@gmail.com

Abstract

The Ministry of Finance recently issued Circular No. 133/2016/TT-BTC “guiding Vietnamese accounting system for small and medium-sized enterprises” to replace Decision No. 48, but, according to many experts, this Circular was like a simplified version of Circular No. 200/2014/TT-BTC. Thus, it can be seen that harmonization with international accounting practices is not a popular trend. The International Accounting Standards Board (IASB) already issued the International Financial Reporting Standards for small and medium-sized enterprises (SMEs). The paper examines the factors that influence the process of applying international financial reporting standards to Vietnamese SMEs. The author conducted a survey of 100 general accountants in small and medium-sized enterprises to identify factors affecting the application of international financial reporting standards for small and medium-sized enterprises. Research has shown that the legal environment factor has a greater influence on the application of international financial reporting standards for small and medium-sized enterprises than those of cultural and business environment. In the legal aspect, the aspect is more concerned than the tax law. Since then, the author has applied the Government should promulgate appropriate financial mechanisms or options for dealing with differences among accounting standards, financial mechanisms and tax policies and train human resources to meet the process of applying these standards.

Keywords: SMEs, legal environment, business environment, cultural environment, IFRS.

1. INTRODUCTION

SMEs play a very important position in the economy of each country, including highly developed ones. In the current trend of integration and globalization, all countries are paying attention to support SMEs to maximize the resources and increase the competitiveness of the products. For Vietnam, SMEs play an even more important role. This has become the most evident in recent years. By the end of 2016, Vietnam had nearly 430,000 operating enterprises with total capitals of about 7 million billion dong. Nearly 98% of them are SMEs and most of which are private enterprises. SMEs use labor resources accounting for 53% of social labor and contribute over 45% of national GDP. By incorporating nearly 130,000 cooperatives and farms and about 3 million individual business households, this sector contributed 60% to GDP. Because of limited capital, SMEs often find it difficult to invest in research and design, improve the technology, procure and equip modern technologies that require a large amount of capital, and provide limited training activities, and improve the qualifications of their employees, thereby affecting labor productivity, product quality and competitiveness in the market.

According to Choi and Levich (1991), differences in accounting systems of different countries have caused significant economic losses to financial statements at an international level. Therefore, international

accounting organizations have been promoting the uniformity in applying accounting standards, helping to increase the transparency and comparability of financial information among countries. According to IASB’s assessment, these standards are applied mostly by those countries with developed economies. According to Bohusova (2012), appropriate accounting standards will help small and medium-sized enterprises prepare high-quality financial statements to meet the requirements on providing stakeholders with reliable and useful information and developed accounting practices also help improve business environment. IASB holds that SMEs are: “Companies without public accountability to disclose and publish financial statements to external entities for any general purpose.” IASB only provides a qualitative criterion of “without public accountability”. This is because there is no suitable quantitative definition for the whole world and this criterion will be formulated by individual countries upon deciding to apply IFRS for SMEs. Although IASB is based on qualitative criteria to identify eligible SMEs for application of IFRS for SMEs, IASB has developed this standard based on common business transactions with about 50 employees and affirmed that IFRS for SMEs is suitable for all SMEs, including micro enterprises with less than 10 employees and whose owner is also the operator of business operations. IFRS for SMEs is an independent set of standards built on the “Theoretical framework for preparing and presenting Financial Statements” of

IFRS, a 230-page document, presented in 35 parts for each standard. IFRS for SMEs is simpler than IFRS in terms of recognition, measurement and disclosure requirements, while paying attention to the balance of costs and benefits in applying to SMEs. Standards that are not suitable for SMEs are eliminated, such as stock earnings, segment reporting, interim financial statements, insurance contracts, and assets held for sale. There are less IFRS options and information presentation requirements are simpler than IFRS.

As Vietnamese SMEs are increasingly participating in international activities and requiring attracting more domestic and foreign funds for development, there is an urgent need for transparent financial information. Similar to other countries, Vietnam is also under the pressure in harmonizing its standards with international financial reporting standards for SMEs.

2. LITERATURE REVIEW

Factors that have promoting effect on application of IFRS.

IFRS advocates also believe that the IFRS-based reports improve the comparability between companies across different markets and countries which facilitates cross-border investment and capital market integration. In dealing with the impacts of IFRS on capital markets, IFRS advocates often find it easier for companies to access international capital markets (Christensen, Hail and Leuz, 2011), especially those with high level of internationalization, by engaging in trading or fund-raising activities in overseas markets.

According to Franco, Kothari and Verdi (2011), there were many reasons previously stated for higher accounting quality in financial statements according to IFRS:

- These standards were originally designed for developed capital market and, therefore, more suitable for investors.
- Less alternative accounting methods resulting in lower income management.
- Require higher quality measurement and recording rules.
- Require a higher level of disclosure, thereby minimizing the problem of information asymmetry between companies and shareholders.

Factors that have restricting effect application of IFRS

There are still many obstacles met during the accounting harmonization process, such as the matter of referring to the fair value in international financial reporting standards. According to Qu & Zhang (2010), while globalization process is rapidly pacing, stock market and legal system are still based on the characteristics of each country and, on the other hand,

international financial reporting standards are not complied with. For countries in which states play a decisive role in accounting matters, legal system has a more significant impact on accounting regulations. In addition, tax system also has a great impact on accounting standards. For developed countries such as the United State or United Kingdom, tax has a negligible effect on the determination of profits, making it easier for accounting harmonization process. This effect, on the other hand, is significant in developing countries. Meanwhile, accountants tend to choose whether to recognize or select accounting methods in compliance with tax laws of their countries. When the desire to expand the international accounting harmonization process must be addressed by specific characteristics of a country, such as business structure, special transactions, etc. especially in countries with the State and Banks as the main sources of capital, such as France, Germany, or Japan, the compliance with laws is respected. In the meanwhile, in countries where capital is mainly provided through capital market such as the United States and the United Kingdom, it requires high levels of completeness, honesty, and rationality of information. This is considered an obstacle to the international accounting harmonization process. The benefits of increasing accounting harmonization are derived from external networks (Dye and Sunder, 2001). However, a standard setting developer needs to indicate whether he or she wants to eliminate national accounting discrepancies, such as whether the benefits of accounting harmonization outweigh the expected costs incurred in changing accounting practices. The study on accounting classification by Nobes (2012) identified various factors that create obstacles for harmonization process. Zeff (2007) discusses four main factors: (1) business culture and finance, (2) accounting culture, (3) audit culture and (4) legal culture, that may cause obstacles to the harmonization of practices among different countries. In addition to the existence of asymmetric information, researchers have the notion that tabulators and users of financial statements may have conflicting interests. The diversity of financial statement users increases the likelihood that the diversity of similar needs makes the comparison between users and tabulators irrelevant; however, all users support the consistency and completeness of disclosures. According to Saemann (1999), his study provides a broader perspective that the tabulators (users) are opposing to the requirements (priority) for increased consistency of and excessive disclosure and publication of information. In order to meet the requirements for global accounting standards, the application of IFRS International Financial Reporting Standards has been developed. According to Vu (2010), factors that have influence on the accounting harmonization process include factors of business environment, legal environment and cultural environment. Factors of business environment include financial supply,

inflation, and provision of labor-specific information. Factors of legal environment include legal system, role of the State and professional associations, and the influence of taxes. Factors of cultural environment are typically those related to power distance, individualism, avoidance of unknown issues, long-term orientation, and masculinity. Three groups of economic, legal and cultural factors are not completely independent from each other, but have close relationships and have interrelated impacts on the international accounting harmonization process. Small and medium-sized enterprises (SMEs) are a potential economic element, that plays an increasingly important role in the economic development of countries. The harmonization of international accounting practices among SMEs is a very interesting problem. For accounting harmonization process in SMEs in the world, IASB believes that it is necessary to develop separate international financial reporting standards for SMEs because of the fact that their financial reporting information need to be compared on a global scale as they are proceeding with the harmonization process. To facilitate accounting harmonization process, the application of IFRS is a reliable but too complex solution, which places a considerable burden on SMEs. Surveys all in an agreement that international financial reporting standards should not generally be applied to SMEs.

Tran (2014), over time, the degree of influence of the factors has gradually formed the basis for Vietnamese accounting system with its unique identity. In term of its business environment, Vietnam is a developing country that is transitioned from a centrally planned economy to a socialist-oriented market economy. In general, Vietnamese financial market has had positive changes in recent years. Inflation is steadily and stably controlled and has no effect on the volatility of the economy. In term of its legal environment, the State plays a decisive role in the national accounting system, specifically including Accounting Law promulgated by the National Assembly, financial regimes promulgated by the Prime Minister, and the system of accounting standards and guiding circulars issued by the Ministry of Finance. In addition, accounting system is also governed by tax regulations. In the past, accounting profit was regarded as similar to profit for taxation purpose as prescribed in the regulations on depreciation of fixed assets, internal revenue, etc. Since 2001, however, these viewpoints have gradually changed particularly with reduced level of domination of accounting activities as prescribed in laws by allowing the setting up of provisions and formation of deferred tax amounts, etc. Fundamentally, Vietnam is heavily influenced by Asian culture with a cautious nature emphasizing on the compliance with regulations and mitigation of judgmental matters. A study showed Vietnamese accountants' perceptions of the advantages and disadvantages of IFRS application, as well as potential costs and challenges of implementing IFRS in

Vietnam. In this study, respondents found that adopting IFRS would increase the comparability as well as the transparency for companies across countries. This would create opportunities for Vietnamese businesses to obtain access to international capital markets and improve their reputation at both national and organizational levels. However, not all of Vietnamese enterprises are considered to benefit from the application of IFRS. The subjects in this study are SMEs that account for a high proportion in Vietnamese business system; however, the accounting harmonization process among SMEs has received inadequate attention as SMEs have simple, vague and inconsistent accounting systems and there is an inconsistency in the application of accounting standards by SMEs.

3. METHODOLOGY

The study to identify the factors that have influence on applying international financial reporting standards for small and medium-sized enterprises. The author sent 150 survey questionnaires to respondents as general accountants. However, only 100 questionnaires were returned by accountants. For respondents as general accountants, they have at least 5 years of experience and are directly responsible for preparing financial statements.

Question 1: In your opinion, what are the benefits in applying international financial reporting standards for small and medium-sized enterprises?

- Help businesses operate more effectively
- Enhance the reliability and honesty of financial statements
- Provide more opportunities to attract investment capital
- Strengthen international activities for small and medium-sized enterprises
- Others

The author continued by addressing environmental factors that may have influence on international accounting harmonization process. The author performed a ratio analysis to see how accountants and auditors think about these factors. These factors are classified in accordance with a previous study into factors of business environment, legal environment and cultural environment.

Question 2: Regarding the factors of business environment, do you think which factors have the greatest influence on applying international financial reporting standards for small and medium-sized enterprises?

- Source of finance supply
- Inflation
- Labor quality
- Others (Please state)

Question 3: Regarding the factors of legal environment, do you think which factors have the greatest influence on applying international financial reporting standards for small and medium-sized enterprises?

- Legal systems
- Role of the State and occupation
- Tax effect
- Others (Please state)

Question 4: Regarding the factors of cultural environment, do you think which factors have the greatest influence on applying international financial reporting standards for small and medium-sized enterprises?

- Power distance
- Individualism
- Long-term orientation
- Avoidance of unknown issues
- Others (Please state)

Question 5 is intended to determine which of above-mentioned factors have the greatest influence on accounting harmonization process, on applying international financial reporting standards for small and medium-sized enterprises.

Question 5: Regarding the factors of business, legal, and cultural environments, do you think which factors have the greatest influence on applying international financial reporting standards for small and medium-sized enterprises?

- Factors of business environment
- Factors of legal environment

- Factors of cultural environment
- Others

In addition to environmental factors, the author also explore internal factors that have influence on accounting harmonization process in enterprises.

4. RESULTS AND DISCUSSION

- For the benefits from the application of international financial reporting standards to SMEs, accountants mostly appreciate the ability to attract investment capital to these enterprises as nearly 50% of the respondents choose this option.

- Regarding business environment factors.

Accountants consider the source of finance supply to be the most important. 58 accountants consider this as the most important factor. Source of finance supply for SMEs has not appeared much in the current capital market, but in the future, investors will play an increasingly important role and need to be paid an adequate attention. Due to a relatively stable economic situation recently, inflation factor is chosen by only 18 accountants.

- Regarding legal environment factors.

Accountants have quite clear differences in opinions. For accountants, due to the characteristics of SMEs, tax effect is considered to be of particular importance when there are 55 accountants choosing this factor. Accountants' opinions are also in complete agreement with expert interviews. Most of interviewed experts say

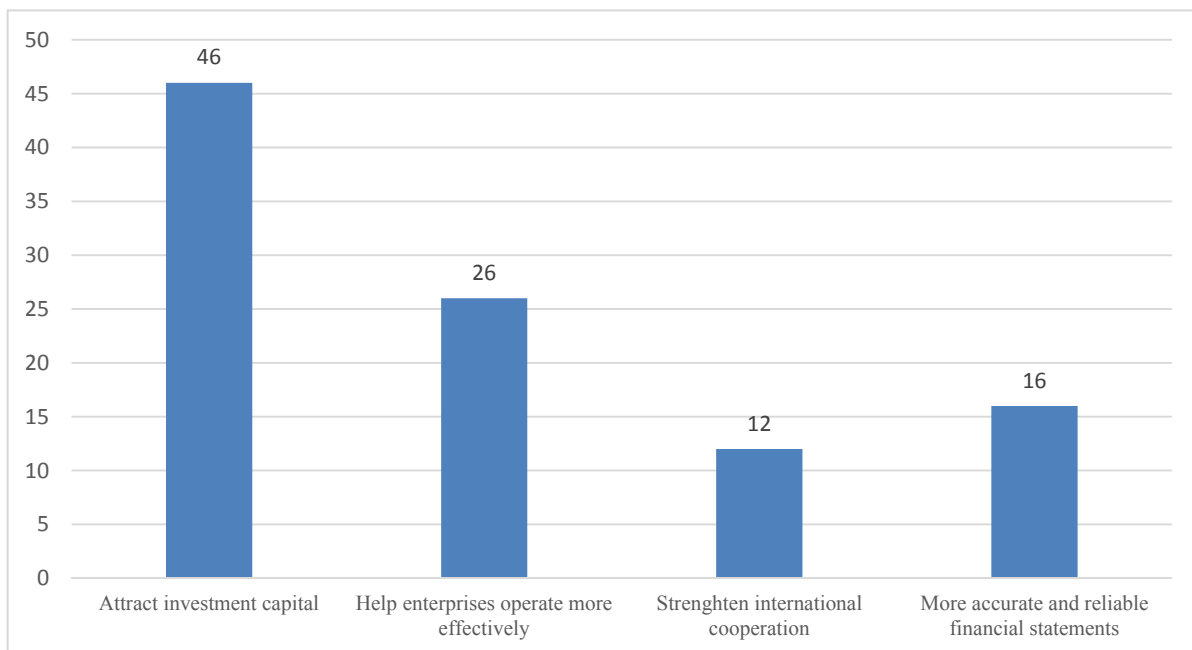


Fig 1: Survey on the benefits of applying international financial reporting standards for SMEs from the perspectives of accountants.

Source: Author

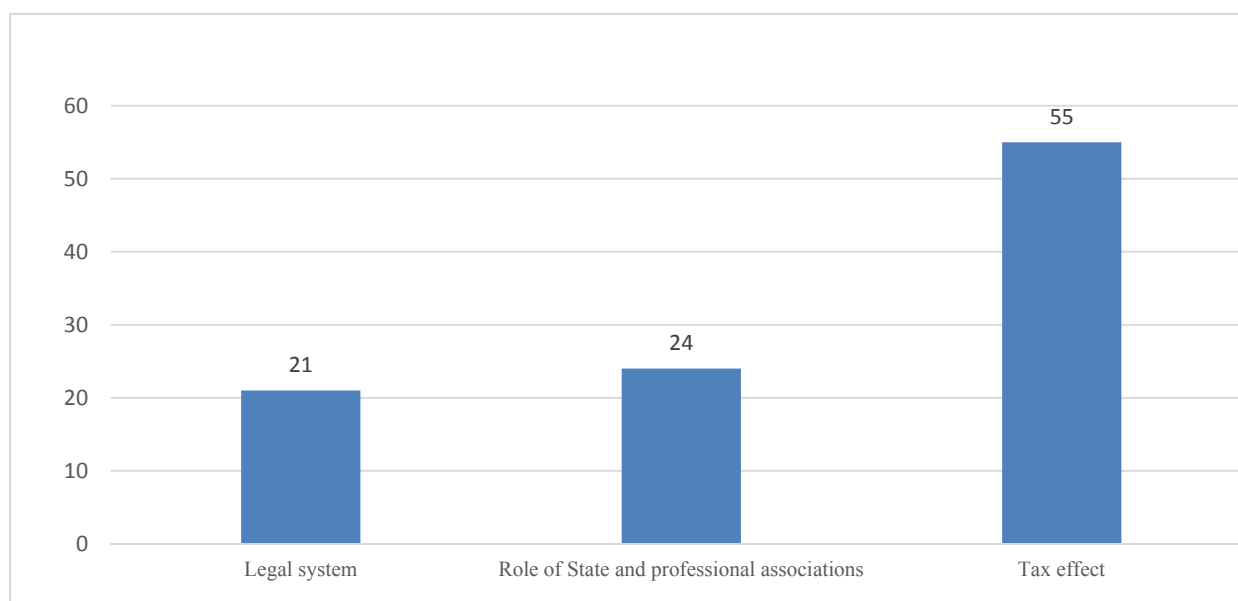


Fig 2: Survey on legal environment factors that have influence on applying international financial reporting standards for SMEs from the perspectives of accountants.

Source: Author

that current record of SMEs focus heavily on taxes with depreciation and provision clauses. This causes accountants less concerned about presenting in a truthful and rational manner but mostly complying with tax regulations only. Experts also say that managers of SMEs often evaluate the results of accounting departments based on tax results. Therefore, accountants tend to recognize and prepare financial statements in accordance with tax regulations to reduce the difference between tax and accounting figures in order to easily explain them to managers.

- For cultural environment.

Accountants hold that the avoidance of unknown issues receives the most attention with 42 responses, followed by power distance with 29 responses.

- Assessment of environmental factors with the most influence on international accounting harmonization process.

Legal environment factors are the most influential with 61 responses while 23 responses choose the business environment and 16 responses choose cultural environment.

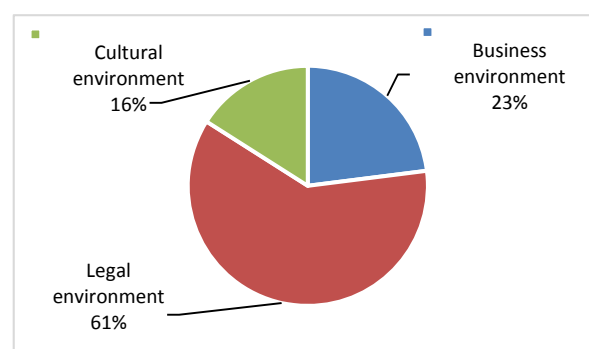


Fig 3: Survey on environment factors that have influence on applying international financial reporting standards for SMEs from the perspectives of accountants.

Source: Author

However, through interviews, the author also identify that three groups of economic, legal and cultural factors are not entirely independent of but closely related to each other. This situation is similar in Vietnam. As capital market is not strong enough in relation to business environment, accounting practices in legal environment will be greatly influenced by tax laws and accounting values focus more on higher compliance.

5. CONCLUSION

Through survey assessment of the factors that have influence on accounting harmonization process for SMEs, it can be seen that legal environment factors, especially tax, have the greatest impacts on those that prepare financial statements in SMEs. Currently, Vietnam has 3 types of laws that have influence on financial performance of enterprises: accounting standards, financial mechanisms and tax policies. This causes a lot of difficulties for enterprises. Through survey results, it is also found that tax policies are a major factor affecting international harmonization process of SMEs. Accountants sometimes prepare financial statements in accordance with tax policies on such matters as provisions, depreciation of fixed assets or dealing with exchange rates.

Within its competence, the Government should promulgate appropriate financial mechanisms or options for dealing with differences among accounting standards, financial mechanisms and tax policies. The State should agree with enterprises that disclose information to users such as investors, creditors, employees, suppliers, etc. so that they comply with accounting standards. Managers need to pay attention to financial statements to ensure the compliance with accounting standards. Managers and accountants also need to improve the awareness that information in financial statements is not intended for tax authorities, but is intended for business owners and stakeholders for decision-making purpose. As SMEs account for a large proportion in the economy, training should be based on a methodical approach initiated by the Ministry of Finance. The Ministry of Finance should coordinate with stakeholders in implementing IFRS training for members of the drafting committee and editorial team, and assist enterprises and training institutions in accounting standard application process.

Regarding the application of international financial reporting standards, accountants still have a lot of concerns that costs are greater than benefits during the implementation. When enterprises still do not believe in future benefits from the application, they will face many difficulties. Therefore, state agencies should propagate to raise the awareness among SMEs of the benefits of applying international financial reporting standards. Enterprises will incur relatively large initial investment costs for training human resources as well as changing information systems, accounting software, and so on, but in the long term, benefits from transparency of information technology, and attracting investors will not only outweigh initial costs but also help enterprises stabilize and develop sustainably. The application will help improve the quality of financial reporting information as well as maintain a good

internal control system. In addition, in order to minimize difficulties in the application, the Ministry of Finance should promulgate documents and update the changes of international accounting standards on a regular basis. The Ministry of Finance should coordinate with associations, professional organizations, foreign auditing firms to translate to overcome language barrier, so that accountants of SMEs can easily access and understand international standards.

In addition, the roadmap on how to apply international financial reporting standards for SMEs, if implemented, should be made public to enterprises, investors, training institutions, agencies, etc. to help these entities be proactive in their application.

6. REFERENCES

- [1] Bohusova, H. (2012), "In what ways are countries which have already adopted IFRS for SMEs different", *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, LX2, 37-44
- [2] Christensen, H. B., Hail, L., & Leuz, C. (2011), "Capital-market effects of securities regulation: prior conditions, implementation, and enforcement", *The Review of Financial Studies*, 29(11), 2885 -2924, <https://doi.org/10.1093/rfs/hhw055>
- [3] Choi, F. D., & Levich, R. M. (1991), "International accounting diversity: does it affect market partici-pants?", *Financial Analysts Journal*, 47(4), 73-82.
- [4] Vu, D. H. (2010) *Basic issues of accounting theory*, Labor Publishing House, Hanoi, Vietnam.
- [5]. Franco, G. D., Kothari, S.P., and Verdi, R.S (2011) "The Benefits of Financial Statement Comparability", *The Journal of Accounting Research*, 49(4), 895-931. <https://doi.org/10.1111/j.1475-679X.2011.00415.x>
- [6]. Nobes, C. (2012), "The survival of international differences under IFRS: towards a research agenda", *Accounting and Business Research*, 36(3), 233-245, <https://doi.org/10.1080/00014788.2006.9730023>
- [7]. Ronald A. Dye and Sunder, S. and Dye, R.A. (2001) "Why Not Allow FASB and IASB Standards to Compete in the U.S.?", *Accounting Horizons*, September 2001, 15(3), 257-271. DOI: [10.2139/ssrn.271090](https://doi.org/10.2139/ssrn.271090)

- [8]. Saemann, G. (1999), "An Examination of Comment Letters Filed in the U.S. Financial Accounting Standard-Setting Process by Institutional Interest Groups", *Abacus*, 35(1), 1-28. <https://doi.org/10.1111/1467-6281.00032>
- [9] Tran, T. Q. (2014), *Orientations for building the standards of Vietnam financial statements meet the international accounting*, Ph.D University of Economics Hochiminh City.
- [10] Qu, X and Zhang, G. & (2010), "Measuring the convergence of national accounting standards with international financial reporting standards: The application of fuzzy clustering analysis", *International journal of accounting*, 45(3), 334-355, <https://doi.org/10.1016/j.intacc.2010.06.008>
- [11] Zeff, S. A (2007), "Some obstacles to global financial reporting comparability and convergence at a high level of quality", *The British Accounting Review*, 39 (2007) 290-302.

CORPORATE GOVERNANCE REFORM, BOARD INDEPENDENCE AND EARNINGS MANAGEMENT: EVIDENCE FROM VIETNAM

Truc Tran*, Rezaul Kabir and Xiaohong Huang

Department of Finance and Accounting, Faculty of Behavioral, Management and Social Sciences
University of Twente, The Netherlands

*Corresponding author: thanhttructran27@gmail.com

Extended Abstract

Research purpose:

Examine whether the mandatory requirement that independent directors of Vietnamese stock exchange listed firms should make up at least one-third of a firm's board of directors succeed in reducing earnings management of firms.

Motivation:

For an emerging economy with a relatively short history of private capital market, corporate governance is a critical area of improvement in Vietnam. A major corporate governance reform took place in Vietnam in 2012 with the issuance of Circular 121. It required that independent directors should make up at least one-third of a firm's board of directors. It also stipulated that independent directors, besides being non-executive, might not have a direct relationship with any major shareholders, large suppliers, large customers, legal advisors, or external auditors of the firm.

Research design:

Statistical analysis using the Ordinary Least Squares regression method is undertaken to analyze a large sample of 523 non-financial Vietnamese firms listed on both the Ho Chi Minh Stock Exchange and the Hanoi Stock Exchange during 2009 – 2016. Robust measures of earnings management are estimated using the Modified Jones model and the Kothari model. The regression model includes control variables representing corporate governance and firm characteristics, as well as industry and year differences.

Main findings:

No evidence of a significant relationship between earnings management of firms and the proportion of independent directors on the board, nor any evidence that Circular 121 has an impact on this relationship. The results are consistent across different regression models and various robustness tests. Overall, the findings of the study suggest that corporate governance reform to increase board independence may not be an effective tool in mitigating earnings management.

Keywords: Earnings management, corporate governance reform, board independence, independent directors, Vietnam.

Section 3
HUMAN RESOURCE MANAGEMENT

EFFECTS OF PSYCHOLOGICAL EMPOWERMENT ON THE CREATIVITY OF VIETNAM TELECOMMUNICATION ENTERPRISES' EMPLOYEES

Nguyen Thi Phuong Linh¹ and Doan Xuan Hau²

¹ Department of General Business Management, National Economics University, Hanoi, Vietnam

² Department of Enterprise Management, National Economics University, Hanoi, Vietnam

Corresponding author: linhnp@neu.edu.vn

Abstract

The objective of this study is to investigate the relationship between psychological empowerment and employee creativity with the influence of creative process engagement and intrinsic motivation by testing the research model. Data were collected from in-depth interviews and surveys of 420 Vietnamese telecommunication enterprises employees. The results confirm that psychological empowerment has a positive direct and indirect relationship through creative process engagement and intrinsic motivation with employee creativity. Based on the relationship and the level of impact on employee creativity, the authors make a few suggestions for managers to promote creativity in the work of employees of Vietnam's telecommunication enterprises.

Keywords: psychological empowerment, employee creativity, creative process engagement, intrinsic motivation.

1. INTRODUCTION

Today, in a dynamic and competitive environment, the increasing demand for quality services has forced most organizations to adjust to new management methods, one of which is empowering employees (Özaralli, 2015). Empowerment has played an important role in team development and organizational effectiveness of both management researchers and practitioners (Bennis and Nanus, 1985; Neilsen, 1986). Many authors used the terms of empowerment role or empowerment environment to describe efforts from the organization executives to transfer some options or decision-making power from managers to employees (Labianca et al., 2000; Logan and Ganster, 2007; Meyerson and Kline, 2008).

Research on employee creativity has taken an interactive approach, arguing that creativity is the result of interaction between contextual factors and employee characteristics (Woodman et al., 1993). Zhang and Bartol (2010) find a positive and meaningful relationship between psychological empowerment and employee creativity; Tung (2016) asserts that managers should empower their employees, so that organizations can survive and become more creative. Moreover, the employees who are empowered feel more confident about their ability to perform the mission successfully. Therefore, they will be willing to take risks and explore new cognitive avenues (Zhang and Bartol, 2010).

In addition, intrinsic motivation is the degree to which an individual is interested in a task and participates in it for the sake of the work itself (Ambrose and Kulik, 1999), also used to explain cognitive processes of psychological empowerment with employee productivity and creativity (Amabile, 1996; Thomas and Velthouse, 1990). But according to componential theory of creativity (Amabile, 1983), intrinsic motivation is only a necessary condition, but not enough, for an individual to achieve favorable creative results (Bin Saeed et al., 2019). Employee creativity is also influenced by the process of participating in creative activities (Amabile, 1988, 1996). Creative process engagement is mediated in the relationship between psychological empowerment and creativity (Aslam, 2017; Zhang, 2007; Zhang and Bartol, 2010).

In the context of Vietnam, the telecommunications industry has been considered as one of the important industries in the economy. The industry has made a full contribution to technological innovation, reduced unemployment and served as a source of community contributions to society. Each telecommunications company is trying to popularize its services, renew products and perform innovation to become famous and gain a major share of the market (Ali and Ibrahim, 2014). The competition among telecommunication enterprises is in their creativity to meet the requirements of customers and some telecommunication providers in Vietnam are taking action to solve this problem

(Nham et al., 2020). Therefore, research on creativity and factors affecting the creativity of telecommunication enterprises employees is necessary in the current context.

This study attempts to expand current research in the following ways. *Firstly*, the authors consider the direct effects of psychological empowerment on employee creativity. *Secondly*, the study explores the influence of creative process engagement and intrinsic motivation in the relationship between psychological empowerment and employee creativity. *Thirdly*, this study is based on data obtained from telecommunication enterprises employees in the context of Vietnam, which will add to the understanding of effective psychological empowerment.

2. THEORETICAL BACKGROUND AND HYPOTHESES

Construct definition of psychological empowerment

Based on the previous theory of empowerment (Conger and Kanungo, 1988; Thomas and Velthouse, 1990), Spreitzer (1995) defines psychological empowerment as an internal motivational force that reflects a proactive orientation and job control consciousness is expressed in four dimensions: meaning, impact, self-determination and competence. Meaning represents the extent to which personal values and beliefs fit the requirements of a job (Hackman and Oldham, 1980). Impact is the extent to which an individual believes that he or she can influence the strategic direction, operational process and results of an entity or organization (Ashforth, 1989). Self-determination involves self-control and control over the beginning, regulation and continuation of work behaviors (Deci et al., 1989). Finally, competence refers to a belief in the degree to which a person possesses the competencies needed to succeed in a job (Bandura, 1989).

Employee creativity

Creativity refers to the creation of original and realistic ideas or to clarify problems on products, processes or services that are appropriate to the problem or opportunity presented (Zhou and George, 2003). By this definition, creativity means creating new ideas that are both novel and useful. Unique ideas with practices that show novelty and usefulness, contribute both directly and indirectly to the organization both in the short and long term (Shalley et al., 2004). Therefore, creativity can be considered as a kind of occasional task in which employees go beyond standard operating processes through psychological empowerment in developing new ideas (Javed et al., 2017).

Psychological empowerment and employee creativity: the influence of creative process engagement and intrinsic motivation

Psychological empowerment greatly influences the attitude and behavior of employees (Dust et al., 2014; Liden et al., 2000; Spreitzer, 1996). Zhang and Bartol (2010) also show that psychological empowerment positively affects employee creativity. Quinn and Spreitzer (1997) assert that empowered employees tend to experiment and look at old problems from new approaches and create innovative results. Conger and Kanungo (1988) argue that psychological empowerment is important to stimulate and manage creativity and innovation in organizations.

Moreover, many previous studies also recognize the link between psychological empowerment and creativity (Seibert et al., 2011; Zhang and Bartol, 2010; Javed et al., 2017). Based on the above arguments, we hypothesize:

Hypothesis 1. Psychological empowerment is positively related to employee creativity.

Creative process engagement is defined as employee engagement in creative methods or processes, including (1) problem identification, (2) information searching and coding, (3) ideas and generations (Amabile, 1983; Reiter Palmon and Illies, 2004). Psychological empowerment has an important impact on employees' willingness to participate in a creative process (Zhang and Bartol, 2010). When the employees believe that they have the ability to carry out a successful task, have a certain degree of self-determination in doing the job, the employees have the ability to focus on an idea or a problem longer (Deci and Ryan, 1991; Spreitzer, 1995). Consequently, we propose the following hypothesis:

Hypothesis 2. Psychological empowerment is positively related to creative process engagement

According to psychological empowerment theory, employees are only aware of empowerment when their psychological state can stimulate their intrinsic motivation (Mishra and Spreitzer, 1998; Quinn and Spreitzer, 1997; Wilkinson, 1998). Thomas and Velthouse (1990) described psychological empowerment that increased the intrinsic motivation. Although this view is widely accepted, little evidence is provided in studies to confirm the relationship between psychological empowerment and intrinsic motivation (Li et al., 2015). Fong and Snape (2013) suggest that empowerment can be viewed as a state of internal origin, indicating that empowerment is related to the concept of intrinsic motivation. Building on the above arguments, we hypothesize:

Hypothesis 3. Psychological empowerment is positively related to intrinsic motivation

According to the concept of composition of creativity (Amabile, 1988, 1996), employee creativity is influenced by participation in creative activities. Over the past decade, researchers have proposed the value of

understanding the processes that ultimately lead to creative results (Shalley and Gilson, 2004). Zhang and Bartol (2010) show that employees tend to be more creative when they are involved in the creative process (Zhang and Bartol, 2010). Participating in the creative process represents the first step necessary for creativity (Gilson and Shalley, 2004). Creative process engagement helps employees engage in creative activities and remain committed throughout the creative process until new, feasible, practical and useful ideas are implemented (Kirkman et al., 2009). Therefore, we formed the following hypotheses:

Hypothesis 4. Creative process engagement is positively related to employee creativity.

Intrinsic motivation is one of the most important and influential influences on employee creativity (Amabile, 1988, 1996). Previous studies have suggested that psychological mechanisms such as intrinsic motivation are the fundamental drivers of creativity (Amabile, 1985; Amabile et al., 1996). According to this line of research, the number of scholars has shown that intrinsic motivation plays a key intermediary role between leadership and creativity (Shin and Zhou, 2003; Zhang and Bartol, 2010). Studies of intrinsic motivation are becoming increasingly important, especially when intrinsic motivation has been shown to have a positive impact on learning, creativity, perseverance and happiness (Ryan and Deci, 2000). Zhang and Bartol (2010) also suggest that intrinsic motivation is an intermediary that links empowering leadership and creativity, a connection between psychological empowerment and creativity. Intrinsic motivation is considered to be the factor forming creativity (Amabile, 1996; Shalley et al., 2004). Thus, the following hypothesis is offered to be tested:

Hypothesis 5. Intrinsic motivation is positively related to employee creativity.

3. RESEARCH METHODOLOGY

3.1. Sample and procedures

After conducting research on secondary data, the authors conducted in-depth interviews with two target groups (i) managers (board of directors, head of department); (ii) employees of some Vietnamese telecommunication enterprises to clarify psychological empowerment, creative process engagement, intrinsic motivation and employee creativity. Based on the research overview and the results of in-depth interviews, the authors have developed a questionnaire to serve the investigation. There are four factors in the research model with observed variables inherited from previous studies.

To collect accurate data, the authors went directly to Vietnamese telecommunication enterprises to distribute and collect survey questionnaires. The questionnaire was divided into two parts: the first part explored the respondents' perceptions of psychological empowerment, creative process engagement, intrinsic motivation and employee creativity; the second part explores personal information such as gender, age, education, job tenure.

The survey was conducted by 500 employees in 21 telecommunication enterprises in Vietnam. After screening, 420 questionnaires were used for the study. Sample statistics show that 188 male and 232 female employees participated in the survey, 44.8% and 55.2% respectively of the total. Of the 420 questionnaires, 64.5% of employees are between 20 and 30 years old; 30.2% of employees are aged between 31 and 40; other age groups are not significant. Research sample has 79.8% with College/University degree; 55.6% have job tenure from 1 to 5 years, 17.9% have job tenure from 6 to 10 years.

To test the model's suitability and research hypotheses, the authors conducted Cronbach's Alpha analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and structural equation modeling (SEM) using SPSS 22.0 and AMOS 24.0 tools.

3.2. Measures

Psychological empowerment (PE). We measured employees' psychological empowerment using 12 items developed by Spreitzer (1995). 12-item psychological empowerment scale was used with four dimensions: meaning (PE-M), competence (PE-C), self-determination (PE-S) and impact (PE-I). These 12-item scale as manifested in four dimensions of 3 items each: meaning, competence, self-determination and impact (α 's = 0.829, 0.798, 0.762 and 0.808 respectively). A sample item is, "The work I do is very important to me." Each item was rated from 1 (strongly disagree) to 5 (strongly agree). A confirmatory factor analysis (CFA) was conducted for the scale, and the result demonstrated an acceptable model fit ($\chi^2(50) = 67.303, p < 0.001; CFI = 0.990, GFI = 0.987, RMR = 0.065, RMSEA = 0.029$), suggesting that the dimensions reflected the overall construct.

Creative process engagement (CPE). Creative process engagement was measured with Zhang and Bartol (2010). This measure contains three dimensions: problem identification (CPE-P), information searching and encoding (CPE-I) and idea generation (CPE-G) (α 's = 0.793, 0.770 and 0.866 respectively). A sample item is, "I spend considerable time trying to understand the nature of the problem." Each item was rated from 1 (strongly disagree) to 5 (strongly agree). A confirmatory factor analysis (CFA) was conducted for

the scale and the result demonstrated an acceptable model fit ($\chi^2(41) = 45.712, p < 0.001$; CFI = 0.997, GFI = 0.980, RMR = 0.052, RMSEA = 0.017), showing that the scale is perfectly suitable for further analysis.

Intrinsic motivation (IM). Intrinsic motivation was measured with three items (α 's = 0.758) adapted from the work of Amabile (1985) and Tierney et al. (1999). A sample item is, "I enjoy finding solutions to complex problems." Each item was rated from 1 (strongly disagree) to 5 (strongly agree).

Employee creativity (EC). Employee creativity was measured with a 13-item creativity scale (α 's = 0.885) developed by Zhou and George (2001). A sample item is, "Suggests new ways to achieve goals or objectives." Each item was rated from 1 (strongly disagree) to 5 (strongly agree). The two items were excluded after analyzing Cronbach's Alpha: EC6, EC7.

Control variables. According to previous literature, we selected four demographic variables which may affect the statistical result as control variables: gender, age, education, job tenure (e.g., Bin Saeed et al., 2019; Dust et al., 2014; Jada et al., 2019; Li et al., 2015; Raub and Robert, 2010; Zhang and Bartol, 2010). Gender was measured as a dichotomous variable coded as 1 for male and 2 for female. Age was measured in years. Education was measured by qualifications. Job tenure was measured as the number of years that an employee had been in the company.

4. ANALYSES AND RESULTS

In order to group the initial observation variables into meaningful factors and discover the underlying structure between the research concepts, the authors conducted an exploratory factor analysis (EFA) with

four factors: psychological empowerment, creative process engagement, intrinsic motivation and employee creativity; in which several factors are measured by groups of dimensions. The KMO coefficient calculated from the sample is 0.887 greater than 0.5, indicating that the sample size is eligible for conducting factor analysis. To identify the main factors, the authors used a factor extraction method based on Eigenvalue values. Factors with an Eigenvalue value greater than 1 can be retained in the analytical model. Using the Kaiser criterion, eigenvalue = 1.158 greater than 1 is appropriate for all 9 groups of factors, explaining 65.996 percent variance. Table 1 presents the means, standard deviations, and zero-order Pearson correlations of psychological empowerment, creative process engagement, intrinsic motivation, employee creativity. As shown in the table, psychological empowerment was significantly related to both creative process engagement ($r = 0.296, p < 0.01$) and intrinsic motivation ($r = 0.178, p < 0.01$). All of which are positively related to employee creativity ($r = 0.313$ and 0.305 respectively, $p < 0.01$). These results provided initial support for some of our hypotheses.

The three important indicators of convergent validity are factor loadings (standardized estimates), the average variance extracted (AVE) and composite reliability (CR). The standardized estimates of each item range from 0.663 to 0.846 and are statistically significant ($p = 0.000$). AVE ranges from 0.505 to 0.623 and CR ranges from 0.758 to 0.918. According Hair et al. (2010), the results of standardized estimates, AVE and CR are all in the acceptable region, thereby providing support for convergent validities of constructs (Table 2).

Table 1: Means, standard deviations and correlations

	Mean	Std. Deviation	Gender	Age	Education	Job tenure	PE	CPE	IM	EC
Gender	1.55	0.49	1							
Age	1.41	0.59	-0.209**	1						
Education	2.03	0.44	0.062	-0.030	1					
Job tenure	2.34	0.94	-0.179**	0.667**	-0.019	1				
PE	3.50	0.69	0.018	-0.007	-0.045	0.006	1			
CPE	3.24	0.73	-0.003	0.013	-0.007	0.017	0.296**	1		
IM	3.67	0.87	-0.045	0.088	0.050	0.112*	0.178**	0.489**	1	
EC	3.65	0.52	-0.010	0.025	-0.070	0.017	0.120*	0.313**	0.305**	1

Notes: n = 420; *p < 0.05; **p < 0.01

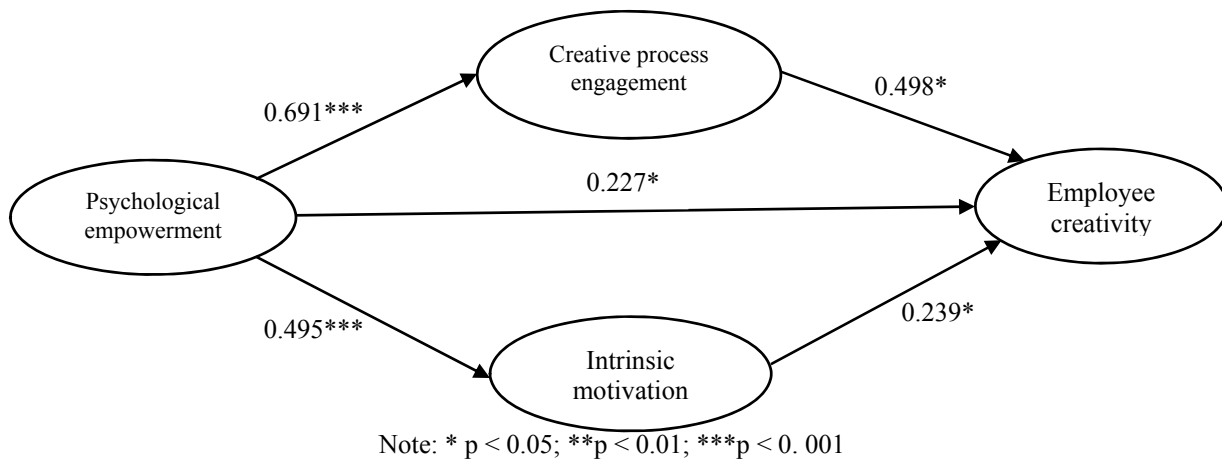


Figure 1: Results of structural equation modeling

Table 2: The measurement model

Construct	Item	Standardized estimates	AVE	CR	p-value
PE	PE-M		0.623	0.832	0.000
	PE1	0.763			
	PE2	0.756			
	PE3	0.846			
	PE-C		0.569	0.798	0.000
	PE4	0.786			
	PE5	0.755			
	PE6	0.721			
	PE-S		0.521	0.764	0.000
	PE7	0.710			
	PE8	0.779			
	PE9	0.671			
CPE	PE-I		0.591	0.812	0.000
	PE10	0.694			
	PE11	0.841			
	PE12	0.763			
	CPE-P		0.562	0.794	0.000
	CPE1	0.754			
	CPE2	0.774			
	CPE3	0.721			
	CPE-I		0.531	0.772	0.000
	CPE4	0.739			
	CPE5	0.663			
	CPE6	0.739			
CPE-G		0.568	0.867	0.000	
CPE7	0.733				
CPE8	0.701				
CPE9	0.738				

Construct	Item	Standardized estimates	AVE	CR	p-value
IM	CPE10	0.829	0.511	0.758	0.000
	CPE11	0.761			
	IM1	0.681			
	IM2	0.734			
EC	IM3	0.729	0,505	0.918	0.000
	EC1	0.685			
	EC2	0.689			
	EC3	0.701			
	EC4	0.729			
	EC5	0.694			
	EC8	0.754			
	EC9	0.721			
	EC10	0.711			
	EC11	0.755			
	EC12	0.710			
	EC13	0.666			

Before testing the research model, confirmatory factor analysis (CFA) was carried out to assess the measurement model. The findings show that the data fit the model as seen in the following indices: $\chi^2 = 845.180$; $df = 616$; $p < 0.01$; $RMSEA = 0.030$; $CFI = 0.964$; $TLI = 0.961$.

The fit of the research model was examined through structural equation modeling (SEM); the results show that the data fit well with the structural model: $\chi^2 = 939.610$; $df = 617$; $p < 0.01$; $RMSEA = 0.035$; $CFI = 0.950$; $TLI = 0.946$. Figure 1 shows the overall structure model with standardized path coefficients. The hypotheses H1, H2, H3, H4 and H5 are all accepted. Psychological empowerment has a direct relationship with employee creativity ($\beta = 0.227$, $p < 0.05$). Psychological empowerment is positively related to creative process engagement and intrinsic motivation ($\beta = 0.691$ and 0.495 respectively, $p < 0.001$). Creative process engagement and intrinsic motivation have a positive relationship with employee creativity ($\beta = 0.498$ and 0.239 respectively, $p < 0.01$).

5. DISCUSSIONS AND CONCLUSIONS

5.1. Discussions

The purpose of this study is to understand direct and indirect influence of psychological empowerment on employee creativity. All hypotheses have been accepted with $p < 0.05$.

This study has proven the hypothesis of a direct relationship between psychological empowerment and employee creativity. The above results are aligned with the preceding studies of Aslam (2017), Javed et al. (2017).

Research results have demonstrated an indirect relationship between psychological empowerment and employee creativity. *Firstly*, psychological empowerment has a proportional relationship with both creative process engagement and intrinsic motivation, in which the impact of psychological empowerment on creative process engagement is stronger than the impact on intrinsic motivation. Zhang and Bartol (2010) agree with psychological empowerment's positive relationship with creative process engagement and intrinsic motivation; however, according to these authors, the effect of psychological empowerment on intrinsic motivation is stronger than that of creative process engagement. *Secondly*, creative process engagement and intrinsic motivation have been shown to have positive effects with the employee creativity. This recognition is consistent with the research of Zhang and Bartol (2010).

5.2. Implications

Firstly, our study explores the direct and indirect relationship between psychological empowerment and employee creativity. The hypotheses of the study are accepted, proving that psychological empowerment plays an important role in the creativity of telecommunication enterprises employees. For the enterprises in the telecommunication industry, an industry associated with technological innovation, should refresh products and implement innovations to gain market share in the market (Ali and Ibrahim, 2014), managers should pay attention to empowering employees when doing the work to stimulate creativity in the work.

Secondly, employee creativity has been found to make a fundamental contribution to organizational innovation, growth and survival (Amabile, 1996; Madjar et al., 2002; Mandel, 2008; Suh et al., 2010), new products performance (Im and Workman, 2004), employee performance (Zhang and Bartol, 2010) and sustainable social sustainability (Patankar, 2010). This study confirms that in order to stimulate employee creativity, attention is needed to the impact of three factors: psychological empowerment, creative process engagement and intrinsic motivation. In particular, managers should focus the most resources to encourage employees to participate in creative process because this factor most strongly affects the creativity of employees ($\beta = 0.498$).

5.3. Limitations

This study is constrained by three limitations. *Firstly*, employee creativity is influenced by many other factors besides those mentioned in this study. *Secondly*, psychological empowerment, a factor that directly impacts employee creativity in practice and in previous studies (Amundsen and Martinsen, 2015; Jyoti and Dev, 2015; Javed et al., 2017; Gu et al., 2018) has shown that it depends on leadership style. A full study of the impact of leadership style on psychological empowerment and from psychological empowerment to employee creativity should be conducted in the future at Vietnamese telecommunication enterprises. *Thirdly*, we have not conducted a survey of all telecommunication enterprises in Vietnam, the study stopped at about 20% of the number of telecommunication enterprises currently operating.

5.4. Conclusions

This research has expanded our understanding of the direct and indirect impact of psychological empowerment on employee creativity. Based on the influence of factors on creativity of employees, telecommunication enterprises managers may choose to impact on that factor to stimulate employee creativity to suit the direction of innovation in the future of the organization. At the same time, the study also confirms that Vietnamese telecommunication enterprises managers should also be interested in empowering employees when doing the work.

6. REFERENCES

- [1] Ali, A. Y. S., and Ibrahim, I. H. (2014), "The impact of leadership style on corporate innovation: Survey from telecommunication industry in Somalia. *International Journal of Academic Research in Management*", 3, (3), 233-241.
- [2] Amabile, T. M. 1983, "The social psychology of creativity: A componential conceptualization", *Journal of Personality and Social Psychology*, 45, (2), 357-376.
- [3] Amabile, T. M. 1985, "Motivation and creativity: Effects of motivational orientation on creative writers", *Journal of Personality and Social Psychology*, 48 (2), 393-399.
- [4] Amabile, T. M. (1988), "A model of creativity and innovation in organizations", *Research in organizational behavior*, 10, (1), 123-167.
- [5] Amabile, T. M. 1996, *Creativity in context*, Boulder, CO: Westview.
- [6] Amabile, T. M., Conti, R., Coon, H., Lazenby, J., and Herron, M. (1996), "Assessing the work environment for creativity", *Academy of management journal*, 39, (5), 1154-1184.
- [7] Ambrose, M. L., and Kulik, C. T. (1999), "Old friends, new faces: Motivation research in the 1990s", *Journal of management*, 25, (3), 231-292.
- [8] Amundsen, S., and Martinsen, Ø. L. (2015), "Linking empowering leadership to job satisfaction, work effort, and creativity: The role of self-leadership and psychological empowerment", *Journal of Leadership and Organizational Studies*, 22, (3), 304-323.
- [9] Ashforth, B. E. (1989), "The experience of powerlessness in organizations", *Organizational behavior and human decision processes*, 43, (2), 207-242.
- [10] Aslam, S. (2017), "Psychological empowerment on creativity among employees of IT sector: The mediating role of creative process engagement and intrinsic motivation", *Canadian Social Science*, 13, (6), 11-34.
- [11] Bennis, W. G., and Nanus, B. (1985), *Leaders: The Strategies for taking charge*, New York: Harper and Row, Publishers.
- [12] Bandura, A. (1989), "Regulation of cognitive processes through perceived self efficacy", *Developmental psychology*, 25, (5), 729.
- [13] Bin Saeed, B., Afsar, B., Shahjeha, A., and Imad Shah, S. (2019), "Does transformational leadership foster innovative work behavior? The roles of psychological empowerment, intrinsic motivation, and creative process engagement", *Economic research-Ekonomska istraživanja*, 32, (1), 254-281.
- [14] Conger, J. A., and Kanungo, R. N. (1988), "The empowerment process: Integrating theory and practice", *Academy of management review*, 13, (3), 471-482.
- [15] Deci, E. L., Connell, J. P., and Ryan, R. M. (1989), "Self-determination in a work organization", *Journal of applied psychology*, 74, (4), 580.

- [16] Deci, E. L., and Ryan, R. M. 1991, *A motivational approach to self: Integration in personality*, Lincoln: University of Nebraska Press.
- [17] Dust, S. B., Resick, C. J., and Mawritz, M. B. (2014), "Transformational leadership, psychological empowerment, and the moderating role of mechanistic-organic contexts", *Journal of Organizational Behavior*, 35, (3), 413-433.
- [18] Fong, K. H., and Snape, E. (2015). Empowering leadership, psychological empowerment and employee Outcomes: Testing a multi-level mediating model. *British Journal of Management*, 26, (1), 126-138.
- [19] Gilson, L. L., and Shalley, C. E. (2004), "A little creativity goes a long way: An examination of teams' engagement in creative processes", *Journal of management*, 30, (4), 453-470.
- [20] Gu, J., Wang, G., Liu, H., Song, D. and He, C. (2018), "Linking authoritarian leadership to employee creativity: the influences of leader-member exchange, team identification and power distance", *Chinese Management Studies*, 12, (2), 384-406.
- [21] Hackman, J. R., and Oldham, G. R. (1980), *Work redesign*, Reading, MA: Addison-Wesley.
- [22] Hahm, S.W. (2018), "Roles of authentic leadership, psychological empowerment and intrinsic motivation on workers' creativity in e-business", *Journal of Internet Computing and Services (JICS)*, 1, 113-122.
- [23] Hair, J. F., Black, W. C., Balin, B. j., and Anderson, R. E. (2010), *Multivariate data analysis*, Maxwell Macmillan International Editions.
- [24] Im, S., & Workman Jr, J. P. (2004), "Market orientation, creativity, and new product performance in high-technology firms", *Journal of marketing*, 68, (2), 114-132.
- [25] Jada, U. R., Mukhopadhyay, S., and Titiyal, R. (2019), "Empowering leadership and innovative work behavior: a moderated mediation examination", *Journal of Knowledge Management*, 23, (5), 915-930.
- [26] Javed, B., Khan, A. A., Bashir, S., and Arjoon, S. (2017), "Impact of ethical leadership on creativity: the role of psychological empowerment", *Current Issues in Tourism*, 20, (8), 839-851.
- [27] Jyoti, J., and Dev, M. (2015), "The impact of transformational leadership on employee creativity: the role of learning orientation", *Journal of Asia Business Studies*, 9, (1), 78-98.
- [28] Kirkman, B. L., Chen, G., Farh, J. L., Chen, Z. X., and Lowe, K. B. (2009), "Individual power distance orientation and follower reactions to transformational leaders: A cross-level, cross-cultural examination", *Academy of Management Journal*, 52, (4), 744-764.
- [29] Labianca, G., Gray, B., and Brass, D. J. (2000), "A grounded model of organizational schema change during empowerment", *Organization Science*, 11, (2), 235-257.
- [30] Li, Y., Wei, F., Ren, S., and Di, Y. (2015), "Locus of control, psychological empowerment and intrinsic motivation relation to performance", *Journal of Managerial Psychology*, 30, (4), 422-438.
- [31] Liden, R. C., Wayne, S. J., and Sparrowe, R. T. (2000), "An examination of the mediating role of psychological empowerment on the relations between the job, interpersonal relationships, and work outcomes", *Journal of applied psychology*, 85, (3), 407.
- [32] Logan, M. S., and Ganster, D. C. (2007), "The effects of empowerment on attitudes and performance: The role of social support and empowerment beliefs", *Journal of Management Studies*, 44, (8), 1523-1550.
- [33] Mandel, M. (2008), "Can America invent its way back", *Business week*, 11, 52-61.
- [34] Madjar, N., Oldham, G. R., and Pratt, M. G. (2002), "There's no place like home? The contributions of work and nonwork creativity support to employees' creative performance", *Academy of Management journal*, 45, (4), 757-767.
- [35] Meyerson, S. L., and Kline, T. J. (2008), "Psychological and environmental empowerment: Antecedents and consequences", *Leadership and Organization Development Journal*, 29, (5), 444-460.
- [36] Mishra, A. K., and Spreitzer, G. M. (1998), "Explaining how survivors respond to downsizing: The roles of trust, empowerment, justice, and work redesign", *Academy of management Review*, 23, (3), 567-588.
- [37] Neilsen, E. (1986), "Empowerment strategies: Balancing authority and responsibility", *Executive power*, 78-110.
- [38] Nham, T. P., Tran, N. H., and Nguyen, H. A. (2020), "Knowledge sharing and innovation capability at both individual and organizational levels: An empirical study from Vietnam's telecommunication companies", *Management and Marketing. Challenges for the Knowledge Society*, 15, (2), 275-301.
- [39] Özaralli, N. (2015), Linking empowering leader to creativity: the moderating role of psychological (felt) empowerment, *Procedia-Social and Behavioral Sciences*, 181, 366-376.

- [40] Patankar, A. (2010), "Unleashing innovations for sustainability: an Indian perspective", available at: www.innovationmanagement.se/2010/06/09/unleashing-innovations-for-sustainability-an-indian-perspective/ (accessed 15 March 2011).
- [41] Quinn, R. E., and Spreitzer, G. M. (1997), "The road to empowerment: Seven questions every leader should consider", *Organizational dynamics*, 26, (2), 37-49.
- [42] Raub, S., and Robert, C. (2010), "Differential effects of empowering leadership on in-role and extra-role employee behaviors: Exploring the role of psychological empowerment and power values", *Human relations*, 63, (11), 1743-1770.
- [43] Reiter-Palmon, R., and Illies, J. J. (2004), "Leadership and creativity: Understanding leadership from a creative problem-solving perspective", *The Leadership Quarterly*, 15, (1), 55-77.
- [44] Ryan, R. M., and Deci, E. L. (2000), "Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being", *American psychologist*, 55, (1), pp. 68.
- [45] Seibert, S. E., Wang, G., and Courtright, S. H. (2011), "Antecedents and consequences of psychological and team empowerment in organizations: A meta-analytic review", *Journal of applied psychology*, 96, (5), 981.
- [46] Shalley, C. E., and Gilson, L. L. (2004), "What leaders need to know: A review of social and contextual factors that can foster or hinder creativity", *The leadership quarterly*, 15, (1), 33-53.
- [47] Shalley, C. E., Zhou, J., and Oldham, G. R. (2004), "The effects of personal and contextual characteristics on creativity: Where should we go from here?", *Journal of management*, 30, (6), 933-958.
- [48] Shin, S. J., and Zhou, J. (2003), "Transformational leadership, conservation, and creativity: Evidence from Korea", *Academy of management Journal*, 46, (6), 703-714.
- [49] Spreitzer, G. M. (1995), "Psychological empowerment in the workplace: Dimensions, measurement, and validation", *Academy of management Journal*, 38, (5), 1442-1465.
- [50] Spreitzer, G. M. (1996). Social structural characteristics of psychological empowerment. *Academy of management journal*, 39, (2), 483-504.
- [51] Suh, T., Bae, M., Zhao, H., Kim, S. H., and Arnold, M. J. (2010), "A multi-level investigation of international marketing projects: The roles of experiential knowledge and creativity on performance", *Industrial Marketing Management*, 39, (2), 211-220.
- [52] Thomas, K. W., and Velthouse, B. A. (1990), "Cognitive elements of empowerment: An "interpretive" model of intrinsic task motivation", *Academy of management review*, 15, (4), 66-681.
- [53] Tierney, P., Farmer, S. M., and Graen, G. B. (1999), "An examination of leadership and employee creativity: The relevance of traits and relationships", *Personnel psychology*, 52, (3), 591-620.
- [54] Tung, F. C. (2016), "Does transformational, ambidextrous, transactional leadership promote employee creativity? Mediating effects of empowerment and promotion focus", *International Journal of Manpower*, 37, (8), 1250-1263.
- [55] Wilkinson, A. (1998), "Empowerment: theory and practice", *Personnel review*, 27, (1), 40-56.
- [56] Woodman, R. W., Sawyer, J. E., and Griffin, R. W. (1993), "Toward a theory of organizational creativity", *Academy of management review*, 18, (2), 293-321.
- [57] Zhang, X., and Bartol, K. M. (2010), "Linking empowering leadership and employee creativity: The influence of psychological empowerment, intrinsic motivation, and creative process engagement", *Academy of management journal*, 53, (1), 107-128.
- [58] Zhang, X. (2007), *Linking Empowerment and Employee Creativity: The Mediating Roles of Creative Process Engagement and Intrinsic Motivation*, University of MD, MD.
- [59] Zhou, J., and George, J. M. (2001), "When job dissatisfaction leads to creativity: Encouraging the expression of voice", *Academy of Management Journal*, 44, (4), 682-696.

A CASE STUDY ON IMPACTS OF HUMAN RESOURCE MANAGEMENT PRACTICES ON FIRMS' PERFORMANCE IN VIETNAMESE STATE – OWNED ENTERPRISES

Ngo Thi Ngoc Anh ¹, Le Thu Huong ²

¹ Institution of Economics, Ho Chi Minh National Academy of Politics, Hanoi, Vietnam

² Vietnam's National University, Hanoi, Vietnam

Corresponding author: ngocanhngo.npa@gmail.com

Abstract

This study arises from the need to manage the human resource (HR) of the Vietnamese firms more effectively, especially at the state companies after their equitization process. The aims of this thesis are to examine the theoretical background of the human resource management (HRM) and its linkages to improve firms' performance via investigating a case study of a state-owned enterprises coded as MACHICON. To obtain these aims, the research will address a research question of how HRM practices influences the company' performance? A qualitative approach with in-depth interviews is used to address the research question. The research has found that the human resource management system is strongly influenced by the traditional management of personnel; there is a need for reforming its human resource system to help the company improve performance. The research has contributed to enrich knowledge about HRM and firm's performance in Vietnamese enterprises under their transitional context.

Keywords: Human resource, Human resource management, firm's performance.

1. INTRODUCTION

This study arises from the need to manage the HR of the Vietnamese firms more effectively, especially at the state companies after their equitization process. The quick development of the market system in Vietnam since Doi Moi occurred has increased in environmental variability and degree of competition that all enterprises need to consider their efficiency to exist in the markets. Especially, the increases in labor turnover and costs of employee replacement have forced firms to pay more attention on their HRM practices. The reform of HRM model is necessary for enterprises, especially state-owned enterprises, such as MACHICON. Without these innovations, they will not be able to improve their competitiveness in the market, because human resources are the key to improve the firm's performance.

Number empirical studies have been conducted to explore relationships between HRM and firm performance. Research by Ahmad and Schroeder (2003) attempts to extend the effectiveness of human resource management functions studied by Pfeffer (1998) in terms of a country and industry. This study focuses only on impacts of HRM on firm's operational performance. The seven activities of human resource

management include job security, selection, group use and decentralization, salary and benefits based on performance, extended training, state, and share information. Performance considered in Pfeffer's (1998) study is in relations to cost, quality, product distribution, flexibility, and organizational responsibility. The research generally confirms an exist of the relationship between human resource management and the firm performance.

In 2002, Chang and Chen (2002) conducted a comprehensive study to assess the relationship between human resource management and the performance of Taiwan's high-tech companies in the Hsinchu Industrial Park. They found the activities of human resource management such as training and development, teamwork, welfare, staffing plans and performance evaluations that affect employee productivity in the workplace. In addition, welfare and personnel planning have negative effects on the number of employees quitting job. Corbett and Harrison (1992) in a study of employee engagement and productivity in New Zealand and Australia have identified workforce-related programs that strongly promote quality progress. This study indicates that communication within an organization can help sustain accomplishments. In addition, a well-trained workforce

will help companies gain market share because they can produce high quality products that meet the needs of their customers.

Huselid et al. (1997) studied the effect of human resource management on the performance of 293 US firms. They clarify human resource management into two groups. The first one is effective human resource management that includes wages and benefits, recruitment and training, labor relations, selective tests to evaluate works and attitudes of employees. The second group is strategic human resource management including teamwork, employee engagement and employee empowerment, communication between management and staff, developing management capacity. This study's findings show that there is a consensus between effective management strategy and firm performance, but the effectiveness of technical management is not related to the performance.

Sang (2005) studies impacts of human resource management on firm performance (including production efficiency and firm performance) of firms in Cambodia and Taiwan. This author selects nine aspects of human resource management: human resource planning, recruitment, incentives, evaluation, training, teamwork, employee engagement, and job rankings and job security) to explore their relationships with perceptions of firm performance (including financial performance and non-financial performance).

Cutcher-Gershenfeld (1991) studies effects of different types of labor relations on firm performance in 25 different work areas which have unions. The author points out three main types of labor relations: tradition, transforming, and completed transformation. The traditional form reflects a management style with emergence of high frequency disputes and slow-paced solutions, less effort to address informal complaints, less problem-solving efforts, and less information sharing and employee autonomy. The pattern of completed transformation in labor relations is strongly expressed in problem solving, worker autonomy, information sharing, and conflict resolution. The form of industrial relations undergoing transformation is characterized by the mixing of traditional and completed transformation forms. Research by Cutcher-Gershenfeld (1991) indicates that traditional forms of labor relations have a high cost because there many working hours lost due to the unsolved disputes, and labor productivity variations are much higher than this of the other two types.

These empirical studies suggest that studying relationships between human resource management and firm performance has been interested by both academia and practices. However, most studies are conducted in developed countries and some others in developing

countries. These issues have studied in Vietnam are still limited. Vietnam's economic and political characteristics are relatively typical: this is a socialist country, and the economy is in the process of transition from central planning to an orientated socialist market economy. Given these unique characteristics, it requires studies on relationships between human resource management and firm performance in the unique context of Vietnam.

2. THEORITICAL BACKGROUND

Human Resource Management (HRM) is a comprehensive and coherent approach to human recruitment and development today (Armstrong & Taylor, 2014). It includes human resource strategy, human capital management, knowledge management, social responsibility of enterprises, organizational development, and human resources (recruitment planning, recruitment and talent management), study and development, compensation and reward, labor relations, welfare and providing services to employees.

The concept of human resource management given by Watson (2010: 919) is more comprehensive. According to this author, HRM is management of efforts, knowledge, competence and commitment that people contribute to a business as part of their exchange (or temporary contract) to carry out tasks. These contributions help the enterprises continuing to develop in the future.

Watson (2010) state that, The main functions of human resource management include human resources planning, recruitment, training, salary and benefits, job evaluation, management and employment.

Human resource planning is the process of developing human resource strategies and establishing programs or strategies to implement them. This process is to meet the organization's objectives and to develop work plans. Human resource planning is the identification of demand and supply for human resource that is to find solutions for balancing these relationships (Nguyen & Nguyen, 2010).

Recruiting is the process of finding, attracting and recruiting the qualified staff to fill the vacancies in an organization. From the above understanding, it can be seen that recruitment has a great influence on other activities within the organization, through recruiting to build the quality and quantity of human resources needed by the organization, so the hiring process should be carefully demonstrated. Recruitment has a great influence on other functions of human resource management such as assessment of work performance, salary, training and development of human resources, labor relations. In practice, bad recruitment will result in financial losses (hiring costs, salaries, etc.), wasting

time (recruiting, training, mentoring), and causing internal conflicts.

Training is an activity that maintains and enhances the organization's quality of HR. It helps the organization moving forward and developing in a competitive environment. Training includes learning activities that enable employees to perform their functions and tasks more effectively. The learning process makes workers understand their works as well as improve their skills (Nguyen & Nguyen, 2010). At the present, most organizations are interested in and focus on the training of employees to improve the working efficiency. The role of training not only focuses on equipping or enhancing knowledge and skills for employees, but also enables employees to share their perceptions, views and training links with the organization's goals.

Compensation are paid for employees doing good work such as commissions, bonuses, dividing productivity and distributing profits for their contributions to the firms (Nguyen & Nguyen, 2010). To develop compensation policy, organizations should pay attention to the factors that affect the employees' remuneration such as factors of the external environment; the elements of the organization; factors of work; factors belong to individual workers.

Job evaluation is the process of providing information about the performance of an employee during completing a given job. Results of the performance assessment allow clarifying both level of job completion of individuals and units, and reasons for completing or not fulfilling the tasks and expectations of the staff. This will serve as a basis for developing work plans and individual employee development plans in the following business cycle (Le, 2008). To be successful, job assessment criteria must be carefully designed and implemented. By doing so, the organization must develop a detailed and descriptive system for job descriptions. When building an assessment system, organizations should base on standards such as suitability, sensitivity, reliability, applicability, and practicality. The condition for a successful evaluation program is that. Some methods used when constructing a rating system are job ranking; classify; grading; compare factors. Each method has certain advantages and disadvantages. In fact, many organizations need to use more than one methodology to build an effective assessment system. To implement this system, it requires co-operation between managers and the employees.

Managing and staffing include many activities in the HRM but this study pays more attention on HR relations regarding to personal relations, HR communication and health and safety issues for

workers. These are core issues to help managing human resource in an organization.

HR relations include human resource management activities having a great impact on the overall labor relations in the organization. They affect attitudes, behaviors and interests of employees that managers need to understand. Clear, appropriate, consistent and equal discipline will help employees to be more disciplined, productive, and positive attitudes and behaviors. For punishment, forcing to leave is the most severe punishment hurting employees and affecting their family life so the management needs to carefully consider when using it. Promoting is a positive activity for encouraging employees, but it is also important to consider carefully because the decision to promote a person may influences entire the organization. Transmission refers to transferring someone from one department to another. This activity might base on the needs of the organization and may be due to personal preferences. However, management needs to consider every detail to ensure that the transfer will bring changes that are more positive for both individual workers and the organization.

Firm's performance

By Nash's definition (1983), the word "performance" means the execution and completion. Effective performance means performing a goal or task effectively. Performance is the fulfillment of a task. Dreher and Dougherty, (2005) used two different dimensions to measure performance of a company: financial performance and non-financial performance. Financial performance includes profits, sales and market share. Non-financial performance include employee productivity, product quality, employee performance, attitudes and behaviors such as responsibility, intent to relocate, and level of satisfaction. labor. However, the analysis of firm performance through financial efficiency in developing countries faces many difficulties and causes very scattered, even conflicting results (Hoskisson et al. 2000). This is due to the lack of information on the financial statements of the companies, or the truthfulness of the financial statements is quite common.

Based on previous studies on firm performance, together with difficulties in accessing information about financial results of the case study company, this study will assess firm performance in terms of non-financial performance includes: productivity; the level employee of satisfaction with the work; employee responsibility for the work. The theoretical framework to investigate relationships between HRM practices and a firm's non-financial performance is presented in Figure 1.

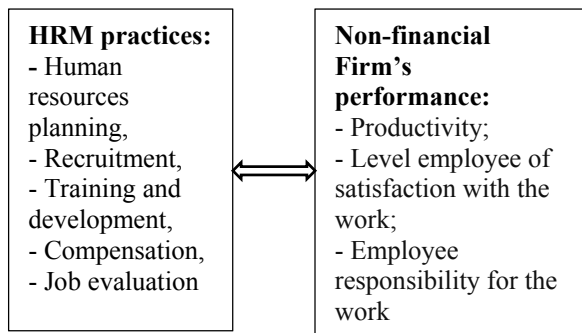


Figure 1: HRM and firm's performance

3. RESEARCH METHODOLOGY

This thesis uses qualitative research methods via using a case study to analyze and answer research questions. The main data source for analysis is 36 in-depth interviews with managers and staff about the case study's human resource management. In addition to data collected from in-depth interviews, the thesis also uses secondary data such as government documents and regulations; company's reports; and relevant studies are published in local and foreign journal and newspapers. The author uses the thematic analysis method to analyze the primary and secondary data collected with the help of NVivo 11 that is a data analysis software.

The interviews were conducted with two target groups at the company: management and employees. Management group includes senior management and middle management. Employee group includes workers and administrative officers. The selection of interviewees is intended to ensure that the selected sample is representatives for the entire staff of the Company. As mentioned above, all participants in the interviews are encrypted to ensure that their personal information is not disclosed and does not affect their current job. 36 interviewees were numbered from S1 to S36.

This study uses thematic analysis to analyze collected data from in-depth interviews and secondary data. This is the method that the researcher analyzes the collected information to find out views, trends and assumptions of the interviewees. This information is used to answer to the research questions. In this study, research themes were developed based on the theoretical framework for the contents of human resource management such as human resource planning, job analysis, training, salary and compensation, job evaluation. In addition, data analysis also shows that there are a number of new factors affecting both human resource management and firm's performance. These new elements are also analyzed in the thesis to help provide an overview impacts of human resource management on performance of MACHICON.

For the cross-checking data, based on interviews of two different interviewees groups: the management team and the employees (non-management). The research questions are examined via multi-dimensional perspectives on human resource management and firm's performance. According to Shenton (2004), data collected from interviewees with different perspectives and experiences, as well as different backgrounds, provides the basis for developing and validating study's findings. This is a rich source of information about interviewees' attitude, needs or behaviors, thus increases the reliability of the research findings.

Introduction to the case study

Mechanical and Construction Joint Stock Company A (MACHICON) is a member of Vietnam Automobile Industry Corporation, operating in the field of construction of traffic, irrigation, civil, industrial, electrical, mechanical, mechanical engineering, metal structures; trading, and importing and exporting... Over a quarter of century of development it was transformed from a state-owned enterprise into a joint stock company. It is now rename as Mechanical and Construction Joint Stock Company A (MACHICON) that the Vietnamese government holds dominant shares (51%).

MACHICON is a joint stock company, thus its management model follows a management model of a joint stock company as shown in Graph 3.1 below. The Company's management structure includes the General Meeting of Shareholders, the Board of Directors, the Director and the Supervisory Board. Accordingly, the General Assembly of Shareholders is the highest decision-making body of the Company. Resolutions of the General Meeting of Shareholders are valid only when they are approved by shareholders and shareholders' representatives hold at least 65% of the total voting shares attending the General Meeting of Shareholders. The Board of Directors has the right to make decisions on issues related to the Company's objectives and interests in accordance with the law, except for matters falling under the authority of the General Meeting of Shareholders. In terms of personnel, the Board of Directors has appointed and dismissed the director, deputy director, chief accountant of the company, approved the organizational plan and personnel of the subsidiary companies. The Board of Directors decides on salaries, bonuses and other incomes for employees working at the company. Besides, the Board of Directors also decides on the regulation on recruitment and dismissal of employees in compliance with the relevant laws. Levels of responsibility allowance for the members of the Board of Directors and the Supervisory Board are decided by the General Meeting of Shareholders. The Board of Supervisors is the organization on behalf of shareholders to control all business activities, governance of the company.

MACHICON currently has young and skilled labor force. Skilled levels of the company human resources are presented in Table 1 as follows:

Table 1: MACHICON's labor force 2017

	Skilled levels	Total employees
I	Bachelor and college degrees	60
1	Bachelors	45
2	College and TAFE	15
III	High skill technique workers	150
IV	Unskilled labors	40
Total (I + II + III)		250

The direct labor force is accounted for 76% of the Company's labor force. They are all trained before taking their jobs. The number of skilled workers at levels of 3/7 and 4/7 are the highest numbers, then followed by the number of laborers at skill level of 2/7. These statistical numbers show that although trained laborers, the majority of workers are still at low skill levels.

4. FINDINGS AND DISCUSSION

Impacts of human resource management on the company's performance

Findings from the in-depth interviews show that human resource management practices affect the company's performance. These effects are summarized in the following Table 2.

According to interview findings, compensation and benefits play the most important impacts on employees' performance, and then followed by performance assessment. These two activities of HRM strongly affect the overall company's performance regarding to employees' productivity, level of job satisfaction, and job commitment. Most of the interviewees said that they are aware of improving working efficiency because their soft salary is calculated based on their performance. However, they are not very satisfied with their salary structure because the total salary is mainly based on seniority and

qualifications. Interviewees further explained that the principle of salary payment still follows the government wage scales, so it demotivates them to innovate or to improve their work efficiency.

In terms of performance appraisals, some employees claimed that their allocated jobs have not yet met their specialization they have trained. Therefore, their productivity and performance are not commensurate with their potentials. These people were dissatisfied and felt no responsibility for their assigned works. Therefore, the company needs to learn more about the needs and job expectations of those workers. If they have a need to work suitable with their specialization trained, the company should rearrange jobs for them; in cause they are familiar with the current positions and satisfied with the job, they also need to be retrained to have suitable skills and knowledge to take the jobs. The company also needs to reconsider "parent to child" policy that allows the next generations of the current employees have jobs when they retire even their children do not have suitable background with the jobs.

Interview findings show that human resource management practices have had certain achievements contributing to improving the Company's performance. First and foremost is the Company's interest in human resource needs planning over the years. The human resource planning has provided more information for the company leaders to take the initiative in personnel management. However, human resources planning still have limitations that hinder the improvement of the Company's performance. The identification of personnel needs is lack of scientific basis and is still superficial. Therefore, the annual human resource plan is not practical. For recruitment, HR for recruitment is only internal. The recruitment information does not contain job description and specific requirement as well as compensation. Post-recruitment evaluation has not been implemented although this is an important task for the company to timely evaluate the results and effectiveness of the recruitment process. For training, the company must invest more in training; increase the training fund to improve employees' working skill and capacity, especially for the senior managers to improve their performance.

Table 2: HRM practices and the company's performance

HRM practices	The company's performance	Numbers of agreement
HRM planning	Productivity	20/36
Recruitment	Productivity	25/36
Compensation and benefits	Productivity; Job satisfaction; Job commitment	36/36
Training	Productivity; Job satisfaction	12/36
Use of cadres	Productivity; Job satisfaction	15/36
Performance appraisal	Productivity; Job satisfaction; Job commitment	25/36

For managers, it is important to develop open communication environment, and to spend time for listening employees' opinions in order to build a good working environment. Employees must be respected and evaluated objectively and equitably to create their motivation at work and increase their performance.

Impacts of other factors on the company's performance

The analysis of interview data shows that in addition to HRM elements, there are other factors also affect the company's performance. These factors include organizational culture, and trust in leadership. This section analyzes impacts of these two factors on the company's HRM and performance.

Interview findings show that management of the company is strongly influenced by the traditional socialist ideology of equitable distribution. Some HR managers said that the company's compensation policy is designed to limit income gaps among the employees. The company is a state-owned company, so it is important to ensure that a state-owned enterprise is equitably distributed. The company applied both hard and soft salary in parallel to ensure fair payment to everyone. The combination of traditional payroll elements and modern elements will make people feel being treated fairly. A senior manager of the company further explained that if the company only applied the method of calculating wages by performance, the senior employees might not adapt with and face difficult to get a living wage.

However, the direct workers have a different perspective. Most of the respondents did not favor salary based on senior and qualifications. They supported salary based on performance. These people believe that salary based on senior and qualifications is unfair because it does not reflect their contributions to the company. At the same time, this pay base does not clarify performance of workers. Most employees who are non-management positions agreed that only performance pay base is truly fair and motivate them to improve performance as they knew if performance increase, surely their income will increase. Thus, the employees' perception of fairness has changed. They now perceive that pay equity is payment based on their contribution to work. Therefore, if the company still holds the view of paying the salary as the traditional view, it will not encourage the employees to improve their work efficiency and thus will negatively affect overall the company's performance.

The interview results show that leadership plays an important role in the personnel management and employees' attitudes and behaviors in the company. Knowledge and thought of the leaders have strong impacts on the strategic direction of personnel

management. To develop business, the company needs to develop a long-term personnel strategy and in line with the business strategy. That strategy must be the vision of the future targets that the company is aiming in the unstable business environment. The strategy is often in the long-term, while the social conditions are always changing so the leaders must have a good vision to make decisions to change if it is necessary. Such decisions are based on analyzes of the company's strengths, weaknesses, opportunities and challenges, but also on the sensitivity and determination of the leaders. Leaders must always be able to take the best opportunities for the company's business.

For the employees, though, the leaders tried to help the workers feel being treated fairly. It's important for the leader to be able to inspire people to work for a common purpose. Leaders must ensure that employees are given proper care. Spiritual motivation for employees in the right moment will create great motivation for employees to complete the work well and overcome the difficulties. Leaders need not be present at all times but must be the creator of working culture for the company.

In general, leading will be the vision, mission and inspiration that build company's harmony. When the company operates well, the leader must take responsibility to maintain that condition longer. When the company's business goes down, the leader plays leading role of motivating all staff to move forward and at the same time find effective solutions to help the company get out of that bad situation. The leader knows the goals, creates the way to achieve it and acknowledges the employees' efforts when the goals are accomplished. Even in many international businesses, their retention of talent is entirely based on the commitment of the leader.

5. CONCLUSION

This study has significant theoretical and practical contributions. In theory, the paper presents additional elements to examine impacts of human resource management on the firm performance. The research findings present that, besides HRM factors, the context of the firm also has strong impacts on the HRM, employees' attitude and behavior and then influences the firm's performance. The additional elements are contextual factors including traditional socialist ideology, employees' perception of fairness, and leadership style. Therefore, the model to show the relationships between HRM and the firm's performance should be adjusted by adding the contextual factors that were explored through the case study in this research. The new theoretical framework to investigate relationship between HRM and the firm's performance now is in the following Figure 2.

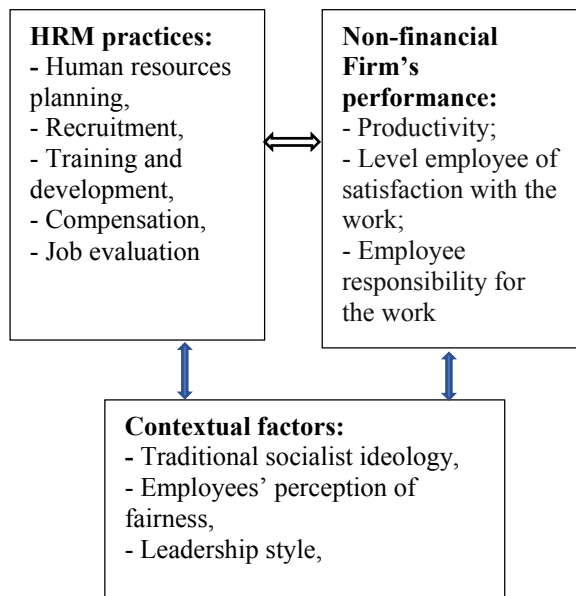


Figure 2: Relationship between HRM and the firm's performance

In practice, this study suggests variety of solutions to improve the firm performance by reforming its human resource management. In order to reform human resource management, the company should focus on improving the main activities of human resource management including human resources planning, recruitment and training, evaluation and use of staff correctly and accurately. A good HR plan helps the company accurately predict and prepare an effective recruitment plan. Proper job descriptions help the company to create correct HR plan. All these activities are linked to actual needs of the jobs and thus assessment of performance is done accurately. Human resource management activities will never be complete without a fair and reasonable evaluation and reward policy for employees. Job evaluations are important to know the performance of individual workers so that they can gradually improve their work. A modern and intelligent human resource management system should focus on both material compensation and spirit for workers. A good remuneration policy is to combine these two types of compensation to create employees' commitment. The reform of HRM model is necessary for enterprises, especially state-owned enterprises, such as MACHICON. The findings show that, the human resource management system in MACHICON company is strongly influenced by the traditional management of personnel; there is a need for reforming its human resource system to help the company improve performance. Without these innovations, they will not be able to improve their competitiveness in the market, because human resources are the key to the success of businesses.

6. REFERENCES

English reference

- [1] Ahmad, S., & Schroeder, R. G. (2003). The impact of human resource management practices on operational performance: recognizing country and industry differences. *Journal of operations Management*, 21(1), 19-43.
- [2] Armstrong, M., & Taylor, S. (2014). *Armstrong's handbook of human resource management practice*. Kogan Page Publishers.
- [3] Batt, R. (2002). Managing customer services: Human resource practices, quit rates, and sales growth. *Academy of management Journal*, 45(3), 587-597.
- [4] Björkman, I., Fey, C. F., & Park, H. J. (2007). Institutional theory and MNC subsidiary HRM practices: Evidence from a three-country study. *Journal of International Business Studies*, 38(3), 430-446.
- [5] Boxall, P. F., Purcell, J., & Wright, P. M. (Eds.). (2007). *The Oxford handbook of human resource management*. Oxford Handbooks.
- [6] Carraher, S. M., & Buckley, M. R. (2008). Attitudes towards benefits and behavioral intentions and their relationship to Absenteeism, Performance, and Turnover among nurses. *Academy of Health Care Management Journal*, 4(2), 89.
- [7] Cascio, W. (2018). *Managing human resources*. McGraw-Hill Education.
- [8] Chang, P. L. & Chen, W. L. (2002). The effect of human resource practices on firm performance: empirical evidence from high tech firms in Taiwan. *International Journal of Management*, 19(4), 622.
- [9] Collins, N. T. (2009). *Economic reform and employment relations in Vietnam*. Routledge.
- [10] Corbett, L. M., & Harrison, N. J. (1992). Manufacturing performance and employee involvement: a study of factors influencing improvement. *International Studies of Management & Organization*, 22(4), 21-32.
- [11] Cutcher-Gershenfeld, J. (1991). *The impact on economic performance of a transformation in workplace relations*. *ILR Review*, 44(2), 241-260.
- [12] Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The qualitative report*, 8(4), 597-606.
- [13] Hoskisson, R. E., Eden, L., Lau, C. M., & Wright, M. (2000). Strategy in emerging economies. *Academy of management journal*, 43(3), 249-267.
- [14] Huselid, M. A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of management journal*, 38(3), 635-672.

- [15] Huselid, M. A., Jackson, S. E., & Schuler, R. S. (1997). Technical and strategic human resources management effectiveness as determinants of firm performance. *Academy of Management journal*, 40(1), 171-188.
- [16] Kato, T. (2006). Determinants of the extent of participatory employment practices: evidence from Japan. *Industrial Relations: A Journal of Economy and Society*, 45(4), 579-605.
- [17] MacDuffie, J. P. (1995). Human resource bundles and manufacturing performance: Organizational logic and flexible production systems in the world auto industry. *ILR Review*, 48(2), 197-221.
- [18] Nash, M. M. (1983). *Managing organizational performance*. Jossey-Bass.
- [19] Pfeffer, J. (1998). *The human equation*, Boston, M.A: Harvard Business School Press.
- [20] Quang, T. & Vuong, N. T. (2002). Management Styles and Organisational Effectiveness in Vietnam, *Research and Practice in Human Resource Management*, 10(2), 36-55.
- [21] Sang, C. (2005). *Relationship between HRM practices and the perception of organisational performance, roles of management style, social capital, and culture: comparison between manufacturing firms in Cambodia and Taiwan*. PhD Thesis, National Cheng Kung University, Taiwan, Taiwan.
- [22] Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for information*, 22(2), 63-75.
- [23] Tsai, C. J. (2006). High performance work systems and organizational performance: an empirical study of Taiwan's semiconductor design firms. *The International Journal of Human Resource Management*, 17(9), 1512-1530.
- [24] Venkatraman, N., & Ramanujam, V. (1986). Measurement of business performance in strategy research: A comparison of approaches. *Academy of management review*, 11(4), 801-814. Dreher và Dougherty, (2005).
- [25] Watson, T. J. (2010). Critical social science, pragmatism and the realities of HRM. *The International journal of human resource management*, 21(6), 915-931.
- [26] Yin, R. K. (2015). *Qualitative research from start to finish*. Guilford Publications.
- Vietnamese reference**
- [27] Vietnamese government (2004), Decree No. 204/2004/NĐ-CP về chế độ tiền lương đối với cán bộ, công chức, viên chức và lực lượng vũ trang.
- [28] Vietnamese government (2004), Decree No. 205/2004/NĐ-CP quy định hệ thống thang lương, bảng lương và chế độ phụ cấp lương trong các công ty nhà nước.
- [29] Vietnamese government (2013), Decree No. 49/2013/NĐ-CP quy định chi tiết một số điều của Bộ luật Lao động về tiền lương.
- [30] Đào Xuân Sâm (2000), *Viết theo dòng đổi mới tư duy kinh tế*, NXB Thanh Niên, Hà Nội.
- [31] Lê Quân, 2008, *Kỹ thuật xây dựng hệ thống tiền lương và đánh giá thành tích doanh nghiệp*, NXB Đại học Kinh tế quốc dân.
- [32] Nguyễn Quốc Khánh (2010), *Quản trị nhân sự*, NXB Tài chính.
- [33] Nguyễn Văn Điềm & Nguyễn Trọng Quân (2010), *Giáo trị nhân lực*, NXB Đại học Kinh tế quốc dân.
- [34] Tạp chí Tài chính (2014), Thực trạng quản trị nguồn nhân lực tại các doanh nghiệp nhỏ và vừa của Việt Nam hiện nay. <http://tapchitaichinh.vn/nghien-cuu--trao-doi/trao-doi-binh-luan/thuc-trang-quan-tri-nguon-nhan-luc-tai-cac-doanh-nghiep-nho-va-vua-cua-viet-nam-hien-nay-57036.html>

PROPOSING ENGLISH TRAINING PROGRAMS TO MEET THE ACTUAL NEEDS OF TRAINEES: AN EMPIRICAL STUDY ON VIETNAMESE AGRICULTURAL SMES

Le Tien Dat ¹, Nguyen Thi Lan Phuong ²

^{1,2} Thuongmai University, Hanoi, Vietnam

Corresponding author: Tiendatle1509@gmail.com

Abstract

Small and medium-sized enterprises (SMEs) have been identified as an important driver in Vietnam's economic development. However, SMEs, particularly Vietnamese agricultural SMEs, are continuing facing challenges related to market access, international competition, human resources, and particularly the technical barriers. Although the total agricultural export value of Vietnam has been seen as quite significant, the challenges of Vietnamese export agricultural SMEs are increasingly fiercer, mostly resulting from the shortage of resources and expertise. Among the limitations of Vietnamese agricultural SMEs, poor foreign language skills have been seen as one of the main factors hindering Vietnamese agricultural SMEs from better international business performance. This paper investigates the perceptions of 124 Vietnamese agricultural SMEs with regard to the needs for English skill training in agricultural export. Also, with the aim of organizing comprehensive training programs, the needs of these Vietnamese agricultural SMEs for different aspects of training such as training content, training schedule, length of training, training location and financial supports for training are also studied. Based on that exploration, some implications on proper training courses are then provided. The research outcomes are expected to assist training program designers, SME managers and macro-administrators in developing appropriate supports based on actual needs of Vietnamese agricultural SME managers. The paper also makes contributions to the body of knowledge related to human resource management in agricultural export SMEs in developing countries such as Vietnam.

Keywords: Training, Agricultural export, Vietnam, SMEs, English skills.

1. INTRODUCTION

Small and medium enterprises (SMEs), with their remarkable contributions to job creation, export turnover, total budget revenue and GDP, have become an essential drive to Vietnam's economy. However, in the process of internationalization these important players are facing numerous obstacles, one of which results from lack of foreign language skills, especially English. This paper therefore aims to investigate opinions of Vietnamese SME managers on the English skills needed to overcome the obstacles in agricultural exports. Some suggestions on developing proper training courses are then given as the implications for relevant stakeholders to meet the stated needs of SME managers in the internationalization process.

SMEs have been identified as critical in achieving broader development objectives in Vietnam. Particularly in the field of agricultural exports, SMEs have proved to be good earners of foreign currencies; however, the outcomes they have gained so far do not

seem to be proportionate to the potential of the sector and the capacity of the enterprises themselves. Part of the reasons for this situation is many Vietnamese SME managers still lack vital skills and supports to compete successfully in international markets. Although numerous efforts have been made to enhance the skills of SME managers, the number of SMEs with qualified, experienced and skilled leaders, especially those with good English competence, remains relatively modest. As the shortage of English skills has been identified as one serious limitation of Vietnamese SMEs, suggestions on how to develop these skills for Vietnamese agricultural SME managers are of great importance.

With the use of qualitative interviews, the study has been able to identify the problems faced by Vietnamese agricultural SME managers with regard to their English skills and analyze the training needs of these managers. On these bases, it has suggested three groups of solutions towards SME managers, training institutions and policy makers so that they can gain better

understanding of how they should develop and run educational programs to improve English skills for SME managers to help their businesses thrive in the internationalization process.

The study is conducted on the basis of the theories on the correlation between human resource capacity development and business performance with specific investigation into the roles of English skills of SME managers to their export success. Also, the study is based on the theories of training need identification and training program development to fulfill the identified needs.

The qualitative research method was employed for this study via the form of semi-structure interviews conducted with managers of Vietnamese SMEs in the field of agricultural exports to help provide researchers with reliable information about the current English skills of SME managers and their training needs.

For the lack of time and resources, the study limits itself to the English skills that SME managers need in their internationalization process rather than looks into the whole sets of skills that are necessary for overall business performance. Also, the study specifically investigates the required English skills and the needs of Vietnamese SME managers in the export sector with regard to some aspects of training as the foundation to suggest training programs to improve these skills so as to facilitate their internationalization efforts.

For the limits of time and resources, the researchers could only approach a research sample consisting of SMEs located in the North of Vietnam, so the representativeness of this sample was not fully guaranteed as there might exist some discrepancies between different regions in the country.

2. THE VIETNAMESE CONTEXT

2.1. Small and medium enterprises in Vietnam

The concept of small and medium enterprises (SMEs) has been discussed over many decades as it is a vital component in the economic development and job creation (BER 2016; Storey 1994). Basically, SMEs refer to a type of businesses with revenue, property or workforce reaching a certain limited level. The “standard” level to classify SMEs vary among countries, for instance, in European nations, enterprises with fewer than 250 laborers are considered SMEs while in the US, an SME has fewer than 500 employees.

In Vietnam, the National Assembly approved Law on Support for SMEs (Law No. 04/2017/QH14) on the 12th June 2017. Accordingly, SMEs include micro enterprises, small enterprises and medium enterprises with the number of laborers paying social insurance of no more than 200 which meet one of the two criteria: i) the total capital does not exceed VND 100 billion;

ii) the total revenue of the previous year does not exceed VND 300 billion. Micro, small and medium enterprises are classified according to the sectors of agriculture, forestry, fishery; industry and construction; trade and services (Government of Vietnam, 2017).

SMEs have been identified as an important factor in Vietnam's economic development strategy. This is considered as an economic component that contributes greatly to GDP, total export output, as well as an important source of job creation. The positive engagement of Vietnamese SMEs in the economic integration has contributed significantly to the transition of the economy towards a market economy, as well as to the internationalization of Vietnam. Many policies and programs supporting SME development have been implemented such as Decree 90/2001/ND-CP and Decree 56/2009/ND-CP on supporting SME development (Government of Vietnam 2012). Most recently, the Law No. 04/2017/QH14 supporting SMEs, along with Decree No. 39/2018/ND-CP detailing a number of articles in the SME Support Law, has been introduced. These support policies mainly focus on information provision, consultancy, human resource development; also on other supports to help SMEs to transform from business households, to start-up their businesses, as well as to join industry value chain (Government of Vietnam, 2017, 2018).

However, the participation of Vietnamese SMEs in the global supply chain as well as in export activities remains insignificant. Accounting for 98% of the total number of enterprises but the contribution of Vietnamese SMEs to the total export turnover is merely 20%. The limitation of Vietnamese SMEs in exports can be seen through the participation rate in international trade, which is only 21%, while this figure in other Asian countries such as Malaysia is as much as 46% (Thu, 2017).

2.2. Agriculture and agricultural exports of Vietnam

It can be said that agricultural exports are of great significance to the national economic development, especially in developing countries. The importance of agricultural exports in developing countries are reflected via the impacts of these activities including stimulating economic growth generating income and providing employment. However, agricultural exports in developing countries are largely determined by the situation in the world market as well as the limited infrastructure, distribution and trade from the developing countries themselves (Kuzminov, 2017).

According to the report World Agriculture Towards 2030-2050 by World Food Organization (Alexandratos & Bruinsma, 2012), agricultural trade activities are still on the rise in the next 30 years. However, Bruinsma (2003) identified some reasons hindering the growth of agricultural imports and exports. Firstly, most agricultural products are still subject to big tariff and

non-tariff barriers in trade agreements. Secondly, the absorption of export markets remain limited, so an increase in quantity usually results in a reduction in export prices. Thirdly, due to the nature of agricultural products, there is little intra-industry & intra-firm.

The impacts of Non-tariff barriers (NTBs), particularly of Technical Barriers in Trade (TBTs), on different nations, on economies with different growth level or on different sectors greatly vary. Accordingly, export activities of developing countries are believed to be influenced more substantially by NTBs than developed economies. Disdier et al. (2008) noted that OECD countries are just minimally affected by TBTs or Sanitary and Phytosanitary Measures (SPSs) while the impacts of these barriers on developing and less-developed countries are usually negative and serious. Research also indicated that SPSs greatly influence agricultural exports from developing countries to developed nations.

Agricultural exports of SMEs are on the rise. However, objective review reveals that the internationalization of SMES in exporting agricultural products remains unsustainable in the global supply chains. According to Global Trade Report 2016 (WTO 2016), SMEs have limited resources in both finance and human resources, which has caused them lots of difficulties in competing in labor productivity and product prices. Particularly, standards related to TBTs or SPSs have generated many obstacles to agricultural export SMEs. They have faced numerous challenges in implementing SPSs and TBTs, which are major barriers to their trading activities in developed markets.

Covid-19 is believed to pose a direct threat to the agricultural exports of Vietnam. In the first four months of 2020, Vietnam's fruit and vegetable export value reached 1.26 billion USD, decreasing 10.3% compared to that in the same period in 2019. One main reason for this fact is that Covid-19 has interrupted export activities, particularly leads to border closures and trade restrictions. The export of goods across the border through the auxiliary border gates and the opening path on the whole border has completely stopped (Huy, 2020).

One of the main markets for the export of Vietnamese agricultural products, particularly the export of vegetables and fruits, is the Chinese market. This has been seen as a great potential market because of its high demand and low cost. However, with more stringent requirements on quarantine, the origin of goods, traceability, food hygiene and safety, requirements for product preservation and packaging, the requirements for Vietnam's export products to the Chinese market is becoming increasingly strict. In particular, since 2019, China has raised standards for imported fruit, especially standards such as traceability and other requirements related to quality. This has led

to a decrease in fruit export from Vietnam to China (Huy, 2020).

2.3. Vietnamese SMEs in agricultural exports

In 2019 and the coming years, Vietnam agriculture and enterprises, most of which are SMEs, are expected to have lots of opportunities. When CPTPP comes into effect, it will many opportunities for the exports of agricultural, forestry and fishery products to a huge and potential market. However, whether the quality of agricultural products of many Vietnamese enterprises, especially of SMEs, can meet international criteria to increase exports remains a big question. In a broad sense, the possibility of SMEs' agricultural products meeting fastidious demand from the international market is still very low. The main reasons are Vietnam's agriculture scale remains quite small, product quality is not standardized, production organization in chains is not effective, the level of compliance with CPTPP's criteria and principles in quality, labor force and intellectual property is low. In this context, supports in science and technology as well as human resources become really necessary. And of course, given the limitations in resources and insufficient foreign investments, SMEs really need the assistance from the government. To apply advanced agricultural standards such as GAP or HASAP, there should be support policies from the authority to raise people's awareness and accumulate resources to meet these standards. With the government's supports, the choices of agricultural products/markets of SMEs will become more effective, the vertical and horizontal links will also be more productive (Tien phong, 2019).

Recently, SMEs, particularly agricultural SMEs which make up 33%, are facing challenges related to credit, market access, international competition and human resources (MPI, 2017). Although the total agricultural export value of Vietnam has been seen quite significant, the challenges to Vietnamese export agricultural SMEs are increasingly higher, which mostly come from the shortage of resources and expertise. A great number of Vietnamese SME managers still lack understanding of regulations and requirements of the export market. They just get used to with doing small businesses and lack business linkage. Consequently, they often face numerous risks in production and business, resulting in losses and unsustainable exports (Huy, 2020).

As shared by policy-makers from developed countries, to improve the performance of agricultural SMEs, as well as to protect environment and enhance agricultural product quality, the investment in human capital is strongly necessary. To assist Vietnamese agricultural SMEs to reach sustainable development, to overcome difficulties that mostly stem from their modest scales, focus should be placed on developing training

programs to SMEs to optimize resources and improve their capacity (World Bank 2016).

Although Vietnam has been a member of many international organizations, English language communication is still one of major barriers for Vietnamese enterprises, especially SMEs. Poor English competence has caused Vietnamese SMEs to miss opportunities in co-operating with foreign partners to export their products. Vietnamese export SMEs themselves have recognized the importance of English skills and sought English courses to improve their English proficiency. In this situations, developing appropriate English programs to meet the actual needs of SMEs in various export stages is of great significance (Ha, 2009; Le, 2015).

3. LITERATURE REVIEW

Training has long been considered as critical to the performance of enterprises, especially to the development of SMEs. In developing training programs, training needs analysis is of great importance to ensure the relevance of the programs to the needs of their participants and avoid possible problems or wastefulness. The training needs of managers in internationalization has received the attention of numerous scholars, some of whom have conducted their research on training in Vietnam; however, there has been no study examining the specific training needs and development for the internationalization of Vietnamese SMEs.

3.1. Internationalization

Various concepts of internationalization have previously been studied by scholars.

From the view of operations, the process of internationalization firstly involves an evolutionary stage through which firms continually strive to commit and engage in international activities (Calof & Beamish 1995). The definition of internationalization refers to the increasing involvement of firms in foreign markets. Over time, newly internationalized firms will start an adaption process towards the international context. Such adaption may be through efforts that firms make to open branch offices and develop new products, while adapting the features of other products for potential use in the world market (Calof & Beamish 1995). This view is supported in the study by Johanson and Vahlne (1977), which introduced a pattern of sequential processes for international development. In this process, the commitment decisions and current performance activities of firms in foreign markets are affected by two factors: market knowledge and market commitment. These in turn are influenced by commitment decisions and current performance activities. Calof and Beamish (1995) implied that internationalization can be considered an evolutionary

activity. Nonetheless, internationalization may sometimes occur in the form of de-investment. In this way, de-investment may involve a cease in trading on certain products or laying off particular people engaged in their internationalization. Thus, internationalization can be broadly defined as “the process of adapting firms’ operations (strategy, structure, resource, etc.) to ‘international environments’” (Calof & Beamish, 1995, p.116).

With regard to the internationalization process, Reid (1981) introduced the concept of “foreign market orientation”. This concept is generally considered a measure of the perceived differences between the home market and foreign markets in terms of politics, economics, cultures and market-strategic dimensions. That is, the decision-maker evaluates the specific market based on these differentiating factors – the more information about particular markets the decision-makers acquire, the stronger their ability to discriminate between them. An increased understanding of foreign markets provides the decision-makers with the capacity to perceive less ambiguity in stimuli from these markets, rather than exporters with limited information. As a result, they are more willing to perceive and take advantage of opportunities to export to these markets, and the decision may be made more promptly.

3.2. SMEs in internationalization

In the modern economy, barriers for entering other domestic markets are generally removed, firms have to compete with not only fellow domestic companies but also MNCs. This requires them to be well-prepared for internationalization in order to maintain sustainable development (Paunović & Prebežac, 2010). Besides, the increasing changes in economic, technological and social conditions, together with fewer constraints in international trade, have encouraged internationalization of small firms and made it easier for SMEs to internationalize their business (Andersson & Florén, 2011; Campbell-Hunt, 2003; Oviatt & McDougall, 1997; Subrahmanya, 2014). Advanced technologies, especially in telecommunications such as the internet, have provided better conditions for SMEs in seeking customers and dealing with suppliers, distributors or network partners (Matenge, 2011).

The number of SMEs engaged in international business activities has increased significantly, and there are numerous *advantages as well as disadvantages* to this internationalization. Regarding the advantages, the main merit that is often seen when SMEs internationalize is the leveraging of their flexible, open, dynamic and innovative operations. Compared to larger sized firms, SMEs generally depend less on a comprehensive hierarchy, and thus have more flexibility in making decisions, promptly satisfying customer needs, and obtaining cooperative partners to

gain synergetic achievement. In contrast, the disadvantages mostly stem from their initial barriers to internationalization. To better leverage their advantages and overcome any disadvantages, SME managers need to improve their competitiveness via a range of business categories including modern manufacturing conditions, innovation, advanced technologies, market knowledge, funding access, and a skilled labour force (Paunović & Prebežac, 2010).

Concerning their barriers, in internationalization, SMEs may be challenged by numerous susceptible barriers in the exports market. In particular, the shortage of entrepreneurial and managerial skills may limit SMEs' internationalization achievements, including overcoming difficulties in the set-up process (Chetty & Campbell-Hunt, 2003; Kahiya, 2013; Karabulut, 2013; Paunović & Prebežac, 2010). While most SME managers are highly professional in the fields they do business in, they often do not have enough skills for the internationalization of the firm. In fact, few SME managers have been well-trained in broader management skills that allow for internationalization and subsequent potential long-term success. Limited management skills in planning strategies, seeking customers, managing innovation, managing cash flow, speaking foreign languages, adapting to advanced technologies, and understanding different cultures and business practices are issues which governments should consider to provide appropriate supports for SMEs in internationalization (Paunović & Prebežac, 2010).

3.3. Roles of foreign language skills to SMEs in internationalization

Scholars have pointed out that in international business, the knowledge of the local language may help SME managers to better interpret the cultural context, understand the needs of the local society, gather insightful market information and adequately conduct market evaluations, as well as to enhance the effectiveness of communications with multidisciplinary audiences including workers, customers, suppliers and governments. In addition, the positive results of marketing activities involving packaging, branding and advertising greatly depend on communications, where the local language plays a key role (Terpstra & Sarathy, 2000).

In business promotions, international advertisers are not required to know all languages across all markets, but the product promotions should be communicated in these languages. The technical accuracy of the professional translator cannot generally replace SME managers who are able to speak the language of the local markets. As the finding of one UK study

suggested, a third of small exporting companies lose opportunities due to linguistic problems (Terpstra & Sarathy, 2000).

Foreign language skills have also been identified by various authors as necessary for conducting international business, including Godiwalla (2012); Neupert, Baughn and Dao (2005); Nordstrom and Kleiner (1990); and Yu et al. (2005). Neupert, Baughn and Dao (2005) rated foreign language skills as an essential international management skill, while Yu et al. (2005) considered them one of a range of important skills. Nordstrom and Kleiner (1990) believed that by using foreign language skills, which improves communications, managers are better able to define their export interests with local partners; thus establishing more collaborative, long-term relationships with foreign partners. Foreign language skills are also considered helpful for managers to better understand the values and customs of local markets – often deemed a key factor to enhancing their competitiveness as well as improving their market share and revenue. Similarly, Godiwalla (2012) argued that international managers should learn to understand and then communicate in the language of the host country in order to develop strong working relationships.

3.4. Training and training need identification

When it comes to training definition, Spector et al. (2013, 963) supported the view that emphasizes the improvement in skills and experience through training. Accordingly, training is understood as “instruction intended to improve performance or support learning of a specific level of knowledge and skill required to perform some aspect of a job or task”. Training has always been affirmed as an extremely important activity in human resource management activities as it relates to the efficiency improvement of both businesses and individuals, through significant improvements in behaviors at workplace (Bartel, 1994, 2000; Bishop, 1994; Huselid, 1995; Black & Lynch, 1996; Blundell et al., 1999; Jones et al., 2012; Lee, 2012).

In an effort to raise management capacity via human resource development programs, training is always regarded as a crucial activity in both long-term strategies and short-term development plans. Reality has shown that knowledge acquired from different school levels as well as university seems insufficient to guarantee that individuals can perform effectively at their workplace. Constant changes in business environment, especially those related to technical and technological standards, urge enterprises to constantly update their employees' knowledge via training programs (Bassanini & et al., 2007). These issues have become increasingly important in the context of

international business environment where high-qualified human resources are seen as the top element in maintaining competitive advantages for enterprises (Huang, 2001).

Besides education, more and more training activities towards the goals of improving work performance are being organized (Arulampalam et al., 2004; Bosch & Charest, 2012; O'Connell, 1999; Sala & Silva, 2013) and the benefits they bring are really big and positive (Booth & Bryan, 2005; Brunello et al., 2012; Dearden et al., 2006).

Among process-driven training models, the ADDIE model (Training - Analysis, Design, Development, Implementation and Evaluation) is the one that is highly evaluated by professionals, universities and training facilities. ADDIE model is often used to develop and implement training programs. Accordingly, in the first step, the training needs - the skills that learners expect to gain - will be investigated. Based on this, the content of the training program is designed to meet the needs of the trainees, and thus, may avoid wasting time, energy and money spent for training program development (Mayfield, 2011). Therefore, investigating training needs is considered an important step to ensure the success of training courses (Nazli, Sipon & Radzi, 2014).

Therefore, it can be seen that analyzing the training needs is an essential step in the training process (Bowman & Wilson, 2008). It not only helps to set up the training programs that meet the set-forth goals but also enhances the efficiency of other stages in the training process, such as designing and developing the training programs, implementing and evaluating the effectiveness of the programs. To put it another way, identifying the training needs is the foundation for establishing the training goals as well as other training stages (Shah & Gopal, 2012). If program developers skip the step of analyzing the training needs to go straight to the step of program design, the following steps may be re-conducted, causing many negative consequences (Lee & Owens, 2004). Without prudent training need analysis, the time and efforts spent to implement the entire training programs will be a waste while the training goals cannot be achieved (Tovey & Lawlor, 2008).

The training need analysis process can be done by exploring the training needs of different stakeholders such as managers, supervisors, employees, for the purpose of developing appropriate training programs to meet their needs. It can be done by investigating the needs of individuals or groups (Lindenmeyer & Newell, 1976).

3.5. Training of English skills for internationalization

English has become a global language for business. With an estimated 1.7 billion reasonably-competent users, 385 million native speakers in countries like the US and UK and 1 billion fluent speakers in formerly-colonized nations like Nigeria and India, it comes as no surprise why many multi-national enterprises mandated English as corporate language. They have well understood that in order to survive and thrive in the global economy, mastering English has become a must (Neeley, 2012).

Regarding what English skills people need to master, various opinions have been voiced. A survey conducted by Cambridge English (2018) about English used in international business indicated that all the four language skills were of great help. Speaking is needed for presenting, talking on the phone, small talk, meetings, etc.; listening is used for telephone conversations, listening to presentations, videos, etc.; reading helps business people read information on websites, books, reports, magazines, blogs, etc. while writing enables them to produce emails, social media, chat, business reports, etc. The survey findings specified that of the four skills, reading was the most important in international business followed by speaking. In an attempt to demonstrate the various uses of English in international business, British Council (2017) identified different situations where English is needed such as participating in international seminars, trade conventions and other business events, bidding, negotiating and managing international projects, researching market, developing and presenting products to foreign customers, communicating with partners, etc. Dividing internationalization into 5 different stages, Vallejo & Almagro (2002) assumed that for the first and second stages of occasional and experimental exports, businessmen needed to master speaking and listening skills for telephoning and negotiating and reading and writing skills for corresponding; in the third stage of regular exports, besides the above-mentioned ones, businessmen also needed to use English for socializing with partners and writing reports; the fourth stage of setting up of sales subsidiaries required the additional use of English for taking part in meetings while the final stages of setting up production and sales subsidiaries overseas called for the use of English speaking and listening skills for telephoning, negotiating, socializing, taking part in meetings and giving presentations and the use of English reading and writing for corresponding and report writing.



Figure 1: Conceptual framework on English skills needed in export

Le (2015) investigated English skills needed by managers from two groups of potential and current exporters. To begin with, two groups shared their needs with regard to conversation and written skills. In particular, the current exporters stressed the need for English skills to assist them to communicate more directly with foreign partners. Specialized English skills related to exports were also needed by participants in two groups. They emphasized the English skills which are helpful for the contract phase and other relevant international business activities. With such English skills, they did expect that they may better understand specialized terms used in foreign markets, and thus, they may gain more confidence in signing contracts and reduce confusion and errors in negotiations and litigations.

3.6. Aspects of training programs

To better organize training programs, factors related to training organization such as training schedule, length of training, location of training and financial supports for training should be taken into consideration. Otherwise, not gauging and addressing potential issues related to training administration may result in negative impacts on training effectiveness (North, Strain and Abbott, 2000).

To begin with, according to Giangreco, Sebastiano and Peccei (2009), to enhance the training effectiveness, training organizer should take the way in which the course is structured with regard to timing of sessions into account. Giangreco et al. (2010), Sitzmann et al. (2008), Saari et al. (1998) and Ghosh et al. (2011) emphasized the influences of the length of the course to perceived training effectiveness. Accordingly, Giangreco et al. (2010), Sitzmann et al. (2008) believed that short training course generally seem to be more

ideal than long courses. Similarly, Saari et al. (1998) explained that shorter training course is often perceived as less disruptive to workflows, and thus, is preferred. Meanwhile, as stated by Ghosh et al. (2011), to ensure that trainees can grasp the content without feeling rushed, the length of the training course should be adequate. Additionally, other factors related to training organization and administration such as convenient location and company support towards training have been acknowledged as influencers on training effectiveness perception (Giangreco, Sebastiano & Peccei, 2009; Kidder & Rouiller, 1997; Lee & Pershing, 2002; Sanjeevkumar & Yanan, 2012).

To better develop English training programs for agricultural export SMEs, the factors related to training organization are also taken into account in this study.

As can be seen from the literature review, there have been few studies examining the English skills needed in international business, and the number of researches investigating this need in Vietnam, particularly in particular fields such as agriculture is insignificant. Also, not many studies have explored trainees' perceptions with regard to both English skills needed and aspects related to training organization. These are the gap for conducting this research to propose a comprehensive English training program for Vietnamese agricultural export SMEs.

4. METHODOLOGY

4.1. Research objectives

Based on the literatures related to training, training needs and English skills needed in internationalization, the training needs of Vietnamese Agricultural SMEs to “go global” is investigated in this paper. Therefore, the



Figure 2: Conceptual framework on aspects of effective English training programs

paper, to begin with, explores the perceptions of Vietnamese agricultural SME managers with regard to English skills needed to export their products. Subsequently, implications related to relevant training programs on English are then provided. Research findings are expected to be beneficial to SME managers and training/consulting institutions in assisting Vietnamese SMEs to overcome foreign language barriers in exporting agricultural products to overseas markets.

The following main research questions have been investigated and guide this study:

1. *What are the perceptions of Vietnamese agricultural SME managers with regard to English skills needed in internationalization?*
2. *What are the perceptions of Vietnamese agricultural SME managers with regard to aspects of training programs on English skills needed in internationalization?*

4.2. Research methods

According to Saunders, Lewis and Thornhill (2012), in the studies where the perceptions of participants are investigated, the qualitative method should be used. The qualitative method often enables researchers to obtain rich and detailed responses to their investigation. That is, it takes into account the perceptions of interviewees rather than the views of researchers (Bryman & Bell, 2011). In this study, to examine the training needs related to English skills of Vietnamese agricultural SMEs, the use of semi-structured questions helped the researchers in gaining deeper understanding. Various opinions on English skills SME managers need to export successfully in general, to overcome technical barriers in particular were shared, which better the quality of data in both breadth and depth (Bryman & Bell, 2011; Saunders, Lewis and Thornhill, 2009). Based on the list of agricultural SMEs in these provinces, the researchers approached SME managers. Thanks to the introduction of state officials in these provinces, the researchers found it more convenient to connect with SME managers. Besides, many participants were referred to by previous interviewees, by using the “snow-ball” technique.

The interview protocol was used to assist the interviewers during interviews. The list of themes and questions are prepared, but questions may not exactly follow the way outlined in the schedule. That is, some questions may be omitted, added or rephrased depending on the flow of the conversation, based on

. An interview protocol is generally designed with major components included, such as instructions to the interviewer, themes, key questions, probes to follow key questions, and blank space for the interviewer's comments (Creswell, 2014). In this study, the protocol

was developed based on the literatures related to English skills in business internationalization.

4.3. Data collection

A survey was conducted with managers of 124 agricultural export SMEs, including 49 people directors (39.52%), 11 vice-directors (8.87%) and 64 heads of business department (51.61%). The survey was implemented mostly in northern provinces, including Hanoi (44 enterprises – accounting for 35.48%), Bac Giang (22 enterprises – 17.74%), Ha Nam (16 enterprises – 12.90%), Son La (15 enterprises – 12.10%), Hai Duong (13 enterprises – 10.48%) and others like Hoa Binh, Lang Son, Thai Nguyen, Lai Chau, Yen Bai, Ninh Binh, Nam Dinh, Quang Ninh, Ha Tinh and 2 enterprises from Hochiminh City. Of the total 124 surveyed enterprises, 61 were joint-stock (61%) and 63 were limited enterprises (50.81%). Enterprises participating in the survey operated in various sectors, from investment, production, trade, agricultural exports, with different products such as tea, sugar, coffee, vegetables, clean food, etc. The number of enterprises with fewer than 10 employees totaled 20 (16.13%), from 10 to 200 employees was 91 (73.39%), from 200 to 300 employees was 13 (10.48%). The number of enterprises with capital of less than VND 10 billion was 42 (33.87%), with VND 10 – 20 billion is 43 (34.68%), with VND 20 – 100 billion is 39 (31.45%). Of 124 enterprises, those with operation years less than 3 was 22 (17.74%), from 3 to 5 years was 34 (27.42%), from 6 to 10 years was 32 (25.81%), from 11 to 20 years was 27 (21.77%) and over 20 years is 9 (7.26%). The surveyed enterprises exported to various markets, of which the biggest number was those exporting to China (52 enterprises – 41.49%), then EU (19 enterprises – 15.32%), the US (4 enterprises – 3.23%) and others (49 enterprises – 39.52%). Other markets included South Korea, India, Iran, Taiwan, Laos, Singapore, Russia, Germany, Hungary, Belarus, Afghanistan, etc. The diversity in genders, products and market is considered as a success of this research, as it ensures the multi-faceted opinions from recipients (Bryman & Bell, 2011).

4.4. Data analysis

To systemize and analyze the qualitative data in this study, the step-by-step procedure suggested by Creswell (2014) was used. Accordingly, the researchers were required to organize the data, conduct a preliminary read-through of the database, code and organize themes, and organize the data in the format for interpretation. The qualitative QSR support software Nvivo was used to support the data analysis process.

5. RESULT FINDINGS

5.1. English skills needed for internationalization

Regarding English skills needed in internationalization, almost all Vietnamese managers participating in the survey agreed that English plays an essential role in their international business performance and identified various situations in which they need to use English to facilitate their work.

5.2. General English

Understanding that *"English is the most popular language for international transactions"* (M_09), SME managers in this study extremely emphasized the importance of learning English. A great number of SME managers expressed the need to be equipped with general English, with four skills of listening, reading, writing and speaking so that they can communicate with foreign partners by themselves, at least in non-work related situations. One SME manager put it:

"Of course it is important to learn English to communicate fluently with foreign partners. But it is also good enough to be able to communicate with them in some situations other than work to establish relationships. An appropriate way of greeting, some English expressions to break the ice before we discuss our business like asking about their hobbies, talking about the weather, etc. can show to my partners that I am interested in developing a long-time relationship with them" (M_07).

In particular, the listening and speaking skills were strongly emphasized by many SME managers as an important foundation for them to be able to confidently communicate with foreign partners, improving the efficiency of international business. One SME manager shared:

"I need four basic skills in English to be able to listen, read, write, and speak in English. Especially I need listening skills to understand what partners say, what they require, and I need speaking skills to communicate and express our needs. Effective international business requires adequate foreign language ability." (M_21).

In addition, some SME managers emphasized that in order to increase confidence as well as to work more professionally in the international context, learning and obtaining certificates such as IELTS and TOEIC was also necessary.

5.3. Business English

In addition to general English skills, SME managers in this study also wanted to be equipped with business English skills in order to *"gain better understanding of business issues"* (M_05). More specifically, SME managers wanted to be trained English skills used in trading activities. These skills become even more essential when foreign languages are still a major

constraint for many Vietnamese SME managers. Having an understanding of specialized English may help SMEs limit risks stemming from language barriers, and also, catch better business opportunities. One SME manager shared:

"Many Vietnamese SMEs still lack foreign language skills, particularly specialized English skills when doing business. Understanding and mastering specialized English may help SMEs increase their professionalism, better communicate and negotiate, avoid the risks of misunderstanding, and seize opportunities promptly" (M_22).

English skills for general export

Due to specific requirements from international business activities, specialized English skills used in the field of export, especially those used in agricultural export is the need of many SME managers in this research. One SME manager said:

"I need specialized English skills in export because in this field, there are a number of specialized words that may not be understood as usual, so it is important to study specialized English skills" (M_01).

Besides terms related to general export, terms regarding agricultural export are also the content that SME managers in this study want to know. Mastering the skill of *"reading and understanding requirements on agricultural export of foreign countries"* (M_08) is expected to help SME managers better understand technical standards in exporting markets.

English skills for understanding technical standards

As the technical barriers have become increasingly rigorous and complex, the understanding of English for agricultural export may support SME managers in overcoming barriers. As shared by one SME manager:

"With my current limited English skills, I need to study comprehensive reading skills to understand specialized terms related to technical standards in agricultural export" (M_03).

In addition to *"comprehensive English reading skills to understand international regulations, and also specific technical standards in each market"* (M_12), specialized English skills are also useful for SME managers when *"researching and implementing regulations related to international technical standards in trade"* (M_15). Understanding technical standards correctly is essential because they are often complicated.

Even when the export market is not an English-speaking country, it is necessary to acquire specialized English skills to understand standard requirements and practices commonly used in the global context. As shared by one manager:

"My company mainly exports to China market, so we mostly use Chinese in business. But I still need to know specialized English to read and understand general rules and standards popularly used in the international business environment." (M_20).

English skills for drafting contracts & updating foreign information

Comprehensive reading skills and document drafting skills in English are directly related to the clarity of foreign trade contracts between SMEs and foreign partners. These are essential skills because *"contract signing and negotiating skills are strongly required in the international business"* (M_13).

Additionally, the ability to seek information in English may help SME managers to catch up with the worldwide information, particularly to update foreign market information more effectively.

English skills for dealing with partners & negotiating contracts

A large number of SME managers in the study wanted to be equipped with business English skills as these skills have been seen as a major barrier to Vietnamese SMEs in integration, particularly in setting international business partnership and negotiating contracts.

To begin with, SME managers need business English skills to help them and business partners better understand each other, thus facilitating the communication. English communication skills are seen as a bridge connecting SMEs to business partners as well as to customers. In particular, the number of native English-speaking markets and partners is increasing, so English skills may help SME managers *"directly communicate and negotiate contracts with business partners from English-speaking countries"* (M_04).

In contract agreements, business English skills make it easier for SMEs to negotiate on terms. When SME managers themselves can communicate in the partners' language, negotiation efficiency is improved, and thus contract agreements come more easily. As one SME manager said:

"Mastering English communication skills is very important as English is worldwide used to discuss, negotiate and develop networks with business partners from all over the world" (M_16).

Therefore, it is reasonable for an SME manager to emphasize that *"good English communication skill is a great advantage, making negotiations faster and more effective"* (M_33).

SME managers also point out that although the international business can be facilitated by the use of interpreters but that practice is somewhat inconvenient as a limited understanding of the business by the interpreter may reduce the effectiveness of the

negotiation, that is not to mention the possible risks of losing business information it using unreliable interpreters. One of these managers stressed:

"In many cases interpreters may be very good at English, but their business knowledge is not sufficient." (M_12) and *"The issue we worry in utilising interpreters is that they may work for our rivals and cheat us in the contracts."* (M_13)

English skills for understanding export standard agreement

Business skills also make it easier for SME managers to understand customers' requirements related to export agricultural products. In particular, knowledge of specialized English along with proficiency in English communication skills may assist SME managers when they must *"discuss with foreign partners on a regular basis to understand and agree on export standards"* (M_11). Especially in contracting, business English skills help SME managers clearer about the provisions, terms, and the technical standards that exporters must satisfy. It also affects following stages of contract implementation. As shared by one SME manager:

"I need English communication skills to be able to clearly understand the requirements of the partner as well as the rules and standards that I will comply with in the contract" (M_02).

English skills for understanding export markets

Not only for signing contracts, business English skills also help SME managers improve their understanding of foreign markets. By working with potential partners, SME managers may better know about the potential products and markets that may nicely match their capacity. Based on that, SMEs may develop appropriate business strategies and plans to penetrate foreign markets. One SME manager said:

"English communication skills help me better approach and develop relationships with foreign partners, and thus fully understand the market's requirements" (M_19).

English communication skills also help SME managers to "directly communicate and interview foreign consumers to better understand the markets" (M_14).

English skills for introducing products to foreign partners

Fluent business English communication skills are also considered as an effective tool for SMEs to introduce their products to foreign markets. The world is becoming more and more flat, if only promoting products in local language, it will be strongly difficult for SMEs' products to expose to broader markets. As emphasized by one SME manager:

"Only when having good English communication skills can SMEs promote their products and brands across the country's borders" (M_10).

Table 1: English skills needed to assist Vietnamese SME managers in internationalization

General English
Business English
English skills for general export
English skills for understanding technical standards
English skills for drafting contracts & updating foreign information
English skills for dealing with partners & negotiating contracts
English skills for understanding export standard agreement
English skills for understanding export markets
English skills for introducing products

Source: Author

English presentation skill is also believed to assist SME managers to *"facilitate the business transaction"*. In many cases, SME managers themselves have to present and convince partners about their products, in particular about the quality of their products in accordance with the international technical standards. At that time, *"SME managers' English presentation skills will be a great advantage for the company in marketing products as well as in persuading partners from various foreign markets"* (M_17). One SME manager said: *"In an integrated environment, skills to introduce and promote products of SME managers is firmly essential, determining the success in signing agricultural export contracts"* (M_18).

SME managers' product marketing skills in English may make business negotiations more effective, increasing the acceptance of foreign markets to their products.

5.4. Training needs with regard to aspect of training programs for English skills

Regarding their needs for English training programs, apart from training content which is related to English skills needed for internationalization – which was investigated and shown in previous section, Vietnamese SME managers participating in the survey all appreciated the importance of further training and expressed different needs for the organization and delivery of the training programs for English skills.

Content of training

The demand of SME managers for what to be trained varies greatly, depending on their job responsibilities as well as their current English proficiency. For those whose English skills are still quite poor, what they expect to learn first is general English for basic communication. A manager in his early forties expressed:

"I feel disadvantaged when I cannot communicate with my foreign partners, even in simple situations. I do not

expect to be able to use English for work communication, I need the support from my interpreter but I feel more confident if I can speak some simple sentences for daily communication, such as greeting, talking about our hobbies or some words to introducing myself and my company." (M_05).

SME managers also express their desires to learn business English so that they can work more effectively and independently with foreign partners and build up long-term relationships. As described in the earlier part about skills needed for internationalization, SME managers want to learn specialized English to help them *"gain better understanding of business issues"* (M_05). Particularly, they would like to study *"specialized words for export"* (M_01), improve their reading skills to *"understand specialized terms related to technical standards in agricultural export"* (M_03) or to *"get and understand more information about foreign market"* (M_13), enhance their speaking skills to *"directly communicate and interview foreign consumers to better understand the markets"* (M_14) or to *"promote their products and brands across the country's borders"* (M_10).

In short, the demand of some SME managers is to learn general English for communication in daily situations. Speaking and listening skills are more highly appreciated for these purposes. Besides, SME managers also have the needs of studying different skills of business English such as drafting and negotiating contracts, presenting products, reading documents on technical standards, etc.

Schedules of training

Most SME managers believe that training courses should be scheduled for during the week. While noting that they are very busy with their daily work, the managers still believe that as long as the training does not last for five consecutive days during the week, they would be able to balance between work and study. One exporter confirmed this preference:

"I prefer studying during the week. If the classes are continuously organized every day during weekdays, our work at the company will stagnate. However, if they are scheduled in between one and two afternoon sessions, I still have time to work and join the class." (M_13).

The managers also believe that by attending weekday classes, they would be able to distinguish more clearly between time spent for work and study, and time spent for the family. One exporter explained:

"Training classes should be organized during the week and avoid Saturday and Sunday because these days are reserved for the family." (M_16).

In addition to not wanting training sessions scheduled to run consecutively across the five weekdays, SME exporters also emphasized that they would prefer to study midweek such as Wednesday or Thursday.

However, some SME managers showed some scheduling flexibility, in that if the timetable during the week does not suit all trainees, the training could instead be organized for over the weekend. One of the managers confirmed this:

"Sometimes, if participants are busy during the weekdays, weekend is acceptable because training is organized based on actual needs of participants." (M_13).

Nonetheless, where training has to run on a weekend, managers stressed that it would be more appropriate for activities such as conferences and seminars, rather than formal training courses. In addition, they believe that due to family commitments and when considering the role of women in the family at the weekend, weekend training should be scheduled for a Saturday afternoon and whole of Sunday. As reflected by a male exporter:

"I think it should be on Saturday afternoon and on the whole of Sunday. In Vietnam women are responsible for housework, and Saturday mornings are spent for family tasks. Best time for training attendance for women would be Saturday afternoon and Sunday. On the following Sunday evening, they may spend time with their family." (M_18).

With regard to time of day, the preference is for midweek training programs to be scheduled from 8 am to 11 am in the morning, 2 pm to 5 pm in the afternoon as these time frames *"do not affect family affairs"* (M_04). Some managers suggested the 6 pm - 8 pm course but noted that evening classes would generally be more suitable for businessmen rather than businesswomen, because most Vietnamese female managers are busy in the evening with household responsibilities. A female manager said:

"It would be a little bit difficult to me to arrange my time for evening courses as it should be the time for family. I can manage it if the courses last for a short

period, but in the long term, it may affect my family life" (M_09).

Length of training

Most SME managers understand that with typical characteristics of English training, the English skill courses could not be too short as they need the time not just for studying in the class but also for practicing at home to improve their skills. Most managers agree that it should take an average 3 months for a course at one level. As expressed by a manager:

"I think it is impossible to learn English in a short time. An English course is different from other courses which can take only a few days. To build up and improve English skills, I think a course should last for about 3 to 4 months, depending on what you learn and what level you want to achieve." (M_21).

SME managers also appreciate that to learn effectively, an English lesson should not take more than 3 hours. A more frequently-organized short-timed class is surely better than an intensive lengthy lesson. Most managers agree that two or three sessions a week is an ideal arrangement for an English class.

"My experience of learning English at university shows that an English lesson should take about 2 hours only. More than that time would be ineffective". (M_17).

Location of training

SME managers expressed different views on where they wanted classes to take place when some preferred to study outside the company while others claimed that attending classes inside the company would be better. Those who support off-site training reason that learning outside would provide them with the chance to network with other exporters and also allow them to concentrate more on the training.

"Organizing training outside the company is better. It makes trainees focus on the training and may call for more participants from various companies. If training is held inside the companies, in many cases we are required to go out of training sessions to solve working tasks, and it reduces the effectiveness of training." (M_02).

In the meantime, those who advocate studying on-site reason that it would be easier to ask for tailor-made classes to suit the specific demand of the trainees and it is more convenient if the number of people attending the course from the company is big.

"If we study in the company, we would have more flexible classes. For example, we may ask to change the learning time if we have some urgent tasks to tackle or unexpected meetings to attend. If we go to classes outside the company, we will have to follow the fixed schedule." (M_03).

Table 2: Training need identification for English training programs

Content of training
General English for daily communication
Business English for specialized purposes
Schedule of training
Training courses should be scheduled for during the week, but may be organized at the weekend if unsuitable for all trainees
Due to family commitments and when considering the role of women in the family at the weekend, training should be on Saturday afternoon and whole of Sunday
Training courses should take place during the day, but may be organized in the evening for a short period
Length of training
Training courses should last for 3 to 5 months
One training lesson should last for no more than 3 hours
There should be no more than three sessions a week
Location of training
Training should be organized outside the company for better networking and concentration
Training should be organized inside the company if the number of trainees is large
Financial supports for training
Need financial support from company such as tuition fees, need a reduction in working hours during training attendance from company to attend training
Where no financial support is provided, exporters consider attending the training a benefit for career development

Source: Authors

Financial supports for training

With regard to company support towards training, many Vietnamese managers believe that participants should be given financial support. From their perspective, such financial support would encourage staff to attend training, especially training courses organized in the evening or on the weekend. One manager shared:

“If the training is for lower managers and top managers find it useful and relevant, they may provide financial support and consider it like a perk or after-working-hour salary.” (M_11).

In particular, paying the tuition fees for staff attending training is strongly supported by these managers. In addition, a reduction in working hours during training attendance is also perceived as a benefit that companies could give to training participants. Yet where no financial support is going to be provided by the company, SME managers believe that attending the training would still be an overriding benefit for the

individual’s career development. In the words of an SME manager:

“To be honest, getting an opportunity to attend training is benefit in itself, and it can be seen as one method of non-financial incentive for an employee.” (M_13).

6. DISCUSSIONS

To begin with, with regard to the perceptions of SMEs managers about the roles of English skills in internationalization as stated in research question 1, it is indicated in the study that SME managers all highly appreciated the importance of English to the success of their international business. They believed that good English skills in both spoken and written forms help them to communicate more directly with partners so that they can build up and develop better relationships. In addition, a good command of English was also considered helpful for businessmen to better understand the cultures of their foreign partners and customers, so that they can customize their offerings to best suit the local market. This result goes in line with the

statements of numerous previous studies which emphasized the importance of English skills, such as those of Vallejo & Almagro (2002), Neupert, Baughn and Dao (2005), Nordstrom and Kleiner (1990), and Yu et al. (2005), Neeley (2012), Godiwalla (2012).

In particular, basic English was considered the foundation for the establishment of the partnership. Just some sentences for greeting or chit-chatting to warm up the conversation before the main working session starts with the help of interpreters can be good enough for SME managers to show their willingness and eagerness to build long-term relationships with foreign partners. The needs for four basic English skills of listening, reading, writing and speaking, as well as the importance of speaking skill among such four skills were also stressed in the study of Cambridge English (2018) and Le (2015). However, apart from speaking skill, listening skill was also strongly stressed by Vietnamese agricultural SME managers in this study. They did need such skills to understand what foreign partners says, and thus, improve the oral-communication. This may be because they want to directly set up and maintain relationship, as well as to involve in communication and negotiation process with foreign partners. The role of speaking and listening skills for business telephoning and negotiating was also highlighted in the study of Vallejo & Almagro (2002).

Another reason for the needs to learn four basic English skills, particularly listening and speaking skills, of agricultural SME managers in this study may be due to the problems related to using interpreters. Despite their awareness of the importance of mastering good English skills in the internationalization process, most Vietnamese SME managers in the field of agricultural exports admitted that their English competence remains insufficient for them to do business effectively in the foreign market. As a short-term solution to the poor competence of English, SMEs had to resort to the use of interpreters to facilitate their foreign business negotiations. However, many managers perceived the use of interpreters as difficult and inconvenient, and in many cases they believed they could lose opportunities if they are overly reliant on interpreters. Some managers also complained that during negotiations there may be misunderstandings between managers and interpreters, realizing that the translation does not always fully match with what they are saying. In such situations, they have found that the negotiation atmosphere is tense and stressful with a sense of ill feelings.

At more advanced levels, SME managers in this study expressed the needs for mastering specialized English skills. They expected that a good command of specialized English helps them in a range of activities related to export, such as to deal with partners, to understand export markets and to introduce products to overseas markets. Simiraly, Vallejo & Almagro (2002)

took the same view when emphasizing that businessmen need specialized English skill to socialize with partners and set up production and sales subsidiaries overseas. Study of British Council (2017) also stressed the role of English skills to research market, to develop and present products to foreign customers.

Vietnamese agricultural SME managers in this study extremely highlighted the role of specialized English skills for better negotiate and sign contracts with foreign partners. They did expect that adequate specialized English skills may enable them to communicate and negotiate in partners' language, thus improving negotiation efficiency. Likewise, the study of Le (2015) acknowledged the role of specialized English skills in assisting managers in understanding terms used in contracts, in building their confidence in signing contracts, as well as in reducing confusion and errors in negotiation. Vallejo & Almagro (2002) also stressed the role of specialized business English, particularly listening and speaking skills, for negotiations.

Since SME managers in this study do international business in agricultural fields, they expressed the strong needs to learn English skills to better understand terms used in agricultural export. In particular, as the technical barrier has been addressed as the great challenges for them in export, they would like to know more about terms related to regulations and technical standards.

With regard to the perceptions of SMEs managers about the training of English skills to foster the internationalization as stated in research question 2, fully understanding the importance of English skills and recognizing their weaknesses in this area, most Vietnamese SME managers expressed their demand for further language training. Depending on their specific tasks, business goals, working positions, job demand, etc. the managers in this study showed different needs for English training, regarding what they want to learn, how long the training courses should last, where and how often the training sessions should take place and what financial incentive they expect to receive from their firms. Previous studies such as those of Giangreco et al. (2010), Sitzmann et al. (2008), Saari et al. (1998) and Ghosh et al. (2011) and Saari et al. (1998) also emphasized the importance of taking into account factors related to training organizations in order to enhance training effectiveness. In particular, when it comes to the length of training courses, with the characteristics of English training, the learners needed time for both studying at the class and practicing at home, the course should not be too short and the suitable length is more or less 3 months. These need identifications are the foundation for the proposals of training programs in the next part.

7. RECOMMENDATIONS AND PROPOSALS

Based on the research findings of the perceptions of SME managers on English skills needed for internationalization and their training needs with regard to aspects of an effective English course, some recommendations are made to different stakeholders, including program designers, SME managers and macro-administrators.

7.1. To training program designers

To provide appropriate and effective training programs, designers should take into account the training needs of learners and try to provide what learner expect to learn.

Content of training

To meet the demand of SME managers, both general English and business English should be the content of the training courses.

To begin with, training courses on general English skills for SMEs can be organized in traditional or online classes. These traditional and online classes can be held in a large-size class or one-to-one tutoring, depending on the cost, time, and accessibility of the venue. Actually, training English skills, especially for SME managers who learn from scratch, is not easy, requiring not only the quality of the courses in accordance to the learning condition of SME managers, but also the patience of these SME managers.

English foundation course may include basic contents such as grammar (tenses, word forms, sentence structures), vocabulary (basic topics), and pronunciation (basic sounds). After this course, learners can communicate in some common situations such as making self-introduction, taking about hobbies and interests, or chatting with partners about work and life. Regarding study methods, in addition to joining lectures, learners can participate in group discussions to develop English presentation skills.

Upon completing the foundation course and gaining basic foundation skills related to grammar, vocabulary and pronunciation, learners then can access higher level English classes to comprehensively develop four skills of listening - speaking - reading - writing. However, these classes just focus on developing these four skills at basic level. Classes with certificates such as TOEIC or IELTS may help trainees to develop these four skills at much more professional levels.

For better performance in the international business environment, English communication courses for SME managers should be emphasized. The English Communication course should cover topics closely related to day-to-day business activities such as writing and replying to emails, chairing and attending meetings, making and answering phone calls, making good impressions in first meetings. In such English communication courses, speaking and writing skills

should be more focused to enhance the fluency in both writing and speaking skills in formal and informal manner for trainees. Learners may be arranged to work in pairs or in groups, under the guidance of teachers, to develop English communication skills. Learners may also learn to express their views and thoughts, use English correctly and naturally. More importantly, learners may gain confidence, professionalism in speaking and writing English.

When it comes to English used in specific international business activities, specialized English courses are essential. This course may focus on the business situations that SME managers may encounter. A wide range of English vocabulary and their flexible expressions, accompanied by terms particularly used in specific business industry, all bring expertise for SME managers in the international business.

Learners may be trained to use English in more specific business situations, such as interacting with customers and colleagues, using English for marketing management, human resource management, or legal procedures governance. In addition, learners should be directly trained to develop skills such as report presentation skills, negotiation skills, and skills to participate in meetings with foreign partners.

The more in-depth contents such as terminologies in import and export, particularly those related to international technical standards, should be introduced to help Vietnamese SME managers more professional in contract negotiations, customer seeking and market entry.

Schedule of training

Training should be organized on the weekdays rather than at weekends as it may affect private business of SME managers who are already very busy at work during the week and wish to spend their weekend for their family. If courses take place on the weekdays, Monday and Friday are not ideal days as these are generally exceptionally busy days at work. If training must be at weekends (since it may be too difficult to find an appropriate time frame to fit all learners), it should not take the whole weekends to leave something for managers to spend with their family.

With regard to learning time, midweek training should be in the morning or afternoon during working hours rather than in the evening as it is not suitable for female managers in particular who also need to take responsibilities for household chores. If it must be delivered in the evening, it should not take for too long.

Length of training

The training courses should not be either too short or too long. Too short-time courses will not be able to cover necessary topics and provide sufficient time for trainees to practice and improve their skills. But they should not be too long as long-time courses may make

it difficult to managers to arrange their time to fulfill the courses. The ideal length for an average English training course should be around 3 to 5 months.

Regarding the length and frequencies of training sessions, a training session should not be longer than 3 hours and there should not be more than three sessions per week. English training aims at training skills rather than delivering knowledge, so too lengthy lessons at a time (4 or 5 consecutive hours as usually seen in a lecture in other subjects) and too many lessons in a week (every day) may become overloaded for trainees and make it difficult for working people to allocate time from their work to attend classes and practice at home.

Location of training

The location of training programs should be arranged based on the demand of the trainees. As both on-site and off-site programs have their own merits, program designers should be ready to offer training services in line with the specific demand of trainees. Training courses provided in the establishment of the trainers are usually designed for the trainees with standard training demand while courses delivered at the company of the trainees may be customized to the training needs of the managers participating in the courses.

7.2. To SME Managers

That SME managers can use English fluently to communicate with foreign partners in different business situations is believed to contribute greatly to the companies' international business, so the leaders of SMEs should consider investing resources to improve the quality of their human resources.

SME leaders should encourage staff learning by providing appropriate financial support for training in the forms of fee-sharing. That is the most direct way of showing the companies' commitment to long-term personnel development and motivating managers to improve their skills. Besides, financial incentives can also be provided as a reduction in working hours during training attendance. That is to show to the staff that the companies appreciate their learning efforts.

In case no financial support is available during the training courses, leaders should offer some other kinds of incentives such as rewards provided to staff upon their accomplishment of the courses or better promotion opportunities open to those who have shown great efforts in improving their professional qualifications to do their jobs more effectively.

All these financial and non-financial commitments should be highlighted in the policies of the companies to create a solid guideline for both leaders and employees to follow.

7.3. To macro-administrators

As SMEs are an important drive to the national economic development, more supporting policies should be made towards these dynamic entities. Particularly in terms of human resource development, to help SMEs improve the quality of their labor force, especially in English skills, there should be more joint efforts from relevant administration agencies. Specifically, foreign trade departments of Ministry of Industry and Trade should do more research on the demand of international market, pay field trips to developed countries to learn experience from their good human development models, provide adequate information to help SMEs improve their awareness of the internationalization. Education and training administration offices should do research on renewing and renovating the training curriculum of foreign languages, especially English, at different school levels so as to improve foreign language proficiencies of Vietnamese laborers in the coming time.

8. CONCLUSION

The paper has provided the discussion on the English skills that Vietnamese SME managers need to internationalize their agricultural products. Following the relevant literature review, perceptions of Vietnamese SMEs related to English skills that they need to export agricultural products as well as their training needs with regard to aspects of an effective English course were explored and presented. Some implications to develop appropriate training courses were also provided to assist SME leaders, training program developers and macro-administrators to improve English skills to take steps to enter foreign markets successfully. Future research may develop these research findings by looking at English skills needed in other business fields or in other countries.

9. REFERENCES

- [1] Alexandratos, N & Bruinsma, J 2012, "World Agricultural towards 2030/2050", ESA Working Paper No. 12-03, June 2012.
- [2] Andersson, S & Florén, H 2011, "Differences in Managerial Behavior between Small International and Non-international Firms", *Journal of International Entrepreneurship*, vol. 9, no. 3, pp. 233-258.
- [3] Arulampalam, W., Booth, A. L. and Bryan, M. L. 2004, "Training in Europe", *Journal of the European Economic Association*, 2, 2-3, 346-60.
- [4] Bartel, A.P., 1994, "Productivity Gains from the Implementation of Employee Training Programs", *Industrial Relations*, 33: 4, 411-425.

- [5] Bassanini, A, Booth, A, Brunello, G, Paola, MD & Leuven, E 2007, "Workplace Training in Europe", in G Brunello, P Garibaldi and E Wasmer (eds), *Education and Training in Europe*, Oxford University Press, Oxford and New York, pp. 143-323.
- [6] BER (Bureau for Economic Research) 2016, "The Small, Medium and Micro Enterprise Sector in South Africa", *BER research Note 2016*, No 1.
- [7] Bishop, J. H. 1994, "The Impact of Previous Training on Productivity and Wages", in L. Lynch (ed.), *Training and the Private Sector: International Comparisons*, Chicago, IL: University of Chicago Press.
- [8] Black, S. E. and Lynch, L. M. 1996, "Human-capital Investments and Productivity", *American Economic Review*, 86: 2, 263-267
- [9] Blundell, R., Dearden, L., Meghir, C. and Sianesi, B. 1999, "Human Capital Investment: The Returns from Education and Training to the Individual, the Firm and the Economy", *Fiscal Studies*, 20: 1, 1-23.
- [10] Booth, A. L. and Bryan, M. L. 2005, "Testing Some Predictions of Human Capital Theory: New Training Evidence from Britain", *Review of Economics and Statistics*, 87, 2, 391-4.
- [11] Bosch, G. and Charest, J. 2012, *Vocational Training: International Perspectives*, New York: Taylor and Francis).
- [12] Bowman, J & Wilson, JP 2008, "Different Roles, Different Perspectives: Perceptions about the purpose of Training Needs Analysis", *Industrial and Commercial Training*, vol. 40, no. 1, pp. 38-41.
- [13] British Council 2017, *Six Ways English Skills Affect Business Results*, eBook by British Council, viewed 6 August 2018, <<https://www.britishcouncil.org/sites/default/files/english-skills-impact-business-british-council-aptis-ebook.pdf>>
- [14] Bruinsma J 2003, *World Agriculture: Towards 2015/2030 FAO Perspective*, Earthscan Publications Ltd, London
- [15] Brunello, G., Comi, S. L. and Sonedda, D. 2012, "Training Subsidies and the Wage Returns to Continuing Vocational Training: Evidence from Italian regions", *Labour Economics*, 19, 3, 361-72.
- [16] Bryman, A., Bell, E. 2011, *Business Research Method*, OUP Oxford
- [17] Calof, JL & Beamish, PW 1995, "Adapting to Foreign Markets: Explaining Internationalisation", *International Business Review*, vol. 4, no. 2, pp. 115-131.
- [18] Cambridge English 2018, *Survey on English language skills in the workplace*.
- [19] Campbell-Hunt, SCC 2003, "Paths to Internationalisation among Small to medium-sized Firms: A global versus regional approach", *European Journal of Marketing*, vol. 37, no. 5/6, pp. 796-820.
- [20] Chetty, S & Campbell-Hunt, C 2003, "Paths to Internationalisation among Small to medium-sized Frms: A Global versus Regional Approach", *European Journal of Marketing*, vol. 37, no. 5/6, pp. 796-820.
- [21] Creswell, J. W., 2014, *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*, Thousand Oaks, CA: Sage.
- [22] Dearden, L., Reed, H. and Van Reenen, J. 2006, "The Impact of Training on Productivity and Wages: Evidence from British Panel Data", *Oxford Bulletin of Economics and Statistics*, 68, 4, 397-421.
- [23] Disdier, A., Fontagne, L. and Mimouni, M. 2008, "The Impact of Regulations on Agricultural Trade: Evidence from the SPS and TBT agreements", *American Journal of Agricultural Economics*, 90(2):336-50.
- [24] Giangreco, A, Carugati, A, Sebastiano, A & Bella, DD 2010, "Trainees' reactions to training: Shaping groups and courses for happier trainees", *International Journal of Human Resource Management*, vol. 21, no. 13, pp. 2468-2487.
- [25] Ghosh, P, Joshi, JP, Satyawadi, R, Mukherjee, U & Ranjan, R 2011, "Evaluating effectiveness of a training programme with trainee reaction", *Industrial and Commercial Training*, vol. 43, no. 4, pp. 247-255.
- [26] Godiwalla, YH 2012, "Training and Development of the International US Executive", *Journal of Modern Accounting & Auditing*, vol. 8, no. 1, pp. 32-39.
- [27] Government of Vietnam 2012, *Decision No. 1231/QD-TTg Approving the Plan for Developing Medium and Small Enterprises 2011-2015*, Hanoi.
- [28] Government of Vietnam 2017, *Law No. 04/2017/QH14 supporting SMEs*, Hanoi.
- [29] Government of Vietnam 2018, *Decree No. 39/2018/ND-CP detailing a number of articles in the SME Support Law*, Hanoi.
- [30] Ha Nguyen 2009, "Poor English language skills, teacher hinder Vietnamese", viewed 20 August 2020, <<https://vietnamnews.vn/sunday/features/189669/poor-english-language-skills-teaching-hinder-vietnamese.html>>
- [31] Huang, T-C 2001, "The Relation of Training Practices and Organisational Performance in Small and Medium Size Enterprises", *Education + Training*, vol. 43, no. 8-9, pp. 437-444.

- [32] Huselid, M.A. 1995, "The Impact of Human Resource Management Practices on Turnover, Productivity, and Corporate Financial Performance", *Academy of Management Journal*, 38: 3, 635-672.
- [33] Huy Quang 2020, "Enterprises need to change their mindset to export agricultural products to China", viewed 20 August 2020, <<http://thoibaotaichinhvietnam.vn/pages/kinh-doanh/2020-07-22/doanh-nghiep-can-thay-doi-tu-duy-xuat-khau-nong-san-sang-trung-quoc-89837.aspx>>
- [34] Johanson, J & Vahlne, J-E 1977, "The Internationalisation Process of the Firm: A Model of Knowledge Development and Increasing Foreign Market Commitments", *Journal of International Business Studies* vol. Spring/Summer, pp. 23-32.
- [35] Jones, D. C., Kalmi, P. and Kauhanen, A. 2012, "The Effects of General and Firm-specific Training on Wages and Performance: Evidence from Banking". *Oxford Economic Papers*, 64: 1, 151-175.
- [36] Kahiya, ET 2013, "Export Barriers and Path to Internationalisation: A Comparison of Conventional Enterprises and International New Ventures", *Journal of International Entrepreneurship*, vol. 11, pp. 3-29.
- [37] Karabulut, AT 2013, 'Internationalisation of Turkish SMEs: An empirical study', *International Journal of Business and Management*, vol. 8, no. 6, pp. 68-88.
- [38] Kidder, PJ & Rouiller, JZ 1997, "Evaluating the success of a large-scale training effort", *National Productivity Review (Wiley)*, vol. 16, no. 2, Spring 97, pp. 79-89.
- [39] Kuzminov 2017, "Determination of Agricultural Export Features in Developing countries", *Technology and IT and production reserves* No 5/5 (37), 2017.
- [40] Le T. D. 2015, *Human Resource Development Capacity Building: Training Needs in Internationalising Vietnamese Small and Medium-sized Enterprises (SMES)*, PhD Thesis, Swinburne University of Technology.
- [41] Lee, SH & Pershing, JA 2002, "Dimensions and Design Criteria for Developing Training Reactions Evaluations", *Human Resources Development International*, vol. 5, no. 2, pp. 175-197.
- [42] Lee, G. J. 2012, "Firm Size and the Effectiveness of Training for Customer Service", *International Journal of Human Resource Management*, 23: 12, 2597-2613.
- [43] Lee, WW & Owens, DL 2004, *Multimedia-based Instructional Design: Computer-based Training, Web-Based Training, Distance Broadcast Training, Performance-Based Solutions*, 2nd edn., Pfeiffer, San Francisco.
- [44] Lindenmeyer, CR & Newell, GE 1976, "A Model for Systematic Training Program Development: Application to Cost Accounting and Budgeting Training", *Industrial Management*, September-October, pp. 11-16.
- [45] Matenge, T 2011, "Small Firm Internationalisation: A Developing Country Perspective", *International Journal of Business Administration*, vol. 2, no. 4, pp. 103-111.
- [46] Mayfield, M 2011, "Creating Training and Development Programs: Using the ADDIE method", *Development and Learning in Organisations: An International Journal*, vol. 25, no. 3, pp. 19-22.
- [47] MPI 2017, *White paper on small and medium sized enterprises in Vietnam*, Statistical Publishing House, Hanoi
- [48] Nazli, NNNN, Sipon, S & Radzi, HM 2014, "Analysis of Training Needs in Disaster Preparedness", *Procedia - Social and Behavioral Sciences*, vol. 140, pp. 576-580.
- [49] Neeley T. 2012, *Global Business Speaks English*, Harvard Business Review, May 2012 Issue, viewed 06 August 2020, <<https://hbr.org/2012/05/global-business-speaks-english>>
- [50] Neupert, KE, Baughn, CC & Dao, TTL 2005, "International Management Skills for Success in Asia: A Needs Based Determination of Skills for Foreign Managers and Local Managers", *Journal of European Industrial Training*, vol. 29, no. 2, pp. 165-80.
- [51] Nordstrom, JO & Kleiner, BH 1990, "What International Skills Are Needed by Managers of Today and Tomorrow?", *Industrial and Commercial Training*, vol. 22, no. 5, pp. 24-30.
- [52] North, RFJ, Strain, DM & Abbott, L 2000, "Training teachers in computer-based management information systems", *Journal of Computer Assisted Learning*, vol. 16, no. 1, pp. 27-40.
- [53] O'Connell, P. J. (1999), "Adults in Training: An International Comparison of Continuing Education and Training". OECD Report No. CERI/WD (99) (Paris: OECD).
- [54] Oviatt, BM & McDougall, PP 1997, "Challenges for Internationalisation Process Theory: The Case of International New Ventures", *Management International Review*, vol. 37, no. 2, pp. 85-99.
- [55] Paunović, Z & Prebežac, D 2010, "Internationalisation of Small and Medium-sized Enterprises", *INTERNACIONALIZA-CIJA POSLOVANJA MALIH I SREDNJIH PODUZEĆA.*, vol. 22, no. 1, pp. 57-76.
- [56] Reid, SD 1981, "The Decision-maker and Export Entry and Expansion", *Journal of International Business Studies*, vol. 12, no. 2, Fall 81, pp. 101-112.

- [57] Saari, LM, Johnson, TR, McLaughlin, SD & Zimmerle, DM 1988, 'A survey of management training and education practices in US companies', *Personnel Psychology*, vol. 41, pp. 731-743.
- [58] Sala, H. and Silva, J. I. 2013, "Labor Productivity and Vocational Training: Evidence from Europe", *Journal of Productivity Analysis*, 40, 1, 31-41.
- [59] Sanjeevkumar, V & Yanan, H 2012, "A Study of determinants of training effectiveness in Kedah State Development Corporation", *Review of Management*, vol. 2, no. 1/2, pp. 18-34.
- [60] Saunders, M, Lewis, P & Thornhill, A 2012, *Research Methods for Business Students*, 6th edn., Pearson, Harlow, England.
- [61] Shah, H & Gopal, R 2012, "Training Needs Analysis for Bus Depot Managers at GSRTC", *European Journal of Training and Development*, vol. 36, no. 5, pp. 527-543.
- [62] Sitzmann, T, Brown, KG, Caser, WJ, Ely, K & Zimmerman, RD 2008, "A Review and Meta-analysis of the Nomological Network of Trainee Reactions", *Journal of Applied Psychology*, vol. 93, no. 2, pp. 280-295.
- [63] Spector, M. J., Merrill, D. M., Elen, J. and Bishop, M. J. 2013, *Handbook of Research on Educational Communications and Technology*, New York: Springer.
- [64] Storey D. J., 1994, *Understanding the Small Business Sector*, London: Routledge.
- [65] Subrahmanya, MHB 2014, "Degree of Internationalisation and Economic Performance of SMEs in Bangalore: Influential Factors and Outcomes", *Emerging Market Firms in the Global Economy*, vol. 15, pp. 35-71.
- [66] Terpstra, V & Sarathy, R 2000, *International Marketing*, 8th edn., Dryden Press, Fort Worth.
- [67] Tien Phong 2019, *Agricultural Export Enterprises Active in Raising Quality to Catch CPTPP Opportunities*, viewed 15 August 2018, <<https://www.tienphong.vn/kinh-te/doanh-nghiep-xuat-khau-nong-san-chu-dong-nang-cao-chat-luong-don-dau-co-hoi-cptp-1406707.tpo>>
- [68] Thu Nguyen 2017, "Supports for small and medium sized enterprises to go global", viewed 20 August 2020, < <http://tapchitaichinh.vn/tai-chinh-kinh-doanh/tai-chinh-doanh-nghiep/ho-tro-doanh-nghiep-nho-va-vua-xuat-ngoai-131125.html>>
- [69] Tovey, MD & Lawlor, DR 2008, *Training in Australia*, Pearson Education Australia, Frenchs Forest, NSW.
- [70] Vallejo, M. C., Almagro, A. 2002, *A Case Study of Collaboration among the ESP Practitioner, the Content Teacher and the Students*, Revista Alicantina de Estudios Ingleses.
- [71] Yu, C-MJ, Guan, J-L, Yang, K-P & Chiao, Y-C 2005, "Developing the Skills for International Business Management: The Implications of the Management Education Opportunity Grid", *Journal of Teaching in International Business*, vol. 16, no. 4, pp. 5-26.
- [72] World Bank 2016, *Agriculture Transition in Vietnam: Increasing Value, Decreasing Input, Vietnam Development Report 2016*, Hong Duc Publishing House, Hanoi.
- [73] WTO 2016, *World Trade Report 2016: Levelling the Trading Field for SME*.

APPENDIX

LIST OF PARTICIPANTS

No.	Recipient	Location	Type of business	Business area	Labor scale (Laborers)	Capital scale (VND)	Year of operation (Years)	Major export market
M_01	Head of Business Dept.	Hanoi	Limited	Agricultural production and export	10-200	10-20 billion	6-10	China
M_02	Head of Business Dept.	Hanoi	Limited	Agricultural production and export	10-200	10-20 billion	6-10	Other markets
M_03	Director	Hanoi	Joint-stock	Investment, production and trade	10-200	10-20 billion	11-20	China
M_04	Director	Hanoi	Joint-stock	Agricultural production and export	10-200	10-20 billion	6-10	China
M_05	Head of Business Dept.	Hanoi	Joint-stock	Agricultural import-export	200-300	10-20 billion	11-20	Other markets
M_06	Director	Lang Son	Limited	Agricultural production and export	< 10	< 10 billion	3-5	China
M_07	Head of Business Dept.	Hanoi	Limited	Agricultural production and export	10-200	10-20 billion	3-5	Other markets
M_08	Director	Hanoi	Joint-stock	Investment, production and trade	10-200	10-20 billion	< 3	EU
M_09	V. Director	Hanoi	Limited	Trade & import-export	< 10	< 10 billion	6-10	India
M_10	Head of Business Dept.	HCM city	Limited	Agricultural and forestry processing and exporting	10-200	10-20 billion	11-20	US
M_11	Head of Business Dept.	Ninh Binh	Joint-stock	Food processing	10-200	20-100 billion	11-20	China
M_12	Head of Business Dept.	Ha Nam	Limited	Clean food	10-200	< 10 billion	< 3	China
M_13	Head of Business Dept.	Ha Nam	Limited	High-Tech Agriculture Investment and Development	10-200	10-20 billion	< 3	Other markets
M_14	Head of Business Dept.	Son La	Limited	Agriculture and Plant Varieties	10-200	10-20 billion	3-5	South Korea
M_15	Head of Business Dept.	Son La	Joint-stock	Agricultural production and export	10-200	10-20 billion	< 3	US
M_16	Director	Son La	Joint-stock	Tea Processing and Exporting	10-200	10-20 billion	11-20	EU
M_17	Head of Business Dept.	Bac Giang	Limited	General Food Production and Exports	200-300	10-20 billion	6-10	China
M_18	Director	Bac Giang	Limited	Agriculture Investment and Development	< 10	10-20 billion	6-10	China
M_19	Director	Bac Giang	Joint-stock	Food Processing and Exporting	10-200	20-100 billion	11-20	China
M_20	Director	Bac Giang	Limited	Food	< 10	< 10 billion	< 3	China
M_21	Head of Business Dept.	Hải Dương	Joint-stock	Agricultural production and export	10-200	20-100 billion	11-20	EU
M_22	V. Director	Quang Ninh	Joint-stock	Food Processing and Exporting	10-200	10-20 billion	3-5	Other markets

FACTORS THAT INFLUENCE WORKPLACE TRAINING IN STATE – OWNED ENTERPRISES IN VIETNAM

Nguyen Ngoc Quy

School of Business Administration, VNU University of Economics and Business, Hanoi

Corresponding author: nguyenquydhkt@gmail.com

Abstract

State-owned enterprises play an important role in the domestic economy of Vietnam. However, the quality of Vietnamese human resources, which state-owned enterprises are a part of them, has not met the demand of the economic development. As a result, many questions have been raised regarding what factors affect workplace training in SOEs. There have been some studies on this topic in last decades, but with the new context, more research on the topic remains to be done. This study, therefore, aims to investigate what are the main factors which influence workplace training in the state-owned enterprises in Vietnam. By using qualitative research methods, semi-structured interview with four state owned enterprises, 32 interviewees, the study found three groups of factor influence workplace training in SOEs, include: (1) factors influence SOEs in organizing training course (laws and regulation, the CPV, unions, ownership); (2) factors influence SOEs in choosing trainees (organizational policy); (3) factors influence learning process of trainees (motivation, age, gender). The outcomes of this study may contribute to the improvement of training as one human resource practice in SOEs in Vietnam and other contributions to theoretical and empirical development of human resource management in Vietnam by providing one more empirical research about workplace training in SOEs.

Keywords: Training, workplace training, state owned enterprises, Vietnam.

1. INTRODUCTION

State-owned enterprises (SOEs) play an important role in the domestic economy of Vietnam. They significantly contribute to the national budget and supply employment for 1.13 millions of workers. By the end of 2018, Vietnam has 2260 SOEs (equals to 0.4% total enterprises of Vietnam), hold 24.8% of total capital, but only contributed 14.4% of net revenue of all enterprises in Vietnam (General Statistic Office 2020). Some SOEs have not been as successful as expected and some state owned business groups were loss-making and made the public discontented. The quality of Vietnamese human resources, which SOEs are a part of them, has not met the demand of the economic development. The poor performance of business administration in SOEs is another reason (the CPV, 2020).

Literature of the field have shown that from 20 years ago, most SOEs recognize the vital role of having a well-trained workforce (Quang & Dung 1998) and have set aside a large proportion of their budget for employee training (Nguyen & Truong 2007). It raises the question of why SOEs spend a large amount of budget for employee training and still hasn't meet the economic requirements. As a result, many questions

have been raised regarding what factors affect workplace training in SOEs. There have been some studies on this topic. However, they are mostly conducted in the last decades. Vietnam is an emerging country which is required regular update. Especially in new context of industry 4.0 where Vietnam constantly joined in regional and international trading and economic organizations, such as the latest EVFTA. These organizations create many opportunities as well as challenges to Vietnamese enterprises, especially challenges in the development of the human resources in such a competitive environment. The on-going transition process towards a market economy requires a critical mass of skilled employees and competent business managers. Thus, more research work remains to be done. The purpose of this study, hence, is to investigate *what are the main factors which influence workplace training in the state-owned enterprises in Vietnam?*

2. LITERATURE REVIEW

Training

Training has been defined by a number of researchers and trainers. This study takes the view that "training" concerned with employees' jobs and the basic feature of training is to provide employees with the knowledge

and skill needed for their current jobs ((Fitzgerald, 1992; Blanchard & Thacker, 2007; AL-Ajlouni, Athamneh & Jaradat, 2011). Simply speaking, training is the process of developing knowledge, skills and abilities for the purpose of increasing effectiveness of employees.

Work place training

The objective of training is learning (Hamblin, 1974). There are two principle sites where learning related to employment can take place: in education and/or training institutions and in the workplace. The knowledge and skills imparted in learning from education and training institutions are primarily concerned with the education goal and targets to the wider society and economy. Whereas learning in the workplace which comprises organised learning, typified by on-the-job training and apprenticeship. However, the workplace is a significant site of learning, both for formal course opportunities and informal learning opportunities, for example, knowledge, experience, lessons from interaction with others in their working processes.

Because few people come to the job with complete knowledge and experience necessary to perform their assigned job (Thang, Quang & Buyens, 2010). Trainers, therefore, must help trainees to meet both the current job requirements and changing challenges at work. Training in the workplace is vital for organizations because emerging competitive markets and technological changes are influencing the basic settings of organizations and exposing pressures on them to improve their performances. However, not all training is good and necessary if it is not designed to meet organizational needs. So identifying training needs helps organizations to determine whether training is a solution to performance gaps. For a training program to be successful, trainers must know the exact aims of it. There is no fix formulation of training in the workplace. It can be conducted differently across organizations as long as it meets organizational goals.

Evaluating the effectiveness of workplace training

Regarding the effectiveness of workplace training, Blanchard and Thacker (2007) state that effectiveness is an objective comparison of actual results versus intended results. This is a short and clear definition about effectiveness and also opens a general method to measure effectiveness which can be counted by a comparison between intended results and achieved results.

Factors influence workplace training

Research shows that various factors may influence workplace training such as firm size and/or type of firm (Carey, 2000; Marginson, 2000; Truong & Quang, 2007); human resource practices (Carey, 2000; Hansen, 2000; Newell, 2000); characteristics of workers (age,

learning, motivation...) (Lim, Lee & Nam, 2006; Marie, 2009); content of training programs (Lim, Lee & Nam, 2006), unions and employers (Sutherland & Rainbird, 2000); government policies (Caldwell, 2000), political and economic factors (Ashton, 2004), organizational factors (Lim, Lee & Nam, 2006; O'Keefe, Crase & Dollery, 2007), workplace culture, economic environment, market structure, labour markets ((O'Keefe, Crase & Dollery, 2007). Heyes (2000) reckons that a set of workplace industrial relation factors which covers human capital, employers and trade unions and political factors affect training. Newell (2000) highlights the following factors: labour markets, little effect of trade unions, business strategy, the importance of a training "champion". He illustrates this training "champion" with two types of factors affecting training, namely business strategic factors related to an organization's environment (for example product market or technological changes) and factors related to an organization's performance (for example, politics and personalities of organization). When these factors apply to context, there are some factors that are a stronger influence than the others and/or not all of the factors will appear.

To summarize, the following categories, which influence training in enterprises, could be highlighted:

- *Worker characteristics* (age, sex, ethnicity, education, ability, motivation and tenure) and *job characteristics* (occupation, hours worked, casual employment, and earnings). Participation in formal education and training differs between different socioeconomic groups. However, a survey by the Australian Bureau of Statistics found, on the contrary, that the incidence of on-the-job training was very similar, at least for males and females and by area. The other studies show that background, characteristics of workers, gender, proportion of worksite's employee and countries where they live effect training. *Worker characteristics and job characteristics* together become key factors which influence training. Mobility of the workforce at national level also is an important influencing factor.

- *Enterprise characteristics* (firm size, the self-employed and employers, industry, sector, human resource policies and technological change). The influence of *enterprise's size* on training activity is widely accepted by many studies. *Learning culture* is realized as a factor in learning organizations. Where organizations want to solve their problems and work towards value for better future, they are towards training and learning. The previous studies also indicate that *human resource practice* in particular workplace provides the context of training and human resource strategies is the surrounding context of workplace training. *Change* is another factor that could strongly affect training and the greatest factor influencing training activity was *workplace change*. Training to re-skill employees is often along with a change in

production methods of enterprises. Trainer's actions can play a critical role to facilitate learning through their functions such as "fostering an environment conducive to learning", "working and learning with co-workers", "structuring and shaping work processes to accommodate learning", "promoting independence and self-direction in workers", "linking external learning experiences with work and learning in the workplace".

- *Sociopolitical and economic environment* (unemployment, competition, legislation and national characteristics). In other words, *Economic climate* or economic conditions influence training in the enterprise – level as well as training decisions made by employers. *Competition* drives enterprises and related to any influence, in which comprises training activity. *Industrial relation* can effect training provision. *Legislation* influence training as it is outside factor control all legal activity of enterprises

This taxonomy, although not the best one adopted, could give a comparatively simple structure that presents the findings of the literature review in the area of enterprise based education and training.

Studies on training in State owned enterprises in Vietnam

A study by Quang and Dung (1998) about HR development in SOEs in Vietnam identifies the need for training and development in SOEs, mostly because of the transition process need a skilled and dynamic workforce that are urgently insufficient in SOEs. This study found that improving employee performance is the main purpose of training in SOEs.

A study by Pham (2011) found that type of ownership influences HR practice in which training is one component, type of firm affects methods of training, for example SOEs outsource their training and use off-site training method such as sending employees to local conferences, short course training, conference and/or training overseas, long term study at educational study more than private and foreign invested enterprises. Other studies find out characteristic of worker have an impact on SOEs training (Kamoche, 2001; Thang & Quang, 2005; Pham, 2011; Pham & Hara, 2011). A research of Sandra, Su Dang and Catherine (2006) shows that small medium enterprises (SME) might not put enough emphasis on training because most SME in the sample was likely to provide informal training, their budget for training and their training hours per employee were all small. This indicates the factor of enterprise's size may reflect on training activity. Other studies indicate some factors such as form of ownership, location, government's policy, external competitive market environment and internal managerial autonomy, political system and regulation, out-of-date management knowledge, customs and practices (Zhu et al., 2008), organizational strategy (Nguyen Ngoc & Dirk, 2008), organizational environment (Bryant & Nguyen, 2004) influence HR

practice, therefore may take these finding into consideration of factors influence training in SOEs.

Although these research was conducted long time ago, they can gives some significant lessons for studying the phenomenon in this current context.

3. METHODOLOGY

A qualitative method is chosen to address the research questions because it helps to give in-depth understanding of the research phenomenon. Empirical evidence for this study was obtained by semi-structured interviews within 4 SOEs. Organizational documents of the case and and other related information were collected to maximize understanding of the research context. Because access was guaranteed on the condition of anonymity, pseudonyms such as A, B, C, D are used to describe each SOE in this study and sometimes description of particular incidents is kept vague to avoid identification.

Two enterprises which are owned by only the Government (State held 100% of charter capital) and 2 share ownership of state enterprises (in which State held over 50% of charter capital) were chosen.

Three categories people was selected for interviews in each enterprise: (1) members of the management board, (2) human resource management staff, (3) employee.

The structural profile of ESOEs and number of interviewees are summarized below:

Table 1: The structural profile of SOEs

	A	B	C	D
Charter capital	State owned 100%	State owned 100%	State owned 62%	State owned 51%
Industry	Chemistry	Power	Transportation	Bank
Number of employees	About 1000	More than 1500	About 300	About 120

Table 2: Summary of interviews and case sites

	Board of directors	HR managers and staff	Employee	Total interviews
A	01	01	04	06
B	01	02	07	10
C	01	02	05	08
D	02	01	05	08
Total				32

Interviewees were asked some information:

- (1) Describe workplace training processes in their SOE?
- (2) What are the learning outcomes desired from their workplace training?
- (3) What factors influence their workplace training?

The purpose of the first question is to draw an explicit picture of workplace training in state owned enterprises in Vietnam such as: How do they carry out the workplace training? What are the purposes of their training? Who are the objectives of their training? What methods do they apply for workplace training? Do they have any long-term plan or/and short-term schedule for their workplace training? How do they follow the plans and schedules? Do they evaluate the effectiveness of their training and what are their actions after taking evaluation of the training? The second question starts with the background from the first question and continues to go in depth of the learning process by investigate through experience and the "eyes" of participant. Their ideas about learning outcomes will help to understand whether their training is value and worth doing, do they finish their training plans in comparison to their intended plan or they leave some undoing parts? Do these actions benefit for their skill and knowledge and help them to work more productively? Do they make any progress after applying their training? The third question try to explore the factors by asking people why do they apply current formulations of workplace training, what are the strengths and weaknesses of the training program, what facilitate these training and what are the obstacles of these training...

Data was collected in 2018-2019. Interviews were conducted via video call or in person and lasted from 15 to 60 minutes. The provided information in the interview was cross-checked after each interview.

This study used an interpretive approach to analyze data, treating answers from interviewees as describing their reality and experience. Coding, clustering, matrices and pattern-matching were used as primary techniques to analyze data. In this analysis of multiple cases, the cross-case synthesis technique is used because it treats each case as a separate study and then aggregates findings across a series of individual cases. Codes and memo details were organized according to categories and themes derived from the research questions.

4. RESULTS AND DISCUSSION

Results show that there was three group of factors influence workplace training in studied SOEs, include: (1) factors influence SOEs in organizing training course; (2) factors influence SOEs in choosing trainees; (3) factors influence learning process of trainees.

4.1. Factors influence SOEs in organizing training course

Responses from interviewees show that factors influence SOEs in organizing workplace training mostly include laws and regulations, the direction of Communist Party (CP) body in SOE, unions such as trade union and women union; and internal control such

as centralization. This is consistent with previous studies that enterprise characteristics and sociopolitical and economic environment influence workplace training. However, the influence of the CP and unions in a very detail content of training activities is specific for Vietnam context. The Trade Union law defines Vietnamese trade unions as a component of the political system (Vietnam Government Portal, 2019). In other words, they are closely tied to the CP. Participants explain that following the required mechanism ensured job security for both managers and employees. Besides, the need to improve labor productivity is always mentioned as a factor for organizing training course. However, although people see the need to have training program, there still need to have approval from authorities.

On the one hand, some interviewees explain that SOEs do not have to face as much pressure in regards to economic gain as other economic entities. Thus, the productivity of workplace training is still under the urgent need. On the other hand, some interviewees from equitized SOEs state that their workplace training improved and more effective after equitization. This is consistent with previous study by Phạm (2011) that ownership influences human resource management practices, which include workplace training.

4.2. Factors influence SOEs in choosing trainees

Most studied SOEs choose trainees based on organizational policy. Depend on the purpose of training program, SOEs will chose the follow up criteria. Employees' characteristics such as their lack of skills and ability to perform the job, age, gender, ability to study are often use to find trainees for skills improvement programs. Besides, some SOEs provide training for employees as some kind of compensation, or favoritism, especially with such training conducted abroad or in a destination resort.

4.3. Factors influence learning process of trainees.

The most frequently mentioned factor among trainees is motivation. Employees found workplace training is the most productivity if it is linked to job performance and future income, and/or career development opportunities in the future. The second most frequent answer is age and the following is gender. There was a strong expression among the youngest male interviewees regarding their effort to study in general and workplace training in particular. Those participants are aware of the fast changing institutional context such as changing technology, social – economic transformation and concern for their future. In contrast, the majority of female interviewees are relatively relax in terms of future career development. Thus, they take part in workplace training in a relax way. One female interviewee explains:

Women do not need chasing a career, just being good at looking after house, husband and children. Making money is men's duty.

These findings suggest that although workplace training at organizational level (SOEs) does not seem to have much change compare to previous studies, young employees in SOEs have very positive attitudes toward learning and career development in response to contextual changes.

Result from this study is limited to the generalization by using a small sample size of case studies. To address this issue, it is suggested that researcher conduct a longer-term study with larger sample of state owned enterprises and more representatives of different sectors in the industry throughout the country. This will help researcher to find out the more accurate results on generalization of the fact and thus, give wider recommendations.

5. CONCLUSION

To sum up, by using qualitative research methods to study factors that influence workplace training in SOEs in Vietnam, this study may have significant contribution to both theoretical and empirical framework about workplace training as a specific practice of human resource management in a typical type of enterprise in a transforming economy. Limitation of generalization when using case studies is unavoidable but can be advanced by conducting a larger sample size studies. This study hopefully can provide impetus for any change in the area of workplace training in Vietnam.

6. ACKNOWLEDGMENTS

The author gratefully acknowledge Dr. Peter McLean, Head of School - School of Management, Operations and Marketing, University of Wollongong, for his advice and inspiring me doing research in this topic.

7. REFERENCES

- [1] AL-Ajlouni, MM, Athamneh, SMH & Jaradat, AA (2011), "Methods of Evaluation: Training Techniques", *International Research Journal of Finance and Economics*, 37, 56-65.
- [2] Ashton, DN 2004, "The Political Economy of Workplace Learning", in H Rainbird, A Fuller & A Munro (Eds.) *Workplace Learning in Context*, Routledge, New York.
- [3] Blanchard, PN & Thacker, JW (2007), *Effective Training: Systems, Strategies, and Practices*, Pearson Prentice Hall, Upper Saddle River, N. J.
- [4] Bryant, SE & Nguyen, TV (2004), "A Study of the Formality of Human Resource Management Practices in Small and Medium-Size Enterprises in Vietnam", *International Small Business Journal*, 22, 6, 595-618.
- [5] Caldwell, P (2000), "Adult Learning and the Workplace", in Helen Rainbird (Ed.) *Training in the Workplace: Critical Perspectives on Learning at Work*, Macmillan, Basingstoke.
- [6] Carey, S (2000), "The Organisation of the Training Function in Large Firms", in Helen Rainbird (Ed.) *Training in the Workplace: Critical Perspectives on Learning at Work*, Macmillan, Basingstoke.
- [7] Fitzgerald, W (1992), "Training Versus Development", *Training & Development*, 46, (5), 81-84.
- [8] General Statistic Office (2020), Press release on White paper in Vietnamese enterprise 2020, Available at: <https://www.gso.gov.vn/default.aspx?tabid=382&idmid=2&ItemID=19594> Accessed: 20 July 2020.
- [9] Hamblin, AC (1974), *Evaluation and Control of Training*, McGraw-Hill, New York.
- [10] Hansen, B (2000), "Performance Management and Training", in Helen Rainbird (Ed.) *Training in the Workplace: Critical Perspectives on Learning at Work*, Macmillan, Basingstoke.
- [11] Heyes, J (2000), "Workplace Industrial Relations and Training", in Helen Rainbird (Ed.) *Training in the Workplace: Critical Perspectives on Learning at Work*, Macmillan, Basingstoke.
- [12] Kamoche, K (2001), "Human Resources in Vietnam: The Global Challenge", *Thunderbird International Business Review*, 43, (5), 625-650.
- [13] Lim, H, Lee, S-G & Nam, K (2006), "Validating E-Learning Factors Affecting Training Effectiveness", *International Journal of Information Management*, 27, (1), 22-35.
- [14] Marginson, P (2000), "Multinational Companies: Innovators or Adaptors?", in Helen Rainbird (Ed.) *Training in the Workplace: Critical Perspectives on Learning at Work*, Macmillan, Basingstoke.
- [15] Newell, H 2000, "Training in the Greenfield Sites", in Helen Rainbird (Ed.) *Training in the Workplace: Critical Perspectives on Learning at Work*, Macmillan, Basingstoke.
- [16] Nguyen Ngoc, T & Dirk, B (2008), "Training, Organizational Strategy and Firm Performance", *The Business Review, Cambridge*, 11, 2, 176.
- [17] Nguyen, NT & Truong, Q (2007), "International Briefing 18: Training and Development in Vietnam", *International Journal of Training and Development*, 11, (2), 139-149.
- [18] O'Keefe, S, Crase, L & Dollery, B (2007), "Does the Reality of Workplace Training Match the Theory? An Analysis of Public Sector Employees' Training Decisions", *International Journal of Training Research*, 5, (2), 41-54.

- [19] Pham, L (2011), "Impact of Applying Human Resource Management Practices on Equitized State-Owned Enterprises' Financial Performance in Vietnam", *Journal of International Business Research*, 10, (2), 79.
- [20] Pham, QT & Hara, Y (2011), "KM Approach for Improving the Labor Productivity of Vietnamese Enterprise", *International Journal of Knowledge Management*, 7, 3, 27-42.
- [21] Quang, T & Dung, HK (1998), "Human Resource Development in State-Owned Enterprises in Vietnam", *Research and Practice in Human Resource Management*, 6, (1), 85-103.
- [22] Sandra, K-K, Su Dang, N & Catherine, A-C (2006), "Impact of Human Resource Management: Sme Performance in Vietnam", *Journal of Developmental Entrepreneurship*, 11, 1, 79-95.
- [23] Sutherland, J & Rainbird, H (2000), "Unions and Workplace Learning: Conflict or Cooperation with the Employer?", in Helen Rainbird (Ed.) *Training in the Workplace: Critical Perspectives on Learning at Work*, Macmillan, Basingstoke.
- [24] Thang, LC & Quang, T (2005), "Human Resource Management Practices in a Transitional Economy: A Comparative Study of Enterprise Ownership Forms in Vietnam", *Asia Pacific Business Review*, 11, (1), 25-47.
- [25] Thang, NN, Quang, T & Buyens, D (2010), "The Relationship between Training and Firm Performance: A Literature Review", *Research and Practice in Human Resource Management*, 18, (1).
- [26] The Communist Party of Vietnam (the CPV) (2020), National Political Publishing house, Hanoi.
- [27] Truong, DX & Quang, T (2007), "The Psychological Contract in Employment in Vietnam: Preliminary Empirical Evidence from an Economy in Transition", *Asia Pacific Business Review*, 13, (1), 113-131.
- [28] Vietnam Government Portal 2019, *The System of Labour Law and Regulations*, Available at: <http://vanban.chinhphu.vn/portal/page/portal/cinhphu/hethongvanban> Accessed: 20 July 2019.
- [29] Zhu, Y, Collins, N, Webber, M & Benson, J 2008, "New Forms of Ownership and Human Resource Practices in Vietnam", *Human Resource Management*, 47, (1), 157-175.

EXPLORING THE RELATIONSHIP BETWEEN EMPLOYER BRAND EQUITY AND EMPLOYEE RETENTION: CASE STUDY OF A JAPANESE RETAILER IN VIETNAM

Tran Cam Tu

Lille University, France

Corresponding author: ICECH@hust.edu.vn

Abstract

Employer Brand Equity, a term that is still in an infant stage for both academics and practitioners, not only in Vietnam but also worldwide, has been explored in this study through an intensive Literature Review and a qualitative case study of a Japanese retailer. The author proposed a theoretical framework for measuring Employer Brand Equity for retailing industry and explored its impact on the organizational outcome- which is employees' decision to stay in this case. This research offers a new perspective to look at Employer Brand Equity- from existing employees, as it differs from most prior papers which only focus on investigating potential employees for recruitment. The study shows the varying results for two groups of employees: office workers and frontline salespeople and also points out important factors in Employer Brand Equity impacting the decision to stay or to leave of this retailer's employees.

Keywords: Employer Brand, Employer Brand Equity, Employee retention, Retailer turnover.

1. INTRODUCTION

The process of making sure all employees understand the meaning, values of promise of their company brand and their role in delivering a brand customer experience are usually referred to as “internal marketing”. Internal marketing is defined as “creating motivated and customer-oriented employees” (Rafiq & Ahmed, 2000), and it was again reflected in the definition of Kotler et al. (2005) as “to train and effectively motivate customer-contact employees... to provide customer satisfaction”. Afterwards, internal marketing was developed into Internal branding, which is a more “inside-out” and company value-based approach. Martin and Beaumont (2003) criticized that then Marketing literature was “rooted in the belief that communications are the main source and solution for all organizational problems. It tends to restrict the role of HR to communicating brand values, rather than being the source of such values and the driver of key aspects of strategy”. However, things became more positive since Barrow and Mosley (2005) and Martin et al. (2005) believed that the attitude of HR towards branding and brand management were changing, which has been proved through the discourse of supporting the “employer brand” within the HR community.

The main focus of employer branding used to be on the external reputation of the company, in order to attract talents. However, there has been a shift to including the internal efforts to create positive employee engagement

or organizational culture (Barrow and Mosley, 2005). In another word, the target audience for employer brand includes both potential and existing employees. Employer brand is proved to be a sustainable competitive advantage for companies not only to recruit the best talents but also to retain them (Kucherov & Samokish, 2016). However, Maxwell and Knox (2009) confirmed that there is a significant difference in employer brand between the perspectives of potential employees and existing employees, and the area of retaining employees using employer brand has been overlooked in the past. Also, Ready et al. (2008) stated that the strength of employer brand is demonstrated through the ability to deliver its promise to its existing employees, and this can be ascertained only when employer brand is assessed through the perspective of current employees.

However, retaining employees and keeping them committed is never easy. It is a known fact that retailing is a very labor-intensive industry employee costs making up for a significant percentage of a retailer's costs (Tang et al., 2014). Retailing industry suffers from high employee turnover rate, especially front-line sales associates (Daves, 2002), meaning employees routinely come and go which can ultimately increase retail labor costs (Tang et al., 2014). Hurley and Estelami (2007) has found that in retail sector, higher levels of turnover is associated with lower levels of customer satisfaction.

Many studies have been done on the causes of high turnover rate in retail industry, but to the author's knowledge, there has been no research on the matter of employer branding or employer brand equity and its impact on retail employees. The significant relationship between employer brand and attracting new employees has been admitted, and most of them are conducted through the viewpoints of potential employees only. However, the number of studies on employer brand through the perspective of existing employees is still limited, and the relationship between employer brand equity and current employee loyalty especially in retailing industry has not been exploited yet. Moreover, all existing studies are done outside Vietnam, which means the topic is not tested in the context of Vietnamese organizations. In addition, given the context that unemployment rate of Vietnam being the lowest in the last 12 years (3.1%), it can be said that employees now, especially the well-educated one have the "bargaining power" in choosing their employers, which poses more challenges for organizations to perfect their employer brand equity to attract and retain talents. Therefore, this study wishes to fill the gap by exploring the impact of Employer brand equity on employees' decision to stay with the firm using a case study of a Japanese retailer in Hanoi.

The author hopes to explore this case study by proposing a new theoretical framework for measuring employer brand equity from perspectives of existing employees in a retailer given the culture characteristics of Vietnamese people. Also, this Japanese retailer is chosen because it operates in the consumer product sectors, which is the sector that the majority of population are involved in as visitors or customers, which leads to the fact that employees of this company are also the customers as well. Another element that makes it interesting is the chosen retailer being a Japanese company given the fact that Vietnamese people have differing opinion towards involving in (using its products or working for) a foreign company.

2. LITERATURE REVIEW

2.1. Employer Brand

The term "employer brand" made its appearance back in 1996 by Ambler and Barrow, they defined it as "the package of functional, economic and psychological benefits provided by employment, and identified with the employing company". Kucherov and Zavyalova (2012) defined employer brand as "an amalgam of the qualitative feelings of the employing company which attracts the target audience". In 2016, Tanwar and Prasad defined the term as "a set of tangible and intangible benefits offered by the organization to attract

potential employees and retain existing employees". Ambler and Barrow (1996) also emphasized that an employer brand has a personality just like any other brand. The choice of an employer even has bigger and longer lasting effects than normal purchasing decisions. As a result, the cost of switching employer is much higher than switching to another product or service. This means, companies need to put efforts into building their employer brand in order to attract and retain employees, just like commercial brands have been doing with their customers for many years.

Employer brand, if done right, would contribute to organization attractiveness and it can help the companies to create, convey and reinforce the positive aspects as an employer to both potential and existing employees (Collins & Kanar, 2013). Srivastava and Bhatnagar (2010) also stressed that employer brand is not just about recruitment, but it is also about a "long-term strategy designed to maintain a steady flow of skills in the organization". That is to say, employees who find their organizations attractive tend to stay longer with their jobs. As a result, committed and satisfied employees are more likely to deliver consistently positive and satisfying service experience to the customers (Mosley, 2007). Happy employees stay loyal and they have more tendencies to make customers happy, which leads to increased sales and better customer service (Duboff & Heaton, 1999).

Much literature has mentioned the importance of a strong employer brand. According to Ambler and Barrow (1996), the benefits of employer brand are similar to those of a product/ service brand brings to the customers, including: functional (employee development), economic (total rewards system) and psychological (feeling of belonging and purpose). Ritson (2002) believed that a strong employer brand assists the company in attracting and selecting more talented people and also reducing the cost of employee recruitment. Similarly, Barrow and Mosley (2005) also said employer brand enhances recruitment, commitment, and retention of employees. Differentiation and loyalty are also benefiting for the organizations as a results of employer brand compared to other employers. Moreover, according to Barrow and Mosley (2005) and Berthon et al. (2005), a strong employer brand can help companies to lower their costs. Employee recruitment and replacement can be costly and even higher than the cost of expanding the company (Barrow & Mosley, 2005). Another aspect of a strong employer brand helping company reduce cost is companies with good brand can even offer lower salaries than companies with weaker employer brands for similar positions (Berthon et al., 2005).

Even though most Employer brand literature describes a focus on both potential and existing employees (Theurer et al., 2018), the majority of empirical studies only focus on investigating the employer brand attractiveness for recruitment. In this study, however, the author would want to assess the impact of employer brand through employer brand equity because employer brand equity takes into account both target groups: potential and current employees.

2.2. Employer Brand Equity

In Marketing world, the concepts of Branding and Brand Equity have been an area of interests for many years, since 1954 because of their effectiveness and proved results. Because of that, some researchers (eg: Lievens et al., 2007; Biswas & Suar, 2014) have adopted the notion of Brand equity into Human Resources context and used that to measure the success of their employer brand management program.

There have been a few definitions regarding the term proposed by many researchers indicated in the table 1 below:

Table 1: Employer brand equity's definitions

Author	Definition
Ewing, et al (2002)	Employment brand equity as “a set of employment brand assets linked to an employment brand, its name and symbol that add to (or subtract from) the value provided by an organization to the organization’s employees”.
Lloyd (2002)	“Sum of a company's efforts to communicate to existing and prospective staff that it is a desirable place to work”.
Collins and Stevens (2002)	Identified two dimensions of employment brand equity: awareness and associations.
Backhaus and Tikoo (2004) and Chhabra and Sharma (2014)	A cumulative evaluation of a package of benefits that reflects the value of being an employee in that company.

Companies usually focus on promoting “the value of being an employee in that company” (Backhaus & Tikoo, 2004; Chhabra & Sharma, 2014) both internally and externally (for both existing and potential employees) in order to make their companies better and more desirable places to work. Therefore, the notion and elements of Brand equity is adopted into Employer brand equity because the company is considered a branded entity and the objectives of its employer branding is to attract and retain employees, which will then attract and retain customers, hence creating a virtuous circle (Heskett, 1997).

Based on 4 Brand equity factors by Aaker (1991), Minchington (2011) developed the model for Employer brand equity including employer brand awareness, brand associations, brand loyalty and perceived employment experience. These Brett Minchington dimensions are accepted and used by a lot of researchers in the past (e.g. Kim et al., 2003; Yoo et al., 2000).

(1) Employer brand awareness: This term is used interchangeably with “Familiarity with employer brand” in some research (Alshathry & Goodman, 2017; Cable and Turban, 2003) and it is understood as “the level of awareness that a job seeker has of an organization” (Cable & Turban, 2003), or the level of recognition that people have about an organization’s employment attributes.

(2) Employer brand associations: Employer brand associations consist of anything linked in memory to a company and may contain the underlying meaning of

an employer brand for employees (Alshathry & Goodman, 2017). In another word, this includes the opinions of both current and potential employees about rational and emotional attributes of the company. According to Rampl (2014), one group of employer brand associations is job attributes, which include factors like salary, advancement opportunities, location and work content. Besides, other studies have proposed that organizational reputation is also one of employer brand associations factors (Cable & Turban, 2003). Alshathry & Goodman (2017) also included factor of CSR into employer brand associations.

(3) Employer brand loyalty: Brand loyalty is a primary dimension of brand equity; it is defined as the customer’s willingness to pay for the same product/service over time (Jacoby and Chestnut, 1978) and that is somewhat different to employer brand loyalty. Employer brand loyalty refers to employees’ commitment to remain with the organization. This dimension is only relevant and applied for current employees who already work for the company through which they can develop their commitment and loyalty (Alshathry & Goodman, 2017). According to Backhaus and Tikoo (2004), employer brand loyalty is analogous to organizational commitment, which is defined as “a psychological state that characterizes the employee’s relationship with the organization and has implications for the decision to continue or discontinue membership in the organization” (Meyer and Allen, 1997). Loyalty to an employer brand can result in employees developing attachment and sense of belonging to the company.

(4) Perceived employment experience: This is considered as the central element in the employment relationship between the employees and the company and “during an employee’s experience within the organization, value is delivered via the employment relationship” (Alshathry & Goodman, 2017). Similar with customer experience definition, brand experience is referred “subjective, internal and behavioral responses evoked by brand-related stimuli” (Brakus et al., 2009). For the employees, it is the “functional, psychological and economic benefits” which together make up the employee experience (Ambler and Barrow, 1996; Edwards, 2010). According to Maxwell and Knox (2009), employment experience includes the following factors: employment, company’s success, construed external image and product/service characteristics. Alshathry & Goodman (2017) classified Job content which has the same elements as Job Attributes proposed by Rampl (2014) into Employment experience. Employee experience with the employer is hard to manage because it is a complex element (Davies, 2008). One reason can be since the employees have to deal with a lot of agents in the company such as supervisors (Liden et al., 1997 in Davies, 2008), co-workers (Parzefall & Salin, 2010; Song et al., 2008 in Davies, 2008) and the organization in general (Dulac et al., 2008 in Davies, 2008), which can lead to confusing or conflicting perception about their experience with that company.

A more detailed analysis of existing definitions for Employer Brand Equity and its dimensions will be included in the Appendix 1.

From the author’s observation, there is one factor that is missing in all mentioned dimensions, which is: perceived organizational external prestige. It is proved to have direct and indirect impact on employee commitment and turnover intentions which ultimately leads to the matter of employee loyalty. Perceived organizational external prestige is defined as the organizational member’s own belief and perception of how people outside of their organization view, judge, evaluate and think of the image, status and prestige of the organization (Carmeli and Freund, 2009). Most people, are believed to desire to belong to an organization that is perceived to have some socially valued characteristics especially by other people (Dutton et al., 1994 in Mishra, 2013). Employees can get the idea of this perceived external prestige through many sources, such as the opinions of reference groups, words of mouth, publicity, press release and even the internal communication among employees about how the organization is perceived by the outsiders (Gotsi and Wilson, 2001 in Rathi & Lee, 2015). The importance of a high external organizational perceived prestige can be explained using the social identity theory by Tajfel and Turner (1985) cited in Rathi and Lee (2015). Organizations shape the social identity of

its members because it provides the status and values that will be judged by outsiders and compared to those of outsiders as well (Mignonac et al., 2006 in Rathi & Lee, 2015). To put it in a simple way, when employees are a part of a prestigious organization, they identify with that organization and feel proud of themselves. In a sense, that organization fulfills the need of its members for self-esteem and recognition by others. As a result, it is easy to understand why organization with high perceived external prestige tend to be a very attractive employer because it enhances its individuals’ self-image (Mael and Ashforth, 1995 in Rathi & Lee, 2015) and self-concept (Herrbach et al., 2004 in Rathi & Lee, 2015). Also, employees want to stay committed and loyal to the organization more, because they want to pursue their association with it in order to maintain the benefits for their own identities (Herrbach et al., 2004 in Rathi & Lee, 2015).

Some findings have pointed out that people from the societies that stress on social status and position tend to be more committed to the organization that offer them a sense of pride and positive identification (Mignonac et al., 2006). This can possibly be true in the context of Vietnam, with the high score on Power Distance-70 (Hofstede, 2019) and low score on Individualism-20 (Hofstede, 2019). High power-distance score means they are status-oriented and they want to be perceived as a member of a prestigious social group. High collectivism score means individual choices cannot be segregated from societal influences.

Another factor that is very retail industry specific and could have some impact on the perception of employees towards their organizations, which is Perceived store image attractiveness. Perceived store image was studied by Martineau (1958) cited in Yurchisin & Park (2010) and defined as “the way in which the store is defined in the shopper’s mind, partly by its functional qualities and partly by an aura of psychological attributes”. The store image of a retailer consists of three dimensions: functional (e.g., physical evidence of the store and products), psychological (e.g., personalities of store) and the characteristics of the store. Martineau’s definition only concerns store consumers, however, in 1998, Samli et al. cited in Yurchisin, J. & Park (2010) proposed that various categories of “retail publics” would develop overall impression and their own perceived store image. Those retail publics can include “customers, former customers, competitors’ customers, those community members who never patronize the store, vendors, shareholders, and the store’s employees and management” (Samli et al., 1998 in Yurchisin, J. & Park, 2010). Employees of a retail company may evaluate their store’s image positively or negatively. When they associate their retailer’s store image with something positive, then tend to be attracted to that

store image (Turban and Dougherty, 1992 in Yurchisin; J. & Park, 2010) and attractiveness is the indication of how much an employee is drawn to an employer, which leads to the perception that certain retailer is an attractive organization to work for.

2.3. Proposed measurement for Employer Brand Equity

The adaptation of employer brand factors by Minchington (2011) for Employer Brand Equity suffers from the limitation that it only considers one target audience - potential employees. This also reflects the fact that most research of employer brand emphasize on attracting and recruiting new employees for the organizations. And to the author's knowledge, there are very few specific measurements for Employer brand equity built particularly only for and from the perspective of existing employees yet.

Therefore, the author will develop his own theoretical framework for employer brand equity for this study based on previous literature about employer brand equity dimensions in Table 2. Besides, the author would like to make some adjustments to better suit the object of this study - the existing employees in retailing industry and also the context of Vietnam as following:

In order to fit with existing employees, the author eliminates the dimension "brand awareness" because "brand awareness" is not an issue for existing employees anymore, and it is used for prospective employees only. Therefore, there are only three dimensions adopted from Minchington (2011) to measure Employer Brand Equity for existing employees: brand associations, brand loyalty and perceived employment experience.

In addition, as for the relevance and importance of external organizational perceived prestige factor for employer brand equity especially in Vietnamese context (large power distance and collective), the author would like to propose adding this factor to the dimension Employer brand associations. External organizational perceived prestige not only forms but also impacts the perception of the potential or current employees about their organization. As a result, these perceptions become impressions and stay in the memories of those individuals that are linked to that specific company. This aligns with the definition by Alshathry & Goodman (2017) on employer brand associations - "consist of anything linked in memory to a company and may contain the underlying meaning of an employer brand for employees". The presence of external organizational perceived prestige factor also supports the explanation by Collins and Kanar (2013) for Employer brand associations as "how they assess the employer based on that knowledge, which includes employment-related and non-related associations".

Another factor that the author would like to add to the dimension Employer brand associations is Perceived store image attractiveness since the nature of retailers is its exposure to the public, mainly through its Marketing and stores. As a result, both the consumers and employees of that retailers can develop their own perceived store image, especially when employees are also the actual consumers of that employer's retail store. To sum up, the figure 1 below represents the factors for employer brand equity aimed at existing employees in retailing industry proposed by the author.

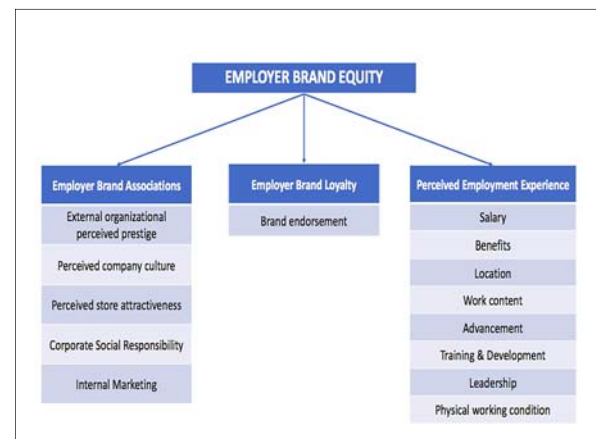


Fig 1: Proposed factors of Employer brand equity for existing employees in retailing industry

2.4. Employer Brand Equity and Employee retention

According to a study by Jain (2013), there is a positive correlation between Employer branding and Intention to stay, which proves that if an organization has a strong EB, the intention to remain in that organization is also high. In addition, other studies also contributed to the finding that brand equity is an important antecedent of loyalty (e.g. Vogel et al., 2008). Therefore, similarly, building a strong internal brand equity is very important to achieve loyalty from its employees. Backhaus and Tikoo (2004) also believed that EBE can contribute to the staying of current employees.

Therefore, the author in this study also wishes to explore the impact of different factors of EBE on employee retention in the context of Vietnam, especially with the modified measurement proposed in Figure 1 only for retailing industry. For employee retention, the author leveraged the questions regarding issues of employee turnover and employees' decision to stay with the organization. In order to explore such relationship, the author employs the qualitative case study research method as will be mentioned in the following part.

3. METHODOLOGY

The design of this study is interpretivist and the author used qualitative case-study data. A case study methodology is defined as “a research methodology based on interviews that is used in a postgraduate thesis involving a body of knowledge” (Yin, 2003). This methodology is usually used to investigate a contemporary phenomenon within its real-life context (Yin, 2003).

This study examined a single case of a Japanese retailer during a 2-month period. The participants in this study only agreed to take part in the research given the condition that their company’s name and the interviewees’ names are kept anonymous. Therefore, in order to maintain the confidentiality for the research subject as agreed, also, the chosen Japanese retailer will be referred as Company/ Retailer X in this research. By doing so, the author wishes to practice ethical research protocol in social research and makes sure that the data the author provided cannot be traced back to the participants or the organization in reports, presentations and other forms of dissemination.

The single-case study is appropriate for some circumstances, and in this research, it “represents an extreme or a unique case” (Yin, 2003). The chosen company is one of the largest retail trade corporations in the world with 179 joint ventures inside as well as outside of Japan. As a result, being a giant Japanese retailer already makes it more special than the rest of retailers in the market of Vietnam mostly because Vietnamese people have certain perceptions, assumptions and opinions towards Japanese companies and products. Moreover, even though the company just entered the market of Vietnam for 5 years, it has soon got ahead of other big names in the market and became the number one in terms of daily traffic.

According to Yin (2003), one case study may involve more than one unit of analysis, which means attention is given to subunits. This type of case study design is more complex, and it is called embedded, single-case design. The subunits of a single case can add “significant opportunities for extensive analysis, enhancing the insights into the single case” (Yin, 2003). Therefore, the author decided to use this single-case design since different subunits (participants) would reflect unique perspectives about employer brand equity and their loyalty at company. The purpose of this design was to describe the uniqueness of each subunit (individual as a case) and still allow for analysis of themes across all subunits. This helped the author to examine and analyze the similar and different results across all subunits in this single case (Yin, 2013).

3.1. Research questions

- 1) What is the current status and issue of employee retention in the chosen company?
- 2) How do the factors of Employer Brand Equity of the chosen company impact on employee retention?

3.2. Types of data collected

To provide rich and detailed understanding about the impact of employer brand equity on employee loyalty in retailer X, the following data was collected:

- 1) Individual interviews - Interview data was collected from 07 current employees and 02 former employees of retailer X. Each of the 09 selected interviewees was the representative of different field in the company and/or also at different stages in their retail career.
- 2) Artifact data: Artifact data included email correspondences, industry reports, company reports, company-based documents related to human resources management policies and practices and company press releases. Artifact data was analyzed through ethnographic content analysis.
- 3) Observational data - Observational data was collected through the author’s visits to the retailers as the role of a customer; and also collected from each of the of the interviewees in their working environment and during the interviews.
- 4) Reflective Field Notes - Personal notes about the author’s experiences and thoughts throughout the research process and stages.

3.3. Data Collection

All data was collected during a three-week period. Firstly, the author went to the retailer as the role of a customer 3 times at three different time, observing the surroundings including the store and its staffs. The author spent approximately 10 hours at the store and during those observations, noted down all the observable procedures involving frontline salespeople handling the goods and interacting with customers. The author also noted all of his impressions, personal thoughts and reactions as a customer or a visitor.

Since this research is both interpretive and inductive, and for interpretive case study, it contains rich and thick description. With that spirit, the author continued to conduct face-to-face and telephone interviews with the aforementioned primary participants using a semi-structured interview protocol. Protocol questions for the interview with the first participant were established mainly based on the theoretical background and the discourses of the company through press release; protocol questions for the next interviews were mainly the same, but were developed more as a result of responses from interview with the first participant in addition to other collected data pieces (observation,

artifacts, researcher's reflection notes). After interviews with the primary participants, the data collection was followed inductively with further interviews with secondary participants.

3.4. Research Perspective

This study employed the research perspective of Interpretivism. Interpretivism means that truth and knowledge are subjective due to the experiences and understanding of each individual. As for researchers, they can never be separated from their own beliefs and values and way of thinking, which will impact the way researchers collect, interpret and analyze the data (Ryan, 2018). In another word, the researcher's work is "deeply informed by philosophical assumptions" (Wilson, 2015 in Ryan, 2018). This perspective will bring "an understanding of the text that is deeper or goes further than the author's own understanding" it provides the "potential to uncover meanings and intentions that are... hidden in the text" (Crotty, 1998). Therefore, by using this perspective, the author was able to authentically interact, learn and understand the collected data as it emerged organically.

3.5. Participants

The main themes of this research were employer brand equity and employee loyalty, which led to the involvement of both Marketing and Human Resources Management fields. Therefore, the author contacted employees who are in charge of Marketing and Human resources in the company to gain insights into company's marketing activities and human resources practices and current employee loyalty situation. Besides, there were two groups of investigated employees in this case study: the office workers and frontline salespeople. Therefore, the author also contacted both of the two groups of employees, which would generate different findings and provide interesting comparisons later.

The primary participants of this study included one marketing team leader, one human resources team leader, two frontline salespeople and one former employee. Secondary participants were the ones that were referred or mentioned by primary participants as being the ones who could provide different perspective of the intended themes. Secondary participants included one marketing deputy manager, two human resources executives, one former marketing officer. All participants were current or former employees of X, and the data was collected within a 3-week period. Comparisons of results were drawn from the interviews, artifacts, observation and researcher notes.

3.6. Analysis

The interviews were then transcribed word using Microsoft Word and all the documents were titled with the pseudonyms of all participants. The author transcribed the first interview himself, but then had one

assistant transcribe the rest of the interviews. This was done with the effort to preserve the accuracy to develop a closer relationship with the data. During the transcription process, any silences, pauses, hesitations or excitements were included and noted as well since they could be important gestures to make the data more meaningful and real. All the interview response was reference coded and linked to its relevant research question.

3.7. Themes across cases

When analyzing the data, the author analyzed the results across all cases to understand each case and then to make comparison across cases.

Theme one: Evaluating factors of Perceived Employment experience. This theme provided insights into how employees (both office workers and frontline salespeople) perceive factors related to employment experience; how they think/feel about them; the importance of each factor in determining their stay with the company. Sub-codes included in this theme are: Salary, Benefits, Location, Work content, Advancement, Training and Development, Leadership, Co-worker support and knowledge sharing, Flexible working time.

Theme two: Evaluating factors of Perceived employer associations and employer endorsement with the company. This theme provided insights into how employees perceive their own company through its external and internal Marketing; and how it affects the associations employees have towards the company as well as their endorsement for the company brand. The sub-codes of this theme are: External organizational perceived prestige, perceived company personality, perceived store attractiveness, customer-based marketing activities, employment-based branding activities.

Theme three: Turnover and retention issue of retailer X. This theme provided insights into the situation of turnover among employees. The sub-codes of this theme are turnover rate and time, post-departure behavior and other factors influencing decision to stay with the company.

4. FINDINGS AND DISCUSSION

4.1. Theme 1: Evaluating dimensions of Perceived Employment experience

For frontline salespeople, the issue that troubles them the most is perceived low salary compared to other manual factory jobs in the same geographical area and same positions in other big retailers. Also, the salary is perceived to be even lower compared to the heavy work content that they need to bear. Many employees left company X after just a few first days at work mainly because they are shocked at the tremendous

workload. However, for employees who choose to stay, the primary reason why they remain at the company until now comes from leadership. Other factors that keep sales staffs with the company is training and advancement opportunities, as employees indicated that there is no other retailer in the market offering various training programs and clear promotion steps like X.

For office workers, their most major concern is the amount of paperwork, along with tight task procedures which takes up too much time. They express their wish to use and develop their field expertise and technical skills rather than spending too much time on administrative tasks. Another factor that causes employees to consider leaving the company is the lack of new tasks and challenges for some positions. Some employees complain about not having the opportunity to do more complicated, more strategic and new tasks, which leads to boredom or worry about career advancement. However, this problem can be settled by leader's understanding and support.

It can be seen that sales and office staffs might decide to leave the company for different reasons, but what keeps them is the same-leader's support (the most important factor) and training and advancement.

4.2. Theme two: Perceived employer brand associations and employer brand endorsement

This theme explores how employees perceive and associate their employer brand through some intangible and psychological functions. In terms of perceived external prestige, being a Japanese company already gives X an advantage in the eyes of outsiders, as Vietnamese people tend to trust and feel more secure towards anything Japanese. Also, since X's stores are big, nice, clean with professional customer service, outsiders naturally expect X to be a good employer as well. Its positive external prestige is not important enough to influence the retention or turnover decision of employees, but it surely is a bonus point that encourages employees to stay given other employment conditions are good as well. Most participants agreed that they will not work for a company with bad reputation perceived by outsiders, except for South - a frontline salesperson who claimed to not care about outsiders' opinions.

In terms of perceived personality, as company X inherits its culture from Japanese working culture, it is perceived to be professional, disciplined and strongly emphasized on customer service. Its working environment is the main reason why participants decide to stay with the company, since they believe that it would be very hard for them to find any other company with similar culture to X. It can be said that X's personality is to be admired, respected and learned by both current and former employees.

In terms of perceived store attractiveness by store employees, participants agreed that X's stores are very nice, big and reasonably displayed, but it does not affect their work motivation much since they get used to it. Therefore, store attractiveness is not to be considered when employees decide to stay or to leave.

For the company's social responsibility, it is committed to educating Vietnamese customers, protecting the environment, building a better local community and investing in future generations. These mission and core values are consistently practiced through its CSR programs every year. All employees are aware of their company's CSR and they are proud of that, which makes X associated with positive perceptions such as "civilized", "ethical", "sustainable" and "community-development oriented". There is a clear alignment between company's discourses and their practices. However, office workers expressed more interest and care about CSR than frontline salespeople.

For company's internal marketing, it is confirmed that there is no official internal employer branding yet. However, there are many activities to boost work motivation such as reading X commitment ritual; many contests to recognize and encourage employees but they are not much appreciated by salespeople.

Regarding employee endorsement towards their company, it is not overly exerted. However, all participants claimed to be proud of their employer, especially the office workers. Salespeople, on the other hand, are also proud, but not so much anymore when the issue of low salary emerges.

Based on all sub-codes of theme two, it is clear that the overall associations of participants towards company X are positive. However, the factor that plays the most important role in theme two to retain employees is the Perceived employer personality, which is referred to as company environment and culture in all interviews. While theme one and two have already explored and discussed many factors that influence the intention/decision to stay or to leave of company X's employees, there are still other factors that emerged from the interviews that I will mentioned in the next theme.

4.3. Theme three: Turnover and retention issue of retailer X

The turnover rate among office workers is about 3%, which is not a big issue. However, for sales staffs, the average rate is believed to be 35-40% for dried food and beverages section employees, 45-50% for wet food employees and it can get higher than 50% during peak times. The peak times of employee turnover usually are after Lunar New Year holiday (February and March) and after they have received their year-end bonus (31st December).

When discussing intention to quit, all primary participants admitted they wanted to quit at some point

in the past for various reasons. However, they all shared the same reasons to not leave, which are good working environment and leader's support. For employees who quit, some of them came back (about 10%) since they could not find any other company with better working environment, but they would leave again after 1-2 years eventually for the same old reasons as when they left in the first place.

Beside all explored factors determining employees' loyalty, age, gender and perceived stability are also very influential. There is an obvious trend that most employees that stay with company X (almost 70%) are females who are more than 30 years old, married with kids and who only want a stable job with moderate income. Another factor that keeps employees longer is their perception about potential growth of the company. People stick around longer because they believe in the future of the company, and have high hopes for their development and advancement as the company flourishes more.

Tables summarizing the main findings sorted out from three main themes which were collected from the author's data sources, shown in the Appendix 2-4.

5. CONCLUSION

The study shows that retail is the industry that suffers from serious unwanted employee turnover, especially for frontline salespeople who are manual workers. The main reasons for employees, of both sales and office staffs at company X to stay loyal are working environment, leader's support, training and advancement opportunities and company culture. On the other hand, the causes of departure for salespeople usually are low salary and heavy workload and weak leadership; the causes for office workers usually come from unfit job content, too much paperwork and lack of leader's support and understanding.

Unexpectedly, perceived external prestige and perceived store attractiveness play quite insignificant roles in influencing employees' decision to stay or to leave the company, especially for salespeople. The author also explored some mediating factors such as perceived external prestige, CSR, internal marketing activities, perceived stability and some moderating factors such as age and gender.

As for managerial implications, company X has done a very good job in creating and maintaining its very Japanese culture; however, there should be some adjustments in terms of its salary, job content and leadership behavior in order to increase employee loyalty

6. LIMITATION AND FUTURE RESEARCH

In terms of methodology, the biggest limitation of this research is it is based on a single case study analysis of

one company. The issues related to this is external validity and generalization. Also, since the chosen case study is quite extreme, mostly due to its Japanese element. Therefore, the findings and implications of this study might not be applied for other retailers.

Another limitation comes from the number of salespeople interviewed. Among primary and secondary participants, there were only 2 salespeople and 07 office workers. This imbalance in the number of participants was due to the unwillingness of salespeople to participate in the study. Most of them who were asked refused to meet me for the interview because they were afraid of saying something inappropriate which might negatively affect their company or their employment.

The terms Employer Brand or Employer Brand Equity still appear quite foreign to employees and managers in Vietnam, even for many academics. All the dimensions of Employer Brand Equity that the author proposed in this study need to also undergo other revisions and testing, especially using a quantitative research to really confirm the factors and measure their impact on firm performance and employee behavior.

7. REFERENCES

- [1] Aaker, D. A. (1991). *Managing Brand Equity: Capitalizing on the Value of a Brand Name*. New York: The Free Press.
- [2] Alshathry, S., Clarke, M. & Goodman, S. (2017). The role of employer brand equity in employee attraction and retention: a unified framework. *International Journal of Organizational Analysis*, 25(3), 413-431.
- [3] Ambler, T. & Barrow, S. (1996). The employer brand. *Journal of Brand Management*, 4(3), 185-206.
- [4] Backhaus, K. & Tikoo, S. (2004). Conceptualizing and researching employer branding. *Career Development International*, 9(5), 501-517.
- [5] Barrow, S. & Mosley, R. (2005). *The employer brand: Bringing the best of brand management to People at Work*. UL: John Wiley and Sons Ltd.
- [6] Berthon, P., Ewing, M., & Hah, L. (2005). Captivating company: Dimensions of attractiveness in employer branding. *International Journal of Advertising*, 24(2), 151-172.
- [7] Biswas, M. & Suar, D. (2014). Antecedents and Consequences of Employer Branding. *Journal of Business Ethics*.
- [8] Brakus, J. J., Schmitt, B.H. & Zarantonello, L. (2009). Brand Experience: What Is It? How Is It Measured? Does It Affect Loyalty?. *Journal of Marketing*, 73, 52-68.
- [9] Burmann, C., S. Zeplin, and N. Riley. 2009. Key determinants of internal brand management success: An exploratory empirical analysis. *Journal of Brand Management* 16(4): 264-284.

- [10] Cable, D. M. & Turban, D. B. (2003). The value of organizational reputation in the recruitment context: A brand equity perspective. *Journal of Applied Social Psychology*, 33(11), 2244-2266.
- [11] Carmeli, A. & Gilat, G. & Weisberg, J. (2006). Perceived External Prestige, Organizational Identification and Affective Commitment: A Stakeholder Approach. *Corporate Reputation Review*. 9 (92-104).
- [12] Collins, C., & Kanar, A. M. (2013). Employer brand equity and recruitment research. *The Oxford Handbook of Recruitment*, 284-297. Oxford University Press, Oxford.
- [13] Collins, C. J., & Stevens, C. K. (2002). The relationship between early recruitment related activities and the application decisions of new labor-market entrants: a brand equity approach to recruitment. *Journal of Applied Psychology*, 87(6), 1121-1133.
- [14] Crotty, M. (1998). *The foundations of social research: meaning and perspective in the research process*. London, Thousand Oaks, Calif: Sage Publications.
- [15] Daves, H. A. (2002). *The predictors of turnover intentions: An investigation of front-line employees in the retail industry*. Unpublished doctoral thesis, University of Tennessee.
- [16] Davies, G. (2008). Employer branding and its influence on managers. *European Journal of Marketing*, 42(5/6), 667-681.
- [17] Davies, G., & Chun, G., & Vinhas da Silva, R., & Roper, S. (2004). A Corporate Character Scale to Assess Employee and Customer Views of Organization Reputation. *Corporate Reputation Review*. 7. 125-146.
- [18] Duboff, R. and Heaton, C. (1999). Employee loyalty: A key link to value growth, *Strategy & Leadership*. 27 (1), 8-13.
- [19] Edwards, M. (2010). An integrative review of employer branding and OB theory. *Personnel Review*. 39. 5-23.
- [20] Ewing, M., & Pitt, L., & de Bussy, N. (2002). Employment Branding in the Knowledge Economy. *International Journal of Advertising*. 21.
- [21] Hurley, R. F. and Estelami, H. (2007). "An exploratory study of employee turnover indicators as predictors of customer satisfaction", *Journal of Services Marketing*, 21 (3), 186-199.
- [22] Jacoby, J. & Chestnut, R. (1978). *Brand Loyalty, Measurement and Management*. New York, NY: Wiley.
- [23] Kim, H. B., Kim, W. G. & An, J. (2003). The effect of consumer-based brand equity on firms' financial performance. *The Journal of Consumer Marketing*, 20, 335-351.
- [24] King, C., & Grace, D. (2008). Internal branding: Exploring the employee's perspective. *Journal of Brand Management*.
- [25] Kotler, P., Wong, W., Saunders, J., & Armstrong, G. (2005). *Principles of Marketing, 4th European edition*. Harlow, England: Pearson.
- [26] Kucherov, D. G., & Samokish, V. (2016). Employer Brand Equity Measurement, *Strategic HR Review*, 15(1), 29-33.
- [27] Leekha Chhabra, N. and Sharma, S. (2014). Employer branding: strategy for improving employer attractiveness", *International Journal of Organizational Analysis*, 22 (1), 48-60.
- [28] Lievens, F., & Highhouse, S. (2003). The relation of instrumental and symbolic attributes to a company's attractiveness as an employer. *Personnel Psychology*, 56(1), 75-102.
- [29] Lievens, F., & Slaughter, J. E. (2016). Employer image and employer branding: what we know and what we need to know. *Annual Review of Organizational Psychology and Organizational Behavior*, 3, 407-440.
- [30] Lievens, F., Schreurs, B., & Van Hove, G. (2005). Examining the relationship between employer knowledge dimensions and organizational attractiveness: An application in a military context. *Journal of Occupational and Organizational Psychology*, 78(4), 553-572.
- [31] Lievens, F., Van Hove, G. & Anseel, F. (2007). Organizational identity and employer image: towards a unifying framework. *British Journal of Management*, 18, S45-S59.
- [32] Lloyd, S., (2002). Branding from the inside out. *BRW*, 24 (10), 64-66.
- [33] Martin, G., & Beaumont, P. (2003). *What's in a Name? Building a Relationship Between People Management and Branding*. Chartered Institute of Personnel and Development, Wimbledon, Great Britain.
- [34] Martin, G., Beaumont, P., Doig, R., & Pate, J. (2005). Branding: A new performance discourse for HR?. *European Management Journal*, 23(1), 76-88.
- [35] Maxwell, R., & Knox, S. (2009). Motivating employees to "live the brand": A comparative case study of employer brand attractiveness within the firm. *Journal of Marketing Management*, 25(9/10), 893-907.
- [36] Meyer, J.P., & Allen, N.J. (1991). A three-component conceptualization of organizational commitment: some methodological considerations. *Human Resource Management Review*, 1(1), 61-89.
- [37] Mignonac, K., & Herrbach, O., & Guerrero, S. (2006). The interactive effects of perceived external prestige and need for organizational identification on turnover intentions. *Journal of Vocational Behavior*. 69. 477-493.

- [38] Minchington, B. (2011). *Building employer brand equity*. Retrieved from <http://www.bretminchington.com/free-resources/strategy/112-build-employer-brand-equity.html>
- [39] Mishra, S. K. (2013). Perceived External Prestige and Employee Outcomes: Mediation Effect of Organizational Identification. *Corporate Reputation Review*, 16(3), 220-233.
- [40] Mosley, R. (2007). Customer experience, organizational culture and the employer brand. *Journal of Brand Management*. 15. 123-134.
- [41] Punjaisri, K., & Alan, W. (2007). The role of internal branding in the delivery of employee brand promise. *Journal of Brand Management*. 15. 57-70.
- [42] Rafiq, M., & Ahmed, P. K. (2000). Advances in the IM concept: definition, synthesis and extension. *Journal of Services Marketing*, 14(6), 449-462.
- [43] Rampl, L. V. (2014). How to become an employer of choice: Transforming employer brand associations into employer first-choice brands. *Journal of Marketing Management*, 30(13-14), 1486-1504.
- [44] Rathi, N., & Lee, K. (2015). Retaining talent by enhancing organizational prestige: An HRM strategy for employees working in the retail sector. *Personnel Review*, 44(4), 454-469.
- [45] Ready, D.A., Hill, L.A., & Conger, J.A. (2008). Winning the race for talents in emerging markets. Harvard Business Review.
- [46] Ritson, M. (2002). *Marketing and HR Collaborate to Harness Employer Brand Power*. Available online: https://www.campaignlive.co.uk/article/opinion-marketing-hr-collaborate-harness-employer-brandpower/162068?src_site=marketingmagazine
- [47] Ryan, G. (2018). Introduction to positivism, interpretivism and critical theory. *Nurse Researcher*, 25(4), 14.
- [48] Slaughter, J. E., Zickar, M. J., Highhouse, S., & Mohr, D. C. (2004). Personality Trait Inferences About Organizations: Development of a Measure and Assessment of Construct Validity. *Journal of Applied Psychology*, 89(1), 85-103.
- [49] Srivastava, P., & Bhatnagar, J. (2010). Employer Brand for Talent Acquisition: An Exploration towards its Measurement. *Vision: The Journal of Business Perspective*. 14. 25-34.
- [50] Tang, C., Y. Liu, H. Oh, & B. Weits. (2014). Socialization Tactics of New Retail Employees: A Pathway to Organizational Commitment. *Journal of Retailing* 90 (1), 62-73.
- [51] Theurer, C., Tumasjan, A., Welpe, I., & Lievens, F. (2018). Employer Branding: A Brand Equity-based Literature Review and Research Agenda: Brand Equity-Based Employer Branding. *International Journal of Management Reviews*.
- [52] Van Hoyer, G. (2008). Nursing recruitment: Relationship between perceived employer image and nursing employees' recommendations. *Journal of advanced nursing*. 63. 366-75.
- [53] Yin, R. K. (2003). *Case Study Research: Design and Methods*. Thousand Oaks, California: Sage.
- [54] Yoo, B., Donthu, N., & Lee, S., (2000). An Examination of Selected Marketing Mix Elements and Brand Equity. *Journal of the Academy of Marketing Science*, 28(2), 195-211.
- [55] Yurchisin, J. & Park, J. (2010). Effects of Retail Store Image Attractiveness and Self-Evaluated Job Performance on Employee Retention. *Journal of Business and Psychology*, 25(3), 441-45.

APPENDIX:

Appendix 1: Employer brand equity and its dimensions

Employer brand equity dimensions	Constructs	Authors	Definitions	Author's valuation of the definitions
<i>Employer Brand awareness</i>		Cable & Turban (2001); Collins & Stevens (2002)	Job seekers' awareness of or ability to identify a company as a potential employer. The level of familiarity that job seekers hold regarding an organization.	Its also called " <i>Brand familiarity</i> " or " <i>Familiarity with the brand</i> ". This dimension is applied only for potential employees who have the intention to apply for a specific employer.
<i>Employer brand associations</i>	<i>Functional associations/ Instrumental associations</i>	Ambler and Barrow (1996)	The package of functional, economical and psychological benefits provided by employment and identified with the employing company"	This is a good definition since it covers both tangible and intangible, aspects of organizational offering. Also, this one can be applied for both potential and current employees of such organization.
		Cable and Turban (2001)	Potential applicants have some knowledge about the attributes of a specific job at the organization to which they might consider applying (job information).	This definition is only applied for potential candidates, not for existing employees (which is the main subject of this research).
		Collins and Steven (2002)	Perceived attributes as job seekers' beliefs about specific aspects of the job and work environment of the organization	This definition suffers from the same limitation, which is it only focuses on potential employees, but forgets about the current employees.
		Lievens and Highhouse (2003)	As instrumental aspects of the employment brand that would describe the " <i>objective, physical and tangible attributes</i> " of the employment offering.	This definition lacks the aspects of intangible and psychological benefits of the employment offering. Moreover, it also targets only the existing employees, not the potential ones of the organization.
	<i>Symbolic associations</i>	Aaker (1997)	" <i>A set of human characteristics associated with the brand</i> ". Identified five dimensions for 'brand personality': Sincerity (eg honest, cheerful), Competence (eg reliable, successful), Sophistication (eg charming, upperclass), Excitement (eg daring, imaginative) and Ruggedness (eg masculine, tough).	Company personalities, just like human's, can be very complex, which means trying to classify them into specific category of personality might be a way of oversimplifying that organizational culture. Moreover, each individual in the organization, depending on their demographic characteristics and positions, will form different perception about their organizational personalities. Same thing goes for non-employees, publics can also form different opinions about one organization
		Lievens, Van Hoye and Schreurs (2005)	Five factors of personality as: sincerity (e.g. honest, sincere), excitement (e.g. daring, exciting), competence (e.g. intelligent, technical), prestige	

Employer brand equity dimensions	Constructs	Authors	Definitions	Author's valuation of the definitions
			(e.g. high status, highly regarded), and ruggedness (e.g. tough, rugged).	depending on their exposure to the organization discourse and practices, too. Therefore, it is very hard to reach an agreed type of perceived personality of the organization, and it can also differ from the type that organization desires to be.
		Slaughter, Zickar, Highhouse & Mohr (2004)	Organization personalities as the set of human personality characteristics perceived to be associated with an organization. Developed organization personality perception scales: Boy Scout, innovativeness, dominance, thrift and style.	Moreover, there is no unified or comprehensive measurement to identify and measure each type of personality proposed by these authors.
		Davies, et al. (2004)	Developed Corporate character scale: Agreeableness (honest, socially responsible); Competence (reliable, ambitious); Enterprise (innovative, daring); Ruthlessness (arrogant, controlling); Chic (stylish, exclusive); Informality (easy going) and Machismo (tough).	
		Lievens et al., (2007)	Symbolic aspects of the organization's employer brand would help describe the organization in terms of its "subjective abstract and intangible attributes" linked to the organization's image.	
<i>Employer brand loyalty</i>	<i>Brand commitment</i>	Burmann et al. (2009)	Brand commitment, is the psychological attachment or the feeling of belonging an employee has towards an organization.	The outcome of brand commitment is not indicated clearly here. Commitment can be proved through continued employment, work engagement, high level of motivation, or word of mouth.
	<i>Brand endorsement</i>	King and Grace (2008)	Brand endorsement can be defined as the extent to which an employee is willing to say positive things about the organization (brand) and to readily recommend the organization (brand) to others.	Since the employees are brand endorsement, they also play the role of brand representative. Therefore, beside just expressing their brand loyalty through verbal communication to other people, they need to act and lead a life (action-based) in which their values identify with those of an organization, and that they represent a good example for outsiders to see what being an employee at that organization should be, or can be.
		Van Hoye (2008)	Recommendation intentions are defined as the extent to which employees intend to recommend their organization as an employer to others.	
	<i>Brand allegiance</i>	King and Grace (2008)	Employee brand allegiance (or purchase intentions in a consumer context) is defined as the future intention of	There are three types of commitment (Meyer and Allen, 1991) which directly impacts the intention to stay of employees at

Employer brand equity dimensions	Constructs	Authors	Definitions	Author's valuation of the definitions
			employees to remain with the organization (brand).	the organization. Three types are affective, normative and continuance commitment, which are caused by different motives and drive. Affective commitment is the most desired form of commitment since that is when employees form a positive emotional attachment with the organization. The other two types of commitment are more rational and practical, sometimes employee choose to stay because the cost of leaving is too high, or they have no other choice; therefore, this definition should include the element of "willingness" or "voluntary commitment" from employees to make sure the decision to stay comes from their own choice, not just because they have to.
		Punjaisri and Wilson (2007)	An employee's expression of their intention to stay with the organization is reflective of their awareness of the need to live up to the brand standards.	This definition implies the intrinsic motivation behind employee's intention to stay, but forgets the more rational reasons to stay with the company (beside living up to the brand standards, it might be the reflective of their perceived values of being such organization's employee).
Perceived employment experience		Brakus et al. (2009)	<i>"Subjective, internal and behavioral responses evoked by brand-related stimuli"</i>	This definition is not specifically employment-based, but can also be applied for customer-based context as well. Therefore, it could be developed more based on employment-based context.
		Kucherov and Samokish (2016)	The association that employees have about working for that organizational through the online and offline touchpoints that employee interacts with.	This definition takes into consideration both online and offline touchpoints, which means the perceived employment experience is formed and influenced by various interactions through all possible channels with the organization. This means the organization needs to deliver a consistent message on all communication channels, and all of their activities have to align with their promised values, whether to their stakeholders or outsiders.

Employer brand equity dimensions	Constructs	Authors	Definitions	Author's valuation of the definitions
		Alshathry, Clarke and Goodman (2017)	<p>- "Differs from employer brand associations in that it is employment-specific and normally occurs inside the organization through interactions with the employer, as employment offerings are provided and benefits exchanged between employees and the employer".</p> <p>- An internal and subjective response to the value exchange process: functional, psychological and economic benefits which together make up the employee experience (Ambler and Barrow, 1996; Edwards, 2010).</p>	<p>- This dimension should not only be limited to current employees only, but it is also possible for potential candidates. Programs like field trips or (paid) internship can actually form the first impression or experience of potential candidates about the organization already.</p> <p>- This definition explains well the element "perceived" with the word "subjective", which means that each individual will form different perceptions about the organization.</p>

Appendix 2: Reasons for employee turnover of company X

Factors	Frontline salespeople	Office workers
<i>Salary</i>	Perceived to be low compared to other industry jobs and some other retailers. Especially given the heavy workload.	N/A
<i>Work content</i>	Heavy workload especially during weekends and holidays. Multiple responsibilities at the same time, which could be challenging.	The procedures are too strict and inflexible, leading to too much paperwork. Certain jobs can get boring due to repetition over time.
<i>Advancement</i>	N/A	Advancement process and time can be slow for some young employees.
<i>Leadership</i>	When there is a lack of leader's support and understanding and respect, it can cause turnover for both types of employees.	

Appendix 3: Reasons for employees' decision to stay with Company X

Factors	Frontline salespeople	Office workers
<i>Benefits</i>	N/A	Good range of benefits especially for married employees with children.
<i>Training and development</i>	Company X provides a lot of training and development programs for all levels and positions, which is appreciated by all employees. This is also the reason why employees stay with the company.	
<i>Advancement opportunities</i>	Salespeople are well aware that it will be very hard for them to find another employer offering quite easy and fast promotion opportunities like X.	Promotion process at company X follows specific steps, so it is not quick. However, since X is expanding their business, opening new stores, employees are given different jobs and promoted to be in charge of more challenging positions.
<i>Leadership</i>	Very important factor determines their stay for both sales and office staffs. Many participants deliberately credit their loyalty to their leader's understanding and support.	

Factors	Frontline salespeople	Office workers
<i>Company personality (Culture and environment)</i>	The common personality traits that employees describe X are: Professional, Discipline and highly committed to delivering excellent customer service with integrity, honesty and sustainability. Both sales and office staffs complimented the working culture and environment of company X, and said they stay also because of that.	
<i>Co-worker support and knowledge sharing</i>	For salespeople, since their work content is heavy and challenging at times, support from co-workers is necessary and much appreciated.	N/A

Appendix 4: Factors indirectly affect employees' decision to stay with company X

Factors	Frontline salespeople	Office workers
<i>Location</i>	It is an advantage for both sales and office workers, and in long term, also affects the decision to stay, especially for female workers. On the other hand, for employees who live far from their workplace, this can discourage them from staying with their company, given the fact that there are many other more convenient employment options; especially for employees who work early morning and late evening shifts.	
<i>Flexible working time</i>	Easy for salespeople to change/switch their working shifts; to ask for days off or to have breaks in-between their working time. This factor is more important and appreciated by salespeople employees than office workers.	No working overtime; and employees do not have to stay inside their office room all the time.
<i>External organizational perceived prestige</i>	All participants agreed that their company has very positive image and reputation for outsiders, which also improves their perception towards the company. However, this matters more for office workers, especially management positions. Also, it is the concern of employees when they started to apply for their jobs at company X, more than when they are already working for the company.	
<i>Employer brand endorsement</i>	Both office and sales staff are believed to be proud and willing to talk about and recommend their employer to outsiders. However, this only encourages them to stay if other more essential factors are satisfied and fulfilled.	
<i>Internal Marketing</i>	There is no official internal marketing or employer branding activities for employees of company X. Most of them are limited to only internal contests and training, and sometimes reinforcement of company's values and missions. Not all employees care about such activities, especially salespeople. However, those still contribute to the organizational culture and parts of training, which directly affect employee loyalty.	
<i>CSR</i>	Important for creating company culture and personality, which directly influences the decision to stay of employees. Both sales and office staffs care about their company's CSR because they are all involved in CSR activities. However, they do not stay because of CSR itself.	
<i>Perceived stability</i>	It is important for both types of employees, particularly more so for females. Most of them need a 9-to-5 jobs with not too much pressure and challenge in order to have time for their families. Also, due to their belief and trust in Japanese company in general, and in their own company's business results and sustainable growth, salespeople believe there will always be jobs for them to do at company X, that it will never go out of business out of the blue.	
<i>Perceived potential growth</i>	All employees especially office workers believe in the future expansion of their company, as well as their future career development if they stay longer. This factor is strengthened as company X is in the progress of opening new stores.	
<i>Age; Gender</i>	Most loyal employees are females, above the age of 30 years old, married with kids. Employees especially male under 26 years old tend to quit more often.	

THE MEDIATING ROLE OF PERFORMANCE MEASUREMENT SYSTEM IN THE RELATIONSHIP BETWEEN TOP MANAGEMENT SUPPORT AND PERFORMANCE IN VIETNAM PUBLIC SECTOR

Tran Thi Yen¹, Le Thi Bao Nhu², Nguyen Thi Thu Hao³, Nguyen Phong Nguyen⁴

¹ Faculty of Economics and Accounting, Quy Nhon University, Vietnam. Email: tranyen@qnu.edu.vn

² Faculty of Finance, Accounting and Banking, University of Phan Thiet, Vietnam. Email: lebaonhu@gmail.com

³ Regional State Audit Office No.13, State Audit Office of Vietnam. Email: thuhao_ktkt@yahoo.com

⁴ School of Accounting, University of Economics Ho Chi Minh City, Vietnam

Corresponding author: nguyenphongnguyen@ueh.edu.vn

Abstract

Performance measurement system (PMS) has been gaining a great deal of interest when the organizations try to implement new measurement systems that can better support their goals. Top management support (TMS) is an important factor in the process of accepting and using PMS. Drawing on institutional theory, this study evaluates the mediating effect of PMS on the relationship between TMS and performance in public organizations in Vietnam. The research model and hypothesis has been tested by SmartPLS3 with 219 survey samples from managers and accountants working in Vietnam public organizations. The results support the direct and indirect relationships between TMS and performance through PMS. From these findings, this paper proposes implications to increase TMS and improve PMS, finally performance enhancement in Vietnam public organizations.

Keywords: Top management support, performance measurement system, organizational performance, public sector, Vietnam.

1. INTRODUCTION

The public sector has a much wider range of stakeholders (Zheng, Wang, Liu, & Mingers, 2019). Therefore, these organizations need to be aware of these stakeholders and manage them successfully, first for efficiency, then for legal and ethical reasons (Wang, Liu, & Mingers, 2015). For many years, public sector reform has focused increasingly on the design and application of results measures. (e.g. Cavalluzzo and Ittner (2004); Modell (2001, 2004, 2009)). Over the past decades, there have been many studies on the role of PMS in the organization (Broadbent & Guthrie, 2008). Performance measurement issues have gained increasing attention when organizations try to apply to the new measurement system that is better to support their goals (Cavalluzzo & Ittner, 2004). Therefore, measuring results is an area of concern in organizational research and has many different concepts. Smith (1988) defines the measuring results through the development of the specific measures rate of effectiveness and efficiency. Fine and Snyder (1999) argues that measuring results related to the selection, definition and application of outcome indicators, which quantify the effectiveness and efficiency of service

delivery methods. Cavalluzzo and Ittner (2004) also defined measuring results through the specific measurements of workload, efficiency and efficiency, customer satisfaction and the social impact. And Johnsen (2005) asserts that measuring results in the public sector mainly refers to outcome indicators such as efficiency, efficiency and equity. More generally, PMS is the process of collecting, analyzing and reporting information to evaluate the organization's results (Sofyani, Akbar, & Ferrer, 2018).

It is clear that the ultimate purpose of the PMS is to provide useful and reliable information about the performance, thereby finding solutions to enhance the organization's results. However, many state and local governments have not improved performance measurement systems and even rarely use them to decision making (Julnes & Holzer, 2001). Previous studies indicate that the development of performance measurement systems and other formal control mechanisms to respond to public sector reforms tend to be dominated by senior managers and employees (Modell, 2009). Indeed, the performance measurement method is used by senior management in the organization (Poister & Streib, 1999). Furthermore, top management influence employees' perceptions and

willingness to engage in tasks; Since then, top management support has been proven to drive the success of software process improvement (J.-C. Lee, Shiue, & Chen, 2016). TMS demonstrates through their authority to make decisions to adopt the PMS, to provide sufficient resources and to assist employees in effectively operating the PMS, which in turn may contribute to organizational performance (Cavalluzzo & Ittner, 2004). Therefore, the impact of TMS on PMS in the organization is more important and needs more attention from researchers.

Besides, the study of PMS in the public sector has attracted many theoretical perspectives, especially institutional theory (Brignall & Modell, 2000; Modell, 2009). The importance of institutional theory to PMS becomes significant because public sector often provide performance information to stakeholders to maintain their legitimacy, meanwhile, they have to comply with regulations and other institutional pressures (Modell, 2009). Local government managers realize that they have to measure their performance to prove what they are doing, both to stakeholders and external organizations (Kloot, 1999). Because PMS provides to stakeholders with the information to increase accountability and control, and reduce uncertainty and asymmetric information (Behn, 2003). Moreover, the competitive pressure in institutional theory forces public sector managers to enhance PMS to compete equally with the private sector (Kloot, 1999). Therefore, it is necessary to have a better performance measurement method in the public sector, including quantitative and qualitative. Performance measurement refers primarily to those performance indicators (PIs) of efficiency, effectiveness and equity that are intended to be used to enhance rational decision-making in public sector (Johnsen, 2005). As system designers, senior managers can change the measuring method through their interactions with the institutional environment in the organization (Oliver, 1991). However, managers are not always under coercive pressure (finding the suitability and legality passively) but sometimes they are proactive for legitimization (Modell, 2009). Thus, the institutional theoretical framework shows the close connection between TMS, PMS and performance in public organizations. Furthermore, empirical studies examining the relationship between the three factors (TMS, PMS and performance) seem to be less found from previous studies.

Therefore, this article extends these efforts to examine TMS and performance measurement system from an institutional theoretical perspective in interacting with performance. Further studies on these issues have been less widely explored on how and why senior management influences PMS in public sector organizations. In general, this study aims to examine

(1) the direct relationship between TMS and performance and (2) the mediating role of PMS in the relationship between TMS and performance. This gap is considered important in developing countries, especially in Vietnam, where are striving to become a socialist-oriented market economy. Vietnam is one of the transition countries that has generated much excitement among international investors, in part due to their rapid economic growth (Doan & Nguyen, 2013). By acquiring some knowledge of how PMS plays a mediating role for the relationship between TMS and performance in a developing country context, it may be possible to gain a deeper understanding of the role of PMS in developing countries.

At present, Vietnam have been implemented many important financial reforms, for example, financial autonomy and self-responsibility mechanism have partly released and created openings for public units in the use of the public asset, providing public services better to meet the needs of citizens (Tran, 2014). Accordingly, the leader of the unit holds many powers and plays any decisive role in all development strategies of the organization; simultaneously, the leader also takes the main responsibility to the superior unit and the government. Moreover, in Vietnam, the PMS application is not mandatory for public organizations. Therefore, the process of using the results measurement system depends entirely on the awareness of the necessity and the selection of senior managers. Therefore, this paper aims to clarify knowledge of the impact of TMS on PMS and performance in the public sector in Vietnam, a transition economy.

This study contributes to the literature in public sector management accounting and provides strong evidence that institutional theory and NPM theory are appropriate in the context of public management reform in a developing country, such as Vietnam. The research results will provide useful management implications for managers to realize their role in the operation of PMS to improve organizational performance. Specifically, public organizations need to apply multidimensional models or frameworks in public performance measurement to strategic planning, resource allocation, program management, monitoring, evaluation and reporting for internal management, elected officials and citizens or the media (Van, 2010).

The rest of this paper proceeds as follows. Next, we introduce background theory, our model and research hypotheses in Section II. We present the research methodology in Section III. Section IV presents the results and discussion of the results. Section V offers some concluding remarks and implications.

2. LITERATURE REVIEW

2.1. Background theory

Institutional theory argues that a key determinant of organizational structure is the external and internal pressure to achieve legitimacy (Meyer & Rowan, 1977). DiMaggio and Powell (1983) distinguished two types of isomorphisms: competitive isomorphism and institutional isomorphism. The competitive isomorphism relates to efficiency and chooses a way that is cheaper, better, or more efficient for doing things. The competitive structure in Vietnam public sector is also more clear. Vietnam is in the process of financial reforms, especially the implementation of financial autonomy policy in both state agencies and public service delivery agencies. To help the public organization evaluate results accurately, it is necessary to apply new management tools, such as the Balanced Scorecard (BSC), the Public Scorecard, or the Performance Prism (Johansson & Siverbo, 2009). These techniques are focused on linking processes across operations and with business strategy, in the end, is to improve performance (Spekle & Verbeeten, 2014). Moreover, the institutional isomorphism also requires public organizations to adopt PMS to provide information to stakeholders to enhance control and accountability, so it can reduce uncertainty and asymmetry information (Behn, 2003). However, the implementation of PMS is more influenced by the institutional isomorphism than the competitive isomorphism (Modell, 2001). Zheng et al. (2019) also showed that one of the key elements in effective implementation of PMS in the public sector is the balance of motivation and interests among stakeholders at all PMS levels, and this requires active support from senior managers in the organization. Therefore, this theory is well suited to explaining the implementation of PMS that is expected to improve public sector organizations' results work under the support of senior managers.

Moreover, the reforms approached the New Public Management (NPM) doctrine have led to major changes in public sector management, based on the application of private sector management and the concept of competitive markets concept (Boston, 2016; Dunleavy & Hood, 1994). Accordingly, performance measurement is not a new management tool in the public sector, but the emergence of NPM has generated increased interest in performance measurement techniques and management accounting innovations (Johansson & Siverbo, 2009). Modell (2004) also emphasizes that the driving force for reform in the

public sector worldwide has focused on measuring results in public sector organizations. Especially, NPM also emphasizes the role of PMS in the goal setting process, performance evaluation and provides incentives for organizations achieving efficiency (Spekle & Verbeeten, 2014). Currently, most public sector organizations in Vietnam can implement performance measurement practices optionally. Therefore, the government's effort is to encourage public units to increase the PMS implementation to evaluate the result accurately, to help the unit and its stakeholders to rationally recognize the organization's performance. The organizational leader is the key person in the organization, so this process depends on their supporting level. Accordingly, senior managers tend to actively support the application of a new performance measure, so the process of applying PMS will be more successful. From there, the results report reflects the current achievement, helping managers realize the weakness to overcome and improve performance. Therefore, the relationship between TMS, TMS and performance is still underresearched to clarify the current theoretical framework.

2.2. Hypothesis development

2.2.1. *The effect of top management support on performance*

Leadership always plays an important role in the success or failure of an organization (Bass, 1999). Accordingly, Fry and Matherly (2006) argues that leaders use the optimal strategies to inspire and motivate to help employees reaching possibly their full potential for growth and development. Leadership practices are always geared towards achieving the best quality and performance (Alam, Said, & Abd Aziz, 2018). Effective leadership can drive improvements in teamwork, quality, safety and innovation (Greenfield, 2007). But when leadership behavior is so different from the expectations of members, undesirable consequences can occur and weaken the performance of individuals and teams (Subramaniam, Othman, & Sambasivan, 2010). Also, senior management support with appropriate employee incentive mechanisms will enable employees to increase their knowledge sharing, which in turn can contribute to the success of the organization (J.-C. Lee et al., 2016). Therefore, Ahyaruddin and Akbar (2016) found that organizational commitment is positively related to performance. So senior managers need to promote their role in active support for management, providing sufficient resources, effectively communicating their support to employees to improve unit performance. In

other words, the support of senior managers will positively influence innovation indirectly through communication and creating knowledge in the organization, ultimately leads to improving organization performance (Ragu-Nathan, Apigian, Ragu-Nathan, & Tu, 2004). On this basis, the author proposes the following hypothesis:

Hypothesis 1 (H₁): Top management support has a positive impact on performance.

2.2.2. The mediating role of performance measurement system for the relationship between top management support and performance

Senior management support is one of the key factors in the implementation of PMS in public sector organizations (Modell, 2001). Ragu-Nathan et al. (2004) showed that TMS related to information systems refers to the understanding levels of senior management about the importance of information system functionality to all activities in the organization. Therefore, the implementation of PMS will be successful if there are support and commitment from all members in the organization, from the top, middle & low - level managers to employees. Especially, the commitment of top management has been repeatedly emphasized as an additional element, or prerequisite for consensus building and successful implementation of a balanced scorecard, or similar management tools (Modell, 2004).

TMS is associated theoretically and empirically with operations management success (Malmi, 1997). Management practices are to be successful if senior managers commit to supporting and providing sufficient resources to sustain them. Furthermore, senior managers have to communicate the goals and benefits of performance measurement methods to employees and use authority if it necessary to overcome obstacles, so that the PMS can achieve the success of their work (McGowan & Klammer, 1997). Julnes and Holzer (2001) also stated that if there is a goal oriented in the organization, the implementation of PMS is more possible. In particular, the support of top managers has a strong positive impact on activity management success (Baird, Harrison, & Reeve, 2007). Therefore, we propose the following hypothesis:

Hypothesis 2a (H_{2a}): Top management support has a positive impact on performance measurement system.

Several scholars have advanced the potential of contemporary management accounting practices to work together to enhance outcomes (Nuhu & Appuhami, 2016). The PMS can serve a variety of purposes within organizations (Spekle & Verbeeten, 2014), such as operational planning, performance evaluation, communicating goals, and strategic formulation. Julnes and Holzer (2001) suggests that measuring results is intended as a tool to make more lucid decisions. For example, by quantifying goals and measuring whether they are achieved, organizations can reduce and eliminate ambiguity and confusion goals, so they get the coherence and focus on their work (Van, 2010). Thus, PMS helps provide input for decision making, as well as for managers' reward decisions, thereby that affect the performance of the organization (Verbeeten, 2008). More specifically, Halachmi (2002) demonstrated that the application of the PMS will enhance performance in public organizations. A recent study by Spekle and Verbeeten (2014), Yen and Nguyen (2020) also provided empirical evidence on the positive effect of the PMS implementation on the public organizations' performance in the Netherlands. In a nutshell, the public organizations use an appropriate PMS that will provide a lot of useful information, so it helps the public units evaluate exactly the results they achieved, understand the problems and its root cause as well as finding solutions to improve better results. From the discussion above, we make the following hypothesis:

Hypothesis 2b (H_{2b}): Performance measurement system has a positive impact on performance.

On the basis of institutional theory, under the institutional isomorphism, managers in the public sector are forced to adopt PMS to report performance to stakeholders. Furthermore, the NPM doctrine provides additional incentives for managers to apply the best PMS to accurately measure outcomes to improve decision making and to enhance the performance of public organizations. Means, TMS can indirectly affect performance through PMS. In addition, Hypotheses *H_{2a}* and *H_{2b}*, therefore, can be combined and expressed as follow:

Hypothesis 2 (H₂): Performance measurement system partially mediates the relationship between top management support and performance.

The proposed model and corresponding hypotheses are shown in Figure 1.

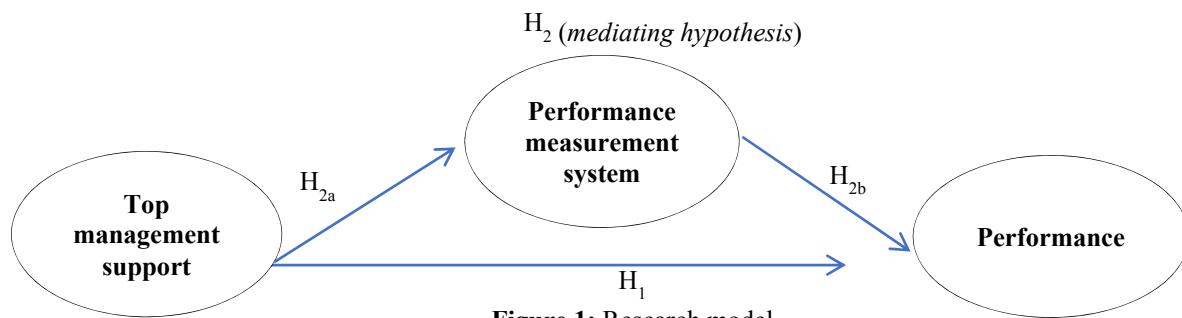


Figure 1: Research model

Table 1: Demographic information

Measure	Item	Percentage
Job position	Senior manager	37.5
	Chief accountant	55.7
	Mid-and low-level managers	6.8
Work experience	Under 3 years	0.0
	From 3 to 5 years	21.9
	From 6 to 10 years	32.4
	Over 10 years	45.7
Type of organisation	Administrative agencies	43.4
	Public service units	53.9
	Other socio-political organizations	2.7
Organizational field	Public administration	45.2
	Education sector	34.2
	Health sector	11.4
	Other sectors	9.1

Note: N, Total number of respondents (N = 219).

3. METHODOLOGY

3.1. Sampling and data collection

This study uses analytical units as organizations. In each public organization, the author selects a representative to answer the entire questionnaire, focusing on accounting or senior managers in public units in Vietnam. In addition, respondents must have a minimum of 3 years of working experience, in order to find appropriate respondents with necessary knowledge. For sample size, this study uses 219 samples, consistent with the sample size regulations for analytical techniques in structural equation modeling (SEM) (Hair, Hult, Ringle, & Sarstedt, 2017). In addition, this study selected a research sample based on

a convenient method. The data was collected through a direct survey process in combination with emailing the survey link to respondents. After collecting and cleaning data, the author uses SmartPLS3 software to test measurement models and verify structural models. The author presents a summary of the descriptive statistical indicators of the sample in Table 1.

According to Table 1, out of 219 respondents, there are 37.5 senior managers, 55.7% chief accountants, and mid-and low-level managers for 6.8% of the population. The majority of respondents are over 5 years (78.1%), showing that the respondents have knowledge and experience in research issues and may reliably represent the organization that answers the questionnaire. In terms of public organization, the highest percentage of public service units is 53.9%.

Administrative agencies also account for a high proportion of 43.4% of the population. Other socio-political organizations are very low (2.7%). In terms of field, public administration accounted for the highest proportion (accounting for 45.2%), followed by the education sector at 34.2%, the health sector accounted for 11.4%, and other sectors accounted for only 9.1%. These are consistent with the structure of the public sector in Vietnam (General Statistics Office, 2018), it shows that the sample is relatively representative of the population.

3.2. Measures

Because the developing new scales of measurement is a complex task, this paper uses pre-tested constructs from past empirical studies to ensure their validity and reliability. The research model has three main research concepts with a total of 15 observed variables. First of all, top management support was measured following Baird et al. (2007), including four observed variables, and was measured on a 7-level Likert scale. Next, PMS was adapted from Cavalluzzo and Ittner (2004); Yen and Nguyen (2020), which consists of 5 observed variables and was measured on a 5-level Likert scale, this scale was also used by Verbeeten (2008) when measuring PMS. Finally, the performance was

measured based on a widely accepted scale adopted from Nuhu and Appuhami (2016), including 6 observed variables that show the quantitative and qualitative results in public organization. This scale asked respondents to rate the performance of the organization they have been working for the past three years by using a 7-point Likert scale, from 1 "very bad" to 7 "very good".

The author used SmartPLS3 software to test the measurement model. According to the scale assessment results shown in Table 2, the authors find that the load factor of most observed variables (ranging from 0.67 to 0.93) was above the minimum recommended threshold of 0.50 (Hulland, 1999). At the same time, all corresponding t-test values of the observed variables (ranging from 14.43 to 89.38) are also satisfactory because they are larger than 1.96 to have statistical significance. The average variance (AVE) of all potential variables in the model is acceptable because it is higher than 0.50 (ranging from 0.70 to 0.79). The composite reliability (CR) of the potential variables ranges from 0.91 to 0.96, higher than 0.708; thereby showing the high reliability of the scales used in the model (Hair, Hult, Ringle, Sarstedt, & Thiele, 2017).

Table 2: Scale items and latent variable evaluation

Construct and items	Outer loading	T-test
<i>Top management support (TMS) (CR = 0.91; AVE = 0.70)</i>		
Top management provided active support for activity management practices	0.79	23.93
Top management provided adequate resources to support the activity management implementation effort	0.86	33.76
Top management effectively communicated its support for activity management	0.87	47.50
Top management exercised its authority in support of activity management practices	0.84	34.69
<i>Performance measurement system (PMS) (CR = 0.92; AVE = 0.70)</i>		
My organization has performance measures that indicate the amount of products or services provided	0.89	52.48
My organization has performance measures that indicate the operating efficiency	0.89	51.07
My organization has performance measures that indicate the customer satisfaction	0.89	54.22
My organization has performance measures that indicate the product or service quality	0.82	29.80
My organization has performance measures that indicate the outcome effects	0.67	14.43
<i>Performance (PER) (CR = 0.96; AVE = 0.79)</i>		
The quality of our output (products/services)	0.85	39.11
The implementation of new procedures and/or practices	0.89	46.38
The introduction of new products/service lines	0.90	63.81
The efficiency of our operations	0.91	64.30
The effectiveness of our operations	0.93	89.38
The level of our customer satisfaction	0.86	33.21

Notes: AVE: Average variance extracted; CR: Composite reliability

Table 3: Construct means, standard deviations, and correlations

Variables	TMS	PMS	PER
Top management support (TMS)	0.84		
Performance measurement system (PMS)	0.48**	0.83	
	<i>0.54</i>		
Performance (PER)	0.43**	0.64**	0.89
	<i>0.47</i>	<i>0.69</i>	

Notes: 1st value = Correlation between variables (off diagonal); 2nd value (italic) = HTMT ratio; Square root of AVE (bold diagonal); **: Correlation is significant at the 1% level (2-tailed t-test).

In the next step, the authors use several criteria to test the distinctive value of the main measurement variables in the research model, the results shown in Table 3.

First of all, the author uses the procedure proposed by Fornell and Larcker (1981). In Table 3, the square root value of the average variance (AVE) of all latent variables is in the range of 0.83 to 0.89 and is higher than all correlation coefficients between the variables (range from 0.43 to 0.64). Therefore, the scales of potential variables in the research model achieve discriminant value. The correlation coefficients between the variables are also smaller than the cut-off value of 0.7, thereby showing that the correlation is acceptable for discriminating value (Tabachnick, Fidell, & Osterlind, 2001). In addition, the author used a new criterion to check the discriminant value of the scale, Heterotrait-Montrait coefficient (HTMT), a more rigorous coefficient than Fornell và Larcker (1981) when assessing the discriminant value of scale (Henseler, Ringle, & Sarstedt, 2015). Table 3 shows the HTMT coefficients ranging from 0.47 to 0.69, lower than 0.85 (Hair, Hult, Ringle, Sarstedt, et al., 2017). This further proves that the scale in the model achieves distinctive value.

Furthermore, this study also examined the corresponding variance inflation factor (VIF) values of the independent variables to check for potential

multicollinearity issues (O'Brien, 2007). The results show that the VIF values for each relationship between the independent variables in the proposed model ranged from 1.00 to 1.297, lower than threshold 5 (Hair, Hult, Ringle, & Sarstedt, 2017), confirming that the study does not have a problem of multicollinearity.

4. FINDINGS AND DISCUSSIONS

The verification of hypotheses in the model is carried out by the author group using SmartPLS3 software. To provide evidence for the testing of proposed hypotheses, the author assessed the magnitude and the statistically significant level of each path in the structural model. The test results are presented in detail in Table 4, including the coefficients β , the t-values for paths in the model, along with the R^2 adjusted for each endogenous structure. Indicators are calculated based on 3,000 bootstrapping samplings.

Based on the research results proposed by Henseler, Hubona, and Ray (2016), the authors calculated the model's SRMR of 0.06, which is less than the proposed level of 0.08. This result shows that the research model has a relative relevance to the collected data. Moreover, the results of the data analysis showed that the adjusted R^2 coefficient of the three dependent variables is higher than the minimum threshold of 0.10 (PMS is 0.23 and performance is 0.42), which demonstrate that the proposed research model has a suitable level for the collected data (Hair, Hult, Ringle, & Sarstedt, 2017).

Table 4: Partial least squares result for theoretical model

Hypothesis	Dependent variable	PMS		Performance	
		β	t-value	β	t-value
Direct effects					
H ₁	Top management support			0.16	2.78***
H _{2a}	Top management support	0.48	8.31***		
H _{2b}	PMS			0.56	9.53***
Indirect effects					
H ₂	Top management support ----> PMS ----> Performance: $\beta = 0.27$; t-value = 6.28***				
Adjusted R²		0.23		0.42	

Notes: ***: Correlation is significant at the 1% level (2-tailed t-test).

Firstly, Hypothesis H₁ suggests that TMS has a positive impact on the performance of public organizations in Vietnam. This can be interpreted as when senior managers enhance staff support as well as support active management practices, organizational performance will be improved. The data analysis results in Table 4 show that this hypothesis is accepted with a high statistical significance at 0.01 level ($t = 2.78$), for which the coefficient β for the path from top management support to performance is 0.16. Secondly, hypothesis H_{2a} suggests that TMS has a positive impact on PMS, which means that managers are more interested in adopting results management practices, the more effective PMS is. The data analysis results in Table 4 show that this hypothesis is accepted with a 1% statistical significance (t -value of 8.31), with a coefficient β of 0.48. Next, hypothesis H_{2b} postulates that PMS positively affects the performance of public organizations in Vietnam. That is, when the public organization applies the PMS successfully, it will help to accurately assess the results of the organization, so they will find solutions to improve their performance. This hypothesis is confirmed because the coefficient β for the path from PMS to performance is 0.56 and is therefore accepted with a 1% statistical significance ($t = 9.53$).

Finally, the author examines hypothesis H₂, ie, examining the indirect impact of TMS on performance through the mediating variable is PMS. According to Hair, Hult, Ringle, and Sarstedt (2017), the two direct effects are statistically significant and have been proposed as the conditions required to confirm the intermediate effect. It means that, if PMS is the mediating variable between top management support and performance, the direct effect between TMS and PMS as well as PMS and performance must be statistically significant. Therefore, the author exam statistically significant level for two hypothesis H_{2a} and H_{2b}. The results (Table 4) show that the indirect effect of TMS on performance is confirmed ($\beta = 0.27$, t -value = 6.28). Therefore, PMS does not fully (but it does partially) mediate the link between TMS and performance, thus supporting H₂.

Besides, to evaluate the fitness of both inner-structural and outer-measurement models to the data simultaneously, we test the standardized root mean squared residual (SRMR) value of the composite model. Data analysis results show that the SRMR of 0.058 was lower than the recommended value of 0.08, indicating a good model fit in our study (Henseler et al., 2016).

5. CONCLUSION AND IMPLICATION

5.1. Theoretical implications

This study inspects the relationships among TMS, PMS and performance within organizations in a developing

country, which is largely overlooked in the extant literature. First, it confirms the TMS – performance relationship, this implication is also evidenced by previous studies such as Ahyaruddin and Akbar (2016), Riaz Ahmed (2016). This result defines TMS in positive support to encourage employees to share their knowledge to improve organizational performance (J.-C. Lee et al., 2016). Therefore, this study extends this knowledge to investigate the direct impact of top management on organizational performance in the public sector in Vietnam. Second, PMS has a long tradition within public policy and management (Johnsen, 2005). The study has shown that PMS has a positive mediating effect on the link between TMS and performance. This mediating effect supports the institutional theory in explaining the role of TMS in promoting performance in the context of public organizations in a transitional economy and the accounting functions in public organization. Building upon this theories, the research finds that senior manager who motivates and inspires employees, encourages them to reach organization goals are more likely to engage in growing PMS, which in turn enhances the organizational performance. In this aspect, this study makes a unique contribution to the manager's behavior and the organizational performance literature by unraveling a pathway that TMS to organizational performance, and PMS in the public sector.

5.2. Managerial implications

Beyond these expected theoretical contributions, this study has several implications for public organizations in Vietnam and other emerging countries. First, the study verifies the PMS role in a public organization, that helps the organization monitor the implementation of plans, evaluate when the implement plans fail, and determine how to improve them (Atkinson, Waterhouse, & Wells, 1997). Nowadays, some countries have mandated performance measurements in local or central government (Johnsen, 2005), mainly in developed countries such as the UK, Finland, the Netherlands and Sweden (Johansson & Siverbo, 2009), USA, Australia (Hawke, 2012). In some developing countries such as Malaysia (Ruzita, Azhar, & Hasan, 2012) or Indonesia (Sofyani et al., 2018), the measurement of results is also required by the local and central authorities. However, in Vietnam today, result measurement is not required, but is encouraged, and whether and how to apply it depends on the choices of each public agency. Therefore, the results of this study help managers as well as policy-making agencies in Vietnam public sector recognize the important role of PMS in measuring and evaluating oganizational performance. They use some way to promote the PMS application. In other words, these organizations should actively manage the connection between TMS and performance by using PMS. This study calls on managers to consider PMS as an important mediating

device that can make the performance outcomes better. These implications are significant because result evaluation tools are not popular and omission in the reforming public sector like Vietnam, a transition economy.

In addition, this study has also pointed out an important factor that affects the successful implementation of PMS as well as positively affects performance, which is TMS. As mentioned above, the result measure in the public sector in Vietnam is not mandatory, so through the research outcome, we find that the performance measures have not been fully implemented in Vietnam public units. Most of the public units have just only evaluated the quantitative results, while the qualitative results are not much concerned and implemented effectively. Therefore, the results information that public units provide to the superior as well as public to stakeholders will not accurately represent the unit's performance. And this is intended to affect the decision making of regulators or stakeholders when using the results information provided. Consistent with Mimba, Jan van Helden, and Tillema (2007), we found that the results information provided by public sector organizations in developing countries is probably quite limited because of a simple outcome measurement system. From this argument, public entities need to improve their organizational and technical factors to comprehensively measure their performance (Cavalluzzo & Ittner, 2004; Sofyani et al., 2018). The TMS factor is considered to be the most important organizational factor that affects the behavior of all members in the organization (J.-C. Lee et al., 2016). Therefore, the public organization should pay attention to enhancing senior management's support for the organization's operations in general and the implementation of the PMS in particular. To accomplish this, first of all, top managers need to be aware of the importance of using result measuring indicators, including quantitative and qualitative performance measures. Then, they should commit to using results information to motivate the adopting and maintaining PMS. The training of measurement techniques for employees is also essential to make the process of result measuring faster, easier and get more accurate results information. Accordingly, the managers should increase the application of information technology to operate as well as to measure the results. Therefore, top managers have to provide sufficient resources to actively support the implementation of the PMS for the organization.

5.3. Limitation and suggestions

Besides the results achieved, this study is subject to several limitations. First of all, the sample is not representative of the public sector in Vietnam. The public sector in Vietnam is very large. The total number of units in the public sector as of 31/12/2017 was 143.7 thousand units (General Statistics Office,

2018). Therefore, the analysis based on 219 data samples collected in 10 provinces across the country does not cover the entire public sector in Vietnam. Future research should expand the sample size to increase the representation of the public sector as a whole.

Secondly, only each respondent was required to answer the entire questionnaire as a representative of an organization, so the response bias is more likely to occur. Therefore, future studies should measure independent and dependent variables from different sources (e.g., staff responding to TMS questions, managers responding to PMS and performance questions) to minimize the impact of method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Thirdly, this study discusses the PMS quite generally. It could be more interesting if future researchers examine the more specific effects of public performance measurement tools such as the balanced scorecard (BSC) (Kaplan & Norton, 2001); benchmarking (Kouzes, 1999); total quality management (Dewhurst, 1999).

Last but not least, this study only addresses the role of TMS. According to institutional theory, other internal and external factors also have a significant direct influence on the PMS, such as organizational culture (Henri, 2006), organization structure, or competition (C.-L. Lee & Yang, 2011). Or some important organizational factors according to contingency theory (Akbar, Pilcher, & Perrin, 2012) that future studies can consider such as organizational size, time of operation, human capacity and organizational commitment. Further research should consider the impact of these factors on the relationship between PMS and performance.

6. REFERENCES

- [1] Ahyaruddin, M., & Akbar, R. (2016). The relationship between the use of a performance measurement system, organizational factors, accountability, and the performance of public sector organizations. *Journal of Indonesian Economy and Business*, 31(1), 1-22. doi:10.22146/jieb.10317.
- [2] Akbar, R., Pilcher, R., & Perrin, B. (2012). Performance measurement in Indonesia: the case of local government. *Pacific Accounting Review*, 24(3), 262-291. doi:10.1108/0114058121128378.
- [3] Alam, M. M., Said, J., & Abd Aziz, M. A. (2018). Role of integrity system, internal control system and leadership practices on the accountability practices in the public sectors of Malaysia. *Social Responsibility Journal*, 15(7), 955-976. doi:10.1108/SRJ-03-2017-0051.

- [4] Atkinson, A. A., Waterhouse, J. H., & Wells, R. B. (1997). A stakeholder approach to strategic performance measurement. *Sloan Management Review*, 38(3), 25-37.
- [5] Baird, K., Harrison, G., & Reeve, R. (2007). Success of activity management practices: the influence of organizational and cultural factors. *Accounting & Finance*, 47(1), 47-67. doi:10.1111/j.1467-629X.2006.00195.x
- [6] Bass, B. M. (1999). Two decades of research and development in transformational leadership. *European journal of work and organizational psychology*, 8(1), 9-32. doi:10.1080/135943299398410.
- [7] Behn, R. D. (2003). Why measure performance? Different purposes require different measures. *Public administration review*, 63(5), 586-606. doi:10.1111/1540-6210.00322.
- [8] Boston, J. (2016). Basic NPM ideas and their development. In *The Ashgate research companion to new public management* (pp. 33-48): Routledge.
- [9] Brignall, S., & Modell, S. (2000). An institutional perspective on performance measurement and management in the "new public sector". *Management Accounting Research*, 11(3), 281-306. doi:10.1006/mare.2000.0136.
- [10] Broadbent, J., & Guthrie, J. (2008). Public sector to public services: 20 years of "contextual" accounting research. *Accounting, Auditing & Accountability Journal*, 21(2), 129-169. doi:10.1108/09513570810854383.
- [11] Cavalluzzo, K. S., & Ittner, C. D. (2004). Implementing performance measurement innovations: evidence from government. *Accounting, organizations and society*, 29(3-4), 243-267. doi:10.1016/S0361-3682(03)00013-8
- [12] Dewhurst, F. (1999). TQM in public organisations: an examination of the issues. *Managing Service Quality: An International Journal*, 9(4), 265-274. doi:10.1108/09604529910273210.
- [13] DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American sociological review*, 48(2), 147-160. doi:10.2307/2095101.
- [14] Doan, N. P. A., & Nguyen, D. T. (2013). Accounting in a developing transitional economy: The case of Vietnam. *Asian Review of Accounting*, 21(1), 74-95. doi:10.1108/13217341311316959.
- [15] Dunleavy, P., & Hood, C. (1994). From old public administration to new public management. *Public money & management*, 14(3), 9-16. doi:10.1080/09540969409387823.
- [16] Fine, T., & Snyder, L. (1999). What is the difference between performance measurement and benchmarking. *Public Management*, 81(1), 24-25.
- [17] Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of marketing research*, 382-388.
- [18] Fry, L. W., & Matherly, L. L. (2006). *Spiritual leadership and organizational performance: An exploratory study*. Paper presented at the Annual Meeting of the Academy of Management, Atlanta-Georgia.
- [19] General Statistics Office. (2018). *Statistical Yearbook 2017*.
- [20] Greenfield, D. (2007). The enactment of dynamic leadership. *Leadership in Health Services*, 20(3), 159-168. doi:10.1108/17511870710764014.
- [21] Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (Vol. Second edition). The United States of America: Sage Publications.
- [22] Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Thiele, K. O. (2017). Mirror, mirror on the wall: A comparative evaluation of composite-based structural equation modeling methods. *Journal of the Academy of Marketing Science*, 45(5), 616-632. doi:10.1007/s11747-017-0517-x.
- [23] Halachmi, A. (2002). Performance measurement, accountability, and improved performance. *Public Performance & Management Review*, 25(4), 370-374. doi:10.1080/15309576.2002.11643674.
- [24] Hawke, L. (2012). Australian public sector performance management: success or stagnation? *International Journal of Productivity and Performance Management*, 61(3), 310-328.
- [25] Henri, J.-F. (2006). Organizational culture and performance measurement systems. *Accounting, organizations and society*, 31(1), 77-103. doi:10.1016/j.aos.2004.10.003.
- [26] Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: Updated guidelines. *Industrial Management & Data Systems*, 116(1), 2-20. doi:10.1108/IMDS-09-2015-0382.

- [27] Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135. doi:10.1007/s11747-014-0403-8.
- [28] Hulland, J. S. (1999). The effects of country-of-brand and brand name on product evaluation and consideration: A cross-country comparison. *Journal of International Consumer Marketing*, 11(1), 23-40. doi:10.1300/J046v11n01_03.
- [29] Johansson, T., & Siverbo, S. (2009). Explaining the utilization of relative performance evaluation in local government: A multi-theoretical study using data from Sweden. *Financial Accountability & Management*, 25(2), 197-224. doi:10.1111/j.1468-0408.2009.00474.x
- [30] Johnsen, Å. (2005). What does 25 years of experience tell us about the state of performance measurement in public policy and management? *Public Money and Management*, 25(1), 9-17. doi:10.1111/j.1467-9302.2005.00445.x
- [31] Julnes, P. d. L., & Holzer, M. (2001). Promoting the utilization of performance measures in public organizations: An empirical study of factors affecting adoption and implementation. *Public administration review*, 61(6), 693-708. doi:10.1111/0033-3352.00140.
- [32] Kaplan, R. S., & Norton, D. P. (2001). Transforming the balanced scorecard from performance measurement to strategic management: Part I. *Accounting horizons*, 15(1), 87-104. doi:10.2308/acch.2001.15.1.87.
- [33] Kloot, L. (1999). Performance measurement and accountability in Victorian local government. *International Journal of Public Sector Management*, 12(7), 565-584. doi:10.1108/09513559910308039.
- [34] Kouzmin, A. (1999). Benchmarking and performance measurement in public sectors: Towards learning for agency effectiveness. *International Journal of Public Sector Management*, 12(2), 121-144. doi:10.1108/09513559910263462.
- [35] Lee, C.-L., & Yang, H.-J. (2011). Organization structure, competition and performance measurement systems and their joint effects on performance. *Management Accounting Research*, 22(2), 84-104. doi:10.1016/j.mar.2010.10.003.
- [36] Lee, J.-C., Shiue, Y.-C., & Chen, C.-Y. (2016). Examining the impacts of organizational culture and top management support of knowledge sharing on the success of software process improvement. *Computers in Human Behavior*, 54, 462-474. doi:10.1016/j.chb.2015.08.030.
- [37] Malmi, T. (1997). Towards explaining activity-based costing failure: accounting and control in a decentralized organization. *Management Accounting Research*, 8(4), 459-480.
- [38] McGowan, A. S., & Klammer, T. P. (1997). Satisfaction with activity-based cost management implementation. *Journal of management accounting research*, 9, 217.
- [39] Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American journal of sociology*, 83(2), 340-363. doi:10.1086/226550.
- [40] Mimba, N. P. S. H., Jan van Helden, G., & Tillema, S. (2007). Public sector performance measurement in developing countries: A literature review and research agenda. *Journal of Accounting & Organizational Change*, 3(3), 192-208. doi:10.1108/18325910710820265.
- [41] Modell, S. (2001). Performance measurement and institutional processes: a study of managerial responses to public sector reform. *Management Accounting Research*, 12(4), 437-464. doi:10.1006/mare.2001.0164.
- [42] Modell, S. (2004). Performance measurement myths in the public sector: a research note. *Financial Accountability & Management*, 20(1), 39-55. doi:10.1111/j.1468-0408.2004.00185.x
- [43] Modell, S. (2009). Institutional research on performance measurement and management in the public sector accounting literature: a review and assessment. *Financial Accountability & Management*, 25(3), 277-303. doi:10.1111/j.1468-0408.2009.00477.x
- [44] Nuhu, N. A., & Appuhami, R. (2016). The association between the use of management accounting practices with organizational change and organizational performance. In K. Baird (Ed.), *Advances in Management Accounting* (Vol. 26, pp. 67-98): Emerald Group Publishing Limited.
- [45] O'brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & quantity*, 41(5), 673-690. doi:10.1007/s11135-006-9018-6.

- [46] Oliver, C. (1991). Strategic responses to institutional processes. *Academy of management review*, 16(1), 145-179. doi:10.5465/amr.1991.4279002.
- [47] Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of applied psychology*, 88(5), 879-903. doi:10.1037/0021-9010.88.5.879
- [48] Poister, T. H., & Streib, G. (1999). Performance measurement in municipal government: Assessing the state of the practice. *Public administration review*, 325-335. doi:10.2307/3110115
- [49] Ragu-Nathan, B. S., Apigian, C. H., Ragu-Nathan, T., & Tu, Q. (2004). A path analytic study of the effect of top management support for information systems performance. *Omega*, 32(6), 459-471. doi:10.1016/j.omega.2004.03.001
- [50] Riaz Ahmed, P. P. (2016). *Top Management Support and Project Performance: An Empirical Study of Public Sector Projects*. Paper presented at the Proceedings of the International Annual Conference of the American Society for Engineering Management.
- [51] Ruzita, J., Azhar, R., & Hasan, H. A. (2012). Performance measurement practices of public sectors in Malaysia. *Journal of Global Strategic Management*, 11, 42-56.
- [52] Smith, G. S. (1988). Performance evaluation for nonprofits. *Nonprofit World*, 6(1), 24-26.
- [53] Sofyani, H., Akbar, R., & Ferrer, R. C. (2018). 20 years of Performance Measurement System (PMS) implementation in Indonesian local governments: Why is their performance still poor? *Asian Journal of Business and Accounting*, 11(1), 151-227. doi:10.22452/ajba.vol11no1.6
- [54] Spekle, R. F., & Verbeeten, F. H. (2014). The use of performance measurement systems in the public sector: Effects on performance. *Management Accounting Research*, 25(2), 131-146. doi:10.1016/j.mar.2013.07.004
- [55] Subramaniam, A., Othman, R., & Sambasivan, M. (2010). Implicit leadership theory among Malaysian managers. *Leadership & Organization Development Journal*, 31(4), 351-371. doi:10.1108/01437731011043366.
- [56] Tabachnick, B., Fidell, L., & Osterlind, S. (2001). *Using multivariate statistics*. Needham Heights, MA: Allyn & Bacon.
- [57] Tran, T. B. (2014). The cycle of transparency, accountability, corruption, and administrative performance: evidence from Vietnam. *Journal of Economics and Development*, 16(3), 32-48.
- [58] Van, V.-D. P. (2010). Different uses of performance measures: The evaluation versus reward of production managers. *Accounting, organizations and society*, 35(2), 141-164. doi:10.1016/j.aos.2009.02.002
- [59] Verbeeten, F. H. (2008). Performance management practices in public sector organizations: Impact on performance. *Accounting, Auditing & Accountability Journal*, 21(3), 427-454. doi:10.1108/09513570810863996.
- [60] Wang, W., Liu, W., & Mingers, J. (2015). A systemic method for organisational stakeholder identification and analysis using Soft Systems Methodology (SSM). *European Journal of Operational Research*, 246(2), 562-574. doi:10.1016/j.ejor.2015.05.014.
- [61] Yen, T., & Nguyen, N. P. (2020). The impact of the performance measurement system on the organizational performance of the public sector in a transition economy: Is public accountability a missing link? *Cogent Business & Management*, 7(1). doi: <https://doi.org/10.1080/23311975.2020.1792669>.
- [62] Zheng, Y., Wang, W., Liu, W., & Mingers, J. (2019). A performance management framework for the public sector: The balanced stakeholder model. *Journal of the Operational Research Society*, 70(4), 568-580. doi:10.1080/01605682.2018.1448247.

TAKING THE UNIVERSAL AND CONTINGENCY APPROACH IN EXPLORING THE RELATIONSHIP BETWEEN TOP MANAGEMENT COMMITMENT, EMPLOYEE COMPENSATION AND AFFECTIVE COMMITMENT

Nguyen Thi Lien Huong

Faculty of Business Management, National Economics University, Hanoi, Vietnam

Corresponding author: mymuaha@yahoo.com

Abstract

The relationship between HRM and employees in an organization has long been examined by scholars around the world. Still there are many blackboxes remain that prevent our full understanding of the impact between HRM practices and employees of an organization. Taking the usual universal approach, this paper attempted to examine the impact that top management commitment and one key HRM practice – employee compensation, influenced on the most focused employee commitment dimension – affective commitment. Moreover, the paper further contributed to the current universal approach by examining the moderating effect of employee compensation on the direct relationship between top management commitment and employee's affective commitment. The model was tested using multiple regression method and its results supported the universal approach which confirm the direct positive impact of top management commitment and employee compensation on affective commitment of employee. Interestingly, however, that once employee has affective commitment with the organization, further enhancement in employee compensation does not further increase affective commitment.

Keywords: organization commitment, employee compensation, top management commitment, affective commitment, HRM practices.

1. INTRODUCTION

Employee has long been considered an asset of every organization. Many organizations make intensive investment in its employee in an attempt to improve its productivity and performance. For organization, getting to know which employee-focused factors bring out the most significant impacts is crucial for its success. Many studies in the field of organization commitment and the dimensions of it that an employee possessed had been conducted but results are still under debate. Researchers believe that there are still many black-boxes in understanding the nature of commitment and the relationships that associated with it. The dominant theory in this research field has been the Three component of commitment by Meyer and Allen. According to them, employee commitment is a psychological state characterized by the relationship between members and their organization which in turn will impact their decision of whether or not they will maintain their membership with the organization. From this point of view, organization commitment is a rational cognitive process of an individual about his/her emotion (affective commitment), benefits (continuance

commitment) and obligation (normative commitment). Previous studies shown that organization wishes to improve the number of employee with affective commitment since these people are proved to exhibit better productivity and performance (Williams & Anderson, 1991; Cohen, 2003), lower absenteeism and turnover (Cohen, 2003) as well as many other positive impacts. Research has also shown that the organization might consider nurture a certain level of normative commitment since people exhibit this dimension tends to contribute more and possess higher tolerance level with accepting and solving challenging task (Saal & Knight, 1987; Meyer & Allen, 1997). The one dimension that organization works hard to hinder is continuance commitment due to the ever-calculation of staying benefits and leaving costs as well as the tendency of avoiding works if possible. Therefore, the need to understand factors that impact each dimension of employee commitment becomes an interesting topic of this research field. The results from such studies not only help filling in the black-box of understanding organization commitment but also gives implications for top management of organization in their policies and practices set up. In this paper, employee

commitment will be examined in the garment and textile industry, a top prioritized industry of Vietnamese government in the coming years. This industry is labour intensive and is the house of upto 3 millions Vietnamese worker so far (VITAS, 2017). The workforce of Vietnamese garment and textile company has been rather unstable with majority of female and unskilled worker. It is crucial for management of garment and textile companies to look into the factors that helps improve their worker's organization commitment in order to opt for a more stable workforce.

2. LITERATURE REVIEW

According to Cohen (2003), the concept of employee commitment is widely used in previous organization psychology studies. Preliminary studies on this issue look at organizational engagement from a unidirectional perspective, based on attitudes, focusing on identification, engagement and loyalty (Porter et al., 1974). Porter and his colleagues looked at commitment as a sense of attachment characterized by the intention to stay with the organization, the identification of the values and the goals of the organization and the willingness to devote efforts that are beyond one's responsibility for the organization. Individuals see things to the extent of how their personal values and goals related to the values and goals of the organization as part of their commitment with the organization so the concept of Porter and associates was seen as the link between a working individual and the underlying organization. Another traditional view of organization commitment rooted from the Side-bet theory of Becker (1960) and further by the introduction of the term "exchange theory" (Alutto et al., 1973). This view assumes individuals will stay with an organization as long as they can hold their positions at the organization and are not affected by the stressing conditions they may face but if better or equivalent benefits are offered, they may be willing to leave the organization. Mowday et al (1982) also support this view by defining organizational commitment in their research as a behavior related to the process by which an individual is tied to an organization and how they handle this process. This behavioural perspective view of commitment is shown in the calculative or normative commitment where individual will continue their stay with the organization based on a balance between the benefits and costs of leaving the organization (Hrebiniak & Alutto, 1972) or when commitment is a reaction or intention being bounded by an individual's view of the normative pressures on the issue respectively.

This paper adopts Meyer and Allen (1997) view and framework for organization commitment. Meyer and Allen (1984) initially identified organization commitment by 2 terminologies: affective commitment and continuance commitment. They defines affective

attachment as a positive emotion about identifying, engaging with and participating in the organization activities and continuance commitment is the extent to which an employee feels attached to the organization by realizing the costs they think will occur with leaving their current job. In 1990, Allen and Meyer added to their model a third dimension of commitment called normative commitment where employee felt a sense of responsibility to stay with an organization. In 1997, Meyer and Allen supplemented this three-dimensional definition of organization commitment by asserting that commitment is a psychological state characterized by the relationship between members and organization which has an influence on whether to continue or suspend membership with the said organization.

Organizations nowadays are facing a challenging, rapidly changing and competitive environment in globalization era. Advanced technology, rapid change of customer needs, and a diverse workforce... further complicated the impact. With changes in the current business environment, a change in the way of organizations operate and manage is needed. Organizations need to attract and retain the right employees for their organization to succeed in the global marketplace. According to Felstead et al. (2001), in the first decade of the 21st century, management science focused on the transition from control to commitment and made commitment as a primary goal in organizational HR management policies. According to Arnold (2005), organizational commitment can be nurtured by leading individuals through positive experiences. HRM practices are seen as effective tools to enhance organizational commitment (Ulrich, 1997). Studies have been carried out in many countries in many different fields such as banking, academia, the IT software industry, high-tech innovation industries and manufacturing industries, and the results show that HRM has a significant positive effect on organizational commitment (Browning, 2006; Nasurdin et al, 2008; Hemdi, 2009; Herrbach et al., 2009; Gellatly et al., 2009; Tremblay, 2010; Scheible and Bastos, 2013). Studies also shown that HRM measures can significantly shape behavioral aspects (Rizvi, 2010; Mossholder et al., 2011; Barratt-Pugh et al, 2013) that engages employees in building commitment. Meyer and Smith (2000) argue that there is a positive relationship between HRM measures and commitment in which HRM practices orient the employees to increase the level of commitment to the organization. Even so, the potential effect of HRM measures on employee organizational commitment received far less attention than needed (Meyer and Smith, 2000).

3. RESEARCH HYPOTHESES AND METHODOLOGY

Theoretically, commitment can be found at any level of the entire organization but the role of top management is especially important as they can make decisions

related to planning, deploy and allocate of resources needed for any organization activities (Ginsberg, 1994; Oliver, 1997; Bansal and Roth, 2000; González-Benito and González-Benito, 2010). Top management occupy a decisive role in the success or failure of an organization in almost all aspects (Wheelen and Hunger, 2006). Harari (1993) recognized this point before and noted that personnel at all levels will become "boss followers". In other words, they will prioritize the tasks that their managers like. If their managers prioritize employee commitment, they will prioritize employee commitment and vice versa. Thus, improving employee organizational commitment should be initiated at the top level, with a clear commitment and a determination to success. In Vietnam, top management commitment may play an even more important role than in Western countries because the culture in Vietnam has many characteristics of top-down hierarchical governance. Labor often relies on senior managers for decision making (Tiessen, 1995).

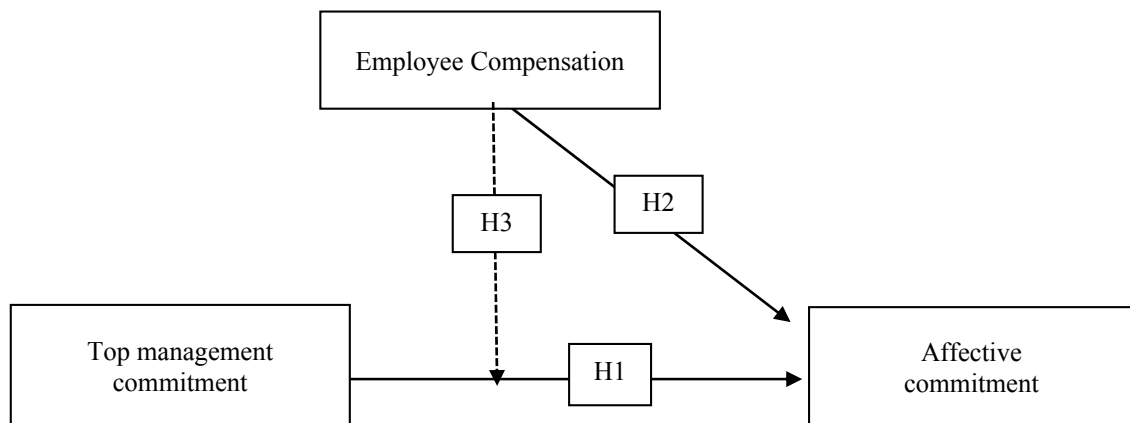
Based on the above description, it can be concluded that top management commitment is a key to fostering success in many aspects of the organization including the employee's commitment to the organization and related HRM practices. This paper will limit the empirically research to the scope of affective commitment, the dimension that all organization wishes to flourish.

H1: Top management commitment has a direct positive relationship with affective commitment.

HRM experts, even in the early studies, agreed that HRM practices are important predictors of employee organizational commitment (Beer et al., 1984, 1985; Guest, 1997). Literature review shown that although there are many different HRM practices that have been studied over the years in many different industries, contexts and countries, there are some measures that was named more frequent than others. Amongst them, employee compensation was agreed by most studies to have a significant impact universally to organization commitment (Mowday et al, 1982; Mottaz, 1988; Igbaria & Greenhaus, 1992; Milgrom và Roberts, 1992; Armstrong, 2008). Therefore, it is hypothesized that employee compensation has a positive direct relationship with affective commitment. This paper also aims to test the contingency impact that employee compensation have on the relationship between top management commitment and employee affective commitment in order to provide emperical evidence to the few studies using contingency approach in Vietnam.

H2: Employee compensation have a positive direct relationship with affective commitment.

H3: Employee compensation moderates the relationship between top management commitment and affective commitment in a posive way.



Source: Author's proposal

Figure 1: Research model

Sample was taken from the VITAS members directory list. This is the biggest association of Vietnamese garment and textiles company. A spread of survey area to all 3 regions of Vietnam has been taken to ensure the representative aspect of the sample. Sample was selected on a random basic. Questionnaire table inherited from Jun et al (2006) for top management commitment scale, from Wright, Gardner and Mohiyan (2003) for employee compensation and Meyer and Allen (1997) for affective commitment. A qualified expert was

invited to conduct the translation of the questionnaire to Vietnamese. And another separate qualified expert was invited to translate this Vietnamese version back to English to ensure the consistency and accurate of wordings. A pilot study of 30 respondents was conducted before mass sending and some recommendation of words and rephrase were made so the questionnaire will be more user-friendly to the workers at garment and textile factories. The survey took place in April and May 2020 with 32 companies

agreed to participate. Each company were asked to provide 25 answered questionnaire. According to Hair et al (2009) the minimum sample size should at least be 5 times the number of model variables therefore the above sample size satisfied requirement. Out of 800 returned questionnaire, 511 (64%) were found completed and qualified for model analysis. Quantitative research method is chosen and the analysis underwent reliability test by Cronbach Alpha, EFA analysis, Pearson correlation test and multiple linear regression via SPSS.

4. RESEARCH RESULTS

The descriptive statistics were shown in Table 1 above. In general, the sample characteristics are in line with facts and figures from VITAS report of garment and textile industry where women is dominant, wide range

of ages but mostly fall in younger tier of 18 to 30 and 31 to 45. The year of services statistic has been rather equal with similar contribution percentage from all tiers. There are more domestic companies than companies with foreign investment. The education level of respondents for this survey has a wide range as well but with 84.6% high school qualification and over, the accuracy of respondents' answers is better.

Reliability test

Reliability of scales was tested using Cronbach's Alpha method. Table 2 summarizes the result of top management commitment, employee compensation and affective commitment Cronbach's Alpha test. In short, all the scales being used in this research are reliable ($\alpha > 0,8$) and after this test no variable was excluded (α if deleted all less than scale's α).

Table 1: Descriptive statistics of the sample

Descriptive statistic item	Frequency	Percentage
1. Years of service		
Under 3 years	93	18.2
From 3 to 5 years	135	26.4
From 5 to 10 years	143	28.0
Over 10 years	140	27.4
2. Age		
Under 18	8	1.6
From 18 to 30 years old	255	49.9
From 31 to 45 years old	211	41.3
From 45 to 55 years old	35	6.8
Over 55 years old	2	0.4
3. Gender		
Women	335	65.6
Men	176	34.4
4. Education level		
Primary school	4	0.8
Secondary school	75	14.7
High school	238	46.6
Vocational school	97	19.0
Others	97	19.0
5. Geographical area		
North of Vietnam	246	48.1
Central of Vietnam	105	20.5
South of Vietnam	160	31.3
6. Types of company		
Domestic	421	82.4
Foreign investment	90	17.6

Table 2: Reliability test results using Cronbach's Alpha

Item	Scale mean if Item deleted	Scale variance if Item deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item deleted
Top management commitment (TM): Cronbach's Alpha = 0.804				
TM1	6.92	2.41	0.612	0.770
TM2	6.72	2.24	0.677	0.703
TM3	6.78	2.24	0.662	0.719
Employee compensation (EC): Cronbach's Alpha = 0.808				
EC1	7.01	2.680	0.612	0.782
EC2	6.96	2.473	0.702	0.692
EC3	7.17	2.305	0.662	0.735
Affective commitment (AC): Cronbach's Alpha = 0.885				
AC1	23.51	18.15	0.610	0.876
AC2	23.84	18.74	0.558	0.880
AC3	23.74	18.37	0.688	0.867
AC4	23.77	17.99	0.702	0.866
AC5	23.76	18.19	0.677	0.868
AC6	23.77	18.20	0.672	0.869
AC7	23.82	18.06	0.695	0.866
AC8	23.73	18.49	0.638	0.872

Validity test using EFA

Results of EFA analysis are presented in Table 3. This sample has a KMO of 0.906 with a sig. of $0.000 < 0.05$ and a total variance explained of $63.53\% > 50\%$ so it satisfied the basic validity requirements. Further more, factor loadings of the variables are all greater than 0.5

which shows that the model and the data are well fitted. The distribution of rotated component matrix also shown that the data passed discriminant and convergent validity. After EFA analysis, no variable was excluded from the model.

Table 3: Validity test results using EFA
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.906
Bartlett's Test of Sphericity	Approx. Chi-Square
	3322.963
	df
	91
	Sig.
	.000

Rotated Component Matrix^a

	Component		
	1	2	3
AC4	.795		
AC3	.771		
AC7	.745		
AC6	.724		
AC5	.695		
AC8	.664		
AC2	.625		
AC1	.597		
TM2		.809	
TM3		.783	
TM1		.746	
EC3			.846
EC2			.846
EC1			.703

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Multi-collinearity test using Pearson's correlation

The strength of linear correlation between the variables and the multi-collinearity test was conducted using Pearson's correlation. The result of the test is presented

in Table 4 below. In general, all the r's results were at acceptable level with the highest r of 0.556 shown only a moderate strength of correlation. There is no signal of multi-collinearity issue.

Table 4: Results of Pearson's correlation
Correlations

		TM	EC	AC
TM	Pearson Correlation	1	.506**	.556**
	Sig. (2-tailed)		.000	.000
	N	511	511	511
EC	Pearson Correlation	.506**	1	.451**
	Sig. (2-tailed)	.000		.000
	N	511	511	511
AC	Pearson Correlation	.556**	.451**	1
	Sig. (2-tailed)	.000	.000	
	N	511	511	511

** . Correlation is significant at the 0.01 level (2-tailed).

Hypotheses testing

Multiple linear regression is used to test the hypotheses. Results concluded that both top management commitment and employee compensation has positive direct relationship with affective commitment. Together top management commitment and employee compensation can explain 34.5% of the changes in affective commitment. A separate regression run shown that top management commitment alone can explain 30.7% of changes in affective commitment while employee compensation

alone can explain 20.2% of it which is significant considering the large number of HRM practices at organization level.

With ANOVA's sig. < 0.05; coefficient's sig. < 0.05 and VIF < 2. both variables has statistical meaning relationships with affective commitment with no collinearity in which top management commitment has a stronger impact ($\beta = 0.440$) and employee compensation has a milder impact ($\beta = 0.229$). Table 5 brings out the regression result for these universal hypotheses.

Table 5: Regression results of universal hypotheses*Model Summary^b*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.590 ^a	.348	.345	.49014	.348	135.430	2	508	.000	2.080

a. Predictors: (Constant), EC, TM

b. Dependent Variable: AC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.070	2	32.535	135.430	.000 ^b
	Residual	122.039	508	.240		
	Total	187.109	510			

a. Dependent Variable: AC

b. Predictors: (Constant), EC, TM

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.488	.119		12.466	.000		
	TM	.369	.035	.440	10.597	.000	.744	1.343
	EC	.184	.033	.229	5.508	.000	.744	1.343

a. Dependent Variable: AC

A test of the contingency hypothesis shown that if workers in the garment and textile companies of Vietnam already possess affective commitment with the organization then compensation will not further enhance strength of top management impact on

employee affective commitment. *The contingency hypothesis was denied due to unaccepted sig. (0.311) > 0.05 and also high VIF (>10)*. Table 6 presents the regression results of contingency hypothesis.

Table 6: Regression results of contingency hypothesis
Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.591 ^a	.349	.345	.49012	.349	90.634	3	507	.000	2.072

a. Predictors: (Constant). EC. TM. TMxEC

b. Dependent Variable: AC

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.317	3	21.772	90.634	.000 ^b
	Residual	121.792	507	.240		
	Total	187.109	510			

a. Dependent Variable: AC

b. Predictors: (Constant). EC. TM. TMxEC

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.183	.324		3.658	.000		
	TMxEC	-.029	.028	-.204	-1.014	.311	.032	31.632
	TM	.464	.100	.554	4.620	.000	.089	11.207
	EC	.279	.099	.346	2.811	.005	.085	11.829

a. Dependent Variable: AC

Therefore, H1 and H2 (universal) are accepted and H3 (contingency) is denied after regression analysis in this research. The accepted hypotheses are:

H1: Top management commitment has a direct positive relationship with affective commitment

H2: Employee compensation have a positive direct relationship with affective commitment.

5. IMPLICATIONS AND CONCLUSION

This paper research results have several implication in both theoretical and practical aspects. Theoretically, this paper contributed in to the research of HRM and organization commitment by looking in both universal and contingency approach. Although many HRM researchers have argued that HRM strategies and practices can be more effective if the plans and their implementation are supported by senior management and vice versa (Garavan, 1991; Torraco and Swanson, 1995; McCracken and Wallace, 2000; Wognum and Lam, 2000; Alagaraja, 2013). there is little empirical evidence to support this claim. At the same time, the studies from this perspective mostly stand on the management perspective to assess commitment. Few studies based on employees' perceptions to evaluate how their commitment is influenced by top management commitment, human resource management activities and how HRM practices moderate the strength and weakness of the relationship between top management commitment and employee's

organizational commitment. This paper has filled in the gap for one of the most recited HRM practices in previous studies for having a significant impact on the dimension of commitment that every organization wishes to improve, affective commitment.

From the above results, it can be seen that the paper also has some beneficial management implications. While the study results do not have enough evidence to conclude about the contingency impact of employee compensation on the relationship between top management commitment and affective commitment. It is safe to conclude that in the context of the Vietnamese garment and textile companies, the workers's commitment is significantly impacted by top management commitment and employee compensation. Therefore, management efforts should focus on designing suitable competitive compensation packages in alignment with the market and the competitors. Management should also conduct frequent different communication channels to show and emphasis their commitment to improve employee's commitment. But once the workers already possess affective commitment management should focus their effort on other HRM practices as improvement from compensation will not further improve the strength of their commitment impact on that of the employee.

This paper focused solely on one method of HRM practices that appears from literature review as one of the most significant impact factor therefore forgo other potentially meaningful factors. The research was

conducted in the garment and textile industry only and the distribution of companies participated is still heavy in the North area where the author located and mostly with large garment companies while the majority of garment and textile companies in Vietnam is small and medium enterprises. Future research could extend the research in the above limitation to provide better analysis of the underlying issue.

6. REFERENCES

- [1] Alagaraja. M.. (2013). "Mobilizing organizational alignment through strategic human resource development". *Human Resource Development International*. 16(1). 74-93.
- [2] Allen. N. J.. Meyer. J. P.. (1990). "The Measurement and Antecedents of Affective. Continuance. and Normative Commitment to the Organization". *Journal of Occupational Psychology*. 63. 1-8.
- [3] Alutto. J. A.. Hrebiniak. L. G.. & Alonso. R. C. (1973). 'On operationalizing the concept of commitment'. *Social Forces*. 51. 448-454.
- [4] Armstrong. M.. (2008). *Strategic Human Resource Management: A Guide to Action*. London: Kogan Page Publisher.
- [5] Arnold. E. (2005). "Managing human resources to improve employee retention". *The Health Care Manager*. 24(2). 132-140.
- [6] Bansal. P.. & Roth. K. (2000). "Why Companies Go Green: A Model of Ecological Responsiveness". *The Academy of Management Journal*. 43(4). 717-736.
- [7] Barratt-Pugh. L.. Bahn. S.. Gakere. E.. (2013). "Managers as change agents: Implications for human resource managers engaging with culture change". *Journal of Organizational Change Management*. 26(4). 748-764.
- [8] Becker. H. S. (1960). "Notes on the concept of commitment". *American journal of Sociology*. 66(1). 32-40.
- [9] Beer. M.. Spector. B. A.. Lawrence. P. R.. Mills. D. Q.. & Walton. R. E.. (1984). *Managing human assets*. Simon and Schuster.
- [10] Beer. M.. Spector. B.. Lawrence. P. R.. & Mills. D. Q. (1985). *Managing human assets: A general manager's perspective*. Personnel Administrator.
- [11] Browning. V.. (2006). "The relationship between HRM practices and service behaviour in South African service organizations". *The International Journal of Human Resource Management*. 17(7). 1321-1338.
- [12] Cohen. A.. (2003). *Multiple commitments in the workplace: An integrative approach*. Psychology Press.
- [13] Felstead. A.. Jewson. N.. Phizacklea. A.. Walters. S.. (2001). "Working at home: statistical evidence for seven key hypotheses". *Work. Employment and Society*. 15(2). 215-231.
- [14] Garavan. T. N.. (1991). "Strategic Human Resource Development". *Journal of European Industrial Training*. 15(1). 17-30.
- [15] Gellatly. I. R.. Hunter. K. H.. Currie. L. G.. & Irving. P. G.. (2009). "HRM practices and organizational commitment profiles". *The International Journal of Human Resource Management*. 20(4). 869-884.
- [16] Ginsberg. A.. (1994). "Minding the competition: From mapping to mastery". *Strategic Management Journal*. 15(1). 153-174.
- [17] González-Benito. J.. & González-Benito. Ó. (2010). "A study of determinant factors of stakeholder environmental pressure perceived by industrial companies". *Business Strategy and the Environment*. 19(3). 164-181.
- [18] Guest. D. E.. (1997). "Human resource management and performance: a review and research agenda". *International journal of human resource management*. 8(3). 263-276.
- [19] Hair. J.. Black. W.. Babin. B.. Anderson. R.. (2009). *Multivariate data analysis*. Prentice Hall. London.
- [20] Harari. O.. (1993). "Ten reasons why TQM doesn't work". *Management review*. 82(1). 33-38.
- [21] Hemdi. M. A.. (2009). "Investigating hotel employees" organizational commitment: The influence of human resource management practices and perceived organizational support'. *Journal of Tourism. Hospitality & Culinary Arts*. 1(3). 1-20.
- [22] Herrbach. O.. Mignonac. K.. Vandenberghe. C.. Negrini. A.. (2009). "Perceived HRM practices. organizational commitment. and voluntary early retirement among late-career managers". *Human Resource Management*. 48(6). 895-915.
- [23] Hrebiniak. L. G.. Alutto. J. A.. (1972). "Personal and role-related factors in the development of organizational commitment". *Administrative science quarterly*. 17(4). 555-573.
- [24] Igarria. M.. & Greenhaus. J. H.. (1992). "Determinants of MIS employees' turnover intentions: a structural equation model". *Communications of the ACM*. 5(2). 34-49.
- [25] Jun. M.; Cai. S.; Shin. H.. (2006). "TQM practice in maquiladora: Antecedents of employee satisfaction and loyalty". *Journal of Operations Management*. 24(6). 791-812.
- [26] McCracken. M.. Wallace. M.. (2000). "Towards a redefinition of strategic HRD". *Journal of European industrial training*. 24(5). 281-290.

- [27] Meyer. J. P.. & Allen. N. J.. (1984). "Testing the "side-bet theory" of organizational commitment: Some methodological considerations". *Journal of Applied Psychology*. 69(3). 372-378.
- [28] Meyer J.. Allen N.. (1997). *Commitment in the Workplace: Theory. Research. and Application*. Sage Publications
- [29] Meyer. J. P.. Smith. C. A.. (2000). "HRM practices and organizational commitment: Test of a mediation model". *Canadian Journal of Administrative Sciences/Revue canadienne des sciences de l'administration*. 17(4). 319-331.
- [30] Milgrom. P.. Roberts J.. (1992). *Economics. Organization and Management*. Prentice-Hall.
- [31] Mossholder. K. W.. Richardson. H. A.. Settoon. R. P.. (2011). "Human resource systems and helping in organizations: A relational perspective". *Academy of Management Review*. 36(1). 33-52.
- [32] Mottaz. C. J.. (1988). "Determinants of organizational commitment". *Human relations*. 41(6). 467-482.
- [33] Mowday. R.. Porter. L.. Steers. R.. (1982). "Organizational linkages: the psychology of commitment". *Journal of Vocational Behavior*. 14(4). 224-247.
- [34] Nasurdin. A. M.. Hemdi. M. A.. Guat. L. P.. (2008). "Does perceived organizational support mediate the relationship between human resource management practices and organizational commitment?". *Asian Academy of Management Journal of Accounting and Finance*. 13(1). 15-36.
- [35] Oliver. C.. (1997). "Sustainable competitive advantage: combining institutional and resource-based views". *Strategic management journal*. 18(9). 697-713.
- [36] Porter. L. W.. Steers. R. M.. Mowday. R. T.. & Boulian. P. V.. (1974). "Organizational commitment, job satisfaction, and turnover among psychiatric technicians". *Journal of applied psychology*. 59(5). 603-609.
- [37] Rizvi. Y.. 2010. "Human capital development role of HR during mergers and acquisitions". *The South East Asian Journal of Management*. 4(1). 17-28.
- [38] Saal. F.E.. Knight. P.A.. (1987). *Industrial/Organizational Psychology: Science and Practice*. Pacific Grove. CA: Brookes/Cole.
- [39] Scheible. A. C. F.. Bastos. A. V. B.. (2013). "An examination of human resource management practices" influence on organizational commitment and entrenchment". *BAR-Brazilian Administration Review*. Vol 10. Iss 1. pp. 57-76.
- [40] Tiessen. J. H.. 1995. "Individualism, collectivism, and entrepreneurship: a framework for international comparative research". *Journal of Business Venturing*. 12(3). 367-384.
- [41] Torraco. R. J.. & Swanson. R. A. (1995). "The strategic roles of human resource development". *Human Resource Planning*. 18. 10-21.
- [42] Tremblay. M. A. (2010). "Fairness perceptions and trust as mediators on the relationship between leadership style, unit commitment, and turnover intentions of Canadian forces personnel". *Military Psychology*. 22(4). 510-523.
- [43] Ulrich. D. (1997). *Human resource champions: The next agenda for adding value to HR practices*. Harvard: Harvard Business School Press.
- [44] Wheelen. T. L.. & Hunger. J. D. (2006). *Cases: Strategic management and business policy* (10th ed.). Upper Saddle River. NJ: Pearson Education Inc.
- [45] Williams. L. J.. & Anderson. S. E. (1991). "Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors". *Journal of Management*. 17(3). 601-617.
- [46] Wognum. I.. & Fond Lam. J. (2000). Stakeholder involvement in strategic HRD aligning: the impact on HRD effectiveness. *International Journal of Training and Development*. 4(2). 98-110.
- [47] Wright. P. M.. Gardner. T. M.. & Moynihan. L. M. (2003). The impact of HR practices on the performance of business units. *Human resource management journal*. 13(3). 21-36.

VIETNAMESE STUDENTS' PERCEPTION OF THE TOP 10 SOFT SKILLS TO THRIVE IN INDUSTRY 4.0

Do Thi Dong

Faculty of Business Management, National Economics University, Hanoi, Vietnam

Corresponding author: dongneu2016@gmail.com

Abstract

This paper investigates Vietnamese students' perception of the top 10 soft skills that employees need to thrive in the Industry 4.0. A survey with 324 students in the two biggest cities, namely Hanoi and Ho Chi Minh City was conducted to explore whether Vietnamese students know the top 10 skills to thrive in the Industry 4.0 and how their soft skills are. The results show that some skills such as service orientation, emotional intelligence and cognitive flexibility were not recognized by Vietnamese students as skills to thrive in the Industry 4.0. Based on analysis of Vietnamese students' self-assessment of the top 10 soft skills needed in the future, implications are given to higher education and training institutions in Vietnam in order to create qualified human resource.

Keywords: Industry 4.0, perception, soft skill, top 10 soft skills to thrive in the Industry 4.0.

1. INTRODUCTION

The term "Industry 4.0" originating from the Fourth Industrial Revolution refers to the fourth major industrial era since the initial Industrial Revolution of the 18th century. It was first used in the high-tech strategy of the German Government, which promotes the computerization of manufacturing. Then it was appeared in 2011 at the Hannover Fair. The term has become common concern in the world since January of 2016 when the World Economic Forum (WEF) was held in Switzerland under the theme "Mastering the Fourth Industrial Revolution". At the conference, Klaus Schwab, Founder and Executive Chairman of The World Economic Forum introduced his new book titled "The Fourth Industrial Revolution" to uncover the current technological revolution we live in and to explore how the world is witnessing a transformation that is inevitably affecting the way we live, interact and work (Schwab, 2016).

Industry 4.0 was created on the base of digital revolution, especially the use of internet. The four key components of Industry 4.0 are cyberphysical systems (connections between the real and virtual world), the Internet of Things (IoT), the Internet of System (IoS), and the smart factory (Roblek et al., 2016). The application of technologies in these components has made foundation of the revolution comprehensive, leading to significant and unpredictable changes in daily life of people. Since the pattern of consumption and production changed, requirements of knowledge and skills of workforces also changed. Being aware of

the revolution and prepare for its requirements is important for labors, especially for those who are willing to participate into labor market in the near future.

In Vietnam, the impact of Industry 4.0 seem become obvious as changes in the way people live and work have been recognized. Plenty of enterprises replaced human with robots (Khanh Chi, 2019; Thi Ha, 2019). The need for new professional jobs in such new fields as IT, Big data, AI, Fintech, etc. has been increasing (Chi Hoang, 2020). Since the way people live and work changes as well as demand for new professional jobs increases, it results to a demand for new skills in the labour market. The necessity for being aware of skills particularly soft skills that employees need in the future becomes important for people (Le Yen Chi, 2019), especially for students, who are going to apply for jobs in the near future. Given the fact that there has not been such study in Vietnam, this descriptive research tries to explore Vietnamese students' perception of the top 10 soft skills that employees need to thrive in the Industry 4.0. Based on analysis of students' perception and self-assessment of their soft skills, implications are given to higher education and training institutions in Vietnam in order to create high qualified human resource.

2. OVERVIEW OF TEN SOFT SKILLS TO THRIVE IN INDUSTRY 4.0

2.1. Soft skills

We are now familiar with the term "soft- skill". The term refers to a cluster of personal qualities, habits,

attitudes and social graces that make someone a good employee and compatible to work with (Vasanthakumari, 2019). It indicates personal transversal competences such as social aptitudes, language and communication capability, friendliness and ability of working in team and other personality traits that characterize relationships between people (Cimatti, 2016). Appropriate soft skills play an important role in a successful career as well as during social interactions in the society (Majid et al., 2012). A survey of over 300 IT managers showed that managers ranked “soft skills” such as interpersonal skills, flexibility and adaptability and organizational skills as much more important than the hard skills related to technical knowledge of databases, web development languages and hardware (Aasheim, Li, & Williams, 2009). For that reason, employees are expected to own appropriate soft- skills in working place.

2.2. Ten soft skills to thrive in Industry 4.0

It is important for students who will find the job in the near future to understand which skills will be necessary in the future. The skills that will be required in 2020 can be defined as the skills that should be acquired by all citizens, in order to ensure their active participation

in society and economy, taking into account the major drivers of change (Cimatti, 2016). As mentioned previously, application of major components of Industry 4.0 will change the way people live and work. It results in significant impact on jobs in the future, making significant job creation as well as job replacement. While some jobs are in risk of redundancy, others grow rapidly; existing jobs are going through a change in skill sets required to do them (WEF, 2016).

To understand the needed skills by the future, an extensive survey of Chief Human Resource Officers and other senior talent and strategy executives of leading global employers, representing more than 13 million employees across 9 broad industry sectors in 15 major developed and emerging economies and regional economic areas was conducted by WEF (Table 1 and Table 2). The target observations included 100 largest organizations in each of selected industry sectors. There were 371 individual companies responded to the survey, providing 1,346 detailed occupational data points on mass employment, specialist and newly emerging occupations.

Table 1: Classification of surveyed industries

Industry group	Industry sector
Basic and Infrastructure	Chemicals Infrastructure and Urban Development Mining and Metals
Consumer	Agriculture, Food and Beverage Retail, Consumer Goods and Lifestyle
Energy	Energy Utilities and Technology Oil and Gas Renewable Energy
Financial Services & Investors	Banking and Capital Markets Insurance and Asset Management Private Investors Institutional Investors, Sovereign Funds, Family Offices
Healthcare	Global Health and Healthcare
Information and Communication Technology	Information Technology Telecommunications
Media, Entertainment and Information	Media, Entertainment and Information
Mobility	Aviation and Travel Automotive Supply Chain and Transportation
Professional Services	Professional Services

Source: WEF, 2016

Table 2: Classification of surveyed regions

Asia and the Pacific	Europe and Central Asia	Middle East and North Africa	Sub- Saharan Africa	The Americas
ASEAN Australia China India Japan	France Germany Italy Turkey United Kingdom	Gulf Cooperation Council	South Africa	Brazil Mexico United States

Source: WEF, 2016

Among 371 surveyed companies, a quarter employ more than 50,000 people globally; another 40% have between 5,000 and 50,000 employees; the remaining third is equally split between employers with 500 to 5,000 - staff and high-growth companies with currently up to 500 employees. Nearly half of respondents identified themselves as the Chief Human Resources Officers for their companies at the global level; another third identified as C-suite or board level representatives of their organizations; and the rest identified as strategy officers or human resources line managers, country directors or functional leads (WEF, 2016).

The result of survey revealed that it is expected there are 10 top soft skills employees need from 2020 to thrive in Industry 4.0 (Table 3).

Table 3: Ten soft skills to thrive in Industry 4.0

No.	In 2020	In 2015
1	Complex problem solving	Complex problem solving
2	Critical thinking	Coordinating with others
3	Creativity	People management
4	People management	Critical thinking
5	Coordinating with others	Negotiation
6	Emotional intelligence	Quality control
7	Judgment and decision-making	Service orientation
8	Service orientation	Judgment and decision-making
9	Negotiation	Active listening
10	Cognitive flexibility	Creativity

Source: WEF, 2016

Table 3 presents lists of top 10 soft skills that employees need to have in 2020 according to the World Economic Forum's The Future of Jobs report 2016.

According to the table, complex problem solving is still the first soft skill that employee need from 2020. In comparison with the ten soft skills that employees needed in 2015, quality control and active listening are no longer in the top ten skills. They are replaced by emotional intelligence and cognitive flexibility.

3. METHODOLOGY

This research focused on ten soft skills to thrive in Industry 4.0 as suggested by the World Economic Forum. The overall objective of the study is to examine Vietnamese students' perception of top 10 soft skills that employees need to have in the future. Findings of the research are completed by applying secondary data research, questionnaire survey and in-depth interview.

Firstly, a secondary data research was conducted to summarize the technological trends, characteristics of Industry 4.0, soft skills that employees need in the future as well as to find if there is any the same research. A short list of relevant researches was compiled. Recognizing the research gap, the study comes up with three objectives as followings:

- To examine Vietnamese students' perception of 10 soft skills to thrive in Industry 4.0;
- To assess Vietnamese students' 10 soft skills to thrive in Industry 4.0;
- To draw conclusions and make some implications for higher education and training institutions in order to create more qualified human resources.

Secondly, semi-structured interviews were conducted with experts. The objectives of interview is exploring how to measure students' perception of top 10 soft skills that employees need to thrive in Industry 4.0. Five experts in human resource management and education were invited for interview in March 2020. After analyzing these data, key questions for assessing students' perception were listed. In order to discover whether students are aware of the top 10 soft skills to thrive in Industry 4.0, in addition to 10 skills suggested by WEF, the experts added another ten soft skills which are believed to be important to employees in the future, making up a list of 20 soft skills for students to select 10 supposed to be important in the context of Industry 4.0.

Thirdly, based on meaning of soft skills, questionnaires are designed to ask students whether they know the top ten skills that employees need to have in the context of Industry 4.0 and to assess their soft skills. A pilot survey with 30 students in Hanoi was conducted in March 2020. Respondents are students those have studied in universities for at least 2 years. The reason for choosing respondents is assumption that students may absorb a number of soft skills after 2 years in university and they may understand the importance of owning soft skills in working place.

Fourthly, official survey was conducted in April to June, 2020 with 324 students in Hanoi and Ho Chi Minh City via internet. The two cities were chosen as they have the largest numbers of universities in Vietnam. Convenient sampling method was adopted to reach students in five large universities. Among them, three are in Hanoi and the rest in Ho Chi Minh City.

At last, in-depth interview was conducted with 20 students, among them, 15 are in Hanoi and 5 are in Ho Chi Minh City. The objective of interviews was to explore whether students understand the surveyed soft skills and how their soft skills are. Interview was conducted with Microsoft Teams.

With the objective of measuring Vietnamese students' perception of top 10 soft skills those employees need to thrive in Industry 4.0. The questionnaire is divided into 4 parts. The first includes questions to collect general information about respondents. The second identifies whether students know the 10 soft skills. The next is for students' self-assessment of their soft skills. Some last questions are opened to gather students' opinions about how they expect the institutions to help them in improving their soft skills. The interview questionnaire is about learning the reasons for answers from students.

There are two set of data. The first is quantitative data, including all information about 324 students in Vietnam. SPSS computer software package was used to analyze the collected data. Descriptive statistics were calculated for all variables to have a general screening on the real data set in terms of frequency, means, variances, etc. The second includes qualitative data which derives from the in-depth interview. This data is used to supplement the quantitative data.

4. FINDINGS

4.1. Characteristics of the sample

Approximately 55% of the students are female and nearly 69% of the students are in 7th and 8th term of study. The percentage of students those are in 5th and 6th term account for 31.0% (Table 4). Among 20 interviewees, 11 students are female; 10 are in 7th and 8th term of study, 8 are in 5th and 6th term, and the rest is in 9th and 10th term.

Table 4: Characteristics of the sample

Characteristics	Frequency	Percentage (%)
<i>Gender</i>		
Female	146	45.0
Male	178	55.0
<i>Major</i>		
Social science	135	41.7
Natural science	87	26.8
Other	102	31.5
<i>Academic term</i>		
5 th – 6 th term	100	31
7 th – 8 th term	224	69
<i>Location</i>		
Hanoi	188	58
HCM City	136	42
<i>GPA</i>		
< 5.0	5	1.5
5.0 - 6.5	37	11.4
6.5 - 8.0	194	59.9
8.0 - 8.5	54	20.0
> 8.5	23	7.1

Source: Survey result

Students in social science field account for 41.7% (Table 4), majority of them are in economics and business management. Altogether, 98 students study economics business management, making up about 30% of the sample. Students those studies in natural sciences account for 26.8%. The rest constitutes a significant proportion of 31.5% of the sample. Among 20 interviewees, 10 students study economic and business management; 5 study natural science. The rest studies engineering, pedagogy and press.

About 60% of respondents got GPA from 6.5 to 8.0 in previous term. 20% surveyed students had GPA from 8.0 to 8.5. Especially, 7.1% of respondents had excellent academic performance as their GPA is higher than 8.5. However, 37 students had GPA ranging from 5.0 to 6.5. GPA of the rest was lower than 5.0.

4.2. Students' recognition of top 10 soft skills to thrive in Industry 4.0

Fig. 1 illustrates information about respondents' perception of 10 soft skills to thrive in Industry 4.0. Among 20 skills suggested by the author, students select ten those they think are the most important to employees in the context of Industry 4.0. The result revealed that 10

skills chosen with the highest frequencies are creativity (79%), time management (76.2%), learning and self-learning (66.4%), relationship development (62.7%), communication (62%), judgment and decision-making (60.5%), teamwork (59.6%), critical thinking (59%), cognitive flexibility (55.2%), and negotiation (53.1%). Half of these skills are for thriving in Industry 4.0 as suggested by WEF's report. They are in turn creativity, judgment and decision-making, critical thinking, cognitive flexibility and negotiation. Five those were not supposed to be skills to thrive in Industry 4.0 were selected with high frequencies, including time management, learning and self-learning, relationship development, communication, and teamwork.

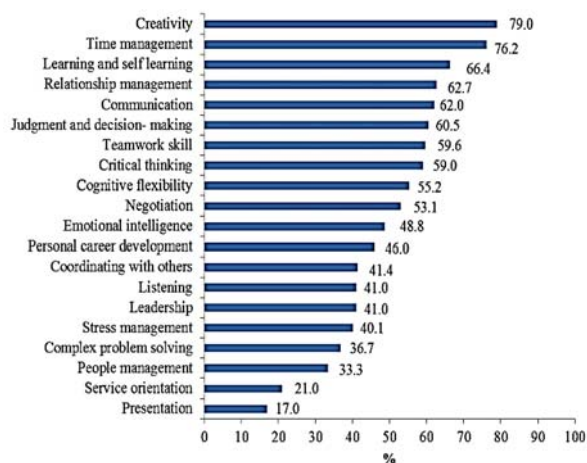


Fig.1: Students' selection of 10 soft skills to thrive in Industry 4.0

Source: Result of the survey



Fig. 2: Students' recognition of 10 soft skills to thrive in Industry 4.0 (ranked in order suggested by WEF)

Source: Result of the survey

Fig. 2 presents respondents' recognition of 10 soft skills to thrive in Industry 4.0. Skills are ranked in order suggested by WEF's report. Among them, five are unremarkably recognized by surveyed students. For example, only 21% of respondents supposed service orientation skill is important. Similarly, 33.3% and 36.7% of the sample thought people management and complex problem solving are critical for employees. Result of interview revealed that students even did not understand the meaning of service orientation skill.

They explain as if the skill is necessary for service staffs only. In addition, the selection rate of coordinating with other and emotional intelligence skills are both less than 50%. Meanwhile, five skills those do not belong to the lists of 10 soft skills to thrive in Industry 4.0 are highly acknowledged, including time management (76.2%), learning and self-learning (66.4%), relationship management (62.8%), communication (62%), and teamwork (59.6%). They are selected by majority of researched students.

Fig. 3 demonstrates respondents' recognition of 10 soft skills to thrive in Industry 4.0. Skills are ranked in order suggested by respondents. Data in figure 2 are reordered from highest to lowest. Three skills, which are selected with the highest frequency are creativity, judgment and decision-making, and critical thinking, standing at approximately 79%, 60.5%, and 59%, respectively. Conversely, three skills having the lowest frequency are service orientation (21%), people management (33.3%) and complex problem solving (36.7%).

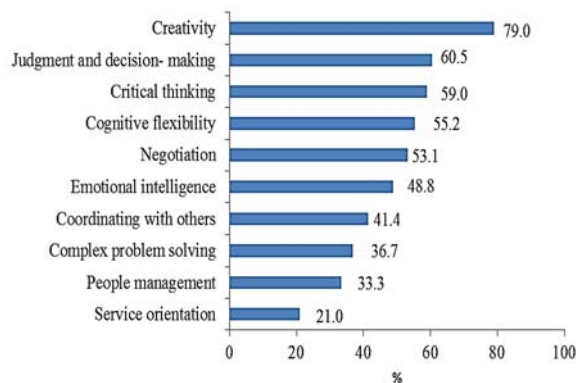


Fig. 3: Students' recognition of 10 soft skills to thrive in Industry 4.0 (ranked in order suggested by respondents)

Source: Result of the survey

Students are asked to self-evaluate their 10 soft skills to thrive in Industry 4.0. The result is represented in Fig. 4. Majority of respondents assumed their soft skills are fair. These percentages range from 57.7% to 69.75%. Especially, when being asked about the reason for self-assessing the soft skill at average level, four students confessed that they actually do not understand clearly about service orientation, cognitive flexibility and emotional intelligence skills. They said, thus, the safe option is medium level. As such, the choice isn't really accurate. It may change to more positive or negative when they fully understand about the skill.

Among ten soft skills, four that have the highest percentage of respondents thinking they are good and very good at include cognitive flexibility, coordinating with others, emotional intelligence, and creativity. The proportions are in turn 28.09%, 27.47%, 22.53%, and 20.99%. However, in comparison with those selecting the middle level, the proportions are much smaller. On

the contrary, three that have highest rates of surveyed students assuming they are not good and even very poor at are service orientation, critical thinking, and negotiation. These percentages are 29.63%, 25.62%, and 24.07%, respectively.

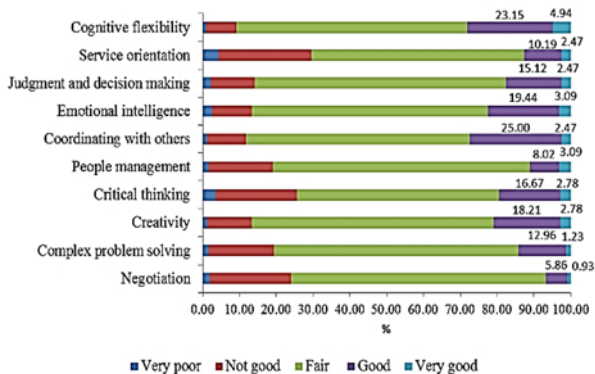


Fig. 4: Students' self-assessment of 10 soft skills
Source: Result of the survey

As a matter of fact, soft skill training in Vietnam has not been adequately paid attention (Ong Quoc Cuong, 2014; Le Thi Hoai Lan, 2017; Nguyen Ba Huan and Bui Thi Ngoc Thoa, 2018; Nguyen Thanh Nhan et al., 2018), hundreds of ideas for improving soft skills are proposed by students. Among them, some suggestions students give at most are as follows:

- Soft skills should be on the curriculum to help student develop their competencies. Some of skills should be taught as completed subjects, some might be embedded into other courses.
- Short courses, seminars, workshops, and even competitions in soft skills should be organized for students to participate.
- Short skills should be practised in student organizations such as union or clubs in university.
- Teachers should be trained on soft skills and embedding soft skills to lessons.

5. CONCLUSION AND IMPLICATIONS

It can be seen that there is a gap between 10 soft skills to thrive in Industry 4.0 suggested by The World Economic Forum and Vietnamese students' perception of these soft skills. Skills that students assumed to be important in working place might not be exactly the skills that the experts and employers thought employees should have in the context of Industry 4.0. Among ten skills, gap seems to be large at such skills as service orientation, people management and complex problem solving. Reversely, gap appears to be small at creativity, judgment and decision-making, and critical thinking skills. Majority of surveyed students thought their soft skills are fair and need to be improved. Students also proposed hundreds of ideas about improving their soft skills.

To improve soft skills, efforts should be from three sides including higher education institutions, teachers, and students themselves. Regarding to institutions, changes in curriculum should be made. Soft skills should be added to curriculum as completed subjects or integrated to professional training courses. Universities should organize short courses, seminars, workshops, and even competitions in soft skills for students to take part in. Training to improve faculties' soft skills should be focused on. Support should be given to student organizations such as unions, clubs, and even intramural teams so that they can help students to develop their soft skills. With regards to teachers, teachers' soft skill competences should be improved. Faculty themselves should self-learn updated soft skills since the soft skills may change quickly. Lastly, students should pay attention to developing their soft skills by a numbers of ways. Each student should have a soft skill strategy in university. They then implement the strategy though a numbers of ways such as selecting courses on soft skills or integrated with soft skills, taking part in seminars, workshops, and competitions in soft skills, or joining in student organizations.

6. LIMITATIONS OF THE RESEARCH AND FUTURE STUDY

The research has two limitations. Firstly, it assumed that the ten soft skills to thrive in Industry 4.0 in Vietnam are those suggested by WEF. In fact, due to the distinct characteristics of Vietnam's economy, top ten soft skills to thrive in Industry 4.0 may not be exact to the mentioned skills. Future study should focus on identifying top skills that employees in Vietnam need to thrive in Industry 4.0. Secondly, convenient sampling method may lead to biased results as the sample may not be representativeness of the entire population. Future research should use probability sampling.

7. REFERENCES

- [1] Aasheim, C. L. , Li, L. , and Williams, S. (2009), "Knowledge and Skill Requirements for Entry-Level Information Technology Workers: A Comparison of Industry and Academia", *Journal of Information Systems Education*, 20(3), pp. 349-356, Retrieved September 2, 2020 from <https://www.learntechlib.org/p/105689/>.
- [2] Chi Hoang (2020), "Phát triển nguồn nhân lực chất lượng trong bối cảnh mới", retrieved on August 26 2020, at <http://tapchitaichinh.vn/nghien-cuu--trao-doi/trao-doi-binh-luan/phat-trien-nguon-nhan-luc-chat-luong-trong-boi-can-moi-323303.html>

- [3] Cimatti Barbara (2016), "Definition, development, assessment of soft skills and their role for the quality of organizations and enterprises", *International Journal for Quality Research*, 10, (1), pp. 97-130.
- [4] Khanh Chi (2019), "Ứng dụng công nghệ 4.0 vào chăn nuôi bò", retrieved on August 26 2020, at <https://www.sggp.org.vn/ung-dung-cong-nghe-40-vao-chan-nuoi-bo-595910.html>.
- [5] Lê Thị Hoài Lan (2017), "Phát triển kỹ năng mềm cho sinh viên Khoa Kinh tế Trường Đại học Đồng Nai theo tiếp cận chuẩn đầu ra", *Tạp chí Khoa học, Đại học Đồng Nai*, No. 6 (2017), pp. 80-94.
- [6] Lê Yến Chi, Nguyễn Diệp Phương Nghi, Lê Thị Nhã Trúc (2019), "Giáo dục kỹ năng mềm theo hướng tiếp cận Cách mạng công nghiệp 4.0: Trường hợp ngành Quản trị văn phòng, Trường Đại học Trà Vinh", *Kỷ yếu Hội thảo khoa học Lồng ghép kỹ năng mềm trong giảng dạy chuyên môn*, Trường Đại học Trà Vinh, 01/02/2019, pp. 280-288.
- [7] Majid, S., Liming, Z., Tong, S., & Raihana, S. (2012), "Importance of soft skills for education and career success", *International Journal for Cross-Disciplinary Subjects in Education (IJCDSE)*, Special Issue, 2 (2), pp. 1036- 1042.
- [8] Nguyễn Bá Huân và Bùi Thị Ngọc Thoa (2018), "Thực trạng và nhu cầu đào tạo kỹ năng mềm của sinh viên Khoa Kinh tế và Quản trị Kinh doanh Trường Đại học Lâm nghiệp", *Tạp chí Khoa học và công nghệ Lâm nghiệp*, No. 6 (2018), pp. 161- 170.
- [9] Nguyen Thanh Nhan, Lu Tung Thanh, Ho Hong Linh (2018), "Issues in soft skills development for Vietnamese students in current undergraduate programs", *Journal of Science*, Vol. 15, No. 7 (2018), pp. 114-124.
- [10] Ông Quốc Cường, Vương Quốc Duy, Lê Long Hậu, Trần Thị Hạnh, Nguyễn Thị Hoàng Quyên, Lê Hoàng Du (2014), "Đánh giá nhu cầu của sinh viên Khoa Kinh tế và Quản trị Kinh doanh đối với lớp kỹ năng giao tiếp", *Tạp chí Khoa học Trường Đại học Cần Thơ*, No. 35 (2014), pp. 50-56.
- [11] Roblek, V., Meško, M., & Krapež, A. (2016), "A complex view of Industry 4.0", *SEGA Open*, April - June 2016: 1-11, DOI: 10.1177/2158244016653987
- [12] Schwab, K. (2016), *The Fourth Industrial Revolution*, World Economic Forum, Geneva Switzerland.
- [13] Thi Hà (2019), "Robot đang thay thế con người ở những công việc nào?", retrieved on August 26 2020, at <https://vnexpress.net/robot-dang-thay-the-con-nguoi-o-nhung-cong-viec-nao-3914257.html>
- [14] Vasanthakumari, S. (2019), "Soft skills and its application in work place", *World Journal of Advanced Research and Reviews*, 3, (2), pp. 66-72.
- [15] WEF (2016), *The Future of Jobs - Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution*, Davos - Klosters, Switzerland.

FACTORS AFFECTING TEAM EFFECTIVENESS OF STUDENT CLUBS: CASE STUDY OF NATIONAL ECONOMICS UNIVERSITY

Ta Thu Phuong, Pham Thu Trang, Vo Ha, Ngo Anh Quang, Dinh Hoang Trung¹

¹ Faculty of Business Management, National Economics University

Corresponding author: tathuphuong@neu.edu.vn

Abstract

The topic "Factors affecting team effectiveness of student clubs: Case study of National Economics University" was chosen to study in which factors play the important role in influencing the effectiveness of the team in clubs. The main target objects of the topic are students in university clubs. By using the theoretical approaching method, the research team has built up the factors affecting the effectiveness of the team including Commitment, Mature communication, and Clearly defined goal. To increase the reliability and representativeness of the results, the research team expects to study at a larger sample size of about 500 or 600 samples. When the sample size increases, the number of variations also increase, leading to the recovery result regulations will also be more accurate; therefore, researching many different subjects and wider scales about the effectiveness of teams will be considered to develop another research soon.

Keyword: Team effectiveness, student clubs, NEU.

1. INTRODUCTION

Teamwork has accompanied the development of humankind from the early days of society to today's modern society. Jobs in all fields of life become increasingly complex requiring the connection of many people together because nobody is perfect, an individual cannot do anything without others, but working together can help one person's weaknesses offset by the other's strengths. The values that teamwork brings us are completely higher than individual working. According to Katzenbach (1993) "In fact, teamwork makes each individual's productivity and results significantly higher than the one of each individual working individually" or the common purpose of an effective team will help people know what they are trying for and why they are working together. That such purposes help them see the meaning of work and put everyone on the right track. They also need to be unified on certain values that act as a guide to the team's choices and how to achieve that goal (Ken Blanchard, 1982).

Teamwork is obviously very important, so how to work in the team "effectively" is being more and more focused on. Much research in the world is given to find the factors affecting the effectiveness of the team. For example, Hamlin (2008) researched the effectiveness of teamwork in a study conducted at La Verne University,

California on 288 agents of Riverside University, California, or the authors Jon Katzenbach and Douglas Smith have given the model of the effective team in 1993 after studying teams across several companies and different job challenges. In Vietnam, some researches have been published, such as the study "factors affecting the effectiveness of the team to the office workers" by Hoang Thi Hanh (2012) and some other articles.

Our team found that the existing studies have identified the theoretical bases and the factors that influence the effectiveness of the team, but the range is restricted in terms of office workers, employees, or students at other universities around the world. By contrast, there is still not any specific study for Vietnamese students or typically National Economics University, especially the effectiveness of the team in clubs - an expanding form of student activities and a place chosen by the majority of students to develop themselves. However, there is not a thorough understanding of the factors affecting the effectiveness of the team in this model. Therefore, our research team chose the topic "Factors affecting team effectiveness of student clubs. The case study of National Economics University" with the expectation of improving the team performance of the student clubs.

2. LITERATURE REVIEW

2.1. Team

There are many different definitions of team. The similar features among these definitions can be described as a group of people working in unison focusing on the common objective of the organization. Members of the team interact and collaborate perfectly with the others to work best-finished and take the responsibilities for their jobs. Relating to the factors which can affect teamwork, many researchers also introduce their own explanations for their projects. By contrast, it can be concluded that the best efficiency of teamwork can be obtained if all individual contributions serve the common goal harmoniously.

There are various ways of team classifications. According to Cohen and Bailey (1997), there are four types of a team: project team, senior administration team, self-managed work team, and virtual team. According to Assoc. Prof Anh Tuan Bui, a team can be divided into formal team and informal team. Based on it, the objects of this research are groups of students in clubs that have traits of project team founded on the shared-goal of the organization and each member of the team is always aware of his or her responsibilities and duties. On the other hand, clubs can be considered as formal teams, each member is managed by the team leader or department manager.

Teamwork can help not only the whole team but also each person in the team can conduct his or her work effectively. By optimizing time and work, members can support mutually; therefore, promoting the ability and strength of each one. Teamwork generates the team spirit, unites everyone to form a single entity, and bringing them good results.

2.2. The effectiveness of the team

Generally, the effectiveness of the team is based on different researcher's points of view: The effectiveness of the team is a collaboration among members to achieve better results in comparison with individual working. Researchers also give out different opinions about the factors which measure teamwork effectiveness.

To obtain effective results in teamwork, members regardless of the position or role they play, need to have skills such as communication skills, flexible solutions, enthusiasm, supporting and respect, and active working. The effectiveness of the team is always an important factor deciding the success of an organization or an enterprise. The interactions among members aim to give out the best solution, reduce wrong decisions, and untold the strength of each one. To work effectively, setting the specific standards for the team must be required, containing the code of behavior, working principles for members.

To the models of the effectiveness of the team, our research team has referred to 4 models which are:

- Rubin and coworkers (1997) put forward the model for the effectiveness of the team, which had been published by Rubin, Plovnick, and Fry in early 1997. This model was known as the term "GRPI" which stands for goals, roles, processes, and interpersonal relationships.

- Micheal and Lombardo and Robert Eichinger (1995) had developed the model T7 (Thrust, Trust, Talent, Teaming skills, Task skills) to determine which factors can affect the effectiveness of the team. They had already specified five internal factors and two external factors.

- LaFasto and Larson (2001) also offered a model of the effectiveness of the team in 2001 called "Five motivations for teamwork and collaboration". They had collected deep understanding from investigating 600 teams in many different industrial fields to find the answer to the question: "Which team is effective?"

- Hackman (2002) proposed the model of the effectiveness of the team in his book: "Leading Teams: Setting the Stage for Great Performance". The author mentioned five conditions must have to work successfully among teams.

Each model gives us specific explanations and the different factors affecting the effectiveness of the team. Effective working can help colleagues becoming more sociable and open-hearted. Thanks to discussions among members, the rate of making mistakes would be minimized and the decisions of the team are subjective and best efficient. Besides, we realize that there are three factors which were referred to: mature communication, commitment, clearly defined goal. In fact, the factors mentioned above always exist and support each other. Every member of the team has goals and purposes on their own. To improve teamwork in the workplace, each member of the team needs to work together to find common goals in which the team moves forward. When the team builds clear goals, they can communicate with all members of the team. And then, each member needs to commit that all work together. This can improve team effectiveness.

2.3. Factors which affect the effectiveness of the team

The models that the research team referred to involving in factors which can affect the effectiveness of the team:

- The model of Carl Larson and Frank M. J. LaFasto (1989). The authors had conducted in teams containing leaders in the industrial zone in both the public and private sectors. According to them, there are eight factors which contributed to the effectiveness of the team: Key and clear targets, the structure of team aims to the results, committing to implement purposes, team

ability, collaborative environment, criteria of the effectiveness of the team, the external recognitions and supports, the ability of team leader.

- The model of Lenicioni (2002) was used by Hamlin (2008) to carry out the effectiveness of the team in the research of La Verne University, California conducted among 288 agents of the Riverside School, California, and the study has achieved high results. The model concludes five factors: the belief, conflict resolutions, team committing, member's responsibility, the interest of results.

- The model of Ulloa (2004) had investigated the impact of seven factors: conflict resolutions, mature communication, clear and specific roles, clearly defined goals, mutual supports, psychological safety, and team's goals toward the effectiveness of the team. The results obtained show that there is a high relation among these factors.

- The model of Rasker and co-workers (2015) has built the model with indirect variables are teamwork to impact on the effectiveness of the team, followed by eleven factors: the rewarding system, the goals, the common goals of the team, team's size, team's structure, team committing, leaders, effective mature communications, knowledge, the methods, and the attitudes.

- The model of Katzenback J. R and Smith D. K (1993) constructed the research model containing five factors: the importance and clarification of targets, the structure of the team toward the results, commitments, member's responsibilities, and team's abilities.

To sum up, by the list of models mentioned above, the research team realized that there are three factors which were referred to most: mature communication, clearly defined goals, and commitments. These are the factors that directly impact the effectiveness of the team.

2.4. Practical Basis

Besides, the research team has also conducted interviewing the members of the Steering Committee of clubs at National Economic University (Vietnam) about three factors: mature communication, clearly defined goals, and commitments. As they play important roles, the effectiveness of teamwork would not be the best without any of them. The factor "clearly defined goals" makes the team arranges the direct schedules and goes the right way. The factor "commitments" helps the team works on schedule, ensure that the common goals of the team must be implemented. The remaining factor "mature communication" is the crucial element increasing the efficiency of works.

According to the results obtained after the interview gave us the information that the factor "clearly defined goals" affects the effectiveness of the team most in comparison to the others. Besides, all three factors

mentioned above can affect the effectiveness of the team as well.

3. RESEARCH METHODOLOGY

3.1. Methods of data processing

The study examines a sample of 273 students studying at National Economic University. All of them have been participating in different clubs.

Our team applied both qualitative and quantitative methods in the research process. The qualitative method analyzed and synthesized primary and secondary information sources obtained by the research team. The quantitative method applied the SPSS20 software, tested the reliability of the scales through Cronbach's alpha coefficients, Exploratory Factor Analysis techniques (EFA), used the regression analysis and summary statistics and comparison methods to process and analyze the results obtained through numerical data.

Methods of data collection: the primary data is obtained directly from students participating in clubs at the National Economics University (NEU) through online questionnaires to select the research factors objectively. The research team had conducted in-depth interviews with 5 students who were and are key members in clubs and unions at NEU. Secondary data are taken from books, articles, journals, research articles, and dissertations, research dissertations on related issues.

3.2. Hypotheses and Research Model

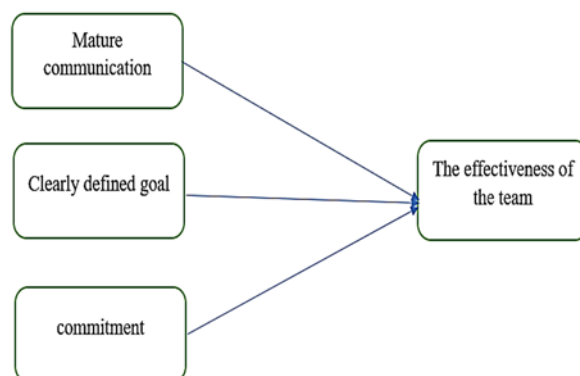
The research team built the model which can be described as follow:

The model contains:

- Independent variables: Mature communication, clearly defined goals, commitments.

- Dependent variable: The effectiveness of the team.

The relation among these variables can be illustrated in the chart below:



The hypothesizes are:

- Commitments are the promises, agreements among members of the team to finish the common goals.

H1: Commitments affect the effectiveness of the team of pupils in clubs of National Economic University.

- Mature communications can express the communication skills or imparting skills of each individual in teams to the others. The more excellently they transfer the messages, the better problems understanding and higher level of knowledge for others.

H2: Mature communications affect the effectiveness of the team of pupils in clubs of National Economic University.

- A clearly defined goal is the condition to urge teamwork more efficiency, making members in the team can easily imagine the schedule, determine the desired targets. Each member must also know clearly why they take part in the team and what they can contribute to the organization.

H3: Clearly defined goals affect the effectiveness of the team of pupils in clubs of National Economic University.

Although the correlation coefficient among three different factors GC, MC, and COM is quite high and having statistically significant at 1%, the sample is quite small so if setting all of these variables are independent variables of a model, the estimated standard deviation may be skewed. Therefore, the study will apply the regression estimation of the variable TEA for each factor individually.

$$TEAi = \beta^{01} + \beta 1. GCi + \varepsilon_{ia} \quad (1)$$

$$TEAi = \beta^{02} + \beta 2. MCi + \varepsilon_{ib} \quad (2)$$

$$TEAi = \beta^{03} + \beta 3. COMi + \varepsilon_{ic} \quad (3)$$

i: The order of survey participants

TEA: Dependent variable - effectiveness of the team

$\varepsilon_{ia}, \varepsilon_{ib}, \varepsilon_{ic}$: The remainder of the regression model.

4. RESULTS

4.1. Assessing the reliability of the scale

To test the reliability and value of the scale, the research team using the method of analyzing the confidence coefficient (Cronbach's Alpha).

- The scale of the Mature Communication factor.

Cronbach Alpha coefficients obtained according to the survey results is $0.732 > 0.6$, all variables have total variable correlation > 0.3 , so the Mature Communication scale is good and reliable.

- The scale of the Commitment factor.

Cronbach Alpha coefficients obtained according to the survey results is $0.715 > 0.6$, all variables have total variable correlation > 0.3 , so the Commitment scale is good and reliable.

- The scale of the Clearly defined goal factor.

Cronbach Alpha coefficients obtained according to the survey results is $0.793 > 0.6$, all variables have total variable correlation > 0.3 , so the Clearly defined goal scale is clearly good and reliable.

4.2. Exploratory Factor Analysis (EFA)

The results obtained with 3 groups of factors presented can explain the variation of observed variables or data. This number is enough to meet the requirement of $> 50\%$.

Giving names to the factors: The results of factor analysis EFA show that the observed variables are loaded into different new factors, from which the research team is proposed to name the factors as follows:

- Factor 1 (F1): includes 6 variables: GC1, GC2, GC3, GC4, GC5, COM4; hence the name "Clearly Defined Goal".

- Factor 2 (F2): includes 4 variables: MC1, MC2, MC3, MC4 so it's named "Mature Communication".

- Factor 3 (F3): includes 4 variables COM1, COM2, COM3, COM5, so it is named "Commitment".

4.3. Evaluation of variables

4.3.1. Descriptive statistics on demographic characteristics

Gender structure: Out of 273 completed questionnaires, 66.1% of respondents are female and 33.1% are male. The study sample has a relatively balanced sex ratio of respondents.

University degree: The number of 3rd-year students accounts for the most (43.2%), followed by 2nd-year students (25.9%), 1st-year students (16.8%), 4th year (13, 9%). 3rd-year students are usually those who have spent 2 years joining the club, have experienced a membership position, even underwent the position of the headboard. They are more likely to cover issues than Year 1 and Year 2 students.

4.3.2. Evaluate survey results according to descriptive statistics

- Mature Communication.

The survey shows that the level of communication that takes place in clubs is quite effective. Members can acquire sources of information within the group, as well as communicate information and receive feedback from other members. Group communication and interpersonal communication in the group both have positive effects.

- Clearly Defined Goal.

The goals that are built into the club through the teamwork process toward totally common goals. The survey results show that it is effective in establishing operational goals in clubs and teams that aim to long-term common goals through the figure that 80% of members agree. This shows that clubs and teams find it necessary to build goals and these goals need to work towards a common goal to bring us the effectiveness.

- Commitment.

Group commitment is quite good when members understand clearly the goal of joining the group and thereby have a contribution to the group's common work tasks. In general, the results showed that the group's commitment to implementing the goals has a significant impact on their participation in common work. Commitments are also the target group's goals, this clearly affects the contribution of individuals to the collective.

4.4. Regression results

4.4.1. Regression of the model

The study will apply regression estimates of TEA variables for each individual factor in model is shown in Table 4.1.

Table 4.1: Regression results of each independent variable

Dependent variable: TEA			
VARIABLES	(1)	(2)	(3)
GC	0.210** (0.058)		
MC		0.136** (0.053)	
COM			0.146** (0.047)
Constant	2.932***	3.230***	3.231***
Observations	273	273	273
R-squared	0.046	0.024	0.035

***, ** and * express the reliability at significance level 1%, 5% and 10%.

The results of the correlation coefficient among the three factors GC, MC, COM are relatively high and statistically significant at 1%. However, the research sample of the study is rather small, if all these factors are included as the (toxic variable) independence variables of this model, the estimated standard deviation of these parameters may be skewed. Therefore, the study will apply the regression estimation of the TEA variables for each factor at the reliability level of 1%, 5%, and 10%. Specifically, clearly defined goal factor influences the most against the other factors, followed by the goal commitment variable and finally the mature communication.

4.4.2. Regression for male and female student groups

The research team also conducted tests on male and female working performance. Regression results are presented in Table 4.2.

Table 4.2: Regression results for male and female students

Panel A: TEA and GC		
VARIABLES	Dependent variable: TEA	
	Female (1)	Male (2)
GC	0.192** (0.091)	0.138 (0.112)
Constant	2.970*** (0.373)	3.250*** (0.430)
Observations	181	92
R-squared	0.037	0.020
Panel B: TEA and MC		
VARIABLES	Dependent variable: TEA	
	Female (1)	Male (2)
MC	0.123 (0.076)	0.161* (0.092)
Constant	3.253*** (0.305)	3.171*** (0.348)
Observations	181	92
R-squared	0.019	0.041
Panel C: TEA and COM		
VARIABLES	Dependent variable: TEA	
	Female (1)	Male (2)
COM	0.179** (0.072)	0.028 (0.088)
Constant	3.091*** (0.270)	3.686*** (0.331)
Observations	181	92
R-squared	0.051	0.001

***, ** and * express the reliability at significance level 1%, 5% and 10%.

The result is that the effects on working performance among the male and female groups are not the same. In particular, the clearly defined goal factor has a stronger impact on the effectiveness of teamwork with female students; The mature communication factors have a stronger impact on male students' teamwork; The factor of commitment has a stronger impact on the effectiveness of teamwork of female students.

4.4.3. Regression for a group of students

The research team also examined and tested the impact of different factors on student performance on groups of students in different school years. The research team considers Year 1 and Year 2 students to be students in the newly entered school group and with little experience in group work, while 3rd and 4th-year students are students in the group that has entered the school longer and have a lot of experience in group activities. Regression results are presented in Table 4.3.

As a result, the clearly defined goal factor and the mature communication factor have a stronger impact on teamwork performance with first and second-year

students; meanwhile, the factor of commitment has a stronger impact on the effectiveness of the team with the 3rd and 4th-year students.

Table 4.3: Regression results for groups of students year 1 & 2 and year 3 & 4

Panel A: TEA and GC		
VARIABLES	Dependent variable: TEA	
	1&2 (1)	3&4 (2)
GC	0.190** (0.090)	0.147 (0.108)
Constant	3.019*** (0.366)	3.159*** (0.430)
Observations	115	158
R-squared	0.048	0.018
Panel B: TEA and MC		
VARIABLES	Dependent variable: TEA	
	1&2 (1)	3&4 (2)
MC	0.157** (0.072)	0.097 (0.092)
Constant	3.151*** (0.289)	3.365*** (0.357)
Observations	115	158
R-squared	0.051	0.009
Panel C: TEA and COM		
VARIABLES	Dependent variable: TEA	
	1&2 (1)	3&4 (2)
COM	0.097 (0.084)	0.157** (0.079)
Constant	3.415*** (0.326)	3.178*** (0.291)
Observations	115	158
R-squared	0.018	0.034

***, ** and * express the reliability at significance level 1%, 5% and 10%.

5. RESULT DISCUSSION AND PROPOSALS

5.1. Conclusion on factors affecting the effectiveness of the team

By using the theoretical methods, the research team has built up factors affecting the effectiveness of the team including commitment, mature communication, and clearly defined goals. From the definitions and the related studies, the research team has constructed a total of 14 observed variables used to measure the effectiveness of teamwork for the above factors. The data was processed and analyzed by the SPSS20 software through analysis: testing the reliability of the scale, analyzing EFA factors, and regression analysis. The results obtained after performing the following methods:

According to the qualitative method, in-depth interviews are conducted with the subjects who are members of the head committee of clubs at the University. Factors commitment, clearly defined goal, and mature communication all directly impact team performance.

According to the results of the quantitative methods after data processing and analysis on SPSS 20.0 software, the results of the hypothesis testing of proposed models H1, H2, and H3 are accepted. This means that the factors: commitment to goal implementation, communication, and goals all affect team performance.

5.2. Recommendations for future researches

To increase the reliability and representativeness of the results, the research team wants to study at a larger sample size of about 500-600 samples because when the sample size increases, the variation also increases, leading to more accurate results. The regression will also be more accurate and researches will be conducted on many different subjects and wider scales like enterprises about the effectiveness of the team in the future. Because a larger scale will show more significant influences of factors on the effectiveness of the team. Moreover, the research team proposes to further study the effects of the other factors, other aspects of teamwork efficiency in the future.

6. REFERENCES

- [1] Larson, Carl E., & Frank M. LaFasto (1989). *Teamwork: What Must Go Right/What Can Go Wrong*. Newbury Park, CA: SAGE. ISBN 0803932898.
- [2] Klimoski & Jones, R.G (1995). *Staffing for effective group decision making: Key issue in matching people and task*.
- [3] Katzenbach J.R và Smith D.K (1993). *The Wisdom of Teams: Creating the High-Performance Organization*, Harvard Business School Press.
- [4] Kelly Strong & Nurhidayah Azmy (2012): *The Role of Team Effectiveness in Construction Project Teams and Project Performance*.
- [5] Hackman (2002): *Leading Teams: Setting the Stage for Great Performance*, Harvard Business Review Press.
- [6] Rubin, Plovnick & Fry Model (1977): *The GRPI Model of Team Effectiveness*.
- [7] Lenicioni (2002): *The Five Dysfunctions of ATeam*, Jossey Bass Press.
- [8] Ulloa (2004): *Attitude toward teamwork and effective teaming*.
- [9] Hamada Fawzy Abuzid & Muzaffar (2017): *Teamwork effectiveness: the role of organizational support and leader fit*.
- [10] Kleingeld A, Mierlo HV, Arends L (2011): *The effect of goal setting on group performance: A meta-analysis*.
- [11] Katzenbach, Jon; Smith, Douglas (2015). *The Wisdom of Teams: Creating the High-Performance Organization*.

FACTORS IMPACTING VIETNAMESE STUDENTS' CRITICAL THINKING IN VIETNAM

Bui Thu Van

National Economics University

Corresponding author: vanbuihu.neu@gmail.com

Abstract

Critical Thinking has been considered as one of the requisite skills that fresh graduates need to possess in order to land a decent job. This article focuses on the influences that learning environments (activating learning and teaching methods, multidisciplinary learning environments, entrepreneurship) and intrinsic motivation create upon Vietnamese students' creativity in Hanoi. In this study, a self-assessment questionnaire was designed and distributed to 1005 undergraduate students in Hanoi to empirically test the research model and hypotheses. The findings reveal that intrinsic motivation effect students' critical thinking positively, meanwhile, multidisciplinary learning environments, activating learning and teaching methods and entrepreneurship have no impacts on students' critical thinking. Basing on these results, the paper also suggests several solutions for higher education institutions and gives recommendations to Vietnamese government in order to foster and enhance Vietnamese students' critical thinking.

Keywords: critical thinking, intrinsic motivation, activating learning, teaching methods, entrepreneurship, innovation, innovation capability.

1. INTRODUCTION

The world economy is undergoing many changes, the need for knowledge for development leads to an increasing rate of knowledge work (Tynjala, 1999). Critical thinking is very important in the knowledge economy as it is driven by information and technology. The new economy poses increasing demands on flexible mind manipulation skills and the ability to analyze information, integrating diverse sources of knowledge into problem solving. Good critical thinking drives these thinking skills and is essential in an ever-changing work environment. Critical thinking is the ability to analyze problems, assess pros and cons and examine associated risks to achieve a certain goal (Garcia et al., as cited in Pérez-Peñalver et al., 2018). Critical thinking plays an important role in the field of innovation. Critical thinkers tend to point out possible problems and possible solutions, evaluate the pros and cons of a given problem, predict future development trends and risk in innovation projects,... (Pérez-Peñalver et al, 2018). Therefore, today's society requires critical thinking in each individual to be able to participate in the innovation process that brings solutions to today's persistent problems. Therefore, in the long-term vision, education plays a prerequisite role in training and improving each individual's critical thinking. Universities provide the foundation knowledge as well as training the necessary skills for

the young generation who in the future will be able to enter the labor market, contributing to the creation process, create new values of products, organizational structure, processes, information technology,... for organizations and businesses to improve social and economic efficiency (Keinänen, 2019). In other words, educational and training organizations, especially the university system directly training resources for the economy, need to focus on designing teaching and learning methods, creating an environment that promotes critical thinking of students.

In recent years, the critical thinking of students has become an important content and been researched in many parts of the world. This content has also been reviewed and discussed in many international research papers such as HHung-Yi Wu (2014), Butter & Beest (2017) - FINCODA research project, Keinänen & Oksanen (2017), Keinänen & Kairisto-Mertanen (2019). However, in Vietnam, researches mentioning about factors affecting students' critical thinking is still limited.

The purpose of this article is to explore the impact of a number of factors on the critical thinking of Vietnamese students. The next part of the article will present the theoretical basis and research hypothesis. It is followed by the research methodology and results. The end of the article is the discussion of research results and proposals and recommendations.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESIS

2.1. Innovation

Ekaterina & Liv (2012) argues that innovation is a process of turning opportunities into new ideas and bringing them into practice with the aim of creating or improving products, processes or business models. In education, innovation can be new pedagogical theories, approaches, teaching techniques, new teaching tools or learning methods, making a change in teaching and learning, making student learning better (Serdyukov, 2017). Specifically, innovation in education includes four main goals: 1) Improve student learning outcomes and quality of educational services; 2) improving equity in access to and the use of education, leading to equality in learning outcomes; 3) cost minimizations; 4) adaptation to socio-economic changes (OECD, 2016).

Within the research field, our team defines "innovation" from the perspective of The organization for economic cooperation and development - OECD. "Innovation" is the implementation of improvement or renewal of a product (goods, service) or process; new marketing methods; new organization-based methods in business activities, workplace or external relationships. In this definition, implementation is to introduce a product to the market, applying processes, marketing methods, and organizational methods. Innovation not only creates new knowledge, it also develops from what's already there.

2.2. Innovation capability

Innovation capability in the education field can be considered as part of generic skills, a type of competency that can be applied across many fields and topics with different levels and contexts (Nykänen & Tynjälä, as cited in Keinänen, 2019). From this perspective, innovation capability can be understood as the capacity that students need to achieve in their learning regardless of their field or major. This can be seen as the skill and knowledge that students in all fields should strive to acquire, in addition to their specialized skills (Kettunen et al., 2013). According to Mertanen & Kettunen (as cited in Keinänen, 2019), innovation capability can be broken down into individual, team, and networking capabilities including the ability to act on goals, the ability to collaborate flexibly within the team or the ability to create and maintain work relationships. In 2016, realizing that the three-factor assessment model was no longer suitable, researchers divided the innovation capability into five aspects based on different stages of the reforming procedure instead of the old three aspects, specifically: creative ability, critical thinking, ability to propose new ideas, teamwork and networking (Marin et al; Pérez et

al; as cited in Keinänen, 2019). This study only offers insights into the assessment of individual innovation capability based on the students' individual level of critical thinking.

2.3. Critical Thinking

Critical thinking is the ability to analyze problems, assess pros and cons and examine associated risks to achieve a certain goal (Garcia et al., as cited in Pérez-Peñalver et al., 2018). Critical thinking plays an important role in the field of innovation. Critical thinkers tend to point out possible problems and possible solutions, evaluate the pros and cons of a given problem, predict future development trends and risks of an innovation project,... (Pérez-Peñalver et al, 2018). Within the scope of the research, the author uses the definition of "Critical Thinking" by Garcia et al., as cited in Pérez-Peñalver et al (2018), critical thinking is the ability to analyze problems, assess the pros and cons and consider the risks involved to achieve a certain purpose.

2.4. The relationship between the learning environment, intrinsic motivation and critical thinking of the students

Activating learning & teaching methods and Critical thinking

Active teaching provides the opportunity for students to participate in the teaching and learning process in addition to passive classroom listening (Akman, 2016). Students learn by observing, communicating, discussing, applying, evaluating and classifying (Kolb, 1984). In an environment using activating learning, teaching methods, students practice through questions and exercises related to problem solving, presentations, observations and overview. Teachers not only provide knowledge, but also teach students how to think, evaluate, and solve problems. Moreover, teachers also regularly exchange ideas with students, arouse interest in the subject, and encourage students to innovate. In other words, activating learning, teaching methods is a method where students are at the center of the teaching (Maria, 2013). The role of the learner is changed from passive to active, completely different from traditional teaching methods, which mainly rely on teachers and the student is simply receiving information. Activating learning, teaching methods is believed to help students develop competencies such as: critical thinking ability, creative thinking, communication and expressing ideas skill, explore themselves, and provide and respond to the information learners receive during their learning (Konopka, 2015). The above definitions are similar to the views of Keinänen & Kairisto-Mertanen (2019) at the Finnish University of Applied Sciences in the research project on innovation education. The author believes that this method will help students gain knowledge and experience from the situations they

encounter in the learning process. From the above discussion, this study proposes the following hypothesis:

H1: *Activating learning & teaching method positively affects students' critical thinking.*

Multidisciplinary learning environments and Critical thinking

According to UNESCO, the multidisciplinary learning environment focuses mainly on teaching and learning that combine different disciplines to illustrate a certain topic or problem. The same subject can be studied from the conception or point of view of more than one discipline. The term "multidisciplinary" is understood as a combination of separately and independently of different fields of study in order to be able to work in a particular industry and achieve its goals (Garner, 1995). The key to being successful in multidisciplinary learning is the effectiveness of communication between different professions. Accordingly, the multidisciplinary learning environment is one that creates opportunities for students from different professional fields to cooperate and share knowledge (Park & Son, 2010).

Based on that view, Hero & Lindfors (2019) conducting research on student experiences through a multidisciplinary innovation project have shown positive results. Collaboration in a multidisciplinary environment helps students improve their personal capacities of initiative, creativity, responsibility and flexibility. Not only that, the project also helps students improve their competitiveness, communication, negotiation, and team leadership, thereby realizing their strengths and weaknesses, and clearer future orientations (Hero & Lindfors, 2019).

Thus, studies around the world show that the multidisciplinary learning environment has a positive impact on the development of essential competencies such as critical thinking for students, bring benefits to the innovation process later on. From the above discussion, this study proposes the following hypothesis:

H2: *The multidisciplinary learning environment positively affects the students' critical thinking.*

Entrepreneurship and Critical thinking

Entrepreneurship refers to capturing the innovative activities associated with starting a new business (Audretsch et al., 2002). Furthermore, it describes how to apply business opportunities to the development of new products and services (Brush et al., 2003). From a pedagogical perspective, entrepreneurship can be understood as a kind of ability that requires the owner to have knowledge of accounting, marketing and marketing, business management,... in the program (Lehto & Penttilä, 2013). Entrepreneurship in education consists of two elements: The training in starting a business and the training of the attitudes and skills for entrepreneurs to develop certain personal qualities (not

necessarily established a new business) (European Commission, 2004, as cited in Haara & Jenssen, 2016). Entrepreneurship is believed to help students develop their ability to innovate, including critical thinking (Keinänen & Kairisto-Mertanen, 2019). From the above discussion, this study proposes the following hypothesis:

H3: *Entrepreneurship positively affects the students' critical thinking.*

Students' Intrinsic Motivation and Critical thinking

Intrinsic motivation is people acting for their own satisfaction (Deci & Ryan, 2000). Intrinsic motivation is an action that is perceived by individuals to have value and performed for a particular purpose (Kanfer & Chen, 2008). In the innovation aspect, the source of intrinsic motivation is the joy and excitement of developing innovative solutions to problems. Individuals are interested in this because they hope to satisfy their intellectual preference or curiosity. Intrinsic motivation strongly influences the level of performance of contributors and the quality of their contribution in the innovation project (Frey et al., 2011). According to Klaijnsen et al (2017) intrinsic motivation is affected by three factors: capacity desire; desire for autonomy in work; desire to interact, connect with colleagues.

In the education field, intrinsic motivation is a set of cognitive and perceived processes (including expectations, attitudes and beliefs in yourself and learning environment) that influence student trends in approaching, participating, making efforts, and persisting in learning automatically, continuously (McCombs, 1984). To maintain interest in learning and to perform well with learning plans and strategies, students need to be aware of themselves, know what is important to them, their capacities and learning abilities (McCombs, 1984). Intrinsic motivation is believed to influence students' ability to innovate (Keinänen & Oksanen, 2017). Students with great intrinsic motivation will feel happy and excited in the process of participating in innovation projects. From there, students can develop critical thinking, problem solving, creativity and teamwork (Apiola et al., 2010). From the above discussion, this study proposes the following hypothesis:

H4: *The intrinsic motivation of the students positively affects the students' critical thinking.*

3. RESEARCH METHODOLOGY

To test the hypothesis, a survey was conducted on students of several universities in Hanoi.

3.1. Research sample and Data Collection

To standardize the theoretical research model and test the scale, first of all, this research has built a preliminary scale based on previous studies. After that, the authors conducted an interview with 10 students to check the appropriateness of the questionnaire about

the content and promptly correct the errors of expression and translation. The authors also conducted a preliminary quantitative survey before conducting a formal investigation to evaluate and adjust the scale with small samples.

Official survey with questionnaires was conducted on students of universities in Hanoi. The study used two methods of collecting survey data at the same time: an online survey (via the Google form application) and direct survey submission. The total number of votes to be issued is 1252, the number of votes collected is 1005, their quality is assured and they were put into analysis.

3.2. Scale

Most of the scales in this research are inherited from studies and are screened, adjusted, and supplemented to suit the Vietnamese research context through qualitative research. Specifically, the scales are as follows:

Critical Thinking Scale: The study has inherited and adjusted 4 suitable indicators in Butter & Beest's scale (2017) (for example: I tend to think in different perspectives).

Activating learning and teaching methods Scale: The study has inherited and adjusted 3 suitable indicators in the scale of Keinänen & Kairisto-Mertanen (2019) (For example: In the course I take, the instructor allows students to work in groups, make presentations and hold discussions to form ideas or solve problems, debate and criticize; In the course I participate, students

play an active role, research, search, apply and combine information).

Multidisciplinary learning environment Scale: The study has inherited and adjusted 3 suitable indicators from the scale of Keinänen & Kairisto-Mertanen (2019) (for example: In the courses I have taken, there are assignments that I collaborated with students from other disciplines; I have attended a specialized multidisciplinary training course as a member, project manager, or instructor).

Entrepreneurship Scale: The study inherited and adjusted 3 suitable indicators from the scales of Keinänen & Kairisto-Mertanen (2019), Dominik & Banerji (2019) and Bennett (2006). Example: I participate in innovation competitions, practice business ideas.

Students' intrinsic motivation Scale: The study has inherited and adjusted 3 appropriate indicators from the scale of Lee et al (2016) (e.g. I feel proud of myself when participating in innovation activities; I feel excited when participating in innovation activities).

4. FINDINGS

4.1. Reliability and validity tests' findings of all scales

Reliability of all adapted scales in this study was tested by Cronbach's alpha test. The values of all scales' Cronbach coefficient alphas were all higher than .6, with their corrected item-total correlations were higher than .3, which was qualified to analyse (Hoang Trong & Chu Nguyen Mong Ngoc, 2008).

Table 1: Overview of measurement scales

No.	Factors	Number of items	Cronbach's Alpha
1	Activating learning and teaching methods (AM)	3	0.677
2	Multidisciplinary learning environments (MD)	3	0.637
3	Entrepreneurship (EP)	3	0.675
4	Intrinsic motivation (IM)	3	0.820
5	Innovation capability (CR)	5	0.819

Source: Compiled from researchers' findings

Then, the validity of measures were tested with two EFA (Exploratory Factor Analysis) tests, one for dependent variables, one for independent variables.

Looking at Table 2, KMO value was reported to be 0.816, which was greater than 0.5, indicating that they were adequate for factor analysis. Results from Bartlett's tests shown that the p-value = .000, demonstrating that all correlations between variables

were zero. When conducting EFA test for independent variables, its factor loadings were satisfied, which were all higher than 0.5. An expected four-factor solution was acquired from the test, all items were sorted to their expected scales, including Activating learning and teaching methods (AM), Multidisciplinary learning environments (MD), Entrepreneurship (EP), Intrinsic motivation (IM).

Table 2: EFA test's results of independent variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.				.816
Bartlett's Test of Sphericity		Approx. Chi-Square		3159.435
		df		66
		Sig.		.000
	Component			
	1	2	3	4
IM2	.849			
IM1	.834			
IM3	.805			
AM2		.797		
AM3		.746		
AM1		.723		
EP2			.809	
EP3			.795	
EP1			.546	
MD2				.817
MD1				.749
MD3				.649

Source: Compiled from researchers' findings

Table 3: EFA test's results of dependent variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.				.887
Bartlett's Test of Sphericity		Approx. Chi-Square		6839.658
		df		153
		Sig.		.000

	Component			
	1	2	3	4
CT1				.756
CT2				.686
CT4				.633
CT3				.583

Examining Table 3, KMO value was reported to be 0.887, which was greater than 0.5, indicating that they were adequate for factor analysis. Results from Bartlett's tests shown that the p-value = .000, demonstrating that all correlations between variables were zero. When conducting EFA test for dependent variables, its factor loadings were satisfied, which were all higher than 0.5. Items were sorted to its expected scale – critical thinking.

4.2. Research results

Before performing multiple regression to test hypothesis, researchers formed a table reporting correlations between variables. The values of correlation coefficient shown that the correlations between variables were reasonable, regarding both the strength and directions. The values ranged from 0 to 0.8, indicating that multi-collinearity did not occur.

The extracted regression equation:

$$CT = \beta_0 + \beta_1AM + \beta_2MD + \beta_3EP + \beta_4IM$$

Table 4: Regression results on factors affecting students' critical thinking skills

	CONSTANT	AM	MD	EP	IM
Beta	2.475	0.043	0.032	-0,017	0.154
VIF		1.234	1.121	1.404	1.281
t-test	16.663	1.248	1.149	-0.496	4.762
Sig.	0.000	0.212	0.251	0.620	0.000
R-square	0.036				
Adjusted R-square	0.032				
N	1005				

Source: Compiled from researchers' findings

From table 4, the regression model shown that AM, MD, EP variables' p-values were reported to be higher than 0.05, consequently, they were unsatisfied for multiple regression analysis, concluding that they had no effects to critical thinking variable. IM variable' p-value was smaller than 0.05, which means that it was statistically significant. Its unstandardized regression coefficient was positive, so IM is positively associated with critical thinking. Adjusted R-square was 0.032, which means that 3.2% of total variation in critical thinking was explained by total variations in four contextual variables in the model. **Therefore, H4 was supported from the data, H1, H2, H3 were rejected.**

H1: Activating learning and teaching methods (AM) is positively associated with students' critical thinking skills. H1 was rejected.

H2: Multidisciplinary learning environments (MD) is positively associated with students' critical thinking skills. H2 was rejected.

H3: Entrepreneurship (EP) is positively associated with students' critical thinking skills. H3 was rejected.

H4: Intrinsic motivation (IM) is positively associated with students' critical thinking skills. H4 was supported from the data.

Lastly, to ensure that the reliability of the extracted regression equation is adequate, a series of tests detecting violations of the necessary assumptions in

linear regression was also performed. The assumptions tested in this section include the independence of the residual (Durbin-Watson), the multi-collinearity phenomenon (VIF coefficients were all smaller than 2). After testing, it can be confirmed that the built linear regression model does not violate the necessary assumptions in linear regression.

5. DISCUSSION OF FINDINGS AND RECOMMENDATIONS ON HOW TO ENHANCE THE INNOVATION CAPABILITIES OF VIETNAMESE UNIVERSITY STUDENTS

5.1. Findings' discussions

The regression coefficient of IM was 0.151, statistically significant and received positive value, which shown that intrinsic motivation of university students was positively associated with critical thinking skills. This was in line with H4b, hypothesized by researchers. The similar findings were found in Keinänen & Oksanen (2017)'s study conducted in Finland, under FINCODA project, and Moldasheva & Mahmood (2013)'s study in Kazakhstan. Intrinsic motivation played an integral role in promoting cognition and attitudes - two aspects that form students' critical thinking skills. In fact, intrinsic motivation motivates students to complete their learning from their own inner perceptions. Therefore, when faced with the problem, students with intrinsic motivation become more active in analyzing, assessing strengths and weaknesses, considering the risks

involved and the different aspects of the problem, accepting differing opinions to find the possible source and solution to the problem. These are essential expressions of an individual with critical thinking. These manifestations are consistent with the study of Pérez-Penalver et al (2018) on the behavior of the innovator. Feeling excited, feeling self-developed and proud when participating in joint activities, wanting to show personal abilities derived from internal motivation help students to have a more positive attitude, when participating in contributing, speaking and commenting; looking for new values; differentiate thinking; embracing and criticizing different perspectives - skills needed to develop critical thinking. Since then, the students' critical thinking has been enhanced. Thus, the more intrinsically motivated students are, the more their critical thinking skills develop.

5.2. Solutions and suggestions

From the above research results. Some solutions and suggestions are given to improve the multidisciplinary learning environment, improve students' intrinsic motivation, thereby enhancing students' creativity in the learning process.

The results show that students' intrinsic motivation has a positive influence on all four aspects of their capacity to innovate: creativity, critical thinking, teamwork, and connection. Therefore, the school needs to enhance and maintain the intrinsic motivation of students through: 1) Building a positive learning atmosphere; 2) Strengthening the movements of the Association, Union and Party; 3) Building the educational system towards "Free Man".

Contents:

Firstly, the school should cooperate with the faculty to take measures to build a positive learning atmosphere for students. Here, the classroom atmosphere is understood as the main psychological state of the class, reflecting the nature of the relationships between the members of the classroom and is reflected in the attitudes of the members to each other, each member's attitude toward class duties, and attitudes toward themselves. The classroom atmosphere can be improved through:

Renovating content and form of class activities, creating conditions for students to express themselves as well as enhancing positive interaction among class members. Lecturers in the role of learning advisers should discuss with class monitor, design group activities, exchange programs (picnics, group activities outside, exchange with guests) next to mandatory content meetings (class review meeting, performance report).

Apply effective teaching methods. Lecturers must be the ones who create an exciting and positive classroom

atmosphere, helping students express the spirit of cooperation, fervor, enthusiasm to contribute to the lesson, have the opportunity to express themselves by giving speeches and discussion. Specifically, lecturers can use case-study methods (video clips, photos), group discussions and group presentations, assign exercises in project format, and report on implementation at the end of the session. The group that performs well, creatively will be encouraged for their positive work ethic.

Secondly, the school needs to have specific and clear plans to develop the Youth Union and Student Union movement, thereby creating opportunities for students to connect, improve and develop the ability to work in groups. As follows:

Increase the support from the school leaders. The school should create conditions for students to freely develop within the framework. This may come from lending lecture halls and equipment so clubs and teams can perform activities or borrow halls to organize seminars, share knowledge and experiences. In addition, the school can support students in communication work, spreading the practical values that students can get after participating in programs and events of the Union and Association. The school can also mobilize resources from the society (Enterprises, organizations) to sponsor the Union - Association to develop student movements.

Improve the quality of the staffs of Youth Union - Association. The group proposed to develop a "set of evaluation criteria for Union - Association" to serve the work of rotation, appointment, and good performance of assigned tasks. Here, the Union - Association staff must be capable of leading, influential, responsible, and encouraging the collective spirit of students.

Establish interest clubs and groups. These clubs and groups need to match the interests of students, creating an environment for students with abilities and talents to be revealed and develop.

Improve the quality of members of Union and Association. The group proposes to set up a student support and advisory club under the Student Union Executive Committee, which operates in a voluntary form for students in the following forms: academic and skill advice, provide information about scholarship opportunities, introduce part-time jobs inside and outside the school, provide information about cheap accommodation, advise to remove difficulties in the process of making relevant policy documents related to students.

Thirdly, the school needs to build an educational system aimed at developing students to become "Free Man". Here, "the free man" is understood as the freedom of thought and the freedom to choose the values he is aiming for, and at the same time learn to take responsibility for his choices. During class time,

teachers should let students have free time to discuss and give opinions. After every three to four weeks of study, the curriculum should supplement a week called "Reading Week" so that students can renew their understanding through self-study, self-acquisition and information processing. Moreover, the curriculum also needs to shorten general subjects, focus on specialized subjects and electives so that students can freely choose subjects and learn to be responsible for their choices. In addition, the school also needs to build a quick response system and organize discussions between school leaders and students so that students can offer ideas and perspectives to help improve the learning environment.

6. CONCLUSION

Critical thinking is very important in the knowledge economy as it is driven by information and technology. The new economy poses increasing demands on flexible mind manipulation skills and the ability to analyze information, integrating diverse sources of knowledge into problem solving. Good critical thinking drives these thinking skills and is essential in an ever-changing work environment. The findings suggest that intrinsic motivation (IM) is positively associated with students' critical thinking skills.

Although the study has achieved its original purposes of testing the influence of factors on critical thinking among Vietnamese students. However, the research still has some limitations. Firstly, the object of the thesis research is students studying at universities, but the survey is mainly implemented on three main universities (National Economics University, Foreign Trade University and Hanoi University of Science and Technology). Secondly, the study only focused mainly on external factors and did not consider other factors such as students' family background.

Therefore, next studies can be conducted with a larger sample size, students from a variety of schools, or students from specific areas. From there, the results and solutions of the study will be more comprehensive. In addition, the scope of the study can be done for other education levels such as high school or primary school.

7. REFERENCES

- [1] Akman, O. (2016). Status of the Usage of Active Learning and Teaching Method and Techniques by Social Studies Teachers. *Universal Journal of Educational Research* 4(7), pp. 1553-1562.
- [2] Apiola, M., Lattu, M. & Pasanen, A. T. (2010). Creativity and Intrinsic Motivation in Computer Science Education: Experimenting with Robots. *ITiCSE '10: Proceedings of the fifteenth annual conference on Innovation and technology in computer science education*, pp.199-203, <<https://doi.org/10.1145/1822090.1822147>>
- [3] Audretsch, B. D. (2003) *Entrepreneurship: A survey of the literature*. Enterprise Papers No 14. Enterprise Directorate-General European Commission.
- [4] Bennett, R. (2006). "Business lecturers' perceptions of the nature of entrepreneurship". *International Journal of Entrepreneurial Behavior & Research*, Vol. 12 No. 3, pp. 165-188.
- [5] Brush, C. G., Duhaime, I. M., Gartner, W. B., Stewart, A., Katz, J. A., Hitt, M. A., Sharon A. Alvarez, G. Dale Meyer & Venkataraman, S. (2003), "Doctoral Education in the Field of Entrepreneurship", *Journal of Management*, 29(3). 309-331, <DOI: 10.1016/S0149-2063_03_00014-X>
- [6] Butter, R. & Beest, V. W. (2017). "Psychometric validation of a tool for Innovation Competencies Development and Assessment using a mixed-method design". *Research Group on Applied Research Methodology*.
- [7] Dominik, T. M. & Banerji, D. (2019). US community college entrepreneurship educator practices. *Journal of Small Business and Enterprise Development*, Vol. 26, No. 2, pp. 228-242.
- [8] Ekaterina S. Bjornali, Liv Anne Støren (2012). Examining competence factors that encourage innovative behaviour by European higher education graduate professionals. *Journal of Small Business and Enterprise Development* Vol. 19 No. 3, pp. 402-423.
- [9] Frey, K., Lüthje, C., & Haag, S. (2011). Whom Should Firms Attract to Open Innovation Platforms? The Role of Knowledge Diversity and Motivation. *Long Range Planning*, 44(5-6), pp. 397-420.
- [10] Gulnara Moldasheva and Monowar Mahmood (2013). Personality, learning strategies, and academic performance Evidence from post-Soviet Kazakhstan, *Education + Training* Vol. 56 No. 4, 2014, pp. 343-359
- [11] H.-Y. Wu et al (2013), "Exploring the critical influential factors of creativity for college students: A multiple criteria decision-making approach", *Thinking Skills and Creativity* 11 (2014), 1-21.

- [12] Haara, O. F. & Jenssen, S. E. (2016). "Pedagogical entrepreneurship in teacher education – what and why", *Icelandic Journal of Education* 25(2).
- [13] Hero, L. & Lindfors, E. (2019). "Students' learning experience in a multi disciplinary innovation project", *Education + Training*, Vol. 61 Issue: 4, pp.500-522, <https://doi.org/10.1108/ET-06-2018-0138>
- [14] Jibao Gu, Changqing He & Hefu Liu (2015). "Supervisory styles and graduate student creativity: the mediating roles of creative self-efficacy and intrinsic motivation". *Studies in Higher Education*.
- [15] Juha Kettunen, Liisa Kairisto-Mertanen and Taru Penttila (2013). Innovation pedagogy and desired learning outcomes in higher education. *On the Horizon* Vol. 21 NO. 4, pp. 333-342.
- [16] Keinänen, M. M. & Oksanen, A. (2017). Students' perception of learning innovation competences in activity-based learning environment, pp. 48-61.
- [17] Keinänen, M. M. (2019). Educating Innovative Professionals A case study on researching students' innovation competences in one Finnish University of Applied Sciences. Research reports from Turku University of Applied Sciences 49.
- [18] Keinänen, M. M., Ursin, J. & Nissinen, K. (2019). How to measure students' innovation competences in higher education: Evaluation of an assessment tool in authentic learning environments. *Studies in Educational Evaluation* 58, pp. 30-36.
- [19] Kolb, D. (1984). "Experiential Learning: Experience as the Source of Learning and Development". Englewood Cliffs, NJ. Prentice Hall.
- [20] Konopka, L. C., Adame B. M. & Mosele H. P. (2015). "Active Teaching and Learning Methodologies: Some Considerations". *Creative Education*, 6, pp. 1536-1545.
- [21] Lee, G., Lee, J., & Tussyadiah, I. P. (2016). The roles of perceived internal and external benefits and costs in innovation co-creation: lessons from Japan. *Asia Pacific Journal of Tourism Research*, 22(4), pp. 381-394.
- [22] Lehto, A. & Penttilä, T. (2013). Pedagogical Views on Innovation Competences and Entrepreneurship Innovation pedagogy and other approaches. Reports from Turku University of Applied Sciences 171.
- [23] Marin-Garcia & Lloret (2008) Improving Teamwork with University Engineering Students. The Effect of an Assessment Method to Prevent Shirking. *WSEAS TRANSACTIONS on ADVANCES in ENGINEERING EDUCATION* Manuscript received Nov. 19, 2007; revised Mar. 18, 2008.
- [24] Ness & Riese (2015) Openness, curiosity and respect: Underlying conditions for developing innovative knowledge and ideas between disciplines. *Learning, Culture and Social Interaction* 6 (2015) 29-39.
- [25] OECD (2016), *Innovating Education and Educating for Innovation: The Power of Digital Technologies and Skills*, OECD Publishing, Paris.
- [26] OECD. (2015, June). *OECD Innovation Strategy 2015, An Agenda for Policy Action*. Meeting of the OECD Council at Ministerial Level Paris, 3-4 June 2015. Retrieved from <http://www.oecd.org/sti/OECD-Innovation-Strategy-2015-CMIN2015-7.pdf>
- [27] Park, J. & Son, J. B. (2010). Transitioning toward Transdisciplinary Learning in a Multidisciplinary Environment. *International Journal of Pedagogies and Learning*, 6:1, pp. 82-93.
- [28] Ryan, R. M., & Deci, E. L. (2000). "Intrinsic and extrinsic motivations: Classic definitions and new directions". *Contemporary Educational Psychology*, 25, pp. 54-67.
- [29] Serdyukov, P. (2017). "Innovation in education: what works, what doesn't, and what to do about it?", *Journal of Research in Innovative Teaching & Learning*, Vol. 10 No. 1, 2017, pp. 4-33.
- [30] Tynjala, P. (1999). Towards Expert Knowledge? A Comparison between a Constructivist and a Traditional Learning Environment in the University. *International Journal of Educational Research*, 31(5), 357-442.
- [31] Vila, L.E., Perez, P.J., & Morillas, F.G. (2012). Higher education and the development of competencies for innovation in the workplace. *Management Decision*, 50(9), pp. 1634-1648.
- [32] Williamson, B. (2001). Creativity, the corporate curriculum and the future: A case study. *Futures*, 33(6), 541-555.

ORGANIZATIONAL COMMITMENT: HISTORICAL TRENDS AND FUTURE DIRECTIONS

Nguyen Thi Lien Huong, Do Quang Anh, Do Thi Thu Trang, Pham Quynh Nhi¹

¹National Economics University

Corresponding authors: mymuaha@yahoo.com

Abstract

This paper provides a systematic review of the theoretical and empirical literatures on Organizational Commitment in three periods, the 1990s, 2000-2010 & 2010-2020 and the traditional theories of Organizational Commitment by Porter and Becker. In each period, highlight theories and findings are presented and explained with note to the antecedents of OC and the changes in these antecedent factors. Toward the final note of the paper, some new trends of empirical study of OC were presented in light of generation gap and different organization types. Despite many years of research, there is still debate on the conceptualization and antecedents of OC but the multidimension model of Meyer and Allen, though receiving criticism, is still the dominant theory in this field.

Keywords: Organization commitment, Side-bet theory, OCQ, Three-component model, commitment profile.

1. INTRODUCTION

Companies nowadays increasingly realize the importance of their human resource in creating competitive advantage values (Pfeffer, 1994). Creating a competitive advantage through human assets requires management to pay more attention to implementation practices and measures that best motivate its workforce. The change in the mindset of decision-makers at organization level has prompted a number of academic studies to explore the relationship between human resource management and its affected areas including employee commitment. It is becoming increasingly important to have a workforce with a high level of commitment to the organization nowadays. According to Worman (1996), organizations need willingness to contribute from a diverse workforce to compete, enter new markets and differentiate their products and services. However, according to Wallace (1997), it is evident that workers increasingly feel insecure, decrease in trust and are less loyal to an organization. Keeping employees with a good individual – organization fit becomes a major challenge for any business that aims for success in the modern market (Dunnagan et al., 2013). The need to maintain membership with an organization is expressed through the level of employee commitment to the organization. Leaders of businesses need to continuously invest in practices and policies to improve employees' organizational commitment and maintain the company's competitive advantage in the global market (Atif et al, 2011; Oladapo, 2014). Research on

organization commitment rooted since 1960 and developed over the years with many contributions from different authors. This paper aims to brief and compare the theories and significant empirical studies in organization commitment from its birth till now.

2. LITERATURE REVIEW

2.1 Traditional views on organization commitment

Becker's theory

Becker's side-bet theory was one of the earliest attempts to study a comprehensive conceptual framework about organizational commitment from the perspective of an individual relationship with the organization (Weibo et al., 2010). The term "side-bet" refers to the accumulation of investments valued by the individual which would be lost if he or she were to leave the organization (Becker, 1960). More specifically, according to Becker's theory (1960), the relationship between employee and organization are based on the "contract" of economic exchange behavior where employees are committed because they have a total or partial hidden investment, the so called "side-bets", with the organization they maintain membership. A person often finds his or her "side-bets" by the existence of *generalized cultural expectations*, the operation of *impersonal bureaucratic arrangements* or the process of *individual adjustment to social positions*. Becker (1960) argued that over time, costs accrue which make it more difficult for the person to disengage from a consistent line of activity, namely,

working for a particular organization or pursuing a certain occupational career (Cohen and Lowenberg, 1990). The greater the costs and investments that accrue, the more difficult for the employee's tendency to leave the organization.

In other words, this theory argued that individuals will stick with an organization as long as they can retain their position at the organization and are not affected by the stressful conditions they may face. But if they are being offered other equivalent benefits, they may be willing to leave the organization. Mowday et al. (1982) also support this view in their research when they defined organization commitment as a behavior that related to the process by which an individual is tied to an organization and how they take care of this problem. This behavioral perspective is evidenced by a calculative commitment where an employee will

continue to work for the organization based on his/her evaluation of the potential benefits versus the cost of leaving such organization (Hrebiniak and Alluto, 1972).

Although generally not considered as a stand-alone theory of organizational commitment today, Becker's side-bet theory continues to be influential as its aspects are being inherited into later theories of organization commitment including the popular multi-dimensional model of Meyer and Allen (1991, 1997) as *continuance* commitment. Meyer and Allen's scale of *continuance* commitment was advanced from the side-bet view and is one of the three dimensions (*affective*, *continuance* and *normative*) of their conceptualized multi dimensional commitment theory. Table 1 provides a summary of related studies rooted in Side-bet Theory.

Table 1: Highlight findings in previous studies using Side-bet Theory

Year	Authors	Research	Main findings
1969	Ritzer and Trice	Empirically test Becker's theory on a nationwide association of America	Rejected side-bet's theory, offered an alternative theory of commitment which emphasized social-psychological factors as affecting workers' identification.
1970	Stebbin	Evaluate Ritzer and Trice's study on side-bet theory	Becker's side-bet theory is not a theory of value commitment as Ritzer and trice indicated, but rather a theory of continuance commitment.
1973	Alluto et al.	Study on 318 school teachers and 395 hospital employed nurses to test the utility of the side-bet concept	Provide support for Becker's side-bet theory; Age, years total experience, marital status, gender have strong positive impact on commitment.
1979	Baba and Jamal	Assess the empirical relevance of Becker's theory among blue collar workers	Job factors are important determining OC compared to demographics and background factors; Age is the only demographic predictor of OC.
1984	Allen and Meyer	Testing the "side-bet theory" of organizational commitment	The "side-bet" view of commitment was labelled as continuance commitment.
1990	Cohen and Lowenberg	Re-examine the Side-bet theory of Becker (1960) through a meta-analysis procedure from 50 studies	11 side-bet variables (age, tenure, education, gender, marital status, number of children, level in the organization, number of jobs in the organization, skill level, perceived job alternatives, and pay) have low correlation with OC. Therefore, little support for side-bet theory.

Source: Author's summary

Porter's theory and the Organizational Commitment Questionnaire (OCQ)

Preliminary studies on this issue look at organizational commitment from a unidirectional perspective, based on an attitude perspective, with a focus on identification, engagement and loyalty (Porter et al., 1974). In 1974, Porter et al. began laying out the first foundations for definition of organizational

commitment. The definition of Organizational Commitment by Porter et al. (1974) is the most widely used in the 1980's and 1990's, particularly in non-Western countries (Reichers, 1985; Yousef, 2000). Porter et al. (1974) developed the idea of employee commitment as a perspective of either a psychological or an affective relationship between an employee and an organization that depends upon the employee's identification with and involvement in an organization.

More specifically, organizational commitment was characterized by three psychological factors: first, a belief in and acceptance of organizational goals and values (identification); second, a willingness to exert considerable effort toward organizational goal accomplishment (involvement); and third, a strong desire to remain in an organization (loyalty).

The Organizational Commitment Questionnaire was developed by Porter et al. (1974) and consists of 15 items that had been used extensively to measure organization commitment. There were a number of studies that utilized this OCQ (Porter et al. 1974) in their empirical research especially between 1985 and 1995. Table 2 below demonstrates some of the empirical studies using OCQ.

Table 2: Highlight findings regarding the use of OCQ in previous studies

Year	Authors	Research	Results
1981	Angle and Perry	Use Porter's OCQ to measure commitment of 96 transit managers in 24 organization in the US	Found a two-dimensional conceptualization of OC: value commitment and commitment to stay.
1983	Ferris, Aranya	A sample of 1,105 professional accountants in Canada and the US. 2,478 subjects were randomly selected	Had significantly greater predictive ability with respect to intent-to-leave. No difference was found between the predictive ability of the two instruments with respect to actual turnover.
1984	Meyer and Allen	Testing the "side-bet" theory of OC	Fifteen-item OCQ scale represent affective commitment.
1985	Luthans et al	Organizational commitment among American, Japanese and Korean employees,	The Porter et al. scale yielded one factor for the American and the Japanese samples and two factors for the Korean sample.
1990	Koslowsky et al	Compare commitment scales, employing data collected from a sample of 216 police officers in Israel	Porter et al.'s fifteen item scale yielded three factors, namely organizational philosophy, loyalty and pride.
1992	Bar-Hayim and Berman	Explore the dimensions of organizational commitment used a sample of 1,299 employees and employed a factor analysis	Revealed a two-dimensional conceptualization of organizational commitment, namely identification and involvement with the organization, and the desire to remain an employee of the organization.
1992	Cohen and Gattiker	Using Porter's OCQ to measure employee commitment in the US and Canada context	Porter's measure is two-dimensional: value commitment and calculative commitment.
1995	Koh et al	On a sample of 2,000 teachers in 100 secondary schools in Singapore	Revealed two factors: acceptance of organizational values and extension of extra effort by employees and intention to leave.
2003	Yousef D. A.	Non - Western culture setting	Validated the dimensionality of Porter et al.'s measurement of organizational commitment construct, using two independent samples drawn from a non-Western culture (the UAE), and with the utilization of a confirmatory factor.

Source: Yousef's (2003)

2.2 Organization commitment in the 1990s

Multi-dimensional approach to organization commitment

During this period, the leading approach in OC field was the three-dimensional (affective, normative, continuance) model of Meyer and Allen (1991, 1997, 2002). This approach inherited the pros and cons of earlier approaches to OC (Becker, 1960; Porter, et al.,

1974) in its design and thus was affected by their strengths and weaknesses. Meyer and Allen approach started with a paper in 1984 argued that the side-bet approach was inappropriately designed (Weibo, 2010). According to Meyer and Allen (1984) the scales developed by Becker's followers (Ritzer & Trice, 1969; Alutto et al., 1973) in fact were more into measuring attitudinal commitment rather than side-bet. To give a more profound basic for their claim, Meyer and Allen conducted a comparison between several commonly

used scales of commitment and their own 2 dimensional scales of affective and continuance commitment. This is the reason why literature review later claims that Meyer and Allen original model only has 2 dimensions. The definitions for these 2 dimensions were provided in the initial paper where affective commitment was considered a positive feelings of identification with, attachment to, and involvement in the organization activities (Meyer and Allen, 1994) and continuance commitment was considered the extent to which an employee still feels attached to their organization due to perception of the costs they assume will occur if they leave their current job (Meyer and Allen, 1994). Meyer and Allen claimed that the affective commitment scale was advanced as a significant improvement over the OCQ while the continuance dimension scale is a better representation of Becker's side-bet approach (Weibo, 2010).

The research field only started to pay attention to Meyer and Allen model after they introduced the third dimension of normative commitment to the original work (Allen & Meyer, 1990). Normative commitment was defined as a feeling of obligation to stay with the organization of an employee (Meyer & Allen, 1991). By 1997, Allen and Meyer supplemented the three-dimensional definition of organization commitment by asserting that commitment is a psychological state characterized by relationships between members and organization and in turn affects their decision to continue or suspend membership with the said organization. According to Weibo (2010), throughout the years, some changes in the scales were proposed and tested. For example, a shorter 6-item version of the three scales was advanced, a revised normative commitment scale was also proposed, and a two-dimensional scale for continuance commitment was also suggested (Meyer & Allen, 1997).

Allen and Meyer (1990) report in the findings that these three aspects of commitment are all distinguishable components, not three distinct types of commitment and thus an individual can undergo each of these psychological states in different degrees at the same time. A person's total commitment to the organization reflects the net sum effects of these psychological states. Meyer and Allen also added that it must be acknowledged that all three aspects of commitment provide a clearer understanding of the link between employees and the organization. However, they must be considered concurrently because it is the combination of these aspects that gives the most interesting insight into what could be considered a detailed commitment profile for different industries or work cultures (Allen and Meyer, 1990; Meyer et al., 2012).

Antecedents of Organizational commitment

The 1990s also see studies explored further into antecedents of organization commitment. Globalization

gave rise to many changes, challenges and crises coupled with a shortage of labor in some sectors or countries and the great pressure from frequent changes in the environment pushed the need for a committed and loyal workforce becoming more and more important over the years. This is understandable because unlike technology, production costs or new product development, human resources are difficult to intimate. Many scholars argued that consideration should be taken to evaluate whether it is reasonable for an organization to require a high level of employee commitment in the context of rapid change at this period (Hawkins, 1998). According to Laabs (1997), signing indefinite labor contracts in exchange for employee loyalty is an old method that is no longer used by many organizations for many reasons in this period. It is interesting, however, to note that in the absence of an indefinite contract, the level of employee commitment to the organization also decreases in most cases.

In addition, focusing on commitment rather than control is essential because modern business processes hold individuals accountable for their own decisions (Guevara and Ord, 1996). Also, according to McMorro (1999), the transition to a lean production model has caused many changes in the job market. More and more jobs were transferred to the form of subcontracting, outsourcing, consulting... and along with it comes the restructuring and reduction of total workforce at organizations. Part-time, casual, flexible and self-employed jobs are also on the rise in most countries around the world. This changing trend makes maintaining a high level of commitment even more challenging. Therefore, the need of understanding factors that impact organization commitment becomes essential.

Demographic factors

In this period, research in demographic diversity literature increased with a considerable link to workplace diversity that connected employees' demographic characteristics to a number of individual, group and organizational outcomes. (Lau and Murnighan, 1998). Demographic variables such as age, tenure and education are related to organizational commitment to a certain extent (Mathieu & Zajac, 1990; Sommer et al., 1996; Chen & Francesco, 2000).

Age: Sommer et al. (1996) revealed that age was significantly related to employee commitment in Korean context. Mathieu and Zajac (1990), Dunham et al (1994) found that older people have higher commitment and are more satisfied with their jobs and younger employees have less commitment to their organizations because they have less investment and very little history with the organization. In contrast, Irving, Coleman, and Cooper (1997) found that age was not related to organizational commitment.

Gender: The examination of differences in OC between males and females have been reported by many writers. While there was a set of studies conclude that OC by men (Arana et al., 1986; Baird et al., 1998; Dodd-McCue and Wright, 1996; Kaldenberg et al., 1995) was greater than that of woman, another set of literatures (Marsden et al., 1993; Wahn, 1998, Mathieu and Zajac, 1990) including a meta-analysis reported greater commitment by woman. In Marsden et al.'s (1993) literature, men and woman experience similar levels of organizational commitment and some scholars found no correlation between gender and OC (Aven et al., 1993; Ngo and Tsang, 1998). Overall, it seems that the tests of gender and OC's correlation still remain inconsistent in empirical studies.

Level of education: Studies found that commitment and level of education are negatively related (Mathieu and Zajac, 1990; Rowden, 2000; Balfour and Wechsler, 1996; Tansky et al., 1997). One possible explanation for this negative relationship is that the increases in the level of education improve external job alternatives (Mathieu and Zajac, 1990). Additionally, more education can be associated with professional status, resulting in stronger identification with professional norms than with a specific organization. Because public organizations are often composed of professionalized workforces (Mosher, 1982), one would expect a negative relationship between education and commitment in the public sector.

Length of service and Tenure: Research indicates that length of service or tenure is positively related to organizational commitment (Mathieu and Zajac, 1990; Meyer and Allen, 1997). According to Meyer and Allen (1997), the positive relationship suggests that highly committed employees remain in the organization while uncommitted employees leave. Meyer and Allen (1997) noted that employees may develop an emotional attachment with the organization during their employment. This emotional attachment is enhanced over a long period, which makes it difficult for the employee to switch jobs (Meyer and Allen, 1997). However, Balfour and Wechsler (1996) found that length of service was not an antecedent of organizational commitment of employees in public organizations. The studies of police officers in Australia showed a negative effect of tenure on organizational commitments (Beck and Wilson, 1997; Lim and Teo, 1998). Three years later, in a further extension of their work in 1997, Beck and Wilson (2000) again confirmed the degenerative nature of police commitment that longer tenure correlated with increasing levels of negative work experiences and thus commitment.

Leadership style

In the period from 1990 to 2000, an impressive amount of research provides empirical evidence that leadership style is an antecedent of organizational commitment.

Most of researchers in this time focused on examining how three leadership styles (developed by Bass, 1985) impact on components of commitment (developed by Meyer and Allen, 1991). They used the combination of Multifactor Leadership Questionnaire (MLQ) and OCQ to assess issues because these instruments are easy to use, have high levels of reliability and validity, and are appropriate for assessing the relationship between leadership styles and organizational commitment. Overall, numerous empirical studies had confirmed certain leadership styles to have impact on development of separate dimensions of organizational commitment. Both transactional and transformational leadership styles were found to have relationships with all dimensions of organizational commitment to various extents (Romzek, 1990; Bass and Avolio, 1993; Terborg, 1995; Lowe, Kroeck, & Sivasubramanian, 1996; Geyer and Steyrer, 1998), but laissez-faire leadership is less beneficial to employee affective commitment (Bass, 1990; Bass and Avolio, 1993). In three styles of leadership, transformational leadership studies have the highest frequency and carried a significant impact on employee commitment. Keskes (2014) believes that transformational leaders influence followers' organizational commitment by encouraging them to think critically by using novel approaches (Yammarino, Spangler & Bass, 1993; Bass & Avolio, 1994). While Garg and Ramjee (2013) sees that transformational leadership can get results from subordinates that are beyond expectations. Leaders can contribute to an employee's desire to remain committed to the organization by inducing employees' trust and confidence in them (Bass, 1997).

Job satisfaction

Job satisfaction typically is defined as "the extent to which individuals/human resources are satisfied with their jobs and how they feel about different aspects of their jobs" (Agho et al., 1993, p. 1007). Job satisfaction has often been viewed as a variable of organizational outcomes, and close correlations are reported between job satisfaction and organizational performance, turnover, organizational commitment and organizational trust (Liao et al., 2009). In the period of 1990s, most studies resulted that there is a significant and positive relationship between job satisfaction and employee commitment across various sales contexts (Jenkins and Thomlinson, 1992; Hellman and McMillan, 1994; Sagar, 1994; Jamal and Badawi, 1995; Bhuian and Abul-Muhmin, 1997; Yavas and Bodur, 1999; Yousef, 2001). Although some researchers have argued that job satisfaction is a result of commitment rather than a cause of it (Bateman & Strasser, 1984), the preponderance of conceptual evidence and empirical research supports the idea that job satisfaction is an antecedent of organizational commitment (Johnston et al., 1990).

Human resource management

Taylor's belief was that HRM involved the recruitment and selection of the right employees for the right positions, providing relevant training, establishing an adequate performance appraisal system and establishing an equitable compensation and reward system (Aladwan, 2015). These four criteria continue to be important elements in the development of successful HRM (Huselid, 1995). Advanced compensation practices enable the organization to retain essential employees for longer periods of time (Lawler & Jenkins, 1992). HRM practices have been effective tools for enhancing organizational commitment (Ulrich, 1997). Igarria and Greenhaus (1992) found that salary and promotional opportunities have a positive influence on the organizational commitment of professionals working in information systems which leads to better cooperation, better communication, and better participation (Weitzman & Kruse, 1990). HRM practices promote, reinforce, and influence commitment through selection, placement, development, rewards, and retention (Wimalasiri, 1995). It has been found that training activities not only

develop employees and improve their skills and abilities but also enhance their satisfaction with the job and their commitment to the organization (Kalleberg & Moody, 1994; McEvoy, 1997; Harel & Tzafrir, 1999). Laabs (1997) found that a training program at Bell Helicopter reduced employee turnover. Profit sharing and stock ownership encourage team members to identify with the organization and work hard on its behalf (Pfeffer, 1998). Career development strengthens the psychological contract and motivates employees to have continued commitment to the firm (Harel & Tzafrir, 1999).

Limitation and Criticism

During this period, various studies have been carried out to test the validity of Allen and Meyer's multidimensional commitment approach and criticism has been leveled against their theory. There were five main studies, which showed the limitations of the approach of Meyer and Allen between 1993 and 2009. Table 3 below illustrates the literature view of critics of Meyer and Allen's approach.

Table 3: Criticism of Meyer and Allen's model

Year	Studies	Authors	Criticism
1993	Assessing newcomers' changing commitments to the organization during the first 6 months of work. <i>Journal of applied psychology</i> .	Vandenberg and Self	A strong instability in the factor structures, particularly in affective and continuance commitment (with the index point is from 0.58-0.82) across the three time frames when measuring four forms of commitment at three points in time.
1996	On the discriminant validity of the Meyer and Allen measure of organizational commitment: How does it fit with the work commitment construct? <i>Educational and Psychological Measurement</i>	Cohen	Limited predictive validity of organizational commitment dimensions.
1997	Assessment of Meyer and Allen's three-component model of organizational commitment in South Korea. <i>Journal of Applied Psychology</i>	Ko, Price and Mueller	Conceptual ambiguity of the scales, which may be responsible for the psychometric difficulties found in the scales. Overlap between affective commitment and normative commitment (0.75-0.85) based on a lack of discriminant validity between the two concepts.
	An assessment of Meyer & Allen's three component model of organizational commitment and turnover intentions. <i>Journal of Vocational Behavior</i> .	Jaros	The multiple elements and lack of definitional clarity create confusion and misinterpretation.
2009	Measurement of commitment. In H. J. Klein, T. E. Becker, & J. P. Meyer (Eds.), <i>Commitment in organizations: Accumulated wisdom and new directions</i>	Jaros	Unclear dimensionality in continuance commitment causing for the ambiguity in the current approach to OC.

Source: Authors' summary

2.3. Contemporary era of organization commitment (2000-2010)

The studies conducted between 2000 and 2010 in the organizational commitment field further contributed to a better understanding of OC especially the Two-dimensional theory (Cohen, 2007) and the combined influence of AC, CC and NC (Somers, 2009) with eight commitment profiles. As illustrated, these studies advanced from Meyer and Allen's theory have brought emerging new aspects to the current organizational commitment approach but received far less attention than they should have.

Cohen's Two-dimensional theory

In an effort to enhance the strengths of current approaches to OC, while applying some of the above criticism, Cohen (2007) introduced a theory of a two-dimensional model for OC. Building upon the strength of the three dimensional approach of Meyer and Allen (1984, 1997) and minimizing its limitations, Cohen (2007) proposed his theory with two dimensions of commitment that an employee develops over successive years of employment, one is instrumental in nature and the second is affective. Instrumental commitment, as proposed by Cohen (2007), is an attachment resulting from one's perception of the quality of the tangible exchange between his or her contributions to the organization and the rewards that he or she receives. This type of commitment will be influenced by one's experiences in the organization regarding the quality of exchange with the organization and the way in which one's earlier expectations regarding this exchange were met, and to a lesser extent by organizational socialization. Cohen (2007) made a distinction between instrumental commitment, which is based on instrumental considerations and affective commitment, which is based on psychological attachment. Affective commitment was defined as a psychological attachment to the organization demonstrated by identification with it, emotional involvement and a sense of belonging to the organization (Cohen, 2007). Affective commitment will be influenced by variables such as transformational leadership, perceptions of justice, and organizational support that represent higher order exchanges.

In addition, Cohen (2007) suggested that a sharp distinction needs to be made between commitment propensity that develops before one's entry into the organization. Different from many other studies, Cohen's approach was attached to the timing of commitment, and that the process begins before the employee enters the organization (pre-entry commitment) and extends over years of employment (post-entry commitment). Before one enters a specific organization, he or she already has two commitment propensities that have developed in the socialization with one's culture, namely normative and instrumental

propensities. Normative commitment propensity is a general moral obligation towards the organization that reflects the likelihood of becoming committed to it. On the other hand, instrumental commitment propensity is derived from one's general expectations about the quality of the exchange with the organization. This exchange is based on the expected benefits and rewards one might receive from the organization.

As proposed by Cohen (2007) about the relationship between the two commitment propensities and the two actual commitments, an employee with a high level of normative commitment propensity is more likely to develop a high level of affective commitment, and an employee with a high level of instrumental commitment propensity is more likely to develop a high level of instrumental commitment.

New development of Cohen's approach

According to Weibo (2010), the two-dimensional model of Cohen (2007) solves two problems lingered from previous studies. Firstly, Meyer et al. (2002) noted that a high correlation between affective commitment (AC) and normative commitment (NC) existed although there is clear distinctions between AC and continuance commitment (CC). It has led researchers to ascertaining the contribution of normative commitment to organizational commitment. Cohen (2007) redefined NC as a function of the temporal dimension, which could account for the changes in AC, but did not separate CC from AC (Singh and Gupta, 2005). Especially, Cohen's approach here argues that the high correlations occur because normative commitment is a propensity needed to be committed, which should be examined and evaluated before entry into the organization, not after entry. Therefore, the two-dimensional model of OC does not effectively measure continuance commitment, and the psychological constructs of continuance might be significant in determining OC in particular individuals (Singh and Gupta, 2005). Secondly, Weibo et al (2010) shown that the suggested instrumental commitment might be able to solve the limitation that associate with the current definition and measurement of continuance commitment (Ko et al., 1997). The problems in the dimensionality of continuance commitment, as well as its weak relationships with determinants and outcomes, might be resolved by defining it as instrumental commitment which better represents the notion of exchange.

Limitations of Cohen's approach

However, over a decade, despite many literatures indicates the development of Cohen's commitment approach, it seems to draw insufficient attention. Most research based on Cohen's theory for example the application of such theory in Irish organizations (Conway and Monks, 2009) did not bring sufficient evidence to validate its reliability. There was no clear

evidence to suggest that tenure were linked to continuance commitment across the Irish organizations so the research found no evidence that attitudes towards HR practices influenced levels of normative commitment. Thus, Cohen's proposed model still need to be validated according to Weibo et al (2010).

The combined influence of AC, CC and NC of Somers (2009)

Commitment profile

According to Weibo (2010), Somers (2009) brought out a new approach in studying commitment which focus on the combined influence of commitment dimensions (AC, CC and NC) on work outcomes. As we can see, in his study of 288 hospital nurses, commitment profiles are studied in the relationship with turnover intentions, job search behavior, work withdrawal (absenteeism and lateness) and job stress (Somers, 2009). Somers proved that there are eight commitment profiles in organizations including: highly committed, affective dominant, continuance dominant, normative dominant, AC-CC dominant, AC-NC dominant, CC-NC dominant and uncommitted, five of eight commitment profiles were developed. Also, positive work outcomes were related with affective-normative profiles (Weibo, 2010).

New developments of commitment profile

Somers (2009) made some new developments in his theory of OC when compared to Allen and Meyer's approach. First, Meyer's studies relied on the theoretical combinations of commitment components, whereas Somers (2009, 2010) emphasized the importance of an empirically driven methodology to look at the emergence of profiles in order to ascertain that the theoretical groups do actually "exist" in a given population. Advocating of the later approach showed that not all the hypothesized combinations were empirically supported (Dello, Vecchione and Borgogni, 2012). Second, with regards to continuance commitment, CC displayed a positive relationship with absences (Meyer, Allen, 2002), whereas Somers (2009) looked at the differences among commitment profiles with regards to absenteeism, and, unexpectedly, found no significant differences among the highly committed, which were hypothesized to show the lowest level of absenteeism, the uncommitted, and the pure continuance profiles (Dello, Vecchione and Borgogni, 2012). Finally, Meyer et al (2002) did not find strong relationship among normative commitment, organizational citizen behavior, and job performance but Somers (2009) found normative commitment are associated with lower turnover intentions and lower levels of employees' psychological stress (Sohel and Raihan, 2020).

Limitations of commitment profile

However, according to some research, studies of Somers (2009, 2010) still have some limitations. Weibo et al (2010) showed that Somers' approach was more complex to measure clearly. Furthermore, findings of Stanley et al (2013) regarding the Continuance Dominant profile differed from Somers's (2010) findings. The CC Dominant profile was associated with a similar, high level of turnover as the Not Committed profile. However, an important distinction between the two studies was that Perceived Sacrifice and Few Alternatives were not examined separately in Somers (2010).

2.4. Recent trends since 2011 and future direction in organization commitment research

Over three decades, we have seen the development of Organizational Commitment Theory from traditional approaches of Becker and Porter, who relatively suggested one-side bet theory and affective dependence theory, then multidimensional approaches by Allen and Meyer in the 1990s, to today's Cohen two-dimensional theory and Somers' combined theory. Although the scholars do not seem to reach an agreement in terms of OC definition and dimensions, the three-component model proposed by Meyer and Allen has been the dominant framework for this research field, regardless of some criticisms on the validity and theoretical conceptualization of the model.

During this period of 2011 going forward, no efforts have been made to develop a new theory of OC. Researchers remains the adoption of previous approaches that have proved their validity and efficiency worldwide and further extended them for test in new context. Nevertheless, the two most widely used are still the multidimensional theory by Meyer & Allen (1991) and the unidimensional theory by Mowday et al. (1979). In some studies carried out in Vietnam using Mowday's unidimensional theory to measure commitment, 3 factors of identification, loyalty and involvement that impact affective commitment are modified to fit the Vietnamese context (Cao Viet Hieu, 2019; Pham The Anh and Nguyen Thi Hong Dao, 2013; Do Xuan Khanh and Le Kim Long, 2015). More specifically, *identification* was replaced by *pride* and the three dimensions of commitments are examined instead of only one like studies in previous periods.

2.5. Measurement of Organizational Commitment

During this period, while some empirical studies utilized the 15-item full scale of Mowday et al. (1979) (Cao Viet Hieu, 2019, 2013; Raub and Robert, 2013; Do Xuan Khanh and Le Kim Long, 2015), others used the 18-item scale of Allen and Meyer (1997) or 24-item scale of Allen and Meyer (1990), which include the three sub-dimensions AC, CC and NC (Yousef, 2016; Nagar, 2012; Gunlu et al., 2010; Fu and Deshpande,

2013; Singh and Gupta, 2015). A number of studies adopted an abbreviated version of Mowday et al.'s (1979) scale of six to nine items (Thorsteinsson et al., 2014; Lester et al., 2010). In other research, only one or two facets of commitment theorized by Meyer and

Allen (1990, 1997) are measured using the scales they developed (Yücel, 2012; Bulut and Culha, 2010; Park et al., 2014). Table 4 summarizes the frequency of usage in the most common measurement instruments of OC in the 2010-2020 period that this paper reviewed.

Table 4: Summary of previous studies using Mowday's and Meyer & Allen measurement

Measurement instrument	Studies
Mowday et al. (1979), Mowday, Streer, & Porter 1982)	Cao Viet Hieu (2019), Pham The Anh and Nguyen Thi Hong Dao (2013), Do Xuan Khanh and Le Kim Long (2015), Raub and Robert (2013); Farndale et al. (2011); Thorsteinsson et al. (2014); Lester et al. (2010)
Meyer and Allen (1991, 1997), Allen and Meyer (1990)	Vu Ba Thanh and Ngo Van Toan (2017); Gunlu et al. (2010); Yücel (2012); Huang et al. (2012); Nagar (2012); Yousef (2016); Fu and Deshpande (2013); Vo Van Dut and Du Quoc Chi (2016); Messner (2013); Bulut and Culha (2010); Glazer et al. (2019); Park et al. (2014)

Attention toward other antecedents of Organizational Commitment

Apart from other traditional antecedents in agreement with previous studies, this period also come up with several new antecedents such as organization culture and climate, training or other HRM practices. These antecedents were tested in both universal and contingency approach. Organization culture and climate received very less attention and empirical research previously in OC field (Lok & Crawford, 2001). In the well-known review and meta-analysis by Mathieu and Zajac (1990) on the antecedents of commitment, organizational culture and climate were not included.

Some studies have found that an organizational culture i.e. shared values especially in organizational decision making, is essential for establishing employee behaviors (Heskett, 2011; Messner, 2013; Al-Jabari and Ghazzawi, 2019). Farndale et al. (2011) stated that employees, who believe they has a voice in organization proposed changes and an influence in the decision-making process, show higher commitment to the organization. Azizollah et al. (2016) conducted an investigation on staff of an Iranian university with different working tenure and found that the stronger the organizational culture, the better the level of organizational commitment exhibited by its staff. Carvalho et al. (2018) examined 4 types of organizational culture (Clan, Hierarchy, Adhocracy and Market) versus the three dimensions of Organizational Commitment and found that except clan (representing supportive culture) which has a significant impact on all 3 dimensions, the other types only exposed significant relationship with either one or two dimensions of commitment. These findings share a common conclusion with Acar (2012) who argued that Clan and Adhocracy culture have positive effects on Affective Commitment and Normative Commitment. Also, various aspects of organizational climate have been found to be significant in predicting

organizational commitment. Berberogly (2018) suggested that if the organizational climate scores of employees are high, organizational commitment scores are also high. Fu and Deshpande (2013) found that caring climate had a significant indirect impact on organizational commitment through the mediating role of job satisfaction.

New streams of research emerge

OC in Multinational Companies

In the most recent 2 decades we have seen a growing number of empirical works on OC and its sub-dimensions. OC has been studied in both public and private sector organizations, and in both large and small to medium sized enterprises. Presbitero et al (2019) said that while the majority of research on OC has focused on organizations based in a single country or region, studies in recent years have also emerged examining OC in the context of multinational corporations (MNCs) (Wang, 2004; Newman et al., 2011; Nguyen et al. 2013; Benton et al., 2014).

Presbitero et al. (2019) revealed that a small but growing number of studies on OC in MNCs consisted of comparative research, and that differences in the levels of employee OC in different organizational forms (e.g. domestic companies and public company) and in the context of MNCs (e.g. subsidiary and parent company). In Benton and Magnier-Watanabe's (2014) work, managers at domestic firms in Japan were found to have a higher commitment level than managers at MNCs. Rupert et al. (2010) found that members from minority cultural groups working in a Dutch MNC had higher levels of OC than members of majority cultural groups.

Follow the general stream of study in SMEs and stated-owned companies, featured antecedents such as individual related antecedents (age, seniority, tenure) or organization related antecedents (HRM practices, organizational culture, leadership) were tested as independent variables. However, as MNCs are big

enterprises whose operation is conducted outside a single country boundary, a more diverse group of antecedents are tested to illustrate and explain for differences in the level of commitment both within MNCs and in comparison between MNCs and other forms of company. Nguyen et al. (2013) tested the impact of *pre-departure training, clarity of repatriation process, policies & practices of International HRM* on Western employees working for MNCs in Vietnam and found that OC of the expatriate employees working in MNCs toward the parent company was stronger than that toward the subsidiary. Paik et al. (2007) found that compensation gap was significant related to affective commitment only is of crucial importance and he found that the compensation gap between host country workforce and expatriates was negatively related to AC. However, despite many studies were conducted in various contexts, there are still many black boxes in the antecedents of OC in MNCs in comparison with other organization forms. In addition, no study has been able to explain why different employee groups within a single MNC exhibit differential levels of OC (Presbitero et al., 2018). Therefore, more comparative work is needed to understand what factors drive differences in OC among different organization types in general and among different employee groups within MNCs in particular. The influence of other job-level antecedents such as job rotation, job enlargement, job enrichment and job crafting on employees' OC should also be tested to see if their influences are differed among employee groups (Presbitero et al., 2019).

OC regarding Generation Gap

A number of studies reveals differences in organizational commitment between generation X (born between mid-1960s and early-1980s) and generation Y or Millennials (born between early-1980s and mid-1990s) (Gena, 2016; Singh and Gupta, 2015; Glazer et al., 2019; da Silva, 2015). The growing interest in generation gap is not only because Millennials are the most recent generation to enter the workforce, but also because of the increasing anecdotal evidence that Millennials are not committed to their workplace compared to older generations (Singh and Gupta, 2015; Adkins, 2016; Glazer et al., 2019).

Difference in generation, as argued by Marky et al. (2008), are theorized to occur because of major influences in the environment within which early human socialization occurs; influences that impact on the development of personality, values, beliefs and expectations that once formed, are stable into adulthood. Those influences mainly arise from technological, economic and political circumstances during their formative adolescent years (Becton et al., 2014). Therefore, it is important to understand members of different generational (cultural) groups to identify ways of mitigating tensions and achieving high performance in the workplace (Glazer et al., 2014).

Many scholars have examined the differences in generation to the level of employee commitment, however, findings remain inconsistent. Singh and Gupta (2015) suggested that employees have different level of commitment to various aspects of work life. Their finding also illustrated that younger generations (generation Y) are less committed to organizations and more commitment to their profession than the older generations (generation X). Glazer et al. (2019) also found that Millennials (vs Generation X) reported significantly lower levels of continuance commitment, but no differences on normative and affective commitment. In addition, Generation X reported more affective and normative commitment than Millennials when having employee development opportunities. In contrast, as Costanza et al.'s (2012) meta-analysis showed, the effect of generation differences tends to be small to moderate.

For future researches regarding Generation difference, many writers implied that more attention should be paid to examine OC longitudinally to better control for changes in attitudes and conditions, such as a troubled economy, as well as changes in commitment through the lifespan. (Glazer, 2019; Sign and Gupta, 2014). Also, future studies should strive to assess more work-related criteria, collect data on all generations in the workplace, and make more comparisons across cohorts.

3. CONCLUSION

With changes in the current business environment, organization must change their method of management and operation. According to Felstead et al. (2001), in the first decade of the 21st century, management science focused on the transition from control to commitment and made commitment a primary goal in organizational human resources management practices. This transition is the inevitable result of a long research process and gradual approach to new perspectives and new management theories since the late 1980s. Traditional Taylor-style management approaches that focus on high division of labor and tight control led many employees experienced lower motivation to work and try to avoid it whenever they can (Kalleberg and Marsden, 1995). The science of management has gradually moved towards the view of managing performance according to commitment level, that is, controlling employees through increased emotional commitment or through improving their attitudes to the organization instead of coercion. A number of OC theories has been presented over the years since the 1960 side-bet theory. Nevertheless, the dominant one is still Meyer and Allen's multidimension theory. However, there are still many black-boxes as to the conceptualization and antecedents of OC and the impact of other factors such as generation gap, organization types... which call for future study to further work and clarify for a better framework.

4. REFERENCES

- [1] Acar, A. Z. (2012). Organizational culture, leadership styles and organizational commitment in Turkish logistics industry. *Procedia-Social and Behavioral Sciences*, 58, 217-226.
- [2] Adkins, A. (2016). "Millennials: the job-hopping generation", Gallup Business Journal, May 12, available at: www.gallup.com/businessjournal/191459/millennials-job-hopping-generation.aspx (accessed September 1, 2020).
- [3] Agho, A. O., Mueller, C. W., & Price, J. L. (1993). Determinants of employee job satisfaction: An empirical test of a causal model. *Human relations*, 46(8), 1007-1027.
- [4] Al-Jabari, B., & Ghazzawi, I. (2019). Organizational Commitment: A Review of the Conceptual and Empirical Literature and a Research Agenda. *International Leadership Journal*, 11(1).
- [5] Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of occupational psychology*, 63(1), 1-18.
- [6] Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of occupational psychology*, 63(1), 1-18.
- [7] Alutto, J. A., Hrebiniak, L. G., & Alonso, R. C. (1973). On operationalizing the concept of commitment. *Social Forces*, 51(4), 448-454.
- [8] Alutto, J. A., Hrebiniak, L. G., & Alonso, R. C. (1973). On operationalizing the concept of commitment. *Social Forces*, 51(4), 448-454.
- [9] Angle, H. L., & Perry, J. L. (1981). An empirical assessment of organizational commitment and organizational effectiveness. *Administrative science quarterly*, 1-14.
- [10] Anh, P. T., & Dao, N. T. H. (2013). Human Resource Management and Employee Commitment to Enterprise. *VNU Journal of Science: Economics and Business*, 29(4).
- [11] Aranya, N., Kushnir, T., & Valency, A. (1986). Organizational commitment in a male dominated profession. *Human Relations*, 39(5), 433-448.
- [12] Atif, A. N, Ijaz, R and Nadeem. S (2011). Employee retention relationship to training and development: A compensation perspective. *African Journal of Business Management* Vol.5 (7), pp. 2679-2685.
- [13] Aven, F. F., Parker, B., & McEvoy, G. M. (1993). Gender and attitudinal commitment to organizations: A meta analysis. *Journal of Business Research*.
- [14] Azizollah, A., Abolghasem, F., & Amin, D. M. (2016). The relationship between organizational culture and organizational commitment in Zahedan University of Medical Sciences. *Global journal of health science*, 8(7), 195.
- [15] Baba, V. V. & Jamal, M. (1979). On Becker's Theory of Commitment: An Empirical Verification Among Blue-Collar Workers. *Relations industrielles / Industrial Relations*, 34 (1), 123-139.
- [16] Baird, J. E., II, R. C. Z., & Marxen, D. E. (1998). Gender differences in the job attitudes of accountants. *American Journal of Business*, 13(2), 35-44.
- [17] Balfour, D. L., & Wechsler, B. (1996). Organizational commitment: Antecedents and outcomes in public organizations. *Public Productivity & Management Review*, 256-277.
- [18] Bar-Hayim, A. and Berman, G.S. (1992). "The Dimensions of Organizational Commitment". *Journal of Organizational Behavior*, 13: 379-87.
- [19] Bass, B. M. (1985). *Leadership and performance beyond expectations*. Collier Macmillan.
- [20] Bass, B. M. (1997). Does the transactional-transformational leadership paradigm transcend organizational and national boundaries? *American Psychologist*, 52(2), 130-139.
- [21] Bass, B. M., & Avolio, B. J. (1993). *Full Range Leadership Development: Manual for the Multifactor Questionnaire*. Palo Alto, Calif: Mind Garden.
- [22] Bass, B. M., & Avolio, B. J. (Eds.). (1994). *Improving organizational effectiveness through transformational leadership*. Sage.
- [23] Bateman, T. S., & Strasser, S. (1984). A longitudinal analysis of the antecedents of organizational commitment. *Academy of Management Journal*, Vol 27, pp. 95-112.
- [24] Beck, K., & Wilson, C. (1997). Police officers' views on cultivating organizational commitment. *Policing: An international journal of police strategies & management*.
- [25] Beck, K., & Wilson, C. (2000). Development of affective organizational commitment: A cross-sequential examination of change with tenure. *Journal of vocational behavior*, 56(1), 114-136.
- [26] Becker, H. S. (1960). Notes on the concept of commitment. *American journal of Sociology*, 66(1), 32-40.

- [27] Becker, H. S. (1960). Notes on the concept of commitment. *American journal of Sociology*, 66(1), 32-40.
- [28] Becker, H. S. (1960). Notes on the concept of commitment. *American journal of Sociology*, 66(1), 32-40.
- [29] Becker, T. E., Klein, H. J., & Meyer, J. P. (2012). Commitment in organizations: Accumulated wisdom and new directions. *Commitment in organizations*, 432-465.
- [30] Becton, J. B., Walker, H. J., & Jones-Farmer, A. (2014). Generational differences in workplace behavior. *Journal of Applied Social Psychology*, 44(3), 175-189.
- [31] Bentein, K., Vandenberghe, C., Vandenberg, R., & Stinglhamber, F. (2005). The role of change in the relationship between commitment and turnover: a latent growth modeling approach. *Journal of applied psychology*, 90(3), 468.
- [32] Benton, C. F., & Magnier-Watanabe, R. (2014). The impact of commitment, empowerment, embeddedness on knowledge management in domestic and foreign-affiliated firms in Japan. *Knowledge Management Research & Practice*, 12, 161-174.
- [33] Berberoglu, A. (2018). Impact of organizational climate on organizational commitment and perceived organizational performance: empirical evidence from public hospitals. *BMC health services research*, 18(1), 399.
- [34] Bhuian, S. N., & Abdul-Muhmin, A. G. (1997). Job satisfaction and organizational commitment among "guest-worker" salesforces: The case of Saudi Arabia. *Journal of Global Marketing*, 10(3), 27-44.
- [35] Bulut, C., & Culha, O. (2010). The effects of organizational training on organizational commitment. *International journal of training and development*, 14(4), 309-322.
- [36] Carvalho, C. R. S. P., Castro, M. A. R., Silva, L. P., & Carvalho, L. O. P. (2018). The relationship between organizational culture, organizational commitment and job satisfaction. *Rebrae*, 11(2), 201-215.
- [37] Chen, Z. X., & Francesco, A. M. (2000). Employee demography, organizational commitment, and turnover intentions in China: do cultural differences matter? *Human relations*, 53(6), 869-887.
- [38] Cohen, A. (1996). On the discriminant validity of the Meyer and Allen measure of organizational commitment: How does it fit with the work commitment construct? *Educational and psychological measurement*, 56(3), 494-503.
- [39] Cohen, A. (2003). Multiple commitments in the workplace: An integrative approach. Psychology Press.
- [40] Cohen, A. (2007). Commitment before and after: An evaluation and reconceptualization of organizational commitment. *Human resource management review*, 17(3), 336-354.
- [41] Cohen, A., & Gattiker, U. (1992). An empirical assessment of organizational commitment using the side-bet theory approach. *Relations Industrielles/Industrial Relations*, 47(3), 439-461.
- [42] Cohen, A., & Lowenberg, G. (1990). A re-examination of the side-bet theory as applied to organizational commitment: A meta-analysis. *Human Relations*, 43(10), 1015-1050.
- [43] Conway, E., & Monks, K. (2009). Unravelling the complexities of high commitment: an employee-level analysis. *Human Resource Management Journal*, 19(2), 140-158.
- [44] Costanza, D. P., Badger, J. M., Fraser, R. L., Severt, J. B., & Gade, P. A. (2012). Generational differences in work-related attitudes: A meta-analysis. *Journal of Business and Psychology*, 27(4), 375-394.
- [45] da Silva, R. C., Dutra, J. S., Veloso, E. F. R., Fischer, A. L., & Trevisan, L. N. (2015). Generational perceptions and their influences on organizational commitment. *Management Research: The Journal of the Iberoamerican Academy of Management*.
- [46] Dello Russo, S., Vecchione, M., & Borgogni, L. (2013). Commitment profiles, job satisfaction, and behavioral outcomes. *Applied Psychology*, 62(4), 701-719.
- [47] Do, X. K., & Le, K. L. (2015). The study of employee commitment to military petroleum corporation. *Journal of Fisheries Science and Technology*, 3, 115-121.
- [48] Dodd-McCue, D. and Wright, G. (1996). Men, women, and attitudinal commitment: the effects of workplace experiences and socialization. *Human Relations*, 49, 1065-1091.
- [49] Dunham, R. B., Grube, J. A., & Castaneda, M. B. (1994). Organizational commitment: The utility of an integrative definition. *Journal of Applied psychology*, 79(3), 370.
- [50] Dunnagan, K., Maragakis, M., Schneiderjohn, N., Turner, C., Vance, C. M. (2013). Meeting the global imperative of local leadership talent development in Hong Kong, Singapore, and India. *Global Business and Organizational Excellence*, Vol 32, Iss 2, pp. 52-60.

- [51] Dut, V. V., & Chi, D. Q. (2016). The Relationship between Job Satisfaction Level and Staff's Organizational Commitment: The Case of VNPT Can Tho. *VNU Journal of Science: Economics and Business*, 32(3).
- [52] Farndale, E., Van Ruiten, J., Kelliher, C., & Hope-Hailey, V. (2011). The influence of perceived employee voice on organizational commitment: An exchange perspective. *Human Resource Management*, 50(1), 113-129.
- [53] Ferris, K. R., & Aranya, N. (1983). A Comparison of Two Organizational Commitment Scales I. *Personnel Psychology*, 36(1), 87-98.
- [54] Fu, W., & Deshpande, S. P. (2014). The impact of caring climate, job satisfaction, and organizational commitment on job performance of employees in a China's insurance company. *Journal of business ethics*, 124(2), 339-349.
- [55] Geyery, A. L., & Steyrer, J. M. (1998). Transformational leadership and objective performance in banks. *Applied Psychology*, 47(3), 397-420.
- [56] Glazer, S., Mahoney, A. C., & Randall, Y. (2019). Employee development's role in organizational commitment: a preliminary investigation comparing generation X and millennial employees. *Industrial and Commercial Training*.
- [57] Guevara, K., Ord, J., 1996. The search for meaning in a changing work context. *Futures*, Vol 28, Iss 8, pp. 709-722.
- [58] Gunlu, E., Aksarayli, M., & Perçin, N. Ş. (2010). Job satisfaction and organizational commitment of hotel managers in Turkey. *International Journal of Contemporary Hospitality Management*.
- [59] Harel, G. H., & Tzafrir, S. S. (1999). The effect of human resource management practices on the perceptions of organizational and market performance of the firm. *Human Resource Management: Published in Cooperation with the School of Business Administration, The University of Michigan and in alliance with the Society of Human Resources Management*, 38(3), 185-199.
- [60] Hawkins Jr, D. W. (1998). Predictors of affective organizational commitment among high school principals (Doctoral dissertation, Virginia Tech).
- [61] Hellman, C. and McMillan, W. L. (1994), "Newcomer socialization and affective commitment", *The Journal of Social Psychology*, Vol. 134 No. 2, pp. 26-7.
- [62] Heskett, J. (2011). *The culture cycle: How to shape the unseen force that transforms performance*. Upper Saddle River, NJ: FT Press.
- [63] Hrebiniak, L. G., & Alutto, J. A. (1972). Personal and role-related factors in the development of organizational commitment. *Administrative Science Quarterly*, 17(4), 555-573.
- [64] Huselid, M. A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of management journal*, 38(3), 635-672.
- [65] Igbaria, M., & Greenhaus, J. H. (1992). Determinants of MIS employees' turnover intentions: a structural equation model. *Communications of the ACM*, 35(2), 34-49.
- [66] Irving, P. G., Coleman, D. F., & Cooper, C. L. (1997). Further assessments of a three-component model of occupational commitment: Generalizability and differences across occupations. *Journal of applied psychology*, 82(3), 444.
- [67] Jamal, M., & Badawi, J. A. (1995). Job Stress, Type-A Behavior And Employees'well-Being Among Muslim Immigrants In North America: A Study In Workforce Diversity. *International Journal of Commerce and Management*.
- [68] Jaros, S. (2009). Measurement of commitment.
- [69] Jaros, S. J. (1997). An assessment of Meyer and Allen's (1991) three-component model of organizational commitment and turnover intentions. *Journal of vocational behavior*, 51(3), 319-337.
- [70] Jena, R. K. (2016). Effect of generation gap on organizational commitment: A case study of Ferro-alloy industries in India. *Global Business Review*, 17(3_suppl), 76S-89S.
- [71] Jenkins, M., & Thomlinson, R. P. (1992). Organisational commitment and job satisfaction as predictors of employee turnover intentions. *Management Research News*.
- [72] Kaldenberg, D. O., Becker, B. W., & Zvonkovic, A. (1995). Work and commitment among young professionals: A study of male and female dentists. *Human Relations*, 48(11), 1355-1377.

- [73] Kalleberg, A. L., & Moody, J. W. (1994). Human resource management and organizational performance. *American behavioral scientist*, 37(7), 948-962.
- [74] Ko, J. W., Price, J. L., & Mueller, C. W. (1997). Assessment of Meyer and Allen's three-component model of organizational commitment in South Korea. *Journal of applied psychology*, 82(6), 961.
- [75] Koh, W. L., Steers, R. M., & Terborg, J. R. (1995). The effects of transformational leadership on teacher attitudes and student performance in Singapore. *Journal of organizational behavior*, 16(4), 319-333.
- [76] Koh, William L., Richard M. Steers, and James R. Terborg. "The Effects of Transformational Leadership on Teacher Attitudes and Student Performance in Singapore: Summary." *Journal of Organizational Behavior* (1986-1998), vol. 16, no. 4, 1995, pp. 319. ProQuest
- [77] Koslowsky, M., Caspy, T., & Lazar, M. (1990). An empirical comparison of commitment scales. *Journal of Applied Social Psychology*, 20(13), 1063-1075.
- [78] Laabs, J. J. (1997). HR initiatives support Bell Helicopter's new plant operations. HRHQ.com [<http://www.hrhq.com/members/archive/2490.html>].
- [79] Lau, D. C., & Murnighan, J. K. (1998). Demographic diversity and faultlines: The compositional dynamics of organizational groups. *Academy of management review*, 23(2), 325-340.
- [80] Lawler, E. E., & Jenkins, G. D. (1992). Strategic reward systems. *Handbook of industrial and organizational psychology*, 3.
- [81] Lester, D. L., Parnell, J. A., & Carraher, S. (2010). Assessing the desktop manager. *Journal of Management Development*.
- [82] Liao, S. H., Hu, D. C., & Chung, H. Y. (2009). The relationship between leader-member relations, job satisfaction and organizational commitment in international tourist hotels in Taiwan. *The International Journal of Human Resource Management*, 20(8), 1810-1826.
- [83] Lim, V. K., & Teo, T. S. (1998). Effects of individual characteristics on police officers' work-related attitudes. *Journal of Managerial Psychology*, 13(5-1), 334-342.
- [84] Lok, P., & Crawford, J. (2001). Antecedents of organizational commitment and the mediating role of job satisfaction. *Journal of managerial psychology*.
- [85] Lowe, K. B., Kroeck, K. G., & Sivasubramaniam, N. (1996). Effectiveness correlates of transformational and transactional leadership: A meta-analytic review of the MLQ literature. *The leadership quarterly*, 7(3), 385-425.
- [86] Luthans, F., McCaul, H. S., & Dodd, N. G. (1985). Organizational commitment: A comparison of American, Japanese, and Korean employees. *Academy of Management journal*, 28(1), 213-219.
- [87] Macky, K., Gardner, D., & Forsyth, S. (2008). Generational differences at work: Introduction and overview. *Journal of Managerial Psychology*.
- [88] Marsden, P. V., Kalleberg, A. L., & Cook, C. R. (1993). Gender differences in organizational commitment: Influences of work positions and family roles. *Work and Occupations*, 20(3), 368-390.
- [89] Mathieu, J. E., & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological bulletin*, 108(2), 171.
- [90] Mathieu, J. E., & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological bulletin*, 108(2), 171.
- [91] McEvoy, G. M. (1997). Organizational change and outdoor management education. *Human Resource Management: Published in Cooperation with the School of Business Administration, The University of Michigan and in alliance with the Society of Human Resources Management*, 36(2), 235-250.
- [92] McMorrow, J. (1999). Future Trends in Human Resources, *HR Focus*, Vol 76, Iss 9, pp. 7-9.
- [93] Messner, W. (2013). Effect of organizational culture on employee commitment in the Indian IT services sourcing industry. *Journal of Indian Business Research*, 5(2), 76-100.
- [94] Meyer J P, Stanley D J, Herscovitch L., Topolnytsky L. (2002). Affective, Continuance and Normative Commitment to the Organization: A Meta-analysis of Antecedents, Correlates, and Consequences, *Journal of Vocational Behavior*, Vol. 61, pp. 20-52.
- [95] Meyer J., Allen N. J. (1997). *Commitment in the Workplace: Theory, Research, and Application*, Sage Publications.
- [96] Meyer, J. P., & Allen, N. J. (1984). Testing the "side-bet theory" of organizational commitment: Some methodological considerations. *Journal of applied psychology*, 69(3), 372.
- [97] Meyer, J. P., & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human resource management review*, 1(1), 61-89.
- [98] Meyer, J. P., & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human resource management review*, 1(1), 61-89.

- [99] Meyer, J. P., & Allen, N. J. (1997). *Commitment in the workplace: Theory, research, and application*. Sage.
- [100] Meyer, J. P., & Herscovitch, L. (2001). Commitment in the workplace: Toward a general model. *Human resource management review*, 11(3), 299-326.
- [101] Meyer, J. P., Becker, T. E., & Vandenberghe, C. (2004). Employee commitment and motivation: a conceptual analysis and integrative model. *Journal of applied psychology*, 89(6), 991.
- [102] Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of vocational behavior*, 61(1), 20-52.
- [103] Meyer, J. P., Stanley, L. J., & Parfyonova, N. M. (2012). Employee commitment in context: The nature and implication of commitment profiles. *Journal of Vocational Behavior*, 80(1), 1-16.
- [104] Mosher, F. (1982). *Democracy and the Public Service*, New York and Oxford: Oxford University Press. Inc., 56-82.
- [105] Mowday, R.T., Porter, L.W. and Steers, R.M. (1982) Employee-Organization Linkages: The Psychology of Commitment, Absenteeism and Turnover. Academic Press, New York.
- [106] Nagar, K. (2012). Organizational commitment and job satisfaction among teachers during times of burnout. *Vikalpa*, 37(2), 43-60.
- [107] Newman, A., Thanacoody, R., & Hui, W. (2011). The impact of employee perceptions of training on organizational commitment and turnover intentions: a study of multinationals in the Chinese service sector. *The International Journal of Human Resource Management*, 22(8), 1765-1787.
- [108] Ngo, H. Y., & Tsang, A. W. N. (1998). Employment practices and organizational commitment: differential effects for men and women?. *The International Journal of Organizational Analysis*.
- [109] Nguyen, P., Felfe, J., & Fookan, I. (2013). Antecedents of commitment to a parent company and to a local operation: Empirical evidence from Western employees working for multinational companies in Vietnam. *International Journal of Human Resource Management*, 24, 1346-1375.
- [110] Oladapo, V., (2014). The impact of talent management on retention. *Journal of business studies quarterly*, Vol 5, Iss 3, pp. 19-36.
- [111] Paik, Y., Parboteeah, K. P., & Shim, W. (2007). The relationship between perceived compensation, organizational commitment and job satisfaction: The case of Mexican workers in the Korean Maquiladoras. *International Journal of Human Resource Management*, 18, 1768-1781.
- [112] Park, H. Y., Christie, R. L., & Sype, G. E. (2014). Organizational commitment and turnover intention in union and non-union firms. *SAGE open*, 4(1), 2158244013518928.
- [113] Pfeffer, J., & Jeffrey, P. (1998). *The human equation: Building profits by putting people first*. Harvard Business Press.
- [114] Pfeffer, J., 1994. Competitive advantage through people. *California management review*, Vol 36, Iss 2, pp. 9-28.
- [115] Porter, L. W., Steers, R. M., Mowday, R. T., & Boulian, P. V. (1974). Organizational commitment, job satisfaction, and turnover among psychiatric technicians. *Journal of applied psychology*, 59(5), 603.
- [116] Presbitero, A., Newman, A., Le, H., Jiang, Z., & Zheng, C. (2019). Organizational commitment in the context of multinational corporations: a critical review and directions for future research. *The International Journal of Human Resource Management*, 30(1), 188-218.
- [117] Raub, S., & Robert, C. (2013). Empowerment, organizational commitment and voice behavior in the hospitality industry: Evidence from a multinational sample. *Cornell Hospitality Quarterly*, 54, 136-148.
- [118] Reichers, A. E. (1985). A review and reconceptualization of organizational commitment. *Academy of management review*, 10(3), 465-476.
- [119] Reichers, A. E.. (1985). A review and reconceptualization of organizational commitment. *Academy of management review*, Vol 10, Iss 3, pp. 465-476.
- [120] Ritzer, G., & Trice, H. M. (1969). An empirical study of Howard Becker's side-bet theory. *Social forces*, 475-478.
- [121] Romzek, B. S. (1990). Employee investment and commitment: the ties that bind. *Public Administration Review*, 50(3).
- [122] Rowden, R. W. (2000). The relationship between charismatic leadership behaviors and organizational commitment. *Leadership & Organization Development Journal*.
- [123] Rupert, J., Jehn, K. A., van Engen, M. L., & de Reuver, R. S. (2010). Commitment of cultural minorities in organizations: Effects of leadership and pressure to conform. *Journal of Business and Psychology*, 25(1), 25-37.
- [124] Sager, J. K. (1994). A structural model depicting salespeople's job stress. *Journal of the Academy of Marketing Science*, 22(1), 74-84.

- [125] Seltzer J, Bass BM. Transformational Leadership: Beyond Initiation and Consideration. *Journal of Management*. 1990;16(4):693-703.
- [126] Singh, A., & Gupta, B. (2015). Job involvement, organizational commitment, professional commitment, and team commitment. *Benchmarking: An International Journal*, 22(6), 1192-1211.
- [127] Sohel, S. M., & Raihan, T. Relationship between Occupational Health & Safety and Employee Commitment: A Study on RMG Sector of Bangladesh.
- [128] Somers, M. J. (2009). The combined influence of affective, continuance and normative commitment on employee withdrawal. *Journal of Vocational Behavior*, 74(1), 75-81.
- [129] Sommer, S. M., Bae, S. H., & Luthans, F. (1996). Organizational commitment across cultures: The impact of antecedents on Korean employees. *Human relations*, 49(7), 977-993.
- [130] Stanley, L., Vandenberghe, C., Vandenberg, R., & Bentein, K. (2013). Commitment profiles and employee turnover. *Journal of Vocational Behavior*, 82(3), 176-187.
- [131] Stebbins, R. A. (1970). On misunderstanding the concept of commitment: A theoretical clarification. *Social Forces*, 526-529.
- [132] Tansky, J. W., Gallagher, D. G., & Wetzal, K. W. (1997). The effect of demographics, work status, and relative equity on organizational commitment: looking among part-time workers. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, 14(3), 315-326.
- [133] Thorsteinsson, E. B., Brown, R. F., & Richards, C. (2014). The relationship between work-stress, psychological stress and staff health and work outcomes in office workers. *Psychology*, 2014.
- [134] Ulrich, D. (1997). Measuring human resources: an overview of practice and a prescription for results. *Human Resource Management: Published in Cooperation with the School of Business Administration, The University of Michigan and in alliance with the Society of Human Resources Management*, 36(3), 303-320.
- [135] Vandenberg, R. J., & Self, R. M. (1993). Assessing newcomers' changing commitments to the organization during the first 6 months of work. *Journal of applied psychology*, 78(4), 557.
- [136] Wahn, J. C. (1998). Sex differences in the continuance component of organizational commitment. *Group & Organization Management*, 23(3), 256-266.
- [137] Wallace, J. E. (1997). Becker's side-bet theory of commitment revisited: Is it time for a moratorium or a resurrection? *Human Relations*, 50(6), 727-749.
- [138] Wang, Y. (2004). Observations on the organizational commitment of Chinese employees: Comparative studies of state-owned enterprises and foreign-invested enterprises. *International Journal of Human Resource Management*, 15, 649-669.
- [139] WeiBo, Z., Kaur, S., & Jun, W. (2010). New development of organizational commitment: A critical review (1960-2009). *African Journal of Business Management*, 4(1), 012-020.
- [140] Weitzman, M., & Kruse, D. (1990). Profit sharing and productivity. 1990, 95-142.
- [141] Wimalasiri, J. S. (1995). An examination of the influence of human resource practices, organizational commitment and job satisfaction on work performance. *International Journal of Management*, 12, 352-352.
- [142] Worman, D. (1996) Take it or Leave it. *People Management*. Vol. 2. No. 21. p. 53.
- [143] Yammarino, F. J., & Bass, B. M. (1990). Long-term forecasting of transformational leadership and its effects among naval officers: Some preliminary findings. *Leadership Library of America*.
- [144] Yavas, U., & Bodur, M. (1999). Satisfaction among expatriate managers: correlates and consequences. *Career Development International*.
- [145] Yousef, D. A. (2001). Islamic work ethic – A moderator between organizational commitment and job satisfaction in a cross-cultural context. *Personnel review*.
- [146] Yousef, D. A. (2003). Validating the dimensionality of Porter et al.'s measurement of organizational commitment in a non-Western culture setting. *The international journal of human resource management*, 14(6), 1067-1079.
- [147] Yousef, D.A. (2000), "Organizational commitment: a mediator of the relationships of leadership behavior with job satisfaction and performance in a non-western country", *Journal of Managerial Psychology*, Vol. 15 No. 1, pp. 6-28.
- [148] Yücel, İ. (2012), "Examining the relationships among job satisfaction, organizational commitment, and turnover intention: An empirical study", *International Journal of Business and Management*, 7(20), 44-58.

VIRTUAL-REALITY BUSINESS MODEL FOR IMPROVEMENT OF TRAINING AND TEACHING

Huynh Nhat Truong¹, Tran Thi Trang^{2*}, Le Tran Nguyen Nhung³

¹Faculty of Business Administration, Ho Chi Minh City University of Technology (HUTECH),
Ho Chi Minh City, Vietnam

*Corresponding author: tt.trang@hutech.edu.vn

Abstract

Nowadays, the trend of the cooperation between universities and businesses is considered as one of the most effective solutions to improve the quality of training undergraduate and postgraduate. Virtual-reality programs built based on the cooperation between universities and businesses will increase practical skills during studying process of students. Therefore, a virtual-reality business model is proposed for training undergraduate and postgraduate, in which some subjects are built so that students can study without classes. In this paper, a "Virtual-Reality Business Model" for improving studying for students who are inexperienced in practice is proposed. In particular, a virtual-reality Business program with the expectation that students at the HUTECH to get acquainted with the real business environment after graduating is designed, in which the model has simulation rooms, small student groups with limited students for effectively studying and lecturers with practical experiences. In addition, this paper introduces some points of view in orientations, objectives, training programs and opportunities of this major. Statistics shows that the proposed virtual-reality business model for business program is effective and should be developed more subjects in the training program as well as other programs at the HUTECH and at other universities.

Keywords: Virtual Business, Virtual-Reality model, Vocational education.

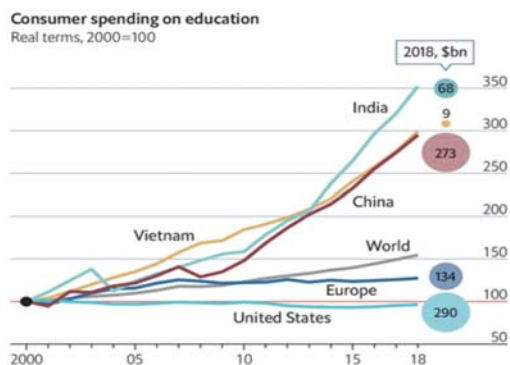
1. INTRODUCTION

Nowadays, a training program built with the cooperation between universities and businesses is considered as one of the most effective solutions to improve the quality. A training programs should be to encourage critical thinking, and knowledge acquisition through rote learning (Rabasso, 2010). In addition, traditional programs are often lack of appropriately contextualized work-experience opportunities (Guile, 2001), and limited soft-skill development opportunities (Fleming, 2008). Therefore, the vocational tendencies of traditional degree programs should be replaced with a focus on practice (Jackson, 2012).

According to Directorate of Vocational Education and Training (2019), the Vietnamese vocational education sector currently has 2,000 vocational education centres, consisting of 400 colleges and over 1,045 centres for Continuing Education. In 2019, vocational education centres have enrolled 2.21 million students, the number of graduated students in the vocational education centres is 2.1 million and Continuing Education has 440,000 graduated students.

According to Mac (2015), the competition can be aggressive for the Vietnamese labour force, in which a critical need for Vietnam's labour force is equipped with skills for integration and operation. This was highlighted in the 2014 release of the Vocational Education Law (formerly the 2006 Vocational Training Law) in 2015. This new law addresses the emerging demand for vocational learners to be equipped with integrated skills, such as the abilities to work independently, to be creative, to apply modern technology and to adapt to a new working environment in the context of the ASEAN Economic Community. Furthermore, the mismatch between the existing curriculum and the demands of employers must be addressed (Tran, 2014).

In addition, according to the statistics in this research, the result of the skills to accommodate with workplace environment when internship of students with the survey of 1,180 students at four universities in Ho Chi



Source: *The Economist, HolonIQ, Oxford Economics*

Fig. 1: Market scale in Vietnam education

Minh city has shown 63% students unemployment because the lack of skills and 49.2 % students has said the content of training programs has focused on the theory and the lack of focusing on the practice (Huynh, 2016). Grasping real demands from the society and the needs of students, the HUTECH's Business Administration faculty pioneers in building the "Virtual-reality Business Model" with the expectation that HUTECH's students to get acquainted with the real business environment after graduating. Firstly, a virtual business program, which is built, can help students gain knowledge in practicing workflows with the support of lecturers with experiences in working at reality businesses.

The new subjects were born to eliminate and to improve all disadvantages that the students are being have, consist of: E-commerce, Data Analysis, Logistics Management, Business Document. These subjects have 6 sessions in theory and 6 ones in practice. The born of the new subjects will reduce the theory in each subject and increase the practice following the reality, called "Virtual Business". This new idea will help the current students at a university return to the subjects one ways interest and the virtual subjects will be a new point in promotion for the university entrance through brochures to attract more new students.

In the E-Commerce, students will practice to create websites to sell goods that they want to business. To do that, the students will be instructed to use Xampp and Opencart software. About Data Analyst, like the E-Commerce, the students will learn and use the SPSS 22.0 software for statistics about all of economic phenomena in practice. This practice requires the students need to know the theory deeply and apply this to resolve the specific economic case in reality. With the Logistics management, the students will get acquainted with the Logware software. This software helps them get to use with resolving the reality logistics case as well as how to manage and organize the transport in the best way. Last but not least, Business Document students will play an important role in the importer and exporter and resolve the reality process of foreign trade. In this subject, the students use Excel to compose all of documents such as Sales Contract, Commercial Invoice, Packing List, Bill of Lading, Certificate of Origin, etc. Besides, they will be to use the Ecus5 to declare with customs (Nguyen, 2017).

The practice – teaching gap in management domain has been explored in recent years, in which, the mutual benefits are shared between teaching and practice Lisa (2010). In addition, the strong belief in developing a closer link between these two components in order to enhance the learning process and to impart the practice skills among the learners was represented. It means that

today's learners are tomorrow's executives. Hence, skills required for the drastically changing corporate world are to be inculcated among learners (Thomas, 2015; Martin, 2007; Mintzberg, 2004). The gap between preach and practice should be removed, learners are to be taught in a practical approach, and applied from learned method (Colby, 2011).

In general, the area of education in Vietnam seems to be saturation due to causes from mostly teaching heavy theory without connection between "Preach - Practice" for students all universities. With the born of new product education "Virtual Business", it will meet the needs of mostly students and may help to fill the distances in GAP of education area.

2. ORIENTATION FOR VIRTUAL BUSINESS TRAINING PROGRAM

2.1. Business Model Canvas (BMC)

Table 1: Business Model Canvas for new subjects

Key Partners (KP)	Key Activities (KA)	Value Propositions (VP)	Customer Relationships (CR)	Customer Segment (CS)
CESIM company Thai Son company	- Research and develop syllabus. - Making finance statement and balance sheet to principal. - Design plan for simulate room. - Making schedule for students to make use of maximum performance.	- Unique training program than others. - Closely to simulation with the reality work at business.	- Cooperate with high school in careers guidance. - Giving the preferential condition for all students at my faculty.	- All students are being learn at my business administration faculty. - All high school students to prepare entrance to university.
	Key Resource (KR) - Well-qualified teaching staff. - Simulation room. - License software.		Channels (CH) - Livestream on Facebook fanpage. - Direct at my university or faculty. - Official websites of university.	

Cost Structure (CS)	Revenue Streams (RS)
<ul style="list-style-type: none"> - Marketing expenses. - Salary for lecturers and technician. - Maintaining software expenses and simulation room: computer and facilities. 	<ul style="list-style-type: none"> - From current students are being learn at university. - From potential students at high school will entrance to my university.

Source: Author's synthesis

Lund (2014) discussed the use of business models as analogies for innovating businesses, in line with the possible decaying role of business plans (Karlsson, 2009). The business model has the opportunity of becoming what the next generation of entrepreneurs will use (Magretta, 2002). When it is completed, the BMC provides a one-page view of “what” the business does to achieve its goals (Osterwalder, 2010). The BMC's popularity has made it with the focus of many academic studies (Kajanus, 2014; Coes, 2014; Golnam, 2014; García-Gutiérrez, 2016; Sparviero, 2019). Table 1 describes some new subjects which were applied the BMC.

BMC consists of two parts: Macro factors and Micro factors. On the left of the canvas, the key partners, key activities and key resources building blocks represent the infrastructure management quadrant of the business. On the right side of the canvas, the customer relationships, customer segments and channels building blocks make up the customer interface quarter covering the business's customers and their interactions with them (Osterwalder, 2010). The value proposition building block represents the product component of the business, and finally, at the bottom of the page, the cost structure and revenue streams comprise the financial aspects of the business. In particular, the first macro factor is customer segment towards the current student being learn at the HUTECH university and the first object impacts to the new training program. This first type will be the object to have a visual look in appreciating this. With the second type, students at high school will entrance to the university after completing the National High School Examination and this type has seemed a potential customer in the future and needs to be more invested.

Value propositions are the second element in BMC. Two factors make the HUTECH university different from other universities. First is the unique training program, with the born of new reality simulation subjects and this will help the training program in HUTECH's Business Administration faculty differ from the training program of other universities.

Currently, most of training programs at universities in Vietnam mainly focus on teaching theory and less

practical subjects for students. It is reason to make students feel bored during studying due to the lack of using in the reality at business after graduating. In addition, this new program not only bring the unique and difference from the rest of university but also help students have experiences and opportunities to reach with the reality in business during studying at university. This makes the students more confident after graduating and may work at business. Therefore, it is two biggest values that the new subject wants to provide for students.

Customer relationship is the next factor in BMC to retain the loyal of own students and also attract more new students. In this enrollment at high school, there is a lot of universities to join. Thus, making difference is an essential thing not only in training program, but also in marketing strategy at high school than others competitors. With the own students to retain the loyal of students, preferential will be the good condition for all students in faculty. In particular, if the current students, who are being learned these new subjects, will replace internship reports and save time for completing their training program. This will encourage students and also make them feel more excited about the new subjects.

Many channels help faculties connect with the customer segment. Through on this, HUTECH's Business Administration faculty will bring the value that students want. The first channel is career's guidance through the livestream on fan-page of Facebook. It is seemed the best modality to connect with students and parents, particularly when Covid-19 pandemic has complicated movements. This livestream careers guidance will be hold in every Sunday, which is the best time for students and parents to have a look. In addition, this livestream of every week often has three faculties to promote and answer all questions from the students and the parents. Through on this, the new reality simulation subjects will promote as well as consultant, besides to explain about the traditional training program. In particular, students at high school and their parents concerning to the training program could give questions and comments at fan-page, and MC of program will collect all these questions of Business Administration faculty for answering to them. After watching the careers guidance from the Facebook fan-page, if the students still have confusion, they can come directly to faculty for consultant. The departments of the faculty have a high responsibility in satisfying the demand of students and their parents. Besides, if the students living so far from Ho Chi Minh city, they can contact through the website.

Next factor, which is revenue stream, reflects a number of cash from each segment at university, consisting of two sources: From current students are being learned at university and from potential students at high school will entrance to HUTECH. The main source of

Business Administration faculty is the current students, who bring the prestige providing a stable cash for faculty and university. Second, revenue will come from the new students who will apply to study at university and this object seems to be considered potential due not their entrance. In particular, it is not sure because they have many choices from other universities. Hence, this revenue is not stable compared to the first source.

Next is the micro factor which is a key resource mentioned to the most important asset that business need to operate the activities. The condition of the new reality simulation subjects is finding well-qualified teaching staff. Lecturers chosen for teaching these new subjects have a lot of knowledge in reality at business and at least 5 years in experience at the business to attract students into the content of the new subjects on the way better. Next, the simulation rooms with facilities have a special design compared to other rooms related to training programs in university, particularly the room at business is used for simulation practice of the good work space for students. Besides, some of simulations request to have specific software, which cannot replace by others software, in which the Business Documents will use ECUS5 VNACCS provided by Thai Son company. In particular, the software of this company is to work with customs being used by all of present companies. In addition, this software is annually retained the license in each computer.

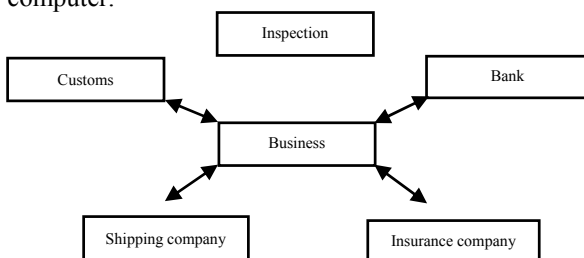


Fig. 2: The block diagram of the process

The key activity is a part of micro factors, in which this factor to describe the most important activities that business needs to maintain. One of the most priority activities is research and develops syllabus. These activities are the premise of these new subjects as well as spending a lot of time in researching is the foreign source, even if the lecturers have to buy the official documents for research. Besides, after research and inheriting these documents, all teaching staff need to be chosen as well as to be eliminated the knowledge for being suitable with the situation of education in Vietnam.

Key partners will be the object to provide the resource to help implementation better. CESIM and Thai Son are two company partners who have the important role in providing the software for all of simulation subjects. About CESIM, this companies have experienced over 7 years at foreign countries in designing and consulting

the simulation at university. Although the input materials of two companies are higher than other competitors, these companies provide a good solution and optimization for new simulation subjects closed to the business.

Final factor in BMC is cost structure, which describe all expense relate to the operate as well as maintaining for company. With the new reality subjects, marketing has seemed a largest expense that we have to invest. Besides, the cost has spent for lecturers to teach, research and contribute in the syllabus as well as the expense have to pay for technician to repair and maintain the computer at the end of each semester extremely high. Not only that, the facilities in the simulation room have to be repaired and retained to assure that the environment in studying is the worth with fees that students have paid for faculty and university. That is all of BMC about the new reality simulation subjects in training program of Business Administration faculty.

2.2. Operation plan and process description

In general, reality simulation subjects such as: E-Commerce, Data Analysis, Logistics, have similar teaching process and layout. For these subjects, a class will have the maximum 30 students and be arranged into a computer practice center with special software equivalent with each subject. Lecturers will act as instructors and students will practice based on similar simulation situations in reality after being instructed.

For the Business Documents of the simulation model, the corresponding rooms are compulsory and designed with a special process in order to fully implement an import and export commercial affair. The virtual enterprise simulation room model will be divided into 6 small units, including enterprises, shipping lines, customs, inspection agencies, banks and insurance companies (Nguyen, 2017).

The 30 students in the room will be divided into 5 groups corresponding to 6 students per group and they will practice alternately to finish the 6 units in the virtual business simulation room. The 5 groups with parts are described as follows:

- Business models: 6 students
- Shipping lines model: 6 students
- Customs model: 6 students
- Inspection agencies: 6 students
- Banking and insurance company model: 6 students

Fig. 2 is the block diagram with blocks related to studying parts. The location of the units in the project is simulated based on the actual geographic location in the outside of businesses. In particular, three departments are arranged nearly for shipping lines, customs and inspection agencies. In addition, these units are located close to each other to facilitate the import and export activities of the business. The

shipping line will be located near the port, which will have a customs office and the inspection agency will be located near to it or may be built to have an office at the port. The reality described can help to build the proposed ideas for the simulation room more accurate and effective (Nguyen, 2017).

Based on a reference to the reality situation, workflow, functions and specific tasks at each unit, the virtual-reality business model is built as follows:

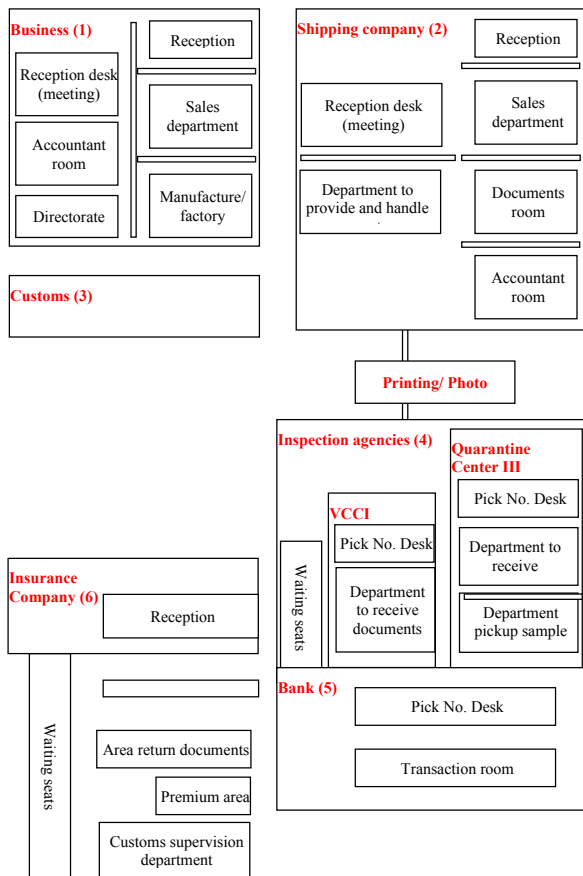


Fig. 3: Representation of designing a virtual-reality business model with subjects in detail

3. RESULTS AND DISCUSSION

A virtual business simulation room serving import and export activities is designed for students to be learned the major of Foreign Trade in university at Faculty of Business Administration. It is obvious that performance to use the reality simulation room is considered. In order to build this room, the faculty has used the business simulation services provided by CESIM company as a key partner. The simulated online accounts for customs declaration software are delivered to students so that they could get acquainted with business reality. Moreover, the authors calculated the value of the relevant statistics for this study based on the number of junior and senior students and that of

lecturers as well as the university's regulations of teaching and learning. To achieve the best efficiency of the virtual simulation model, estimating the number of classes for faculty is necessary, in which the number of business administration classes from years of 2020 to 2021 is described in Table 2.

Table 2: Semester 1A/2020 - semester 1A/2021

Type of training	Semester 1A/2020	Semester 1B/2020	Semester 2A/2020	Semester 2B/2020	Semester 1A/2021	Avg. Class per year
University	35	31	30	33	37	33

Source: Author's calculation

In addition, the performance to use the virtual business simulation room has been built as shown in Table 3.

Table 3: Performance to use virtual business simulation room

Faculty	Credits	Number of students/Shift	∑ number of class/year	∑ number of simulation reality classes	∑ Shifts/year	Performance to use facilities
Business Administration (University Type)	3	30	33	$33 \times 2 = 66$	$66 \times 6 = 396$	$(396 + 100) / 444 = 1.117$

Source: Author's calculation

It is noted that the largest number of shifts related to the device, which operates at 100% performances, is calculated as follows:

+ 1 day: 2 shifts

+ 1 week: 6 days

+ 1 year: 37 weeks, consisting of 8 weeks for each semester, 5 weeks for summer semester.

Therefore, the largest number of shifts is calculated to be $2 \times 6 \times 37$ equal to 444 shifts.

In which a virtual business simulation consists of 3 credits = 30 sessions = 6 shifts (1 shift: 5 sessions).

In addition, the maximum number of students will reach at 2,520 students per week with the teaching participation of 7 lecturers.

Market share in the future is often used to describe the position of a firm within its industrial sector. The implication is usual that the bigger market share is more successful than the firm. Gale (1993) suggests that the market share could be an important determinant of profitability in the medium to long term.

In Fig. 4, the market share of private education in 2020 is achieved 25.5% (Thai, 2019). In the next stage of 2021, the number of estimate will increase 30% when compared with 2020. The prediction is that up to the 2022, HUTECH expectation will have the seize of 35%

market share in the education area along with the growth of private university in the future. At present, the traditional education has a heavy theory and extremely passive in interacting between lecturers and students. In the future, open-education will be suitable with the condition of learners and the reality can be related to development of country, so it can achieve the market share of education area. With the new trend, the learners will be more access to the reality related to the change of the economic in country.

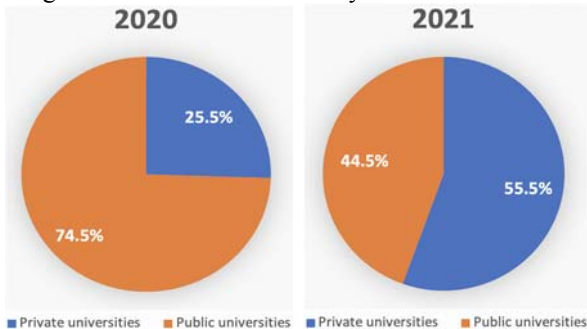


Fig. 4: Market share of private university from 2020 to 2021

With the virtual business, the faculty of Business Administration as well as HUTECH university will become a new phenomenon in the education area. However, the difficulty is how to attract and create the prestige with the new subjects, training program and change of the mindset for students and their parents. Therefore, the satisfaction of students is very important for existing the new virtual business subjects. These new subjects will change the habit of the current students studying at university and of the next generation. In particular, the students have to practice more than studying theory, this change helps students to know more knowledge in the reality and they can remember for a long time. Thus, this process needs much time for proving the effectiveness.

4. CONCLUSION

This paper proposed a virtual-reality business model for improving training program to achieve high performance in education area. In particular, the virtual business simulation model with simulation rooms and new subjects were built, in which lecturers, which use the simulation rooms and teach the new subjects, were chosen. In addition, the actual model was represented and did statistics for estimating its performance, in which this simulation room suggested to teach for 30 students divided into 5 groups with 6 students a group in Business Administration faculty at HUTECH. The result was analyzed and estimated its effectiveness from the year of 2020 to 2021 and predicted for the 2022 year. With the improvement after each semester, this method with the virtual-reality business model can change the traditional education and students will

achieve the high performance with practice after graduating.

5. ACKNOWLEDGMENTS

The authors gratefully acknowledge the contribution of lecturers in Faculty of Business Administration and the HUTECH.

6. REFERENCES

- [1] Rabasso, C.A. and Rabasso, J. (2010), "A Chomskyan approach to responsible critical management education", *Journal of Global Responsibility*, **1** (1), 66-84.
- [2] Fleming, D.L. (2008), "Building bridges to connect the disconnects: an analysis of business program design processes", *American Journal of Business Education*, **1** (2), 21-49.
- [3] Guile, D. and Griffiths, T. (2001), "Learning through work experience", *Journal of Education and Work*, **4** (1), 113-131.
- [4] Jackson, D. and Chapman, E. (2012), "Non-technical skill gaps in Australian business graduates", *Education + Training*, **54** (2-3), 95-113.
- [5] Mac, V.T. (2015), "Strengths, opportunities and challenges for Vietnamese human resources when joining the ASEAN economic community".
- [6] Tran, T. L., Le, T. T. T. and Nguyen, T. N. (2014), "Curriculum and pedagogy", *Higher Education in Vietnam*, 86-104.
- [7] Huynh, V. S. (2016), "The skills to accommodate with workplace environment when internship of students", *Journal of Science Ho Chi Minh city University of Education*.
- [8] Nguyen, P. T. (2017), "The project of virtual business model design".
- [9] Lisa and Barbara Rau (2010), "The research-teaching gap in management", *Academy of Management Learning and Education*, **9** (1), 132-143.
- [10] Thomas, D. (2015), "Responsible management education for a sustainable world", *Journal of Management Development*, **34** (1), 16-33.
- [11] Colby, A., Ehrlich, T., Sullivan, W. M. and Dolle, J.R. (2011), *Rethinking Undergraduate Business Education: Liberal Learning for the Profession*, Jossey-Bass, San Francisco, CA.
- [12] Martin, R.L. (2007), *The Opposable Mind: How Successful Leaders Win Through Integrative Thinking*, Harvard Business School Press, Boston, MA.

- [13] Mintzberg, H. (2004), *Managers Not MBAs: A Hard Look at the Soft Practice of Managing and Management Development*, Berrett Koehler, San Francisco, CA.
- [14] Lund, M. (2014). "Capturing the business model narrative - designing business models with narratives", Ph.D. series, Aalborg Universitetsforlag.
- [15] Karlsson, T. and Honig, B. (2009), "Judging a business by its cover: an institutional perspective on new ventures and the business plan", *Journal of Business Venturing*, **24** (1), 27-45.
- [16] Magretta, J. (2002), "Why business models matter", *Harvard Business Review*, **80** (5), 3-8.
- [17] Osterwalder, A. and Pigneur, Y. (2010), *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*, Wiley, Hoboken.
- [18] Kajanus, M., Iire, A., Eskelinen, T., Heinonen, M. and Eric Hansen, E. (2014), "Business model design: new tools for business systems innovation", *Scandinavian Journal of Forest Research*, **29** (6), 603-614.
- [19] Coes, B. (2014), "Critically assessing the strengths and limitations of the business model canvas", Master Thesis Business Administration, University of Twente.
- [20] Golnam, A., Moser, C.I., Gopal, A. and Wegmann, A. (2014), "Value map: an innovative tool for business model innovation", Paper presented at the XXV ISPIM Conference – Innovation for Sustainable Economy and Society, 8-11.
- [21] García-Gutiérrez, I. and Martínez-Borreguero, F.J. (2016), "The innovation pivot framework fostering business model innovation in startups", *Research-Technology Management*, **59** (5), 48-56.
- [22] Sparviero, S. (2019), "The case for a socially-oriented business model canvas: the social enterprise model canvas", *Journal of Social Entrepreneurship*, **10** (2), 232-251.
- [23] Gale, B.T. and Buzzell, R.D. (1993), "Market position and competitive strategy", in Day et al. (Eds), *The Interface of marketing and Strategy*, JAI Press, Greenwich, CT.
- [24] Directorate of Vocational Education and Training (2019), "Breakthrough in career education innovation: Focusing on career orientation and school-business linkage".
- [25] Thai, V. H. (2019), "Development of private universities in Vietnam: Reality and recommendations", *Journal of Finance*.

INFLUENCES OF LEADERSHIP STYLES ON ORGANIZATIONAL AND MANAGEMENT PERFORMANCE: EVIDENCE FROM VIETNAMESE SMES

Le Tien Dat – Thuongmai University

Pham Thi Thanh Hong – School of Economics and Management, HUST

Nguyen Thi Thu Thuy – School of Economics and Management, HUST

Christopher Selvarajah – Swinburne University of Technology

Abstract

Vital to individual and organizational performance, leadership styles have increasingly received the attention of scholars and practitioners. In small and medium-sized enterprises (SMEs) leaders and their relationship with followers are usually personal and direct, the managerial behaviors and actions seem to impact more directly on the employees' satisfaction as well as the operational performance. This study, based on individual interviews of 51 Vietnamese SMEs managers, reports on their perception of leadership styles influencing managerial and organizational success and benefits to organizational operations. Not only the close relationship between leadership styles and SME business performance but also the suggestions with regard to the effective leadership styles are reflected in this paper. The study has practical and theoretical implications in that it examines leadership styles in the context of SMEs. The findings from this research is of practical value to Vietnam, an emerging nation seeking to internationalize SMEs whilst addressing a deficit in SME leadership studies and thus adding value to the extant literature.

Keywords: Leadership style, SMEs, Vietnam, organizational performance, managerial performance.

1. INTRODUCTION

The role of an effective leader in the survival and development of organizations in a constantly changing business environment is undeniable (DuBrin, 2001). The leader's style, reflecting his or her behavioral approach, provides motivation and direction to followers and inevitably influence the success or failure of enterprises (Ojokuku, Odetayo & Sajuyigbe, 2012). Leadership style therefore, impacts on the overall business performance (Hayat & Riaz, 2011; Ojokuku, Odetayo & Sajuyigbe, 2012; Arham, Boucher & Muenjohn, 2013; Oladipo et al., 2013; Ikram, Fiaz & Saqib, 2017), and in particular, on the motivation, trust, willingness and enthusiasm of employees (Avolio et al., 2009; Mayowa, 2009; Cho & Dansereau, 2010; Aydin, Sarier & Uysal, 2013; Samad et al. 2015; Ikram, Fiaz & Saqib, 2017).

In SMEs, where the owner often plays a role of the manager, the relationship between leaders and followers are generally personal and direct (Bass, 1981; Durham. Knight & Locke, 1997; Hambrick & Mason 1984, Hunt, 1991; Yukl, 1998), and this close relationship entails the selection of proper leadership style becomes more important compared to leadership in large firms. The managerial actions of the leader

may directly shape the attitude, motivation, eagerness, and thus, the performance of employees. This requires the SME manager to take more consideration in adjusting their leadership behaviors.

SMEs play an essential role in the economic development of Vietnam. In the period 2011-2015, despite facing many difficulties, this sector still contributed about 30% of the total state budget revenue and 25% of the total national export turnover whilst contributing nearly 50% to the annual economic growth (MPI, 2017). However, in the transition from a centrally planned economy to a market economy, a large number of Vietnamese SMEs managers still lack vital skills and competencies to compete successfully (Steer, 2001; Agency for Enterprise Development, 2012). Therefore, a great number of programs and policies to support SMEs have been created and implemented. In Vietnam, by law (No.04/2017/QH14), and by government decree (No.39/2018/ND-CP), the support for SMEs to enhance their managerial skills has been emphasized (Government of Vietnam, 2017, 2018). In is in this endeavor, that the practicality of this research is cast, that is, to conduct a study on the managerial leadership styles in Vietnamese SMEs to assist leaders to improve their leadership effectiveness for sustainable development.

2. DISCUSSION

In this study, Vietnamese SME managers shared their perceptions with regard to the influences of leadership styles to the management and business performance of SMEs. Almost managers emphasized that styles of the leaders – who direct the development and steer all SMEs' activities – have great impact on overall business performance. The relationship between leadership styles and organizational performance has been discussed by many authors (Hayat & Riaz, 2011; Ojokuku, Odetayo & Sajuyigbe, 2012; Arham, Boucher & Muenjohn, 2013; Oladipo et al., 2013; Ikram, Fiaz & Saqib, 2017). The researches of DuBrin (2001) and Oladipo et al. (2013) go in line with the findings of this study when stressing that selecting leadership styles may lead to success or failure of companies. In particular, SME managers in this study stressed that the leadership and business performance of enterprises may not only be influenced but also be determined by leadership style as it affects the ways decisions are made.

This study further explains the influences of leadership styles on the working styles and then, on the performance of employees. The idea that work performance of followers may be enhanced by proper leadership styles is also supported by authors such as DuBrin (2002) and Guangoyi et al. (2008).

In addition to overall organizational and individual efficiency, this study specifically highlights the influences of leadership styles on corporate culture. By using the appropriate leadership styles, leaders may promote the morale of employees as well as create favorable working environment. Avolio et al. (2009), Cho & Dansereau (2010), Aydin, Sarier & Uysal (2013), Olawale (2013), and Samad et al. (2015) agree with this point when showing the significance of proper leadership styles in building open working environment and developing team spirit.

As reflected in this study, the leader manners and effectiveness are seen directly influenced by leadership styles. This finding reinforces the idea of Bruno (2013) and Franco & Matos (2015) with regard to the impact of leadership styles on effectiveness of leaders. In particular, this study highlights that selecting a proper leadership style directly affects the leader prestige. Prestigious leadership style easily receives the credibility from employees. Dubrin (2001) also indicates that leadership style reflects personal features derived from the characteristics of the leader.

This study provides further evidence for the influences of leadership styles on the trust of employee in leaders as well as on their working morale. Accordingly, productive leadership style, accompanied with the credibility and experience of the leader make him or her earn the trust of employees. The influence on employees' trust in leaders and organizations is also

declared by Podsakoff et al. (1990) and Fang, Chang & Chen (2010).

This study particularly emphasizes that the leader may inspire subordinates to accomplish their tasks and enhance their performance by promoting their working motivation, spirit and dedication. This impact has widely been discussed by authors such as Avolio et al. (2009), Mayowa (2009), Cho & Dansereau (2010), Aydin, Sarier & Uysal (2013), Samad et al. (2015), Ikram, Fiaz & Saqib (2017). Meanwhile, the influence of leadership styles on the passion and willingness of employees to make extra effort for the organization is also emphasized by Jeremy et al. (2012) and Özer & Tinaztepe (2014).

The solidarity enhancement among employees and between employees and leaders by proper leadership styles is also highlighted in this study. Accordingly, leaders with a productive style may promote followers and call for their contribution for organizational purposes. Effective leaders often pay attention to engage people and connect employees and leaders. This kind of influence is also stressed by authors such as Burns (1978), Obiwuru et al. (2011), and Özer & Tinaztepe (2014).

Besides investigating the influence of leadership styles on business and management performance of enterprises in general, this study takes a closer look at the impact of leadership styles on SMEs' performance. Assuming some features of SMEs such as the small size of enterprises, the modest number of employees, the direct and personal relationship between owners-leaders and employees (Bass, 1981; Durham, Knight & Locke, 1997; Hambrick & Mason, 1984; Hunt, 1991; Yukl, 1998), this study emphasizes that leadership style firmly decides SME management and performance (Bass, 1990; Tharenou & Lyndon, 1990; Yukl, 1998; Chaganti, Cook & Smeltz, 2002). The conclusion on the direct and strong influence of leadership styles on the viability of SMEs is also reflected in the studies of authors such as Bass (1990), Tharenou & Lyndon (1990), Yukl (1998), Chaganti, Cook & Smeltz (2002), Arham, Boucher & Muenjohn (2013). In particular, this study supports the idea of Hayat & Riaz (2011), noting that leadership style directly affects the development direction of SMEs.

Furthermore, this study explains the direct influences of leadership styles on the employee performance in SMEs. As reflected in the study, due to the typical organizational structure of SMEs, the command of leaders on human resource system is far more direct in SMEs. Also, SME managers - owners tend to intervene in activities of individuals and departments, and thus, their managerial behaviors and actions directly decide the SME business performance. In addition, this study also explains that in the context where the contacts of leaders and their subordinates/departments is close, the productive leadership styles should be the one which

can assist the leaders to develop the trust, eagerness, enthusiasm, and particularly the retention of followers. In the literatures, there have been few studies providing such explanations and this can be seen as other contribution of this study.

3. IMPLICATIONS

This paper has provided further evidence and explanation for the influence of leadership styles on the organizational and management performance of enterprises in general and of SMEs in particular. To begin with, research findings suggest that managers need to be aware of the importance of selecting the right leadership style as it affects greatly the business performance and the corporate cultures. Besides, the right leadership style may assist the leaders to develop the trust, enthusiasm, willingness, dedication of followers, as well as to increase the solidarity among employees and between employees and employers, which in turn strongly influences the organizational success.

The study also emphasizes the strong and direct influence of leadership style on the viability of SMEs. However, in fact, the managerial skill of SME managers, including the leadership skill, is often limited. Many SME managers-owners were not well-educated in business fields. They had been the technical workers or farmers before starting their own business. Therefore, to succeed, they need to continuously learn to acquire business and management knowledge and skills. In particular, as suggested from this study, they need to understand and keep adjusting their managerial behaviors and actions to select the proper leadership styles.

Recently, there have been numerous training courses focusing on management skills, including leadership skills, and SME managers may choose to attend the appropriate ones. By joining such courses, SME manager may better understand issues related to management and leadership, such as leadership effectiveness, styles of leaders, leadership theories, which may assist them in choosing the productive leadership styles.

As can be seen from this study, the transformational leadership style is seen as the style that may bring many benefits and has been supported by many SME managers interviewed. In literatures, many researchers have also supported for the application of transformational leadership styles (Burns 1978; Guang-yi et al. 2008; Avolio et al 2009; Cho & Dansereau 2010; Hayat & Riaz 2011; Obiwuru et al. 2011; Voon et al 2011; Aydin, Sarier & Uysal 2013; Özer & Tinaztepe 2014; Samad et al. 2015). This may be the suggestion for Vietnamese SMEs to consider.

From the viewpoints of SME managers in this study, the effective leader would be the one who pay attention to create open and productive working environment.

The team spirit as well as members' confidence and enthusiasm need to be enhanced. The leaders should know how to show their trust in subordinates and increase the trust of employees in both the leaders and the organization. They should find methods to motivate followers, inspire them to achieve goals and commit to the organization. By doing so, the satisfaction and contribution of employees may be remarkably enhanced.

However, the leaders should understand that leadership style selection is affected by many factors such as the business fields, the characteristics of both leaders and followers, the development phase of enterprises. Since there is no one-fits-all leadership style (Ojokuku et al. 2012; Boykins et al. 2013) and when the circumstances change, leadership styles change accordingly (Johansen, 2014), the SME leader should be flexible in select the appropriate ones.

Besides training courses, using management consultants seems to be effective in assisting leaders to adjust their behaviors and actions to enhance leadership effectiveness. As leadership style relates to characteristics of enterprises, employers and employees, the consultants who also investigates such factors may suggest the appropriate leadership style for SME leaders. The trainers, consultants and government officials may use the outcomes of this study to assist SME leaders to adjust their managerial behaviors and actions for better managerial and organizational performance.

4. CONCLUSION

The paper, to begin with, reviews the literatures with regard to leadership and leadership styles, takes a closer look at the influence of leadership styles on the organizational and managerial performance of SMEs. By using the individual interviews, perceptions of 51 Vietnamese SME managers on the influence of leadership styles were investigated, analyzed and described in this paper. The Vietnamese SME managers emphasized the influence of leadership style on the organizational and individual performance, the corporate culture, as well as the working environment improvement. The effectiveness of leadership, particularly the increase in employee working motivation, trust, enthusiasm, commitment and engagement were believed to result from proper leadership styles. The strong and direct impacts of leadership styles to the survive and development of SMEs, to the employee performance, and to employee working attitudes are also revealed in this study. The research findings are expected to be beneficial to SME managers, training and consulting institutions to assist SME managers to adjust their managerial behaviors and enhance their leadership effectiveness. The theoretical contribution can be clearly seen when this paper explores the influence of leadership styles in the

qualitative approach, providing more evidences and explanation, particularly when it specifically explores leadership styles in SMEs in developing countries such as Vietnam.

This paper also has some limitations. The paper just looks at Vietnamese SMEs and investigates one-way relationship between leadership styles and organizational and managerial performance. Further studies may develop this research by examining this influence in larger enterprises, in other regions and in multi-dimensions.

5. REFERENCES

- [1] Afshinpour, S. 2014, "Leadership Styles and Employee Satisfaction", *International Letters of Social and Humanistic Sciences Online*: 2014-05-04 ISSN: 2300-2697, Vol. 27, pp. 156-169
- [2] Agency for Enterprise Development 2012, *White paper on small and medium sized enterprise in Vietnam 2011*, Statistical Publishing House, Hanoi.
- [3] Antonakis, J., Avolio, B. J., & Sivasubramaniam, N. 2003, "Context and leadership: An examination of the ninefactor full-range leadership theory using the Multifactor Leadership Questionnaire", *The Leadership Quarterly*, 14, 261-295.
- [4] Arham, A.F., Boucher, C. & Muenjohn, N. 2012, "Leadership and Entrepreneurial Success: A Study of SMEs in Malaysia", *World Journal of Social Sciences*, vol. 3, no. 5, pp. 117-130.
- [5] Assunta, B.M., & Agostino, "L.A.B, Leadership Styles of World's most Admired Companies a Holistic Approach to Measuring Leadership Effectiveness", *International Conference on Management Science & Engineering*, 14th August, 20-22.
- [6] Avolio, Bruce J., Reichard, Rebecca J., Hannah, Sean T., Walumbwa, Fred O., & Chan, Adrian 2009, "A MetaAnalytic Review of Leadership Impact Research: Experimental and Quasi-Experimental Studies". USArmy Research.262. [Http://Digitalcommons.unl.edu/usarmyresearch/262](http://Digitalcommons.unl.edu/usarmyresearch/262).
- [7] Aydin, A., Sarier, Y. & Uysal. S 2013, "The Effect of School Principals' Leadership Styles on Teachers' Organizational Commitment and Job Satisfaction", *Educational Sciences: Theory and Practice*, v13 n2 p806-811 Spr 2013.
- [8] Bass, B. M. 1981, *Stodgill's Handbook of Leadership: A Survey of Theory and Research*, New York: Free Press.
- [9] Bass, B. M. 1990, "From Transactional to Transformational Leadership: Learning to Share the Vision", *Organizational Dynamics*, (Winter), pp. 19-31.
- [10] Bass, B. M. 1997, *The ethics of transformational leadership*, KLSP: Transformational Leadership, Working Papers.
- [11] Bass, B.M. & Riggio, R. E 2006, *Transformational leadership* (2nd ed.), Lawrence Erlbaum Associates Publishers.
- [12] Bartol, K., & Martin, D. 1998, *Management*, 3rd Ed., USA, McGraw-Hill Companies, Inc
- [13] Berryman, J. 1983, "Small business failure and bankruptcy: A survey of the literature", *International Small Business Journal*, 1(4): 47-59.
- [14] Boykins, C., Campbell, S., Moore, M. and Nayyar, S. 2012, "An Empirical Study of Leadership Styles", *Journal of Economic Development, Management, IT, Finance and Marketing*, Vol. 5, No. 2, pp. 1-33.
- [15] Bruno. Leo. 2013. Longitudinal Assessment of the Impact of Leadership on Organizational-Leader Slovenia.
- [16] Bryman, A & Bell, E (2011), *Business Research Methods*, 3rd edn., Oxford University Press, USA.
- [17] Burns, J. M. 1978, *Leadership*, NY: Harper & Row.
- [18] Chaganti, R., Cook, R.G. and Smeltz, W.J. 2002, "Effects of Styles, Strategies and Systems on the Growth of Small Businesses", *Journal of Development Entrepreneurship*, Vol.7, No.2, pp. 175-192.
- [19] Chandrakumara, PMKA, Zoysa, AD & Manawaduge, AS 2009, in *4th international Asian academy of applied business conference Asian Academy of Applied Business*, Makati City, The Philippines, pp. 391-401.
- [20] Cho, J. and Dansereau, F. 2010, "Are Transformational Leaders Fair? A Multi-Level Study of Transformational Leadership, Justice Perceptions, and Organizational Citizenship Behaviors", *The Leadership Quarterly*, 21, 409-421.
- [21] Chowdhury, G. R. 2014, *A Study on The Impact of Leadership Styles on Employee Motivation and Commitment*, doctoral dissertation, Padmashree Dr. D.Y. Patil University.
- [22] Cox, A., Hanif, Z. & Rowley, C. 2014, "Leadership styles and generational effects: examples of US companies in Vietnam", *The International Journal of Human Resource Management*, vol. 25, no. 1, pp. 1-22.
- [23] Chung-Hsiung Fang, Sue-Ting Chang and Guan-Li Chen 2009, *Applying Structural Equation Model to Study of the Relationship Model among leadership style, satisfaction, Organization commitment and Performance in hospital industry*, IEEE 2009.

- [24] Creswell, JW 2014, *Research design: qualitative, quantitative, and mixed method approaches*, 4th edn., SAGE Thousand Oaks Calif.
- [25] Dodge, H. R. and Robbins, J. E. 1992, "An empirical investigation of the organisational life cycle model for small business development and survival", *Journal of Small Business Management* 30(1):27-37.
- [26] DuBrin A. J. 2001, *Leadership: Research findings, practice, skills*, 3rd ed., Boston, MA, Houghton Mifflin.
- [27] Durham, C., Knight, D. and Locke, E. 1997, "Effects of Leader Role, Team-set Goal Difficulty, Efficacy, and Tactics on Team Effectiveness", *Organizational Behavior and Human Decision Processes*, Vol. 72, pp. 203-231.
- [28] Fang, C-H, Chang, S-T & Chen, G-L 2009, Applying Structural Equation Model to Study of the Relationship Model among leadership style, satisfaction, Organization commitment and Performance in hospital industry, *IEEE*.
- [29] Franco, M. & Matos, P.G. 2015, Leadership styles in SMEs: a mixed-method approach, *Int Entrep Manag J*, vol. 11, pp. 425-451.
- [30] Goh Yuan, Sheng Victor and Geoffrey N. Soutar, 2005, *The Role Of Ethical Behaviours In The Relations Between Leadership Styles And Job Performance*, ANZMAC Conference: Corporate Responsibility, University of Western Australia.
- [31] Government of Vietnam 2017, *Law No. 04/2017/QH14 supporting SMEs*, Hanoi.
- [32] Government of Vietnam 2018, *Decree No. 39/2018/ND-CP detailing a number of articles in the SME Support Law*, Hanoi.
- [33] Guang-yi Wang Zhi-sheng, 2008, "The Impact of Transformational Leadership Style on Organizational Performance: The Intermediary Effects of Leader-Member Exchange", *International Conference on Management Science & Engineering*, 15th September.
- [34] Hambrick, D. C. and Mason, P. A. 1984, "Upper echelons: The organization as a reflection of its top managers", *Academy of Management Review*, Vol.9, No.2, pp. 193-106.
- [35] Hayat, N. & Riaz, M. T. 2011, "The Influence of the SMES Top-Level Managers' Leadership Styles and Their Entrepreneurial Orientation on the Business Performance", *Social Science Research Network*.
- [36] House, R., et al 1999, "Cultural Influences on Leadership and Organizations: Project Glob". In Mobely, W., et al, (Eds), *Advances in Global Leadership*, pp 171-233. Stamford, CT: JAI Press.
- [37] House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. 2004, *Culture, leadership, and organizations: The GLOBE study of 62 societies*, London: Sage Publications.
- [38] Hunt, S. D., 1991, *Modern Marketing Theory: Critical Issues in the Philosophy of Marketing Science*, Cincinnati: SouthWestern Publishing Co.
- [39] Ikram, A., Su, Q., Fiaz, M., and Saqib., A 2017, "Leadership styles and employees 'motivation: perspective from an emerging economy", *The journal of developing areas*, volume 51 no.4 (2017).
- [40] Jacobs, T & Jaques, E. 1990, *Military Executive Leadership*, in E. Clark (Eds.), "Measures of Leadership", West Orange, NJ, Leadership Library of America, pp. 281-295
- [41] Jeremy M., Melinde C. and Ciller V. 2012, "Perceived leadership style and employee participation in a manufacturing company in the democratic republic of Congo", *African journal of business management*, 6(15),5389-5398
- [42] Johansen, M. 125 Transformational Leaders, Legacee website, 22 March 2014, https://www.legacee.com/transformational_leadership/list-of-leaders/.
- [43] Katz, D. & Kahn, R. 1978, *The Social Psychology of Organizations*, 2nd ed., New York, Johan Wiley
- [44] Kerfoot K., *Medsurg Nursing* 17(2) (2013), 133-135.
- [45] Keskes, Imen. 2014, "Relationship between leadership styles and dimensions of employee organizational commitment", *Intangible Capital IC*, 2014 – 10(1): 26-51.
- [46] Khang, L.A. 2013, "Research on leadership transformation styles: Credibility and organizational commitment in the Vietnamese context", *Journal of Science*, vol. 4
- [47] Koech, P. M. & Namusonge, P. G. S. 2012, "The Effect of Leadership Styles on organizational Performance at State Corporations in Kenya", *International Journal of Business and Commerce*, vol. 2, no. 1, pp. 01-12.
- [48] Kouzes, J. & Posner, B. 2007, *The Leadership Challenge*, 4th edition, Jossey-Bass: San-Francisco.
- [49] Kumar, S. R 2018, "Literature review on leadership, leadership theories, style and leadership development", *International Journal of Research in Business Management (IMPACT: IJRBM)* ISSN (P): 2347-4572; ISSN (E): 2321-886X Vol. 6, Issue 6, Jun 2018, 13-24
- [50] Lewin, K., Leppitt, R. & White, R.K 1939, "Patterns of Aggressive Behavior in Experimentally Created "Social Climates", *The Journal of Social Psychology*, vol. 10, no. 2, pp. 269-299.

- [51] Lyons, J. B., & Schneider, T. R. 2009, "The effects of leadership style on stress outcomes", *The Leadership Quarterly*, 20(5), 737-748. <https://doi.org/10.1016/j.leaqua.2009.06.010>
- [52] Malik, S. Z., Saleem, M., and Naeem. R 2016, "Effect of leadership styles on organizational citizenship behaviour in employees of telecom sector in pakistan", *Pakistan Economic and Social Review* Volume 54, No. 2 (Winter 2016), pp. 385-406.
- [53] Maner, J.K., Mead, N.L. 2010, "The Essential Tension Between Leadership and Power: When Leaders Sacrifice Group Goals for the Sake of Self-Interest", *Journal of Personality and Social Psychology*, 99, 3, 482-497.
- [54] Mayowa, A. 2009, *Leadership definition by scholars*, Nigeria.
- [55] Michael, A. 2010, *Leadership Style and Organizational Impact*, <http://www.ala-apa.org>
- [56] MPI 2017, *White paper on small and medium sized enterprises in Vietnam*, Statistical Publishing House, Hanoi.
- [57] Nanjundeswaraswamy, T.S & Swamy, D.R. 2014, "Leadership styles", *Advances In Management*, vol. 7, no. 2, pp. 57-62.
- [58] Nahavandi A. 2002, *The art and science of leadership*, 3rd ed., Upper Saddle River, NJ, Prentice Hall.
- [59] Newstrom, J.W., Davis, K. 1993, *Organizational Behavior: Human Behavior at Work*, New York: McGraw-Hill.
- [60] Obiwuru, T. C., Okwu, A. T., Akpa, V. O., Nwankwere. I. A. 2011, "Effects of Leadership Style on Organizational Performance", *Australian Journal of Business and Management Research* Vol.1 No.7 [100-111] | October-2011.
- [61] Ojokuku, R., Odetayo, T.A, Sajuyigbe, A.S 2012, *Impact of Leadership Style on Organizational Performance: A Case Study of Nigerian Banks*, *American Journal of Business and Management* 2(1):202.
- [62] Olawale, T. 2013, *Leadership Style: Impact on employee*, thesis, Lahti University of Applied Sciences.
- [63] Oladipo K. S., Jamilah O., Abdul daud S., Jeffery L. D. and Salami D. K. 2013, "Review of leadership theories and Organizational performances", *International Business Management Journal*, 7(1), 50-54.
- [64] Omolayo, B. 2007, *Effect of Leadership Style on Job-Related Tension and Psychological Sense of Community in Work Organizations: A Case Study of Four Organizations in Lagos State, Nigeria*, *Bangladesh e-Journal of Sociology*, vol. 4, no. 2.
- [65] Özera, F & Tinaztepeb, C 2014, "Effect of Strategic Leadership Styles on Firm Performance: A Study in a Turkish SME", *Procedia - Social and Behavioral Sciences*, vol. 150 (2014), pp. 778-784.
- [66] Podsakoff P. M., MacKenzie S. B., Moorman R. H. and Fetter R. 1990, "Transformational leader behaviors and their effects on followers trust in leader, satisfaction and organizational citizenship behaviors", *Leadership Quarterly*, 1, 107-142 (1990).
- [67] Porkka, K. 2014, *Cultural differences and leadership in The Color Club A/S: The effects of cultural differences on the leadership style of a Danish leader in a Vietnamese subsidiary*, thesis, Department of Business Administration, BSc Business Administration and International Management.
- [68] Prince, L. 2005, "Eating the menu rather than the dinner: Tao and leadership", *Leadership*, Vol. 1 No. 1, pp. 105-26.
- [69] Samad, Ataus., Reaburn, Peter., Davis, Heather., Ahmed, Ezaz. 2015, "An Empirical Study on The Effect of Leadership Styles on Employee Wellbeing and Organizational Outcomes within an Australian Regional University", *The Journal of Developing Areas*, ISBN 978-0-9925622-1-2.
- [70] Saunders, M, Lewis, P & Thornhill, A 2012, *Research Methods for Business Students*, 6th edn., Pearson, Harlow, England.
- [71] Selvarajah, C., and Meyer, D. 2017. "Leadership Excellence in Organizations in the Mekong Region", In S. Ragunath & E. Rose (Eds). *IBS - Perspectives on Implementation in Emerging Markets*, Palgrave Macmillan, 391-418.
- [72] 2008 Selvarajah, C and Meyer, D 2008b, "Profiling the Chinese Manager-Exploring Dimensions that relate to leadership", *Leadership and Organization Development Journal*. 29 (4), 359-375.
- [73] Selvarajah, C., & Meyer. C. 2020, "Exploring managerial leadership in Vietnam-where Confucianism meets Dharma", *Asia Pacific Business Review*.
- [74] Shasrti, Shashi Mishra & Sinha 2010, "Charismatic leadership and organizational commitment: An Indian perspective", *African journal of business management* 4(10).
- [75] Steer, L 2001, *The Private Sector in Vietnam: Facts, Figures, Policy Changes, and a Survey of Research Findings*, Centre for International Economics, Canberra.
- [76] Storey, D. J. 2005, *Understanding the Small Business Sector*. London: Thomson Learning.

- [77] Tannenbaum, R. and Schmidt, W. H. 1973, How to choose a leadership pattern, Harvard Business Review, May-June:162-180.
- [78] Taormina, R and Selvarajah, C 2005, "Perceptions of Leadership Excellence in ASEAN Nations", *Leadership*, 1 (3), 299-322.
- [79] Stumpf, M. N. 2003, *The relationship of perceived leadership styles of North Carolina County Extension Directors' to job satisfaction of county extension professionals*, Unpublished doctoral dissertation, North Carolina State University, Raleigh, North Carolina.
- [80] Aalateeg, S. 2017, "Literature Review on Leadership Theories", IOSR Journal of Business and Management (IOSR-JBM) e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 19, Issue 11. Ver.III (November. 2017), pp. 35-43.
- [81] Tharenou, P. and Lyndon, J. T. 1990, "The effect of a supervisory development program on leadership style", *Journal of Business and Psychology*, Vol.4, pp. 365-373.
- [82] Vo, A. & Hannif, Z.N. 2013, "The reception of Anglo leadership styles in a transforming society: the case of American companies in Vietnam", *The International Journal of Human Resource Management*, vol. 24, no. 18, pp. 3534-3551.
- [83] Voon M. C. et al 2011, "The influence of leadership styles on employees, job satisfaction in public sector organizations in Malaysia", *International Journal of Business, Management and Social Sciences*, 2(1), 24-32 (2011).
- [84] Wang, Y. & Poutziouris 2010, "Leadership Styles, Management Systems, and Growth: Empirical Evidence from UK Owner-managed SMEs", *Journal of Enterprising Culture*, vol. 18, no. 3, pp. 331-354.
- [85] Williams, A., Dobson, P. & Walters, M., 1993, *Changing Culture: New Organizational Approaches*, Institute of Personnel Management.
- [86] Yukl, G. A. 1998, *Leadership in Organizations* (4th ed.). Englewood Cliffs, NJ: Prentice-Hall.
- [87] Yukl, G. A. 2005, *Leadership in organizations*, New York: Prentice Hall.

EFFECTS OF FEMALE DIRECTORS ON GENDER DIVERSITY AT LOWER ORGANIZATION LEVELS AND CSR PERFORMANCE: EVIDENCE IN JAPAN ¹

Nguyen Thi Phuong Thanh¹, Thai Minh Hanh²

¹ School of Commerce, Waseda University, Japan

² School of Economics and Management, Hanoi University of Science and Technology, Vietnam

Corresponding author: phuongthanh264@gmail.com

Extended Abstract

Research purpose:

This paper examines the effects of board gender diversity on female representation in lower organization levels and corporate social responsibility (CSR) performance by using data of Japanese listed firms, which has not been used in related literature.

Motivation:

So far, researchers try to identify and quantify the impacts of female directors on the firms they serve. While extant literature measure the effect of accounting performance, still few literature use other measures of corporate performance that are more relevant and specific to women characteristics. This paper aims to examine the effects of female directors on female representation in lower organization level and corporate social responsibility (CSR) performance, which have not documented yet with Japanese data.

Japan is an interesting context to investigate the relation between board gender diversity and gender diversity at lower board levels, such as women corporate officers and managers. Japan is one of few advanced country that lag on female empowerment.

Research design:

We constructed a panel data of listed non-financial firms in Japan from 2005 to 2014, obtaining about 9,600 firm-year observations from four profound databases, CSR Ranking Database, CSR Database published, Yakuin Shikiho (Directory of Directors) and Nikkei Corporate Governance Evaluation System (CGES).

Our database shows that female directors cover a small part of the boardroom. Only 9% of firm-year observations have at least one female director on board. We examined the determinant of firms introducing their first female directors and found that that these firms are associated with larger board size, more outside directors on board, higher managerial ownership and foreign ownership ratio, higher ratio of woman officers but lower ratio of women at managerial positions.

Next, we examined the effects of female directors on the female representation at lower organizational levels and found out that the first introduction of a female director(s) is associated with a greater number of female officers and managers. We found the “empowering woman” syndrome where newly-introduced female directors are associated with more women officers and managers at the workplace.

We then examined the effects of first-introduced female directors on CSR performance and found that CSR total score and HR score increased after the firm introduced the first female director on board.

¹ We would like to thank seminar participants at the 32nd SASE Annual Conference for their helpful suggestions and comments. Nguyen Thi Phuong Thanh is grateful for Special Research Grant for Project Number 2016S-182 provided by Waseda University. All remaining errors are the authors' responsibility.

Corresponding author at E-mail address: phuongthanh264@gmail.com

Main findings:

Our paper contributes to the existing literature in several ways. First, we provide empirical evidence about the effects of female director on gender diversity under board levels in a unique setting where the gendered organizations are large. Instead of using female director variable as a whole, we focus on a special dataset, first-introduced female directors, in order to measure clearly the before and after change, also avoiding causality problems often arisen between board gender diversity and employee gender diversity and CSR performance.

Second, in this paper we explore the impacts of female directors on specific CSR aspects in a rich dataset of Japanese firms. Prior studies focus on CSR as a single index while not really focusing on specific CSR aspects. We investigated CSR performance as a sum of three components (Human Resource, Environment and Corporate governance and social performance) and found a linkage between board gender diversity and female-favored HR policies, one of important CSR aspects.

Third, we contribute to the existing literature by breaking up female directors in different types, and compare the effects of inside female directors to those of outside female directors on female supporting policies, female representation under board level and CSR performance.

Overall, the finding of positive relation between female directors and gender diversity at organization levels and CSR might provide broad implication for researchers, policy maker and business leaders to increase the board gender diversity.

Keywords: Board gender; CSR; Corporate governance; Japan.

Section 4
MARKETING MANAGEMENT

STUDY THE INTERNATIONAL TOURISTS' ATTITUDE AND BEHAVIORS TOWARDS JAPANESE CULTURAL AND HERITAGE TOURISM: AN UNDERSTANDING FOR POST – COVID-19 TOURISM POLICY AND MANAGEMENT

Nguyen Quynh Hoa¹ and Vafadari Kazem²

¹School of Economics and Management, Hanoi University of Science and Technology

²Ritsumeikan Asia Pacific University

*Corresponding Author: hoa.nguyenquynh@hust.edu.vn

Abstract

Around the world, people travel to explore natural beauty, different culture and social traditions. Art, historical places, architecture, traditional festivals, local people's lifestyle and customs, and traditional performances have become important motivations for international travelers. Heritage tourism turned out to be one of the fastest growing tourism segments and contribute huge economic benefits to many countries lately. Besides, it also brings positive impacts to the culture, society and environment conservation. The Japan Tourism National Promotion Basic Law (2006) stated that culture and heritage are "the most important components of Japan tourism" and Japan will emphasize its abilities to attract more international travelers and supports conservation of cultural heritage. However, as the result of the Covid-19 pandemic, the Japanese tourism has been damaged significantly and is forecasted to take a long time for recovery. Besides, the Olympics 2020 has been decided to move to 2021 due to the risk of the pandemic also raises some concerns of how to balance the tourism impacts on the society and economy upon the international tourist arrivals. This study aims to understand better the international tourists' attitude and behavior and their motivations under the "new normal" condition in Japan. A total of 211 answers from 43 countries and territories collected from July 2019 to June 2020 were used for analysis, with the consideration of new policies to promote the domestic tourism and to open the border step-by-step of Japanese government. From the findings, there are some discussions and recommendations to the Japanese tourism were proposed.

Keywords: Japanese culture and heritage tourism, international tourists, tourism policy, tourist's behavior and motivation, post-covid19.

1. INTRODUCTION

1.1. Heritage tourism and heritage tourists

Tourism is a huge business and has become one of the fastest growing economic sectors over the world. According to the UNWTO (World Tourism Organization, 2016), "the business volume of tourism today equals or even surpasses that of oil exports, food products or automobiles". Therefore, it was affected the most due to the risk of the Covid-19 pandemic.

However, it is no doubt that cultural attractions such as historical places, monuments, architecture, people and art are important motivations to travel (McIntosh, Goeldner & Ritchie, 1995). Many types of attractions fall into the heritage tourism sector, which accounts for

a considerable portion of tourism in developed countries (Garrod & Fyall, 2000). Cultural creativity and heritages are essential elements of community development and play a vital role for sustainable livelihoods (Moli, 2011). Heritage helps establish individual, community and national identities which enable people to define who they are (Hall & McArthur 1998).

Heritage tourists are motivated by a desire to enhance one's own cultural self, to learn something new, to spend time with friends and family, to satisfy one's curiosity or simply to use up excess time (Timothy, 2011). Stebbins (1996) discussed that serious cultural tourists may find their visit or participation in heritage places or cultural events as their hobby; they want to learn something new or expand their personal skills, and they

are enthusiastic about heritage. On the other hand, casual heritage tourists are people who do not necessarily plan to visit a heritage site or museum while on vacation but decide to attend once they discover it, while in the destination for other purposes. They might be curious about the attraction but are not active seekers of heritage places and cultural experiences. In some cases, they might even have to be convinced to visit a historic environment or cultural setting by relatives or friends in the destination who drag them along. However, studies show that heritage tourists, regardless serious or casual ones, tend to have more money and are more willing to spend it. This supports a trend toward the less-vigorous, experiential kinds of activities.

A 2009 study conducted for the US National Trust for Historic Preservation found that nearly 80% of all leisure travellers take part in a cultural heritage activity. It also revealed that cultural heritage tourists spend an average of \$994 per trip, compared to \$611 for the “general” traveller – almost 50% more. Heritage travellers also travel more often than generalists, taking about 5 trips per year compared to 4 by general travellers. Researchers and site managers have conducted a great deal of study on the marketing characteristics of heritage tourists over the past decades and their findings are consistent and interesting.

Table 1: Heritage tourists’ motivation and behavior dimensions in previous literature

Researcher	Heritage tourists’ motivation and behaviour
Chen (1998)	(1) pursuit of knowledge: learning about culture and nature, new personal knowledge (2) personal benefits: health benefits, relaxation, gaining spiritual reward, recreation activities and enjoying sightseeing
Timothy & Boyd (2003)	(1) learning dimension (2) perception of a greater willingness
Confer & Kerstetter (2000)	(1) interest in culture, heritage or ethnicity
Poria, Butler, & Airey (2004)	(1) new experience and knowledge (2) satisfying curiosity about unique and interesting places (3) accompany friends and relatives (4) relaxation and sightseeing (5) connect to their work/ business
Timothy (1997)	Religious purposes
Bruner (1994)	Effort to understand themselves Understanding the past

1.2. Background of Japan tourism and international arrivals

Since 2006, understanding the importance of tourism, in Japan, many public policies from national to local government levels have been issued to preserve and promote the culture and heritage value for sustainable tourism development. The Tourism National Promotion Basic Law (2006) was announced to emphasize abilities to attract more international travelers and supports conservation of local culture and heritage, including natural beauty, historic monuments, onsen sites, ecosystems, and traditional handicrafts. This law defined culture and heritage as “one of the most important components of tourism” to Japan.

In year 2012, the Japan government released the Japan Tourism Nation Promotion Basic Plan - The 5-year period from fiscal 2012 to 2016 - to set out the goals: (1) increase in Domestic Consumption, (2) expansion/improvement of International Tourism, (3) increase the satisfaction of international visitors to Japan, (4) become the No. 1 conference-host country in Asia, (5) increase the number of Japanese travelers going overseas, (6) expansion/Improvement of Domestic Tourism, and (7) improve traveler satisfaction of tourist areas.

Other laws and tourism policies in Japan was revised to adapt with these Tourism Basic Law and Basic Plan. From central government to local government, more efforts were given to support for the tourism development. Since 2012, Japan has got significant jump in tourism growth, especially international tourist arrivals and tourism revenue (Fig 1 and 2).

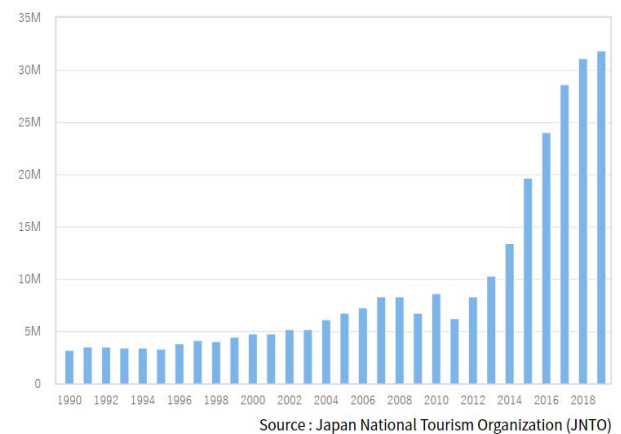


Fig. 1: International tourist arrivals to Japan by year

The tourism growth leads to the modernization of rural areas, accelerates the urbanization and modernization process, promotes free trade, and reduces border barriers. It also makes the change in the employment structure (people from agriculture sector move to service sector) and save the transportation time and costs due to

the improvement of infrastructure and facilities (JNTO, 2019).

The Japanese government identifies the following as basic policies:

- to develop internationally competitive and highly appealing tourism destinations,
- to enhance the international competitiveness of the tourism industry,
- to develop individuals who will contribute to the promotion of tourism,
- to promote international tourism, and
- to roll out measures needed to create an environment conducive to travel.

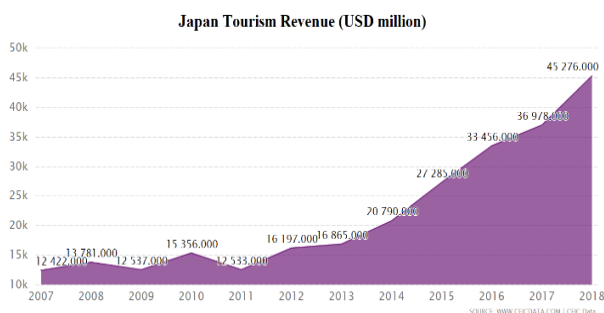


Fig. 2: Japan Tourism Revenue by year

However, Table 2 shows the international tourist arrivals to Japan has dropped dramatically since the start of the Covid-19 pandemic by the end of January 2020. In the first half of 2020, this number has reduced nearly 99.9% in comparison with the achievement in same time of the previous years.

Table 2: International visits to Japan through time

(Unit: 1000 arrivals)

	2017	2018	2019	2020
Jan	2295.7	2501.4	2689.3	2661.0
Feb	2035.7	2509.3	2604.3	1085.1
Mar	2205.6	2607.9	2760.1	193.6
Apr	2579.0	2900.7	2926.7	2.9
May	2294.7	2675.1	2773.1	1.7
Jun	2346.4	2704.6	2880.0	2.6

Source: Japan National Tourism Organization (JNTO)

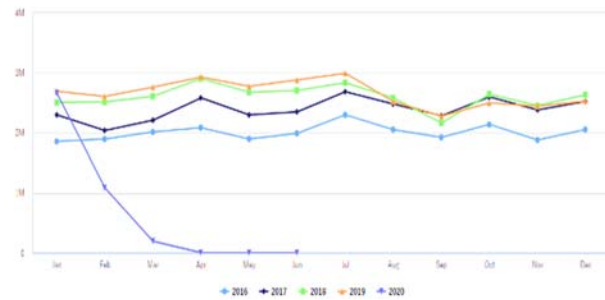


Fig. 3: International tourist arrivals in recent years

The Covid-19 pandemic is not only affecting Japan tourism industry, it also bars re-entry for many permanent and long-term residents, labors and students that creates subsequently difficulties to this 3rd largest economy. The report of NLI Research Institute in May 2020 estimated that the pandemic would result in the loss of 700,000 jobs, leaving nearly three quarters of million people without paychecks and their families insecure. One of the negative results was that the Japanese government decided to delay the Olympics 2020 to summer 2021 which caused them a loss of US\$6 billion.

Therefore, the Japanese government officers have expressed their hope that the Olympics 2021 would be a “kick start” for Japan’s economy as it would help to attract the international tourists to come back to Japan. However, due to the unpredictable situation of corona pandemic, international traveling may create further risks that affect the international tourists’ attitude and behaviors. Therefore, the purpose of this study is to answer these questions:

- (1) What are the international tourists’s attitude and behaviors towards Japanese cultural and heritage tourism?
- (2) What are the most beneficial attributes of Japanese culture and heritage to the international tourists? How they consider these benefits against the risks of traveling during the Covid-19 pandemic?
- (3) What are the barriers to international tourists during their trips in Japan that affect their motivation and satisfaction?
- (4) How these attitude and behaviors would change among different groups of international tourists based on some demographic criteria?

2. METHODOLOGY

The methodology and attributes of the research are adopted from previous literature about international tourists’ behaviors and modified to suit with the Japan context based on the researcher’s direct observations during the research trips. Data collection was conducted over two phases:

- (1) On-site data collection: The participants were recruited on-site in several tourism destinations in Japan during the researchers’ field trips from July 2019 to February 2020.

Table 3: Research schedule

Date and time	Place
12 th – 15 th July 2019	Kanazawa city and Shunran-no-Sato village, Noto Peninsula GIAHS, Ishikawa Prefecture Toyama Prefecture
1 st September 2019 – 30 th October 2019	Kunisaki GIAHS, Beppu, Oita Prefecture
	Saga Prefecture
	Fukuoka Prefecture
	Miyazaki Prefecture
	Yamaguchi Prefecture
24 th November 2019 – 6 th December 2019	Tokyo Metropolis
	Nikko in Tochigi Prefecture
20 th – 24 th February 2020	Okinawa Prefecture

- (2) Online data collection: The online survey link was posted on several international travel blogs and social media channels; Japanese travel blogs and forums where international tourists often use to search for Japan tourism information to ask if they have the intention/ plan to visit Japan in the coming time.

The link was also sent to the researchers’ academic and social networks to ask people in targeted countries, who has visited Japan within 3 years lately, to answer and then forward it to other people in their networks, who has visited Japan within 3 years, that they know.

However, due to the Covid-19 pandemic, this phase was divided into 2 periods:

- (1) From September 2019 to January 2020 (before the existence of Covid-19); and
- (2) From January 2020 to June 2020 (during Covid-19 in Japan).

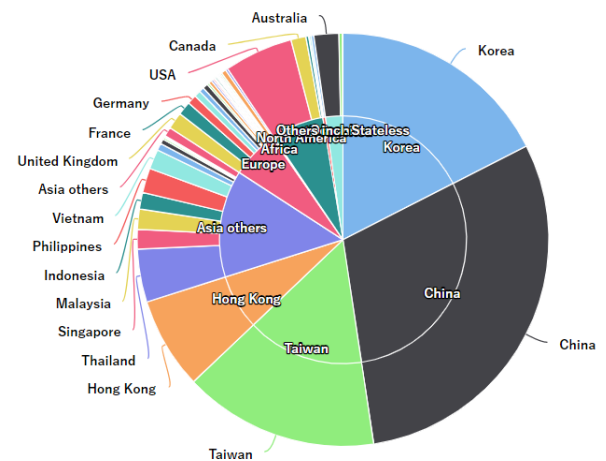
The purpose of this division is to identify the effect of Covid-19 on the attitude of international tourists on traveling in/to Japan which is measure in item AT1.

It is necessary to conduct two phases for this research as it studies about the international tourists’ attitude and behaviors towards Japanese cultural and heritage tourism and considers their perceived motivations

against the Covid-19 pandemic’s risks. Therefore, those respondents have already stayed in Japan might consider the benefits higher than the risks. So, if it is only conducted the research on-site in Japan, the result may be affected. Hence, it is necessary to conduct the second phase to explore the attitude and behaviors and the motivation of the people who have visited Japan recently or have plan to visit Japan in the coming time.

The questionnaire was designed where international tourists were asked to rate their attitude, behaviours and motivations on their visit to Japan. In this study, items chosen are widely used in international travel. A “7-point rating Likert scale” where “1 = strongly disagree, 4= neutral, and 7 = strongly agree” was applied to quantify the responses to the items. The questionnaire was written in English as it focused on international tourists.

According to the category of international tourists to Japan by country in 2018 (Fig.4), the participants of the research were focused on Asia countries, especially China (Mainland), Hongkong, and other Northeastern Asia countries as tourists from these countries contribute the most in the international tourists visiting Japan in recent years. The questionnaire was also sent to ASEAN tourists as the proportion of international tourists visited Japan is increasing over the late few years according to the Japan Tourism Statistics (JNTO, 2018). It was also sent to the European, US, and Oceania residents as the Japan Tourism Vision Realization Program 2018 (Action Program for Realization of Tourism Vision 2018) indicated that Japan would focus on these markets in the coming years.



Source: JNTO

Fig. 4: International tourists to Japan by country (2018)

Participation in this study was voluntary. However, as the questionnaire was conducted in English, which is one of its limitation, only people who understand English would participate in the research. Therefore, the

number of respondents in some countries such as China, S. Korea, Europe, etc. is not as high as expected. It is believed that all respondents answered the questionnaire honestly as it was anonymous and self-administered.

Questions requiring answers of categorical and quantitative value included specific purposes of trip, interests in Japan culture and heritage sites, preferred activities, preferred tourism sites, respectfulness to local community and cultural heritage, cultural barriers to their Japan visit, tourists' satisfaction and perceived benefits, and their concerns about the perceived risks while traveling in Japan as well as demographics such as region of origin, age, traveling group and number of visit to Japan.

Due to the limitation of language, a total of 211 answers were collected by June 2020, and all of these are usable for coding and analysis.

3. RESEARCH RESULTS AND DISCUSSION

3.1. Descriptive Statistics

According to frequency analyses on sociodemographic and travel-related profile of respondents, most of them are coming from ASEAN region (63.5%), China (Mainland) (10.9%), Oceania (6.6%), Northeastern Asia (4.7%) and Europe (4.7%). Tourists from other regions are less than 4%. The interviewees are from 43 countries and territories, however, in order to conduct the t-test, the researchers have grouped them into 11 main regions as below:

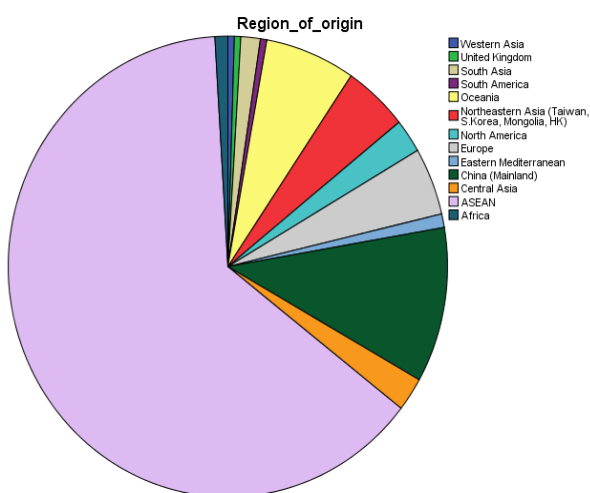


Fig. 5: Percentage of international tourist based on their nationalities

Table 4: Provision of regions

Region	Frequency	Percent (%)
ASEAN	134	63.5
China (Mainland)	23	10.9
Oceania	14	6.6
Northeastern Asia (Taiwan, S.Korea, Mongolia, HK)	10	4.7
Europe	10	4.7
North America	5	2.4
Central Asia	5	2.4
South Asia	3	1.4
Africa	2	0.9
Eastern Mediterranean	2	0.9
Western Asia	1	0.5
United Kingdom	1	0.5
South America	1	0.5
Total	211	100.0

Most of the respondents were from 25 to 40 years of age (76.3%) while young tourists (under 25 years old) participated in this research were 17.1%. Only 4.3% of the respondents were from 40 to 60 years old. The rest of 2.4% was over 60 years old.

Table 5: Provision of Age

Group	Frequency	Percent (%)
Under 25 years old	36	17.1
From 25 to 40 years old	161	76.3
From 40 to 60 years old	9	4.3
Over 60 years old	5	2.4
Total	211	100.0

Nearly half of the respondents travelled to Japan with a friend or a group of friends. The international tourists that came with their family or travelled alone reported at 28.9% and 20.9% respectively. However, only 3.8% of the interviewees used a travel agency to spend their visit with other tourists.

Table 6: Provision of Tourist Group

	Frequency	Percent (%)
Go with family members	61	28.9
Go with a friend/ friends	98	46.4
Go with other tourists (tour)	8	3.8
Alone	44	20.9
Total	211	100.0

In reference to the number of times visiting Japan, nearly half of the respondents reported that this was their first time, whilst more than one-third of them repeated their travel in Japan for more than two times.

Table 7: Provision of Number of Trips to Japan

	Frequency	Percent (%)
First time	102	48.3
Second time	33	15.6
More than twice	76	36.0
Total	211	100.0

3.2. International tourists' attitude and behaviors towards Japan tourism in general

Table 8 indicates the mean and standard deviation values of 23 items. In general, almost the items get the mean score higher than the neutral point of 4.

However, it is clear to see that Covid-19 really made a strong effect on the tourists' attitude and perception toward traveling during this time. Using the independent sample t-test for the group of respondents participated in the survey before February 2020 and those participated from February 2020 onward, there is no significant different between two groups on other items, except AT1. The AT1 fell from the highest mean of 6.44 before the Covid-19 to 3.89 after the existence of the pandemic. However, the standard deviation became larger which indicate the difference in the attitude among different groups.

Continuing with one-way ANOVA for AT1, it is found that the people from Eastern Mediterranean, Africa, and ASEAN are worried the most for their safety due to Covid-19. Tourists from Europe, North America, and Asia (except ASEAN) have high confidence about their safety during their trips to Japan.

Table 8: Overview of Attitudinal and Behavioural Characteristics

Items	Mean	Std. Deviation
Attitude to Japan tourism		
AT1 - It is safe to travel in Japan	6.44	0.77
AT1* - It is safe to travel to Japan (with consideration of Covid-19 pandemic)	3.89	1.59
AT2 - The infrastructure in Japan is convenient for my traveling	6.27	0.83
AT3 - The service in Japan are convenient for my traveling	6.16	0.93
Japanese tourists' barriers to international tourists		
BT1 - I can understand and follow the instruction, information leaflet, map, signboard, ... in Japan	5.17	1.59
BT2 - I can search for information that I need from a Japanese tourism/ traveling website	5.32	1.37
BT3 - I can communicate with Japanese public officers/employees	4.50	1.61
Behaviors toward Japan cultural and heritage tourism		
TB1 - I respect the lifestyle or customs of Japanese residents	6.23	1.02
TB2 - I try to understand and follow Japanese culture	5.90	1.10
TB3 - I would like to learn about Japanese history and culture	5.79	1.28
TB4 - I would like to experience Japanese food and drink	6.14	1.22
TB5 - I would recommend other people to try special food in Japan	6.07	1.08
TB6 - I would like to experience native Japanese culture	6.11	1.06
TB7 - I would like to participate in Japanese cultural activities	6.03	1.23
TB8 - I would recommend other people to participate in some cultural activities in Japan	5.94	1.15
TB9 - I would like to visit or have visited some heritage sites	6.32	0.95
TB10 - I would recommend other people to travel to some heritage sites in Japan	6.12	1.10
TB11 - I will keep the natural environment and reduce the pollution	6.35	0.52
TB12 - I will buy Japanese traditional handicraft as souvenir of my trip	5.78	0.98
Tourists' satisfaction of Japan tourism		
SA1 - I am happy with my travelling in Japan	6.39	0.96
SA2 - I would tell other people about my trip in Japan on my social media channel	5.56	1.58
SA3 - I would share my experience about Japan on some traveling websites	4.81	1.77
SA4 - I would like to return to Japan	6.30	1.05

Note: Likert 7-point scale: strongly disagree = 1, neutral = 4, strongly agree = 7

Table 8 also indicates that people are worried about the language barrier during their trips in Japan. The items in BT category got the mean score lower than other items of the questionnaire. However, they are still above the neutral point meaning that there's a proportion of international tourists got difficulties with information searching, language, communication, signboards and other direction instruction during their trips in Japan.

There are significant differences in the attitude of international tourists toward Japan tourism due to the group of people they were going with. Table 9 shows that people who were going with other tourists that they don't know on a tour to Japan have more concerns about their safety and convenience while traveling in Japan. However, they can understand and follow the instruction, map, signboard, etc. or search for information from a Japanese tourism website as good as other groups as it is shown in the BT items result.

It is supposed that as these people were worried more about the risks, they chose to use the tour from a traveling operator/agency instead of arranging the trip by themselves. And with the help of tour guide/tour operators, they could go over all the language and communication barriers during their trips.

Table 9: ANOVA test for AT and BT items among "Traveling group" groups

Items	Go with family members (n = 61)	Go with a friend/friends (n = 98)	Go with other tourists (on tour) (n = 8)	Go alone (n = 44)	F value	Sig.
Attitude to Japan tourism						
AT1	6.64	6.34	5.25	6.61	10.31	.000
AT2	6.48	6.18	5.50	6.30	4.06	.008
AT3	6.30	6.03	5.25	6.40	4.98	.002
Japanese tourisms' barriers to international tourists						
BT1	4.90	5.08	5.25	5.73	2.54	.048
BT2	5.03	5.33	5.00	5.75	2.54	.047
BT3	4.44	4.20	5.00	5.14	3.82	.011

The result also shows that while the people decided to travel Japan alone had the best experience in dealing with these language and communication barriers, the people who were going with their family or friends had the most problems to understand and follow the signboard, instruction, map, etc., search for information and communicate with Japanese public officers/staff.

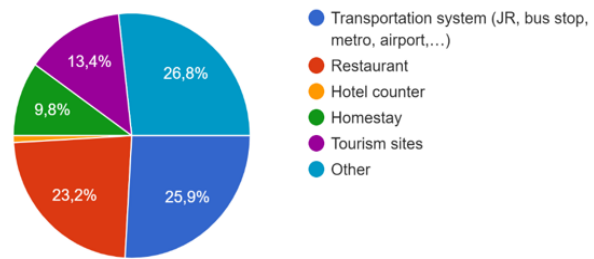


Fig. 6: Difficulty in communication with Japanese public officers and/or service staff during trips in Japan

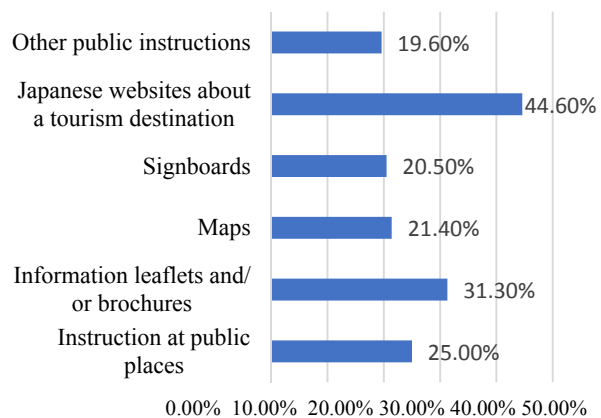


Fig. 7: Difficulty in understanding and follow public traveling instructions and information in Japan

Three traveling instruction systems and communication channels that international tourists find the most difficult to them are "Japanese websites about tourism destination" (44.6%), tourism "information leaflets and/or brochures" (31.3%), and "instruction at public places" (25%). And they also find the places where they often meet the problems with communication are transportation systems (stations, metro, bus stop, train, airport, etc.), restaurant, tourism sites, and other non-tourism places (trading centers, on the streets, toilets, etc.). Therefore, to better help the international tourists during their visit, and encourage them for heritage and nature conversation, the Japanese tourism authority should focus more on this issue to reduce the tourism barriers, especially people who were going with their family and friends.

3.3. International tourists' attitude and behaviors towards Japan cultural and heritage tourism

According to Table 8, international tourists in this study showed their interests in Japan culture and heritage. However, they prefer more in visiting heritage site, participating in cultural activities, and they are willing to

recommend their experience to other people through social media channels and other travelling websites.

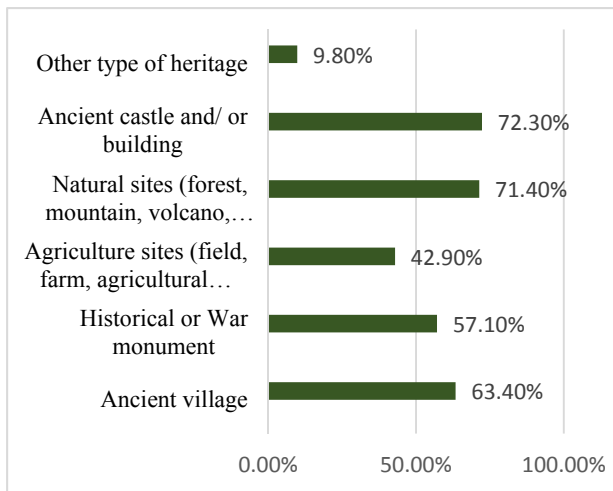


Fig. 8: International tourists' preferences in heritage sites during their visit in Japan

During the Japanese trip, international tourists spent their time on visiting some heritage sites which are indicated as World heritages or National heritages. They spent most of their visits on ancient castles and/or buildings (72.3%), natural sites (71.4%) and ancient villages (63.4%). About half of them paid their visit at historical or war monuments and less than a half of them chose agricultural sites on their trip.

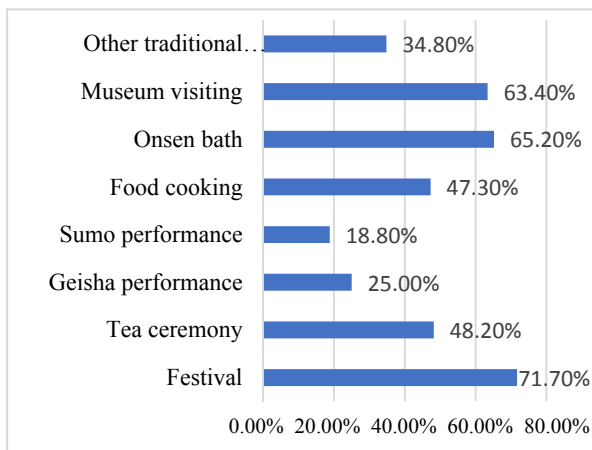


Fig. 9: International tourists' preferences in cultural activities during their visit in Japan

Regarding cultural activities of international tourists' preferences, the three most interesting activities to them are festivals (71.7%), onsen bath (65.2%), and museum visiting (63.4%). About half of international tourists would like to experience in Japanese food cooking or tea ceremony. Not many international tourists spent their time on sumo and geisha performances.

In overall, the international tourists are happy with their trips in Japan (SA1 = 6.39), however, some of them are

not willing to share their review or experience on travelling websites or they are not familiar with doing this (SA3 = 4.81) as they are willing to share this informative experience with their friends on their own social media channels like Facebook, Twitter, Instagram, etc. (SA2 = 5.56). This finding also indicates that social media channels would be a more efficient to reach the potential markets and promote the image of Japan cultural and heritage tourism.

The respondents indicate that they are willing "to return to Japan" (SA4 = 6.30) and it was also reflected in Table 7 that half of the international tourists came to Japan on their "second trip" or "more than twice" trip.

Table 10: ANOVA tests for TB items among "Number of visits" groups

Items	First time (n = 102)	Second time (n = 33)	More than twice (n = 76)	F value	Sig.
TB1	6.39	5.91	6.16	3.16	0.373
TB2	5.84	5.76	6.03	0.91	0.000
TB3	5.81	5.39	5.92	2.02	0.000
TB4	6.16	5.45	6.41	7.47	0.000
TB5	6.19	5.39	6.21	8.27	0.002
TB6	6.26	5.61	6.12	5.03	0.003
TB7	6.25	5.33	6.03	7.37	0.000
TB8	6.06	5.42	6.00	4.08	0.001
TB9	6.42	5.82	6.41	5.74	0.001
TB10	6.33	5.48	6.12	7.88	0.000
TB11	6.49	5.91	6.35	5.01	0.001
TB12	5.98	5.35	5.70	4.74	0.002

All the items in this domain (except TB1) get the p-value < 0.05 which mean there are significant differences among groups of international tourists based on the number of their visits. People who travelled to Japan for their first time and people who visits Japan more than twice show the highest interests in Japanese culture and heritage and they are most willing to participate into the cultural activities. They are also eager to recommend their experiences to other people.

Regarding their ages, in general, all the four groups "Under 25 years old", "From 25 to 40 years old", "From 40 to 60 years old", and "Over 60 years old" all show their interests in and respect to Japanese culture and heritage. Table 11 demonstrates the result of ANOVA

analysis which generated a significant effect of age on TB1, TB3, TB4, TB7, and TB9 items ($p < 0.05$). This result shows that international tourists over 60 years old are less “respect to the lifestyle or customs of Japanese residents” and less interest in Japanese “history and culture”, “food and drink” than the younger groups. Hence, they (over 60 years of age) indicate the least interest in “participation in cultural activities” and “Japanese heritage sites” among the four groups of age. However, they are willing to recommend other people to “try Japanese special food”, “participate in cultural activities” and “travel to heritage sites in Japan”.

Table 11: ANOVA tests for TB items among “Age” groups

Items	Under 25 years old (n=36)	25 to 40 years old (n=121)	40 to 60 years old (n=29)	Over 60 years old (n=25)	F value	Sig.
TB1	6.17	6.29	6.22	5.00	2.68	.014
TB2	5.92	5.92	5.44	5.80	0.54	.900
TB3	6.25	5.68	6.33	4.80	3.60	.006
TB4	6.61	6.06	6.11	5.40	2.72	.003
TB5	5.94	6.08	6.44	6.00	0.53	.716
TB6	6.33	6.09	5.67	5.80	1.23	.238
TB7	6.14	6.08	5.56	4.40	3.67	.013
TB8	5.72	6.00	5.89	5.94	0.72	.211
TB9	6.56	6.34	5.89	5.00	4.82	.000
TB10	6.28	6.12	5.56	6.00	1.06	.820
TB11	6.45	6.40	6.23	6.10	2.50	.760
TB12	5.90	5.85	5.49	5.60	3.10	.350

This result suggests that the “over 60 years old” group are also interested in the activities like other groups, but they would not like to participate in because of their physical abilities/age. Therefore, traveling operators and managers should have more services and supports for senior tourists to serve them better with the experience during the trips in Japan.

Table 12: ANOVA tests for SA items among “Traveling group” groups

Items	Go with family members (n = 61)	Go with a friend/friends (n = 98)	Go with other tourists (on tour) (n = 8)	Go alone (n = 44)	F value	Sig.
SA1	6.56	6.28	5.50	6.57	4.04	.008
SA2	5.98	5.60	5.50	4.89	4.37	.005
SA3	5.16	4.84	5.50	4.11	3.63	.014
SA4	6.38	6.23	5.75	6.45	1.30	.277

Table 13: ANOVA tests for SA items among “Number of visits” groups

	First time (n=102)	Second time (n = 33)	More twice (n = 76)	F	Sig.
SA1	6.62	5.94	6.28	7.45	.001
SA2	5.66	5.18	5.59	1.16	.316
SA3	4.95	4.06	4.93	3.56	.030
SA4	6.44	5.91	6.29	3.30	.039

Although the respondents of this study indicated that they are happy with their trips in Japan (SA1) and would like to return (SA4), the behaviors of the people in each group according to some demographic criteria are not the same. Table 12 and 13 show that there are significant differences in their satisfaction and future intention behavior due to their traveling experience and the group of people they were going with.

People visited Japan by a tour operator/agency have least satisfaction with their trip among the four groups, however, they are most willing to share their experience about Japan on some traveling websites. Understanding this behavior is important to the promotion and marketing activities of Japan tourism as traveling website is one of prime channels of information that the potential tourists would look for.

Moreover, the people who visited Japan for the first time and more than twice have the highest score of their satisfaction (SA1) and most willing to share their

experiences with other people on their personal social media channels and traveling websites (SA2 and SA3). They also have higher intention of return to Japan (SA4).

4. RECOMMENDATIONS AND CONCLUSION

Japan government declared their plan to turn the country to be a highly international competitive tourism nation. The Japan Tourism Vision Realization Program 2018 (Action Program for Realization of Tourism Vision 2018) announced at the 9th meeting of the “Ministerial Conference for the Promotion of Tourism” (June, 2018) pointed out that a “tourism nation is a key task essential for economic development of the nation in the 21st century” in view of a declining birthrate and aging population and full-fledged development of international exchanges, together with promoting its culture and heritage value.

According to the result of the study, the international travelers enjoy in the Japanese cultural and heritage tourism. They prefer Japanese cultural activities, food and drinks, and heritage sites to its culture knowledge and history. Within these areas, they show their most interests in (1) visiting ancient castle and architecture, national heritage sites, ancient village, museum, (2) participating in festival, food cooking and tea ceremony, and (3) enjoying onsen experience. These are the most beneficial attributes of Japanese heritage tourism to the international tourists. Even though the Covid-19 has raised a high concern in the attitude of the international tourists about the risk of travelling during this time, they are still interested in Japanese cultural activities and heritage experience. That would be an advantage to the Japanese tourism recovery after Covid-19 pandemic time.

From the results of this study, there are some issues that need more attention to improve the satisfaction and experiences of international tourists:

- (1) There should be more foreign language training to the public staff, officers and local people in the tourism/ heritage sites. If they are working or living in a tourism sites, the local government should help them how to communicate and help international tourists to get familiar with the infrastructure and traffic system in their area.
- (2) Besides Japanese, the public signboard, information leaflets, maps, traffic instructions, etc. should be written in English and other languages to help international tourists easier to find the destination, save time and cost for their travelling, especially for people who are going with their family.

- (3) The Japanese websites about tourism destinations need more upgrade and to be easier to understand to help international tourists understand better about the place they want to visit, as almost half of the respondents in this study found it is difficult to understand and follow these websites.
- (4) According to this study, the people who visit Japan through a tourism agency or tour operator are less satisfied with their visit and less willing to return. The Japanese tourism authority should work more with these agencies and operators, train them how to serve their customers and help them to bring more cultural activities and experiences to tourists.
- (5) The visitors of above 60 years old are less willing to participate in cultural activities, festivals or heritage sites visit, but they are eager to recommend these activities to other people. There should be more studies on this issue to understand more about this group of tourists’ needs. They might find some difficulties due to their age and physical abilities, therefore, would need more helps from the tourism service staffs than younger tourists.
- (6) Heritage tourism product development: AI, 3D media, and other advanced technologies are the advantage of Japan; however, they are applied mainly in urban areas and prime tourism destinations. In rural and remote areas, the application of these smart technologies is still limited. They are not only can provide the enjoyable experience and convenience to the tourists, but also can partially help with language barrier problems and reduce the risk of Covid-19 and/or other pandemics. Smart technologies can be used as a tool to preserve cultural heritage and enhance the live experience to the visitors, especially for the young people, introducing some new methods of cultural performance and traditional knowledge education. It may earn more attention, and interests of international tourists in learning and participation into rare cultural heritage of local or ethnic communities.

Future research is necessary to investigate the attitude and behaviors of tourists visit Japan through a tourism agency or tour operator, and senior international tourists of above 60 years old to increase their satisfaction and understanding about Japanese culture and heritage values.

5. REFERENCE

- [1] Garrod, B. & Fyall, A. (2000). Managing heritage tourism. *Annals of Tourism Research*, 27(3), 682-708.
- [2] Hall M. & McArthur (1998). Integrated Heritage Management: Principle and Practice. *London, Stationery Office*.
- [3] Japan National Tourism Organization (JNTO), <https://www.tourism.jp/en/tourism-database/stats/inbound/> accessed on 9 October 2019.
- [4] McIntosh, R.W., Goeldner, C.R. and Ritchie, J.R.B. (1995) Pleasure Travel Motivation. *Tourism: Principles, Practices, Philosophies*, 7th Edition, 167-190.
- [5] Moli, P. (2011). Community-based Eco Cultural Heritage Tourism for sustainable development in the Asian region: a conceptual framework. *International Journal of Social Ecology and Sustainable Development*, 2(2), 66-80.
- [6] Stebbins, R. A. (1996). Cultural tourism as serious leisure. *Annals of tourism research*.
- [7] Timothy, D. J. (2011). *Cultural heritage and tourism: An introduction* (Vol. 4). Channel View Publications.
- [8] Tourism National Promotion Basic Law (2006) <https://www.mlit.go.jp/kankocho/en/kankorikkoku/index.html> accessed on 10 December 2018.
- [9] UNWTO (2016), *UNWTO Annual Report 2015*, Madrid, World Tourism Organization.

VIETNAMESE TOURIST SATISFACTION IN AGRO-TOURISM: A CASE STUDY AT TRA QUE VILLAGE, QUANG NAM PROVINCE, VIET NAM

Ha Van Trung¹, Suchint Simaraks^{2*}

¹ Faculty of Rural Development Management, Khon Kaen University, Khon Kaen, Thailand

² Faculty of Agriculture, Khon Kaen University, Khon Kaen, Thailand

* Corresponding author: suchint@kku.ac.th

Abstract

Agro-tourism is a form of rural tourism that has actively developed in recent years. Tra Que Vegetable Village has developed this type of tourism to meet the needs of visitors to visit and experience. However, Vietnamese tourists' satisfaction of agro-tourism in the village has not been giving sufficient attention. The purpose of this study was to find the level of Vietnamese tourists satisfaction and factors that contribute to the levels. Tourist participants responded to questionnaire of the survey in terms of the levels of their satisfaction from one to five points scale among ten criteria of evaluation. The results indicate that three of these ten factors, included infrastructure (X3), agricultural experience activities (X2), and restaurant service (X8) play crucial roles, contributing directly and significantly to the general tourists' satisfaction and the model is $Y = 0.928 + 0.938X2 + 0.470X3 + 0.622X8$. Focusing on upgrade, development of these three elements will further enhance the Vietnamese tourist satisfaction, gain more benefits of the villagers if those factors are improved, directly contribute to the ago-tourism development of in Tra Que Vegetable Village in the future perspective.

Keywords: Agro-tourism, tourist's satisfaction, Vietnamese tourists, Tra Que Vegetable Village.

1. INTRODUCTION

According to Sasu & Epuran (2016), the number of visitors who concern about rural tourism is an ascendant tendency nowadays, and they look for a new type of ecological tourism or responsible tourism. Simultaneously, the tourists tend to pay more attention and their consideration to areas that bring unique and extraordinary experiences, authentic and specific activities, as well as primordial lifestyle. In this way, it can avoid the globalized nature of mass tourism (Sasu, 2016). Rural tourism is increasing in the world and gaining popularity amongst tourists (Villanueva-Álvarez, Mondéjar-Jiménez, & Sáez-Martínez, 2017; Shikha Kapur, 2016). Agro-tourism growth as an inevitable trend in tourism development (Mahaliyanaarachchi, 2015; Busby & Rendle, 2000). It is not only bringing profits in terms of the economy, especially in the rural area but also contributing to well preserving the ecological environment.

Agro-tourism was developed in Viet Nam 15 years ago (Pham Xuan Hau, 2017). Yet, agro-tourism in Vietnam has not been developed vigorously as in other countries

in the region and in the world. Despite the considerable potential for agri-tourism, agri-tourism activities in Vietnam remain unprofessional (VNA, 2018).

Hoi An is one of the most famous tourist destinations in Vietnam. Tourists visiting Hoi An, besides visiting the old town, can also experience many tourist activities in surrounding tourist spots. The most prominent activities are agro-tourism activities in Tra Que vegetable village, Cam Ha ward, Hoi An city. However, there are many issues influenced to Vietnamese tourist satisfaction but have not been identified. Therefore, this research was designed to capture the levels and factors influencing Vietnamese tourist's satisfaction in Tra Que village.

2. LITERATURE REVIEW

Agro-tourism itself has been defined by different manners in different regions of the globe. Barbieri and Mshenga (2008) determined that agro-tourism is any activity of attracting guests that have been developed on-farm with the intention. However, Maruti (2009) defined differently that agricultural tourism is an advanced activity of agriculture-related of both tourism and agriculture side in which it can provide opportunities for

employment and create supplemental sources of revenue to people in the community. Furthermore, Marques (2006) argued that agri-tourism could be a part of rural tourism in which the local households have to incorporate with an agricultural estate, permitting travellers to join in agro-activities on their farm. While according to Sasu & Epuran (2016), Darău et al. (2010) stated that agricultural tourism is a subordinate activity being organized by peasants to remain their primary job and maintain the source of income sustainably. Dennis & Richard (2004) indicated that agro-tourism activities included purchasing a product directly from a farmhouse, feeding animals on-farm, picking fruit, or overnight at a farm. It involves those activities for income-generating that being conducted on a farm or enjoying the fun of things and carry out education functions. It also includes activities to an understanding of the nature, culture, history, environment of the land, and people on the site. (George, 2008). However, in the context of Viet Nam, agro-tourism could be defined as a tourism activity related to local agricultural production activities such as cultivation and harvesting crop activities and raising livestock activities. In particular, local people exploit available agricultural production activities, combined with other services such as accommodation, eating and drinking, transportation services, etc. to exploit the unique cultural and natural values of the rural community to serve tourists' sightseeing and experience needs. This understanding is close to MSc. Bui Thi Lan Huong's perception in term of agro-tourism concept (2010). She distinguished the concept Agricultural tourism: "Agricultural tourism is a single form of tourism based on the exploitation of agricultural production resources, the tourism participants are farmers, the tourist space is a farm in the field, can cause conflicts of interest with the community".

Tourist satisfaction is level of gratification, which tourists fulfilled in terms of experiences of a tourism product and/or a service that satisfy their wants, desires, and expectations in involvement with their trips (Severt et al., 2007). In the tourism perspective, the satisfaction level is compared between desires/expectations before travel and experiences after travel. The tourist satisfaction will be fulfilled well when their experiences about products and/or services go beyond their expectations (Aliman, Hashim, Wahid, & Harudin, 2016). However, Bagri & Kala (2015) showed that attributes related to tourism product of spiritual and cultural nature, atmosphere and climate, a variety of tourist activities, hospitality and safety are significant factors in determining tourist satisfaction. Whereas basic facilities such as accommodation, transportation, tourism infrastructure and hygiene and sanitation at destination are of significant importance in satisfaction

evaluation. While, Castro, Quisimalin, Carmen, Gancino, & Jerez (2017) identified and validated determinants of tourist satisfaction included of infrastructure, attention, cleanliness of the establishment and availability of parking; food and fun; ease of finding places and availability of service information; gastronomic and cultural tourism, positive tourism experience, successful choice of destination, fulfilled expectations, repetition of the trip and recommendation of destination.

3. MATERIAL AND METHOD

3.1. Research design

Population

The study was conducted at Tra Que village, Quang Nam province, Viet Nam. Because the study aims to identify the factors contributing to Vietnamese tourist satisfaction in agricultural tourism, so available sampled Vietnamese tourists was analyzed. According to the newest data of Statistical Office of Hoi An (2019), there are 850 Vietnamese tourists visited Tra Que in 2018. It should be noted that this study was conducted during the Covid-19 pandemic.

Sample size and sampling technique

This research used a quantitative method, Taro Yamane formula ($N > 200$). Theoretically, the sample size was calculated approximately equal to 89 Vietnamese tourists as formula $n = \frac{N}{1 + N e^2} = \frac{850}{1 + 850 \times 0.1^2} = 89$ (n: Sample size, N: Number of population, e: Level of precision). But the actual sample size was calculated as $89 + 89 \times 10\% = 98$ tourists. In fact, there are 100 Vietnamese tourists participated in the study.

The research applies non – probability sampling method to select the respondents. Simple random sampling was employed to 100 Vietnamese tourists (respondents). The respondents will be chosen rely on two criteria: the first is they have ever experienced all agro-tourism services at Tra Que; and the second is tourists visited the village from on January 2020 to July 2020.

3.2. Data collection

This research used a quantitative approach, by questionnaire survey of 100 Vietnamese tourists who have ever visited Tra Que village from June to July in 2020. The questionnaire focused to elucidate level of tourist satisfaction on agro-tourism. The Vietnamese tourists included both group and individual tourists. The questionnaire was developed pretested. Semi-structured interview of two groups of 10 Vietnamese tourists for 30 minutes was also conducted to check the reliability of the data collected by questionnaire.

3.3. Data analysis

Issues related to the satisfaction included: (X1) Tour guide service, (X2) Agricultural activities used in agro-tourism (X3) Infrastructure such as toilets, parking lots, roads, welcome house and other public services (X4) Communication and language skills of local guide and villagers, (X5) Attitude and behaviour of the local toward tourists (X6) Specialization in organizing experienced activities (X7) accommodation services such as homestays, hotels and villas, (X8) Restaurant and food services, (X9) Tour activities such with various option for experiences (cooking tours, farming experienced tours, photo-taking tours, cycling tours etc), and (X10) Tourist supported service such as sightseeing directions, maps, etc

Descriptive statistical tools such as percentage, mean, median, and mode were used to analyze and describe tourist' response to their satisfaction of their visits, Multiple Regression Linear analysis with using the stepwise method to select independent variables and estimate regression coefficients was applied to find the factors influencing their satisfaction in agro-tourism services at Tra Que. Independent variable is the general satisfaction level of respondents (Y), and dependent variables are from variable X1 (Tour guide service) to variable X10 (Tourist supported service). Statistical Package for Social Science (SPSS Inc., version 26) have used for the analysis process.

4. RESULTS

4.1. Respondent characteristic

Tra Que Village started to develop tourism in 2003, now Tra Que provides many services for domestic and foreign tourists such as accommodation services, food services and multiform experienced tours. There are 29 males and 71 females participated in the survey. More than half of the respondents (51%) are age from 26 to 35

years old. There was approximately one-third (31%) of the respondents currently work in school and educational institutes followed by tour guides (23%).

4.2. Satisfaction level of tourists on agro-tourism services in Tra Que village

Table 1 shows levels of Vietnamese tourists' satisfaction of those who had visited Tra Que. Among the tourists who had ever used services/activities, a majority of them are quite satisfied with what they experienced. More than half of the respondents answered that their satisfaction levels were above average level included of agricultural activities (79%), communication and language skill of tour guide and local people (75%), attitude and behaviours of villagers (80%), restaurant service (53%), specialization of organization in agro-tourism (70%) and tourist supported service (55%). Also, approximately half of them stated that their satisfaction levels are higher than the average level consisted of: the quality of infrastructure (50%), tour programs (49%). However, there are also some respondents felt unsatisfied on the supported services (6%) and infrastructure (5%). Almost half of the respondents have never used accommodation service (49%) at Tra Que and majority of them had participated in agricultural activities and felt good about it (97%). The results above indicated that most of the respondents' satisfaction in agro-tourism services in this village were higher average level (level 3).

To Vietnamese tourists satisfaction level of agro-tourism services in general, more than half of the respondents (57%) are satisfied with what they experienced in agro-tourism in the village, and the number of respondents who feel very satisfied is 17% of the total. On the other hand, about one-fourths of them (26%) are still not satisfied. This result is similar to the research result of Tran, Lan & Thuy (2012) about foreign tourists' satisfaction.

Table 1: Tourist's satisfaction level of agro-tourism in Tra Que Village

(1: very unsatisfied, 2: unsatisfied, 3: average, 4: satisfied, 5: very satisfied)

Services	1		2		3		4		5		No answer		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
X1. Tour guide service	1	1	2	2	22	22	45	45	8	8	22	22	100	100
X2. Agricultural activities	0	0	0	0	18	18	52	52	27	27	3	3	100	100
X3. Infrastructure (car park...)	0	0	5	5	24	24	41	41	9	9	21	21	100	100
X4. Communication & language skills	0	0	1	1	20	20	48	48	27	27	4	4	100	100
X5. Attitude and behavior	0	0	1	1	15	15	51	51	29	29	4	4	100	100
X6. Specialization of organization	0	0	2	2	24	24	48	48	22	22	4	4	100	100

X7. Accommodation	1	1	1	1	9	9	32	32	8	8	49	49	100	100
X8. Restaurant	1	1	1	1	11	11	45	45	8	8	34	34	100	100
X9. Tour programs	2	2	1	1	14	14	37	37	12	12	33	33	100	100
X10. Tourist supported service	1	1	5	5	17	17	46	46	9	9	22	22	100	100
Y. The general satisfaction level	1	1	0	0	24	24	54	54	16	16	5	5	100	100
			N											
			Valid	Missing	Mean	Median	Mode		Std. Deviation		Range			
X1. Tour guide service			97	3	3.94	4.00	4		.775		2			
X2. Agricultural activities			97	3	4.09	4.00	4		.678		2			
X3. Infrastructure			97	3	3.87	4.00	4		.759		3			
X4. Communication and language skills			96	4	4.05	4.00	4		.731		3			
X5. Attitude and behavior			96	4	4.13	4.00	4		.700		3			
X6. Specialization of organization			96	4	3.94	4.00	4		.751		3			
X7. Accommodation			51	49	3.88	4.00	4		.765		4			
X8. Restaurant			66	34	3.88	4.00	4		.691		4			
X9. Tour programs			67	33	3.79	4.00	4		.962		5			
X10. Tourist supported service			78	22	3.73	4.00	4		.801		4			
Y. The general satisfaction level			95	5	3.88	4.00	4		.713		4			

4.3. Factors affecting Vietnamese tourist satisfaction in agro-tourism in Tra Que village

The table 2 shows the Bivariate correlations of the variables in the study. The value of the correlation coefficients between Y and X above shows that there is a close relationship between variables X and Y.

The research hypothesis is $Y = B1X1 + B2X2 + B3X3 + B4X4 + B5X5 + B6X6 + B7X7 + B8X8 + B9X9 + B10X10$.

Dependent variable is the General satisfaction level (Y, scale 1 to 5).

Independent variables are: Tour guide service (X1, scale 1 to 5), Agricultural activities used in agro-tourism (X2, scale 1 to 5), Infrastructure (X3, scale 1 to 5), Communication and language skills (X4, scale 1 to 5), Attitude and behaviour of the local toward tourists (X5, scale 1 to 5), Specialization in organizing experienced

activities (X6, scale 1 to 5) accommodation services (X7, scale 1 to 5), Restaurant and food services (X8, scale 1 to 5), Tour activities (X9, scale 1 to 5), and Tourist supported service (X10, scale 1 to 5).

However, the correlation coefficient between the variable Y and the rest of the independent variables were high, except for variable X1 and X9, the lowest correlation coefficient was also 0.282. It is possible to conclude that these independent variables (except for X1 and X9) can be put into the model to account for the variable Y. But the correlation coefficient among the independent variables was also high (the lowest was 0.261). Thus, it is necessary to carefully consider the role of the independent variables on this multiple linear regression model.

Table 2: Bivariate correlations of the variables between independent variable Y and dependent variables X (from X1 to X10)

Pearson Correlation	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
Y	1	.212	.480**	.365**	.479**	.455**	.367**	.282*	.344**	.216	.327**
X1	.212	1	.322**	.692**	.329**	.331**	.218	.669**	.697**	.791**	.803**
X2	.480**	.322**	1	.428**	.793**	.836**	.710**	.262	.215	.281*	.486**
X3	.365**	.692**	.428**	1	.506**	.425**	.365**	.761**	.702**	.597**	.745**
X4	.479**	.329**	.793**	.506**	1	.872**	.778**	.371**	.277*	.287*	.514**
X5	.455**	.331**	.836**	.425**	.872**	1	.760**	.272	.280*	.261*	.491**
X6	.367**	.218	.710**	.365**	.778**	.760**	1	.161	.098	.189	.397**
X7	.282*	.669**	.262	.761**	.371**	.272	.161	1	.826**	.781**	.633**
X8	.344**	.697**	.215	.702**	.277*	.280*	.098	.826**	1	.638**	.658**
X9	.216	.791**	.281*	.597**	.287*	.261*	.189	.781**	.638**	1	.676**
X10	.327**	.803**	.486**	.745**	.514**	.491**	.397**	.633**	.658**	.676**	1

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).

Table 3 below shows the coefficients and adjusted R square of variables to form the regression model Y on variables X1, X2, X3, X4, X5, X6, X7, X8, X9, X10. To examine lack of fit in multiple regression, the multiple regression equation estimated by Stepwise method was applied. The model 1 shows that variables of (X2) agricultural activities, (X3) infrastructure, and (X8) restaurant are the best predictor of the satisfaction level of Vietnamese tourists in Tra Que. The hypothesis that the independent variable (X2, X3, X8) have an impact on the dependent variable (Y) is accepted as P-value $X2 = 0.008 < 0.01$ at significant level 0.01, P-value $X3 = 0.042 < 0.05$ at significant level 0.05 and P-value $X8 = 0.015 < 0.05$ at significant level 0.05 respectively.

Other variables are also related to tourist satisfaction level, but when these independent variables (X2, X3, X8) are included in the equation, the effects of the other variables are not as prominent.

And from the table 3, the equation that predicts factors influence to the level of Vietnamese tourist satisfaction being $Y = 0.928 + 0.938X2 + 0.470X3 + 0.622X8$. Thus, for every unit increase of the agricultural activities (X2) or infrastructure(X3) or restaurant (X8), the general tourist satisfaction will increase by 0.938 or 0.470 or 0.622, respectively. It can account for 68.2 percent of the variability of the Y value by the multiple regression equation.

Table 3: Coefficients and Adjusted R Square of Variables between independent variable (Y) generally satisfied level of Vietnamese tourists and dependent variables (from X1 to X10)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Adjusted R Square	
	B	Std. Error	Beta				
1	(Constant)	.928	.651		1.427	.162	.682
	X1. Tour guide service	-.254	.237	-.259	-1.074	.290	
	X2. Agricultural activities	.938	.331	.943	2.835	.008	
	X3. Infrastructure	.470	.223	.476	2.110	.042	
	X4. Communication and language skills	.293	.418	.321	.702	.488	
	X5. Attitude and behavior	-.182	.277	-.188	-.659	.514	
	X6. Specialization	.073	.261	.078	.279	.782	
	X7. Homestay	-.331	.232	-.358	-1.426	.163	
	X8. Restaurant	.622	.242	.654	2.568	.015	
	X9. Agricultural activities/tours	-.143	.253	-.163	-.564	.576	
	X10. Tourist supported service	.195	.194	.222	1.007	.321	

a. Dependent variable: (Y) The general satisfaction level of Vietnamese tourists

5. DISCUSSION AND RECOMMENDATION

In the evaluation criteria reflect the needs of Vietnamese tourists for agricultural tourism in Tra Que vegetable village, the above criteria are very important to determine the necessary issues for tourism development of Tra Que vegetable village. And possibly for Hoi An city in general.

However, it was found that the most prominent factors affecting visitor satisfaction, included participation in agricultural activities by the tourists (X2), the quality of restaurants, food stalls in the village (X8) and the quality of infrastructure for agricultural tourism (X3). These are critical factors contributing directly to the satisfaction of visitors when visiting and experiencing agricultural tourism in Tra Que vegetable village. In particular, the most important factor is infrastructure. They should be upgraded, so that satisfaction level of visitors would increase significantly, followed by restaurants and agricultural experience activities.

Therefore, local authorities should pay more attention to the development of local infrastructure, especially public services such as toilets, car parking, resting and other related public facilities. However, local authorities should plan and built public construction in appropriate ways to upgrade public services for tourists to relax and entertain during their trip to the vegetable village. In addition, the local government should focus on developing the quality and quantity of surrounding restaurants through incentive policies to support local restaurants in terms of funding and training local human resources.

Likewise, to local people, the experimental agricultural activities also need to pay more attention in terms of diversifying agricultural experience activities and enhance the tourists' participation level in agricultural activities. Developing new experienced programs, increasing the participation of tourists in those activities will make an positive affect to tourist's satisfaction. That will also contribute significantly to promoting tourist attraction.

Besides, the local people should work with local government to organize culinary activities such as food festivals or cooking contests so that visitors can join and experience with local people. It is necessary to establish the close linkages between tourists and tourism companies and local restaurants to increase potential and minimize the constraints of parties.

6. CONCLUSION

There are ten factors that contribute to the satisfaction of Vietnamese tourists in agricultural tourism. In which infrastructure, restaurants services, and agricultural experience activities play a key role in promoting visitor satisfaction. In the coming future, if Tra Que vegetable village wants to promote tourism development, attract more tourists, Tra Que vegetable village needs to focus in the upgrade, development of all three factors in terms of both quality and quantity. Besides, Tra Que also needs to pay attention to other factors to make sure that agricultural tourism development is sustainable in the future.

7. REFERENCES

- [1] Aliman, Nor Khasimah & Hashim, Shareena & mohd wahid, Siti & Harudin, Syahmi. (2016). Tourists' Satisfaction with a Destination: An Investigation on Visitors to Langkawi Island. *International Journal of Marketing Studies*, 8, 173, 10.5539/ijms.v8n3p173.
- [2] Bagri, Satish & Kala, Devkant. (2015). Tourists' Satisfaction at Trijugarayan, India: An Importance-Performance Analysis. *Advances in Hospitality and Tourism Research*, 3, 89-115.
- [3] Busby, G., & Rendle, S. (2000). The transition from tourism on farms to farm tourism. *Tourism Management* 21 (2000), 635-642.
- [4] Castro, Juan & Quisimalin, Mauricio & De Pablos-Heredero, Carmen & Gancino, Viviana & Jerez, Jessica. (2017). Tourism Marketing: Measuring Tourist Satisfaction. *Journal of Service Science and Management*. 10. 280-308. 10.4236/jssm.2017.103023.
- [5] Darău, A. P., Corneliu, M., Brad, M. L., & Avram, E. (2010). The Concept of Rural Tourism and Agritourism. *Studia Universitatis "Vasile Goldiș"*, Vol. 5, Nr. 1, pp.39-42.
- [6] Dennis, M., & Richard, J. (2004). *Agro-tourism Offers Opportunities for Farm Operators'* London. Waterloo and Sons. Ltd.
- [7] Dr Shikha Kapur, Senior Assistant Professor Department of Adult and Continuing Education & Extension Jamia Millia Islamia, N. D.-1. (March 2016). *Rural Tourism and Economic Development: Relevance and Prospects in India*.
- [8] George.H., (2008). *Agritourism Enterprises on your Farm or Ranch: Where to Start*. Oakland, California: UCANR Publication.
- [9] Hau, P. X., & Tuan, V. A. (2017). The development of rural tourism in Viet Nam: objectives, practical experiences, and challenges. *Journal of Science of Van Hien University*, volume 5 number 2.
- [10] Huong, B. T. (January 2010). *Agricultural Tourism and Rural Tourism*. Scientific Research Magazine, School of Agricultural and Rural Development Managers 2, Ho Chi Minh City.
- [11] Lew, A. A. (1987). A framework of tourist attraction research. *Annals of tourism research*. Vol 14., 553-575.
- [12] Marques, H. (2006). Searching for complementarities between agriculture and tourism—the demarcated wine-producing regions of northern Portugal. *Tourism Econ* 12., 147-155.
- [13] Maruti, K. (2009). Agro-tourism: Scope and opportunities for the farmers in Maharashtra. *Socio-economic voice*. <http://www.indiastat.com/article/09/kvm/fulltext.pdf>.
- [14] Mahaliyanaarachchi, R. P. (2015). Role of Agri Tourism as a Moderated Rural Business. *Tourism, Leisure and Global Change*, volume 2 (2015), p.TOC- 193 .
- [15] Nguyen, N. T., Suwann, S., Thongm, W., & Visuthismajarn, P. (2018). The Attitudes of Residents towards Agro-tourism Impacts and Its Effects on Participation in Agro-tourism Development: The Case Study of Vietnam. *African Journal of Hospitality, Tourism and Leisure*, Volume 7 (4).
- [16] Pham Xuan Hau, V. A. (2017). The development of rural tourism in Vietnam: objectives, practical experiences and challenges. *Van ien university journal of science*, volume 5, number 2.
- [17] Sasu, K., & Epuran, G. (2016). An overview of the new trends in rural tourism. *Bulletin of Transilvania University of Brasov, Series V: Economic Sciences* • Vol. 9 (58).
- [18] Thuy, L. T. (2018-2019). The impact of community-based rural tourism on rural development, a case study of Tra Que village, Viet Nam. *Khon Khaen, Thai Land: Thesis Master of Master of Rural Development*, Graduate School, Khon Khaen University.
- [19] Tran, N. H., Lan, N. T., & Thuy, N. T. (2012). The collection of the 8th Scientific Research Student Conference Report. Da Nang City, Viet Nam: Department of Economics, University of Economics, Da Nang University.
- [20] Villanueva-Álvaro, J.-J., Mondéjar-Jiménez, J., & Sáez-Martínez, F.-J. (May 2017). *Rural Tourism: Development, Management and Sustainability in Rural Establishments*. *Sustainability*, 818.
- [21] VNA. (2018, 4 2). *Vietnam Investment Review*. Retrieved from <https://www.vir.com.vn/agri-tourism-development-inevitable-trend-in-vietnam-57895.htm>.

KNOWLEDGE, ATTITUDE AND BEHAVIOR TOWARDS SUSTAINABLE CONSUMPTION AMONG STUDENTS: A STUDY AT HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY, VIETNAM

Nguyen Tien Dzung^{1*} and Pham Thanh Khuyen²

¹ Department of Business Administration, School of Economics and Management,
Hanoi University of Science and Technology, Hanoi, Vietnam

² Department of Financial Management, School of Economics and Management,
Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: dung.nguyentien3@hust.edu.vn

Abstract

Sustainable consumption (SC) is an important issue in the 21st century and one of 17 developmental goals by United Nations. The paper aims at (1) evaluating the levels of student knowledge, attitude and behavior towards SC; (2) determining the relationship between SC knowledge, attitude and behavior among university students; (3) giving suggestions for enhancing positive knowledge, attitude and behavior towards SC. A survey of 260 students in different study majors at Hanoi University of Science and Technology was conducted. The results show that (1) the level of SC knowledge attitude and behavior at the medium-high level; (2) SC attitude has a positive effect on SC behavior but knowledge has no significant relationship with attitude and behavior. Communication and propaganda programs are necessary to change and improve student knowledge, attitude and behavior on SC.

Keywords: sustainable consumption, sustainable development, SDG, knowledge, attitude, behavior.

1. INTRODUCTION

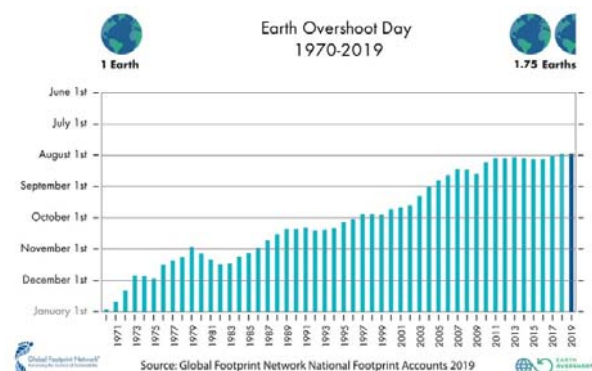
1.1. The necessity of sustainable consumption (SC)

Economic development goes with the increases of human consumption and demand. This results in issues on natural resource depletion, wastes, pollution, climate changes and others.

Global Footprint Network measures a population's demand for and ecosystems' supply of resources and services. These calculations then serve as the foundation for calculating Earth Overshoot Day. Earth Overshoot Day was first calculated in the 1970s and has been going ever since. Earth Overshoot Day marks the date when humanity's annual demand on nature exceeds what Earth's ecosystems can regenerate in that year.

Humanity first saw ecological deficit in the early 1970s. The overshoot day has moved up two months to July 29 in 2019, the earliest day for 20 recent years. This means that humanity is currently using nature 1.75 times faster than our planet's ecosystems can regenerate, equivalent to 1.75 Earths. Overshoot is possible because we are depleting our natural capital, compromising the planet's future regenerative capacity (**Fig. 1**).

Global earth overshoot day 2020 takes place on August 22. It is later than expected this year because of the corona virus crisis. The main drivers were the carbon footprint, reduced 14.5 percent from 2019, and the forest product footprint, reduced 8.4 percent from 2019 (Global Footprint Network, 2020).

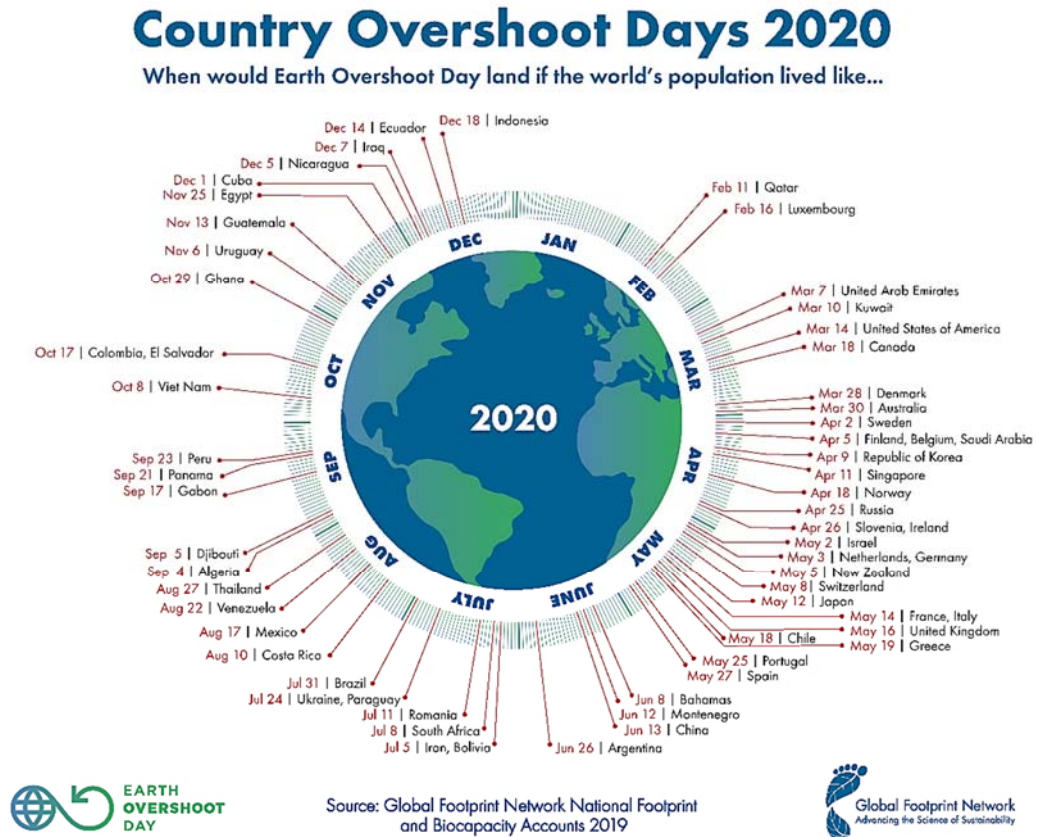


Source: Global Footprint Network, published on June 26, 2019, accessed from <https://www.overshootday.org/newsroom/press-release-june-2019-english/>

Fig. 1: Earth Overshoot Day 1970-2019

The overshoot day of Vietnam in 2020 is October 8. It means Vietnam needs 1.3 earths to provide enough natural resources for human consumption or the current

natural resources will be depleted rapidly (Figure 2). This fact creates an urgent need for changing attitude and behavior toward consumption.



Source: Global Footprint Network, National Footprint and Biocapacity Accounts 2019, accessed on June 2020, from <https://www.overshootday.org/newsroom/country-overshoot-days/>

Fig. 2: Earth Overshoot Days by Country 2020

Hanoi University of Science and Technology (HUST) is the leading public university in terms of technology and science higher education. In 2017, HUST got accreditation from the High Council for the Evaluation of Research and Higher Education (France). In September 2019, Times Higher Education (THE) ranked HUST in the top 801-1000 best university in the world.

HUST leaders are striving for higher world ranking, quality and standards. Students are the future masters of the country. Up to now, there is no study about the sustainable consumption topic in HUST. Hence, a study of knowledge, attitude and behavior among students toward SC is necessary.

1.2. Concept of Sustainable Consumption

The Oslo Symposium in 1994 proposed a working definition of sustainable consumption (SC) as “the use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of

natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations” (United Nations, 2020).

Sustainable consumption and production were stated as Goal 12 in 17 Sustainable Development Goals by United Nations (United Nations, 2017).

Sustainable consumption and production patterns enable efficient resource use and can reduce the impact of economic activities on the environment. To that end, this Goal focuses on decoupling economic growth from resource use, and ensuring that hazardous chemicals and wastes are managed in a way that minimizes their impact on human lives and the environment (United Nations, 2020).

The Global Development Research Center (2015) defined SC is the consumption of goods and services that have minimal impact upon the environment, are socially equitable and economically viable whilst meeting the basic needs of humans, worldwide. SC aims at everyone,

across all sectors and all nations, from the individual to governments and multinational corporations.

Quoquab and Mohammad (2016) stated that SC should ensure at least 3 elements that are quality of life, natural environment protection and meeting the next generation demand.

Thus, SC could be understood as the purchasing and using goods and services economically, reasonably in such a way that both meeting the demand of the current generation and not harming the capability of serving the demand of the next generation in the long term.

In this study, the concept of SC will be explored in terms of 3 elements as (1) economical use of natural resources, (2) natural environment protection, pollution minimization and (3) reuse and recycle.

1.3. Knowledge, attitude and behavior

Knowledge includes the information that a person has or cumulative that relates to a specific field of study. Knowledge relates to the statement of: (1) what it is; (2) how you know; and (3) why you know. Knowledge is an important aspect to formulate a person's action or behavior. Recent studies show that knowledge-based behavior is better than behavior without knowledge (Gusti, 2016). Consumer knowledge is a multi-dimensional construct consisting of experience, expertise and familiarity (Kolyesnikova et al. 2010).

Attitude describes a person's relatively consistent evaluations, feelings, and tendencies toward an object or idea. Attitudes put people into a frame of mind of liking, moving toward or away from them (Kotler & Amstrong 2014).

Attitude has three dimensions that are cognitive, affective and behavioral. Attitude is important because it leads the way we think (cognitive), impacts on our emotion (affective) and shapes our behavior (behavioral) (Hoyer & MacInnis, 2010).

Most of psychologists agree that a person's behavior is the person's observable actions. Researchers also define human behavior is the way a person react the external stimuli in the certain conditions (Schrader & Lawless, 2004).

In the consumer behavior theory, consumer behavior reflects all the consumer decisions relating to the selection, loyalty, usage products, services, experiences or ideas to satisfy human needs (Hoyer & MacInnis, 2010).

Sybille (2011) argued Knowledge-Attitude-Behavior (K-A-B) surveys show not only characteristics in knowledge, attitude and behavior but also the conception each person has on the subject matter. It has the potential

to enhance knowledge, attitude and practices in a way that it identifies what is known and done about the different subjects.

Even though there are arguments around the reliability, validity and measurements of K-A-B, the type of research has been widely used to explore human behavior in different fields (Ahmad et al., 2015).

Common conclusions from K-A-B surveys are that knowledge forms attitude, and both knowledge and attitude are the building blocks for behavior (Ahmad et al., 2015).

1.4. Conceptual Model and Research Hypotheses

From previous researches on SC, it could be proposed a conceptual model on the relationship among SC knowledge, attitude and behavior as follows (Fig. 3).

Aria Gusti (2016) indicated that there is a positive relationship between knowledge and attitude toward sustainable waste management. Ahamad & Ariffin (2018) in a study on university students in Selangor, Malaysia also concluded that knowledge has a positive effect on attitude and behavior. Consumer knowledge is therefore a cogent driver of behavioral intention (Kolyesnikova et al. 2010, Ahmad et al. 2015).

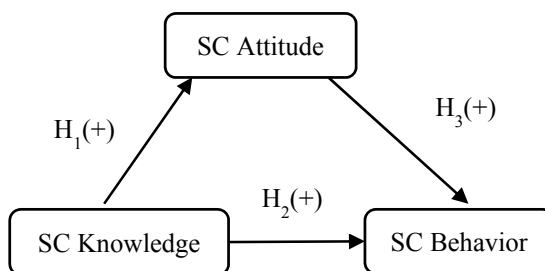


Fig. 3: The conceptual model

The research results from Ahamad & Ariffin (2018) and Ahmad (2015) showed that the improvement of community knowledge could lead to behavioral change. Therefore, it could be stated the following hypotheses:

H₁: SC knowledge has a positive effect on SC attitude.

H₂: SC knowledge has a positive effect on SC behavior.

The relationship between attitude and behavior has been proved by a lot of psychological studies (Kotler & Amstrong, 2014; Hoyer & MacInnis, 2010). In Vietnam, Ho Huy Tuu (2007) showed that attitude is a decisive factor in explaining consumer choice. Pham Tuan Anh et al. (2019) also indicated that individual awareness and attitude toward environmental protection has a positive effect on SC behavior for the eating purpose. Thus, the third hypothesis could be stated as.

H₃: SC attitude has a positive effect on SC behavior.

2. METHODOLOGY

2.1. Measure scale development

From literature review (Ahmad et al. 2015, Ahamad & Ariffin 2018, Asmuni et al. 2012), five in-depth interviews with current students at Hanoi University of Science and Technology, the research team has built the measure scales for the three constructs of SC knowledge, attitude and behavior.

The question items for SC knowledge, attitude and behavior were designed to cover three main areas in SC that are (1) economical usage of natural resources; (2) environmental pollution reduction and (3) reuse and recycle.

The measure scale for SC includes 16 true-false items. The higher the correct answer, the higher the level of SC knowledge a student has.

The measure scale for attitude was designed using the six-point Likert scale, in which 1 is totally disagree, 6 is totally agree. The scale for SC Behavior is also a six-point scale, in which 1 is "never", 6 is "always". An even-point rating scale will force respondents to express their opinions more clearly. The higher score in the rating scale means the more positive attitude and behavior toward SC. There are 12 items in the attitude scale and 15 items in the behavior scale. All the items relate to everyday activity of university students such as saving electricity, water, paper; keeping places clean, discarding wastes, using plastic bottles and boxes, using public buses and less-polluted transportation vehicles.

2.2. Sampling Plan

The study uses the quantitative approach. The target population includes HUST undergraduate students in the full-time programs. The intended sample size was 260. According to Bollen (1989), the smallest sample size for a structural model of concepts should be 5 per model parameter. If it is not sure about the normality of population distribution, the sample size should be 7 to 10 per parameter. It is estimated that there are 43 parameters in the conceptual model, so that the planned sample size is $43 \times 6 = 258$, rounding to 260.

The sampling method is quota sampling based on two criteria: study year and faculty. The intended sample structure by study year was Year 1: Year 2: Year 3: Year 4 = 25: 25: 25: 25. By faculty, the sample structure is intended to take 50% students in economics and business and 50% in other majors of study.

The interview method is a combination of Google form online survey and direct interview at classrooms and auditoriums.

3. RESULTS AND DISCUSSION

3.1. Sample Characteristics

The collected sample size is 260, of which nearly two thirds come from online interview and one third is from direct interview in classrooms. More than a half is male while 46% are female students. More than one quarter is the first-year students whereas 18% are the fourth year and higher year students. Among the 260 students, nearly a half is economic and business while more than a half is the students from other faculties in HUST (Table 1).

3.2. Levels of knowledge, attitude and behavior toward sustainable consumption

3.2.1. Knowledge on sustainable consumption

In order to measure the level of SC knowledge, 16 items in three aspects were designed. The first six items represent the saving of natural resources. The next six items are about environmental protection and pollution reduction. The last four items mention the aspect of reuse and recycle.

Table 1: Sample demographic characteristics

	<i>Frequency</i>	<i>Percent</i>
Actual sample size	260	100.0%
By interview method		
- Online	168	64.6%
- Offline	92	35.4%
By gender		
- Male	141	54.2%
- Female	119	45.8%
By study year		
- 1 st year	67	25.8%
- 2 nd year	58	22.3%
- 3 rd year	88	33.8%
- 4 th year and more	47	18.1%
By faculty		
- Economics and business	127	48.8%
- Technology and others	133	51.2%
By living area		
- Urban	78	30.0%
- Rural	182	70.0%

On the first aspect, about 80% viewed that water saving is SC and about 75% regards electricity saving is SC. However, paper saving received less percentage (Table 2).

Table 2: Levels of student knowledge toward sustainable consumption

<i>Student viewpoint on what activities are sustainable consumption</i>	<i>Frequency</i>	<i>Percent</i>
1. Saving water for myself (I have to pay)	212	81,5%
2. Saving water for others (university, public places)	206	79,2%
3. Saving electricity for myself (I have to pay)	198	76,2%
4. Saving electricity for others (university, public places)	195	75,0%
5. Saving paper for myself	169	65,0%
6. Saving paper for others (university, public places)	152	58,5%
7. Do not litter	210	80,8%
8. Keeping the public space clean and hygienic	206	79,2%
9. Keeping the private place clean and hygienic	187	71,9%
10. Reducing the usage of nylon and plastic package	172	66,2%
11. Using personal transportation vehicles that are lowly polluted (walking, bicycles, electric bicycles and motorcycles)	154	59,2%
12. Using the public transportation services (buses...)	138	53,1%
13. Reusing old items but usable, instead of buying new ones or disposable products	172	66,2%
14. Using multiple-time bags when shopping	151	58,1%
15. Willing to pay more when shopping to have environment-friendly packages (paper, decomposable plastic packages)	149	57,3%
16. Buying, using recycled products or recycling used products	139	53,5%
Overall mean	176	67,5%

On the second aspect, not littering and keeping spaces clean and hygienic got 70% and two thirds agreed that the reduction of using nylon and plastic packages is SC. Using less-polluted vehicles received lower percentage, just around 53% - 59% (Table 2).

On the third aspect, two thirds conceptualized that reusing old items is SC (66%). Whereas, less than 60% viewed the usage of multiple-time bags, paying more for

environmentally friendly products, or using recycled items, recycling products is SC (Table 2).

In overall, the level of SC knowledge decreased from the first aspect (saving natural resources) to the third one (reuse and recycle). It could be seen that the level of SC knowledge is about 67 points in the 100-point scale. It means the level of SC knowledge of HUST is not low, but not very high (Table 2).

When each item with the correct answer will get one mark, one wrong answer will receive zero (0) mark, the lowest score was 3 and the highest score was 16. It could be classified the level of SC knowledge into three categories as follows: (1) Low (from less than 8 correct answers); (2) medium (from 8 to 11 correct answers); and (3) high (from 12 correct answers and higher). When using this classification, about one fifth of HUST students is considered a low level of SC knowledge, 39% at the medium level and 43% at the high level of SC knowledge. In other words, there are about 60% students with low and medium levels of SC knowledge (Table 3).

3.2.2. Attitude toward sustainable consumption

Twelve items in three aspects were designed to measure student attitude toward SC. On the first aspect of saving natural resources (the first 4 items), students have positive attitude toward SC in general. About saving paper, although there were only 60% students regarded the paper saving as SC, the attitude toward paper saving gets the highest scores (4.91 and 5.03 - Fig. 4).

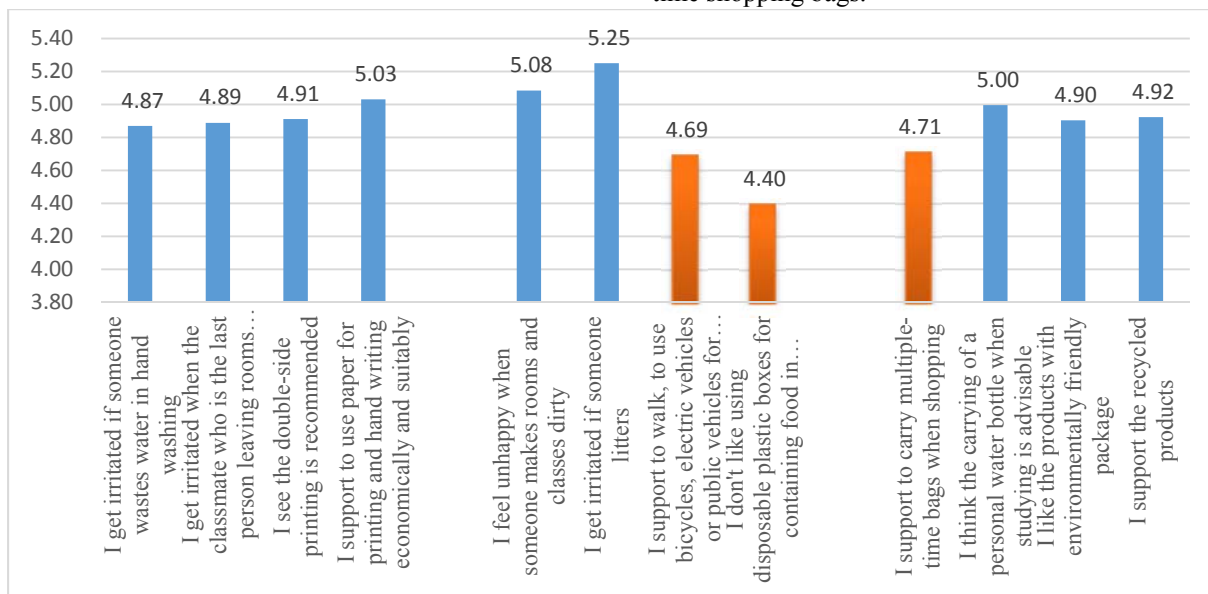
Table 3: Levels of sustainable consumption knowledge

Levels of knowledge toward sustainable consumption	Frequency	Percent
Low	49	18.8
Medium	100	38.5
High	111	42.7
Total	260	100.0

On the aspect of environmental protection and pollution reduction, students had more positive attitude toward keeping spaces clean, but less positive attitude toward using less-polluted transportation vehicles and disposable plastic packages (Fig. 4).

On the aspect of reuse and recycle, it seemed that students showed more positive attitude toward environmentally friendly package and recycled products, the carrying of personal water bottle. Nevertheless, the students had less positive attitude on carrying multiple-time bags when shopping (Fig. 4).

In overall, students have positive attitude toward SC. The least positive attitude is shown in using less-polluted vehicles, avoiding plastic bags and carrying multiple-time shopping bags.



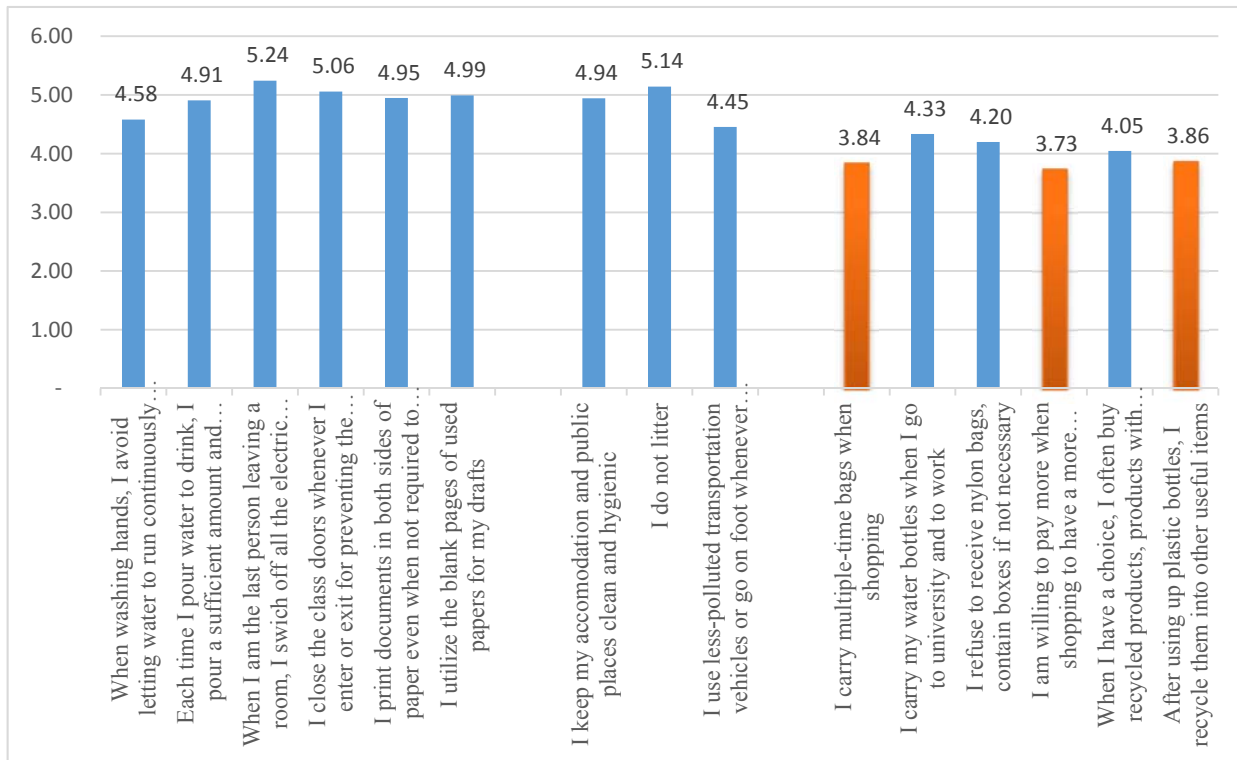
Note: Sample size = 260. The Likert scale from 1 to 6, of which 1 is totally disagree, 6 is totally agree.

Fig. 4: Student attitude toward sustainable consumption

3.2.3. Behavior toward sustainable consumption

To measure the practice level of SC behavior, 15 items were designed in the questionnaire. These items are comprised of three aspect SC: (1) the first 6 items are

about the saving of natural resources; (2) the next 3 items are about environmental protection and pollution reduction; and (3) the last 6 items represent for the reuse and recycle aspect.



Source: Authors' survey

Fig. 5: The practice level of sustainable consumption behavior among students

On the aspect of saving natural resources, the students have a rather high level of practice. However, the students pay more attention to save electricity than water (Fig. 5).

On the second aspect of SC, the students showed high level of practice for “keeping places clean” and “do not litter” (4.94 and 5.14, respectively). Nonetheless, the practice level of using public transportation services or walking is lower (4.45). It is easy to understand because in the current situation, most students go to university by their personal vehicles (motorbikes, electric bikes - Fig. 5).

On the aspect of reuse and recycle, the overall score is lower than in the first and the second aspect. The carrying of multiple-time shopping bags and private water bottles is not very difficult to do, but the scores are not so high (3.84 and 4.33, respectively). It is understandable that a low scores were put for the item of willing pay more money for more environmentally-friendly packages (3.73 – money for students is a scarce resource) and “after using plastic bottles, I recycle them to make other useful items (3.86 – some may not know to recycle) (Fig. 5).

In general, the practice level of students toward SC is not so high (4.45 / 6 points). There is a difference among the three aspect. The practice level is the highest for the saving of natural resources (4.93), at the medium in the aspect of environmental protection, pollution reduction (4.84) and the lowest in the aspect of reuse and recycle (4.00).

3.3. Relationship among sustainable consumption knowledge, attitude and behavior

Spearman's rank correlation was used to test the relationship among SC knowledge, attitude and behavior. For the construct of knowledge, the aggregate variable is computed by totaling all the marks of correct answers, each correct answer gets one mark. For the constructs of attitude and behavior, the aggregate variables are built by the mean of the measure scale items.

It is seen that there is no correlation between knowledge and attitude, as well as between knowledge and behavior. However, there is a very strong correlation between attitude and behavior (Table 4).

Table 4: Testing hypotheses on the relationship among SC knowledge, attitude and behavior

Variable pairs	Spearman's rank correlation coefficient	Statistical significance (p-value)	Conclusion
Knowledge – Attitude	-0.062	0.320	Reject H ₁ (no correlation)
Knowledge – Behavior	-0.067	0.284	Reject H ₂ (no correlation)
Attitude – Behavior	0.626	0.000	Accept H ₃ (positive correlation)

The results are both similar and different from previous studies. This study shares the same result with other studies that SC attitude has a positive effect on SC behavior. However, some recent studies on SC confirmed that knowledge has a positive impact on attitude and behavior (Ahmad et al., 2015; Ahamad & Ariffin, 2018) while that kind of relationship cannot be proved in this research. It could be explained by the fact that the students have a variety of SC knowledge levels, some students may have low levels of SC knowledge, but they showed very positive attitude and active behavior toward SC. A part of students may not know

whether what they do is SC or not, but they act consistently based on their attitude.

Continuing the regression analysis of the pair Attitude – Behavior, it could be drawn out the following regression equation:

$$\text{Behavior} = 1.59 + 0.61 * \text{Attitude}$$

R-Square = 0.402 indicated that about 40% of the variation of Behavior could be explained by the variation of Attitude. When Attitude increases by 1 point, the average of Behavior could be increased by 0.61 points.

Table 5: Regression model between SC Attitude and SC Behavior**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.634 ^a	0.402	0.4	0.60521

a. Predictors: (Constant), Attitude

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.584	1	63.584	173.593	.000 ^a
	Residual	94.5	258	0.366		
	Total	158.08	259			

a. Predictors: (Constant), Attitude

b. Dependent Variable: Behavior

Coefficients^a

Model			Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Std. Error	Beta			
1	(Constant)	1.594	0.228		7.005	0
	Attitude	0.605	0.046	0.634	13.175	0

a. Dependent Variable: Behavior

3.4. Comparing between the students in Economics-Business and other majors of study

The technique of Independent Sample T-test was used to compare knowledge – attitude – behavior between the economic-business student group and the rest. It is shown that there is no difference between the economic-

business group and the others in terms of SC knowledge and attitude. However, there is a difference between these two groups in terms of SC behavior. The students in other majors have more positive behavior toward SC than the economic and business students at the 90% confidence level (Table 6).

Table 6: Comparing the economic-business students with the students in other majors

	Major of Study	Sample size	Mean	Std. Deviation	Independent Sample T-test Significance
SC Knowledge	Economics and business	127	10.76	3.66	0.681
	Others	133	10.57	3.58	
SC Attitude	Economics and business	127	4.87	0.83	0.777
	Others	133	4.90	0.81	
SC Behavior	Economics and business	127	4.47	0.78	0.094
	Others	133	4.63	0.78	

4. CONCLUSIONS AND RECOMMENDATIONS

Sustainable development is a big challenge for all the countries in the world. United Nations established 17 sustainable development goals and sustainable consumption (SC) is one of these. Along with the economic development, human needs and consumption are increasing and various. Such increases of human consumption may lead to resource exhaustion, sooner global overshoot day and environmental deterioration. SC is regarded as a vital solution for saving natural resources, making cleaner living spaces and lessen environmental burden.

The research results showed a medium-high level of SC knowledge, attitude and behavior among HUST students. In specific aspects, the HUST students still have low scores. In a leading university of science and technology such as HUST, it is expected that the levels of knowledge, attitude and behavior among students toward SC be higher.

Students are the future masters of this country. Therefore, communication and propaganda programs on SC should be implemented so that students will have higher awareness of what SC is, how SC is importance for them and future generations.

There is a close relationship between SC attitude and SC behavior. Hence, it is very necessary to have communication campaigns to enhance positive attitude and active, regular behavior toward SC.

The research findings can give the leaders and decision makers in Hanoi University of Science and Technology (HUST) a good picture of the current level of student knowledge, attitude and behavior toward SC. It could

provide insights to the managers of other public university for accomplishing sustainability goals.

5. ACKNOWLEDGEMENTS

The authors would like to express utmost gratitude to the Ms. Nguyen Thi Hong Trang, Ms. Bui Thi Thanh Nhan who are in Intake 62 Accounting Class and the members of the Student Team for Scientific Research in School of Economics and Management for the substantial contribution in collecting the survey data. Sincere thanks are also extended to everyone who gave helpful assistance and support for the research. There is no research funding to declare.

6. REFERENCES

- [1]. Ahamad, N. R., & Ariffin, M. (2018), "Assessment of knowledge, attitude and practice towards sustainable consumption among university students in Selangor, Malaysia", *Sustainable Production and Consumption*, 16 (2018), 88-98.
- [2]. Ahmad, J., Noorm, S. M., & Ismail, N. (2015), "Investigating Students' Environmental Knowledge, Attitude, Practice and Communication", *Asian Social Science*, Vol. 11, No. 16, 284-293.
- [3]. Asmuni, S., Khalili, J. M., & Zain, Z. M. (2012), Sustainable Consumption Practices of Students in an Urban Setting: A Case in Selangor. *Procedia - Social and Behavioral Sciences*, 36(2012), 716-722.

- [4]. Bollen, K. A. (1989), *Structural Equations with Latent Variables*, New York, USA: John Wiley & Sons.
- [5]. Global Footprint Network (2019), Earth Overshoot Day 2019 is July 29, the earliest ever, published on June 26, 2019, accessed from <https://www.overshootday.org/newsroom/press-release-june-2019-english/>
- [6]. Global Footprint Network, *National Footprint and Biocapacity Accounts 2019*, retrieved June 2020, from <https://www.overshootday.org/newsroom/country-overshoot-days/>
- [7]. Gusti, A. (2016), “The Relationship of Knowledge, Attitudes, and Behavioral Intentions of Sustainable Waste Management on Primary School Students in City of Padang, Indonesia”, *International Journal of Applied Environmental Sciences*, 11 (5), 1323-1332.
- [8]. Hồ Huy Tựu (2007), “Vận dụng lý thuyết hành vi hoạch định (TPB) để giải thích động cơ của người tiêu dùng cá nhân tại Nha Trang”, *Tạp chí Khoa học – Công nghệ Thủy sản*, Số 3/2007.
- [9]. Hoyer, W. D., & MacInnis, D. J. (2010), *Consumer Behavior, 5th edition*, South-Western (Cengage Learning).
- [10]. Kolyesnikova, N. et al. (2010), “The Influence of Product Knowledge on Purchase Venue Choice: Does Knowing More Lead from Bricks to Clicks?”, *Supply Chain Forum Journal*, Vol. 11 No. 1, January 2010, 28-39.
- [11]. Kotler, P. & Armstrong G. (2014), *Principles of Marketing, 15th edition*, Pearson Education, 174-175.
- [12]. Phạm Tuấn Anh, & Nguyễn Thị Thu Hồng (2019), “Các yếu tố ảnh hưởng đến lựa chọn tiêu dùng bền vững trong lĩnh vực ăn uống: Nghiên cứu trường hợp sinh viên các trường đại học tại khu vực Hà Nội”, *Tạp chí Khoa học Thương mại*, Số 131/2019, 23-31.
- [13]. Quoquab, F., & Mohammad, J. (2016), “Sustainable Consumption: Sacrificing for the Future”, *Procedia - Social and Behavioral Sciences* 224 (2016), 599 – 604.
- [14]. Sybille, G., (2011), *The KAP survey model (knowledge, attitude and practices)*, retrieved May 10, 2020 from https://issuu.com/medecinsdumonde/docs/mdm_guide_kap_survey_2011.
- [15]. The Global Development Research Center (2015), *Sustainable Consumption*, retrieved April 30, 2020, from <https://www.gdrc.org/sustdev/concepts/22-s-consume.html>
- [16]. United Nations (2017), *The Sustainable Development Goals Report*. New York, USA: United Nations.
- [17]. United Nations (2020), *Sustainable Development Goals - Goal 12: Sustainable Consumption and Production*, retrieved April 30, 2020, from <https://sustainabledevelopment.un.org/topics/sustainableconsumptionandproduction>.

DETERMINANTS OF VIETNAMESE YOUTHS' INTENTION TO USE ONLINE DATING APPS OR SITES

Pham Thi Lien,* Mai Anh, Dang Nguyen Phuong

Vietnam National University, Hanoi - International School

*Corresponding author: Lienpt@isvnu.vn

Abstract

The online dating industry has significance developed recently and it has become a trend of many people in the world including Vietnam. The aim of study was to delve into anticipate the reason leads to the Intention to use online dating apps or sites. It can find out the effect to the standard of users which can reflect on their choice. A questionnaire including demographic questions, trust toward online people, attitude, word - of - mouth, dating anxiety, perceived enjoyment and the number of tasks perform on internet was developed and distributed to 260 people. The finding shows that perceived enjoyment is the main factor that affects consumers' purchase intention. In addition, the relationship between trust toward online people and Intention to use online dating apps or sites is stronger with lower concern. Besides, the relationship between dating anxiety and attitude with use intention is found as positive result. Meanwhile, the study proved that word - of - mouth and the number of tasks perform on internet has no effect on use intention of online dating. The research can be used as information for marketing purpose or future study about online dating users' psychology. It concludes by discussing the model theoretical implications and by offering practical recommendations to app companies.

Keywords: intention to use online dating apps or sites, determinant to use online dating apps or site, online dating

1. INTRODUCTION

For as long as humans have realized the importance of romantic relationships, they have also recognized that it can be a challenge to find an appropriate partner, which sometimes getting some help is useful. For example, from the Khastegāri marriage customs of Iran, to the arranged marriages still common in some part of Southeast Asia, there is a thousand years old tradition of romantic relationships still can be seen not from the chance of meeting between two individuals but also from the deliberate intervention of third parties (Coontz, 2005). For all those years, the third parties' resources that available remained the same: a broad social network, strong opinions about the types of individuals belong together, and the willingness of application those judgments to the formation of actual couples. Nowadays, the desire to search a romantic partner still exist, as does the sense that doing so can be challenging.

With the development of the internet, social media, and other technologies, in addition to tradition methods, online dating was invented to help people to deal with this circumstance. Online dating is one of the most prevalent social networking system that enable people to contact and search for their personal and romantic

partner. Over the last decade, the popularity of online dating has increase dramatically. It has become one of the largest paid online business sites Online Publishers Associations (OPA). Katz and Aspden (1997) found that the number new direct meetings had taken place start with the participation on the Internet is at least 2 million. According to Nikkei Asian Review, dating app developers are actively increasing gadgets to meet boom demand in the Southeast Asian market (Dylan Loh, 2020). Vietnam also among those countries, about 54% of Vietnamese have used the Internet and applications to online dating (YouGov, 2017).

The market is on a huge competition. More and more companies engage in creating dating application and website. In 2005, the total number of dating sites in the world increased 17% than 2004 and the country had the highest increase at 42.9% is the United States and this number is still raising to now. Most successful when leveraging from single people to mention the Tinder app. The revenue of Match Group has rapidly increased in recently year and reached 2.051 million US Dollar in 2019. In 2018, according to Kelly analyst, "Tinder has contributed greatly to the promotion of revenue growth of Match Group-owners of dating applications including Tinder, estimated to be able to order 815 million and

increase 104% in 2018. Thanks to the positive impact of Gold feature launched last summer and new monetization features increase the chance to share crypto wallet in the Tinder app" (Enternews, 2019). Moreover, Facebook launch its own dating feature Facebook Dating firstly in Colombia in 20 September 2018 and the rest of the world in 2019.

All business sectors put customers in the top position. Deep understanding about customers plays an important role in doing business. Due to the highly development and competitiveness of the online dating industry, the companies need to deeply concern about the customers' psychology because that is the key to business success.

This paper aims to answer the question: What are the determinants of Vietnamese youths' Intention to use online dating apps or sites apps or sites?

The objectives of this research are: (1) Investigating the psychological factors that affect Vietnamese youth Intention to use online dating apps or sites website and application. (2) testing the relationship between those factors with the intention to use online dating.

2. THEORETICAL BACKGROUND

2.1. Overview of online dating

There are at least in three aspects make online dating is different from offline dating: the wide scope of access, the communication mode, and the availability of matching systems. In terms of large scale of access, the Internet provides more potential partners than any family members, friends, or traditional media can introduce to a person. Moreover, by using the Internet, the user can know about the information about their potential partners. Some dating apps and websites can connect to personal social network pages like Facebook (Gibbs, Ellison, & Lai, 2006), Instagram or music interests like Spotify. In terms of communication, online dating creates opportunities for people to interact with each other before meeting face-to-face. People can communicate with each other by texting, voice message, video call or audio-based. Lastly but not least, the online platforms help dating site user select suitable partners by providing algorithm.

Online dating (also known as Cyber dating) is defined in many different ways. According to Hencock, J.T., Toma, C. and Ellison, N (2007) online dating "as the place where individuals create, profile, and initiate contact with others through an online service". Posited that making relationships through online system was easier, faster and more intimate than other ways of forming romantic relationships (Walther and Park, 2002, Walther and Granka 2005). The anonymous nature of online dating sites was the main reason to for their

popularity. There is no doubt that face to face meetings and communication through telephone can help to make offline relationship. However, self-integration can be enhanced with online contact, and it can provide intimacy and autonomy. But an easy way to comply with the paper formatting requirements is defined online dating as the use of websites or application that provide a database of potential partners especially in nearby areas that the user can detect and contact to others. With this definition, online dating has distinct advantages such as easy and continuous accessing to the database, more opportunities to meet potential partners, and it is a nonthreatening way to initiate contact.

As from the literature review, there are six main factors that influence the intention to use online dating apps or sites which are trust toward online people, attitude, word - of - mouth, dating anxiety, perceived enjoyment and the number of tasks perform on Internet. These factors are included in this paper that conducted them as hypotheses to do the research for these following reasons. This research mainly focused on the psychology and behaviors of the online dating users so factors like functions and features of online dating apps and website or demography element were not chosen. In the other word, two factors age and wider selection were not included in this research as variables to examine. Additionally, those above factor were included and examined in previous studies about online dating.

2.2. Relationship between trust toward people online and Intention to use online dating apps or sites

Many earlier research found that many online dating users are skeptical about the presentations of others on dating websites (Donn & Sherman, 2002). The fear of being lied by people they meet online can discourage the use of mobile apps for dating. Chan, L. S. (2017) proposed a hypothesis that people with a high level of trust toward people online may be less likely to use dating apps. And the result is similar to the paper that explored by earlier researcher about personal attributes on the use of online dating sites, the author's study found that a greater degree of trust toward people online, the stronger intent to use dating apps. Therefore, the first proposed research hypothesis is:

H1: Trust has a positive relationship with Intention to use online dating apps or sites.

2.3. Relationship between attitude and Intention to use online dating apps or sites

Ajzen & Fishbein (1980) who came up the Theory of reasoned action (TRA) mentioned that person's behavior is determined by his or her intention to perform the behavior can evaluate by the attitude toward that behavior. Or we can say that the more favorable the

attitude toward the behavior, the stronger will be an individual's intention to adopt the behavior (Syed Shah Alam, Md. Rabiul Islam, Zafir Khan Mohd Mokhbul, Nurkhalida Binti Makmor, 2018). In this study, the attitudes that people hold toward application and website dating might impact the encouragement, as well as the likelihood of a person using them. Hence, the study proposes the following hypothesis:

H2: Attitude has a positive relationship with Intention to use online dating apps or sites.

2.4. Relationship between word - of - mouth and Intention to use online dating apps or sites

In the previous research, word - of - mouth has been shown to influence intentions and actual behavior of consumers (Syed Shah Alam, Md. Rabiul Islam, Zafir Khan Mohd Mokhbul, Nurkhalida Binti Makmor, 2018). Word - of - mouth or recommendation is an important determinant of Intention to use online dating apps or sites. Therefore, this study postulates following hypotheses:

H3: Word - of - mouth has a positive relationship with Intention to use online dating apps or sites.

2.5. Relationship between dating anxiety ad Intention to use online dating apps or sites

According to the American Psychological Association social anxiety is the anxiety around "being embarrassed, humiliated, rejected or looked down on in social interactions", and dating anxiety is that dating and meeting new people can bring serious triggers for people who has this anxiety and even non-anxious people. People who were very anxious about dating preferred to communicate with prospective romantic partners through dating apps compared to in-person meetings. Therefore, the proposed hypothesis is:

H4: Dating anxiety has a positive relationship with Intention to use online dating apps or sites.

2.6. Relationship between perceived enjoyment with Intention to use online dating apps or sites

In the early study of Factors influencing the usage of websites, Van der Heijden, H. (2003) introduced the concept of perceived enjoyment. This factor is the extent to consumers' enjoyment is perceived when engaging the activity of using a specific product or service. Teo, T. S. H and Lim, R. Y. C. (1999) found that perceived enjoyment have a positive influence on Internet users in Singapore and in this research, we are mention about online dating. Hence, the study proposes the following hypothesis:

H5: Perceived enjoyment has a positive relationship with Intention to use online dating apps or sites.

2.7. Relationship between the number of tasks perform on internet and Intention to use online dating apps or sites

In the literature review of Kang, T., & Hoffman, L. H. (2011) and Chan, L. S., (2017), this study had point out the positive relationship between the number of tasks perform with using internet and the Intention to use online dating apps or sites. To this end, in examining trust and online dating usage, this research proposes a hypothesis that individuals who use the Internet for a greater amount of tasks are more likely to use online dating sites. Therefore, the following is hypothesized:

H6: The number of tasks perform on Internet has a positive relationship with Intention to use online dating apps or sites.

2.8. Framework development

The research model of Shah Alam, Md. Rabiul Islam, Zafir Khan Mohd Mokhbul, Nurkhalida Binti Makmor (2018) had been chosen as a base model according to the strong predictor of actual behavior in Malaysia – The Asian country. Moreover, it also had been applied for the study of Intention to use online dating apps or sites in India by Chan, L. S. (2017). However, this research would like to make some change about the additional variable from other research. The research model of factors affecting the Intention to use online dating apps or sites is proposed as follow:

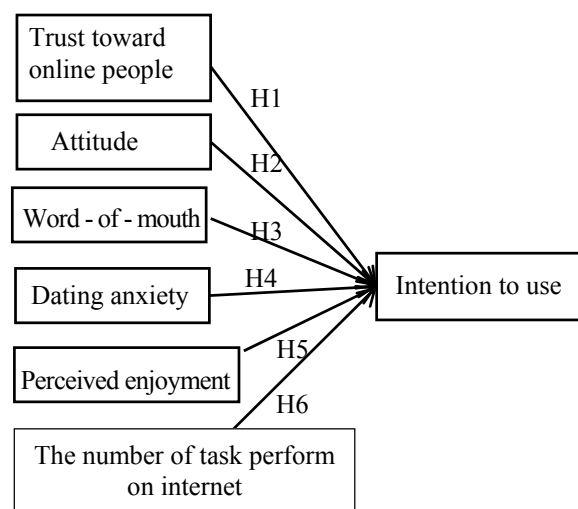


Figure 1: Research framework

This research model explained the relationship of 6 factors that was considered as a positive influence to Intention to use online dating apps or sites. They are: trust toward online people, attitude, word - of - mouth, perceived enjoyment, social anxiety and The number of tasks perform on internet.

According to previous researches, all the factors in the model is expected to impact positively to the Intention to use online dating apps or sites of the youth. It includes in table 1 below:

Table 1: Research hypotheses

No	Hypothesis
1	H1: Trust toward online people has a positive relationship with Intention to use online dating apps or sites.
2	H2: Attitude has a positive relationship with Intention to use online dating apps or sites.
3	H3: Word - of - mouth has a positive relationship with Intention to use online dating apps or sites.
4	H4: Dating anxiety has a positive relationship with Intention to use online dating apps or sites.
5	H5: Perceived enjoyment has a positive relationship with Intention to use online dating apps or sites apps or sites.
6	H6: The number of tasks perform on Internet has a positive relationship with Intention to use online dating apps or sites apps or sites.

In the study, there are seven variables, one of which is dependent and the others six are independent. The dependent variable is Intention to use online dating apps or sites in the model. Intention to use online dating apps or sites is built on various factors. In this study, the dependent variable was measured through six factors. They are trust toward online people, attitude, word - of - mouth, perceived enjoyment, dating anxiety and the number of tasks perform on internet. The six factors are the independent variable in the model which is a vital element for Intention to use online dating apps or sites. This study will assess the importance of these factors and how they influence Intention to use online dating apps or sites.

3. METHODOLOGY

Quantitative is applying in this research to explore the behavior of online dating users in application apps.

3.1. Sample size

According to Hair, et al. (2014) the minimum of sample size is to have at least five times as many observations as the number of items in questionnaire to be analyzed. This can be interpreted that each variable need at least 5 respondents. This is the lowest limit for the number of respondents. Due to limited time and resources, this study will apply this for calculating the number of sample size. Considering this research is following quantitative approach, with the number of variables is 30

in total, the sample size is above: $3 \times 5 = 150$ samples. However, the study had collected 207 samples from the participants.

3.2. Sampling method

Non-profitability where members of the target population that meet certain practical criteria, such as geographical proximity, easy accessibility, availability at a given time, or the willingness to participate (Etikan, et al., 2016). Convenience sample are sometimes regarded as “accidental samples” because elements may be selected in the sample simply as they just happen to be situated, spatially or administrative, nearby where the researcher is collecting data (Ekitan, et al., 2016). For online surveys, the respondents are acquaintances, family, relatives of researcher from 18 years old to 30 years old with different jobs and level of education.

3.3. Primary Data Collection

The primary data is the information which is collected directly from the experiences of the author for a specific research objective, using method such as surveys, interviews, experiments. In this study, data was gather from a designed questionnaire by the researcher, where information about the attitudes and intention of Vietnamese users in the intention to choose dating through internet were obtained. In spite of the wide information of secondary data primary data is more relevant and accurate for the measurement of this research because it contains the direct opinions of participant. The primary data were collected to investigate factors affecting consumers’ use intention of online dating applications and websites and they were collected by the following ways:

After choosing samples and items to form a questionnaire, we created the survey online with Google Form. The link was sent to 220 chosen target respondents (ages from 18 to 30, usually use a smartphone to access the application, might have interest in higher education) through Facebook Messengers to the individual, Facebook groups of International School, high school, secondary school and to relatives. The questionnaire was also sent to the researcher workplace to collect data. Online responses were sent back to Google Form in form of charts and excel. The survey was conducted in 30 days (from 1/4/2020 to 1/5/2020) and all answers were received. Besides, respondents reported back that it took them about less than 5 minutes to complete the survey and it did not bother them doing online survey. After distributing the answers, there were 207 answers and continued to be tested.

3.4. Questionnaire design

In order to gain insight into the factors leading to the intention of using online dating, this research article has

applied Likert scale to measure the opinions of research participants. It is a series of evaluation that consist of four or more items so that users can choose the extent to which they are engage (Harry N. Boone, Jr. A. Boone, 2012). The Likert scales are enough to meet criterion of test or retest reliability, concurrent validity, and predictive validity (Jacoby & Mattel, 1971). The reason why this study used the Likert scale is that the result of the total scores obtained is primarily the directional component and only a small degree the intensity component. It is useful because this research aims specifically at the user's actions. In addition, the Likert scale offers a perfect way to assess attitudes, awareness, beliefs, values and behaviors.

The questionnaire of this research was designed to be simple for the respondents easily to understand and answer. This approach is in harmony with Easterby-Mith et al (2008) who recommended that “the shorter the questionnaire, and the simpler the questions, the more likely that people will reply it”. Moreover, it was designed in English then translated to Vietnamese for Vietnamese respondents. The questions are used in the questionnaire are obtained and modified based on similar ones from previous studies.

The questionnaire is used in this study composed of two sections:

- The first section is introduction and it contained 5 questions for demographic information.
- The second section consisted 30 measuring items of 7 constructs including the Intention to use online dating apps or sites, trust toward online people, attitude, word-of- mouth, perceived enjoyment, dating anxiety and the number of tasks perform on internet. These items are developed by using and modifying items from previous research as in table 2.

Table 2: Measurement references

Construct	References
Intention	Syed Shah Alam, Nurkhalida Makmor, (2018)
Attitude	Kyla C. Flug, (2016)
Trust toward online people	Kang, T., & Hoffman, L. H. (2011); Chan, L. S. (2017)
Word-of- mouth	Syed Shah Alam, Nurkhalida Makmor, (2018)
Dating anxiety	Meredith E. M. Poley, 2011
Perceived enjoyment	Chakraborty, D. (2019)

Analytical technique

In order to analyze the collected data, this research used the Smart PLS 3 (SEM) software due to the flexibility to handle sample size and construct of measurement model. After gathering the online questionnaires’ result, each item of questionnaire was coded and the research model will be created base on the coded variables and items on Smart PLS 3 (SEM). There were two step was conducted in the data analyzing process which is Evaluation of the Measurement Model and Evaluation of the Structural Model. From the number that provided by the software, we can evaluate the result of the relationship of each factor to the Intention to use online dating apps or sites.

4. RESULTS AND DISCUSSION

4.1. Descriptive data

Eligible answers were chosen from 207 surveys that collected from 207 people. There was a participation in the study of 47.8 % of women, 46.4% of men and 8.8% of other gender. The age includes 65.2% of 18 to 22 years old, 22.7% of 23 to 26 years old and 12.1% of 27 to 30 years old. Regarding the educational level of the people surveyed, there are 76.3% people who are study or have for Bachelor’s degree, about 9.7% are Postgraduate degree, 7.2% of Associate’s degree and the rest which is 6.8% achieved General education. Most of the respondents are single (63.85), 32.9% are in a relationship and 3.4% are married. Many people know about online dating and it is about 78.3% of total respondent. However, the only 34.3% have used online dating before. The most mentioned online dating application and websites are Tinder, Facebook Dating and Badoo.

4.2. Analysis and result

To systematically evaluation of PLS-SEM results, the research model is evaluated in two stages process: Evaluation of the Measurement Model and Evaluation of the Structural Model.

Evaluation of the Measurement Model includes:

- Indicator reliability (outer loading)
- Internal consistency (composite reliability)
- Convergent validity (average variance extracted)
- Discriminant validity
- Evaluation of the Structural Model includes:
 - Size and significance of path coefficients
 - Coefficients of determination (R²)
 - f² effect sizes

After evaluating the measurement model, the evaluation of structure model was conducted.

In this research multicollinearity did not appear because there is no significant level of collinearity between each set of predictor variables. Both outer model VIF and inner model VIF are below 5.

After assessment structural model for collinearity issues, the significance and relevance of the structural model relationships was analyzed with the help of Smart PLS 3. To achieve this purpose, direct and indirect effect was examined. The hypothesis was confirmed by the consideration of the path coefficient and “t” value.

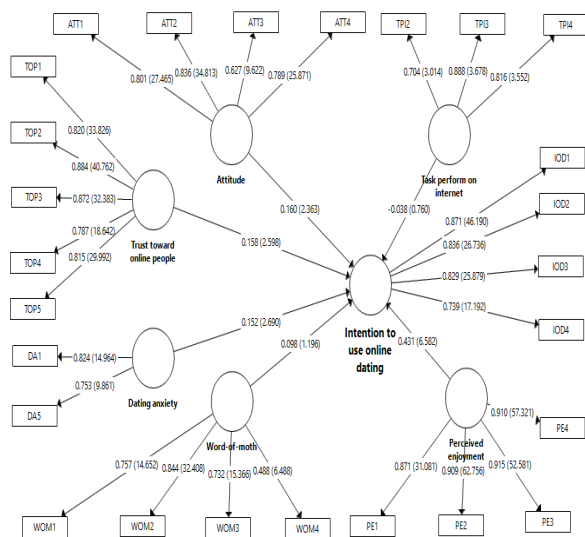


Figure 2: Research model with path coefficient and t-value

Figure 2 represents the research model, on which are showed the path coefficients, their associated-t value.

According to Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012) the normal distribution have qualities as critical values which researcher can compare the empirical t value with. The coefficient is significant at a certain error probability when the empirical t value is larger than the critical value. Normally used critical values for two tailed tests are 1.65 (significance level = 10%), 1.96 (significance level = 5%), and 2.57 (significance level = 1%). In this research, the significance level was used is 5% which mean the empirical value should higher than 1.96. Most of the hypotheses were accepted as the t-value was greater than 1.96 can be seen in Fig 1 and Table 3. PLS (SEM) bootstrapping was choose to analyses the mediation effect. Researchers can routinely report p values instead of t values that correlate to the likelihood of mistakenly rejecting the null hypothesis, regarding the information at hand. The p value should lower than the significant level $\alpha = 0.05$.

Table 3: Structural Model Assessment

Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics O/STDEV	p-Values
TOP -> IOD	0.158	0.158	0.064	2.475	0.014
ATT -> IOD	0.16	0.163	0.063	2.543	0.011
WOM-> IOD	0.098	0.1	0.079	1.235	0.218
DA -> IOD	0.152	0.145	0.053	2.858	0.005
PE -> IOD	0.431	0.432	0.072	5.974	0
TPI -> IOD	-0.038	-0.024	0.052	0.729	0.467

In order to have the positive relationship with the Intention to use online dating apps or sites of Vietnamese youth, hypotheses need to meet two following conditions. The first condition is path coefficients β -value is above 0.1. And the others are empirical t value must higher than the critical t value which is 1.96 so p-value less than 0.05 is statistically significant. Or to indicate strong evidence against the null hypothesis, as there is less than a 5% probability the null is correct, p-values $< \alpha = 0.05$. Based on these conditions, the hypotheses were analyzed and gave result as follow:

H1: Relationship between trust toward people online and Intention to use online dating apps or sites.

The findings confirmed that trust toward people online ($\beta = 0.158$, $t = 2.475$, $p = 0.014$) posited a significant direct effect on Intention to use online dating apps or sites. After conducting research, the result that was found out is the same with the prior study of Chan, L. S. (2017). It showed that higher degree of trust toward people online, the stronger intent to use dating apps and sites.

H2: Relationship between attitude and Intention to use online dating apps or sites.

The relationship between attitude ($\beta = 0.16$, $t = 2.543$, $p = 0.011$) and Intention to use online dating apps or sites was proved significant. People who have positive attitude have more potential to use online dating.

H3: Relationship between word - of - mouth and Intention to use online dating apps or sites.

Word- of- mouth ($\beta = 0.098$, $t = 1.235$, $p = 0.218$) do not posit direct positive effect on Intention to use online dating apps or sites because empirical p value is higher than the critical p-value which is 0.05 and its path coefficient (0.003) is lower than the standard which is 0.1.

H4: Relationship between dating anxiety and Intention to use online dating apps or sites.

The results showed that dating anxiety ($\beta = 0.152$, $t = 2.858$, $p = 0.005$) posits direct positive effect on Intention to use online dating apps or sites.

H5: Relationship between perceived enjoyment and Intention to use online dating apps or sites.

Perceived enjoyment ($\beta = 0.431$, $t = 5.974$, $p = 0$) posited a significant direct effect on Intention to use online dating apps or sites.

H6: Relationship between the number of tasks perform on internet and Intention to use online dating apps or sites.

Finally, a relationship between the number of tasks perform on internet ($\beta = -0.038$, $t = 0.729$, $p = 0.467$) do not represent direct effect on Intention to use online dating apps or sites. The reason is the β value is lower than 0.1 and the empirical p value is higher than the critical p value which is 0.05.

As above-mentioned results hypotheses H1, H2, H4, H5 are accepted. However, H3 and H6 are rejected. Table 4 summarized results for the hypothesis assessment.

Table 4: Summary results for the hypotheses

Hypothesis	Result
H1: Trust toward online people has a positive relationship with Intention to use online dating apps or sites.	supported
H2: Attitude has a positive relationship with Intention to use online dating apps or sites.	supported
H3: Word - of - mouth has a positive relationship with Intention to use online dating apps or sites.	Not supported
H4: Dating anxiety has a positive relationship with Intention to use online dating apps or sites.	supported
H5: Perceived enjoyment has a positive relationship with Intention to use online dating apps or sites.	supported
H6: The number of tasks perform on Internet has a positive relationship with Intention to use online dating apps or sites.	Not supported

Table 5: R-square (R^2) value

Latent Variable	Variance Explained (R^2)
IOD – Intention to use online dating apps or sites	0.602

Coefficients of determination (R^2) is a measurement of the model predictive accuracy. The table 5 showed that the R^2 value equal to 0.602 which means 60.2%. It indicated that the tendency of influencing 60.2% change in the dependent variable (Intention to use online dating apps or sites) by putting all the constructs together. The coefficients of determination R^2 was considered between the level of moderate and sustainable.

Additionally, in order to test the collinearity, the research also conducted the detailed discussion of the model which is analyzing the f^2 effect. As well as assessing the R^2 values for all endogenous construct, change of R^2 value when an exogenous con- has been defined the construct may be omitted from the model to assess if the omitted construction has a significant effect on endogenous. That measure is called the size of the f^2 effect The f^2 effect shows the tendency of an exogenous latent variable contributes to an endogenous latent variable's R^2 value. In the other word, f^2 effect size assesses the strength of relationship between the latent variables. This study assumed this is important because effect size can help researchers to assess the overall contribution of a research study. Chin (2010) has said that besides indicating whether the relationship between variables is significant or not, the researcher should report the effect size between these variables. The f^2 effect size is determine by the value of 0.02, 0.15, and 0.35, respectively, represent small, medium, and large effects (Cohen, 1988) of the exogenous latent variable.

As some hypotheses were eliminated from the Assess the significance and relevance of the structural model relationships step (H3, H6), table 5 only showed the remained hypotheses (H1, H2, H4, H5).

Table 6. f^2 effect

	TOP	ATT	PE	DA
IOD	0.036	0.03	0.178	0.046

From the table, the study can show that relationship between the independent variables had small to medium effect to the dependent variable. The variable has significant effect to the Intention to use online dating apps or sites is perceived enjoyment (PE) which had value of 0.178. The relationship is evaluated as medium because is higher than 0.15. Attitude toward online

dating had smallest effect to the dependent variable with the value 0.03.

4.3. Findings and discussion

After analyzing five hypotheses, the research received the result and has some discussion as follow:

The first hypothesis is Trust toward online people has a positive relationship with Intention to use online dating apps or sites. Through the examination, the hypothesis is supported. The result was compatible with previous studies about online dating of Syed Shah Alam, Md. Rabiul Islam, Zafir Khan Mohd Mokhbul, Nurkhalida Binti Makmor (2018) and Chan, L. S. (2017). Which means that trust toward people online has a certain influence on the Intention to use online dating apps or sites. The result indicates the more trust toward online people that a person has, the higher possibility that person will use online dating. From the results of the study, we see online dating as much as everyday life. The trust plays a very important role; it is one of the foundation of human relationship which each other. Same as on the internet, the matter of trust toward people online never has not been a worrying concern of internet users. Moreover, the life is much more complicated than before. It is hard to trust someone in real life relationship and online people is much harder. Especially for an individual who is looking for a long-term partner seriously. With this concern of the user, the website or app developer should preferentially take this matter important. They should focus on improving the authentication level of information. Such as report system or reduce credibility of user who violate the truth of the information.

The following hypothesis H2 was proved significant. Prior studies also stated that attitude toward online dating had positive effect on the Intention to use online dating apps or sites (Maden. M; Lenhart, 2006). Attitude is the most obvious characteristic of a human's mindset. Personality, people who manifest, in fact are the manifestation of attitude and emotions inside. The attitude is one of the reason which make human perform an action. In this case, the attitude has positive relationship with the Intention to use online dating apps or sites. Otherwise speaking, the person who has positive attitude toward online dating has more potential to use online dating than who do not. With people who have positive thinking about online dating, they tend to see the advantages that online dating brings to user like convenience, wide range of selection or fun. On the other hand, if a person who have negative attitude he or she will see that online dating a lot of issue and try to avoid or hate it. In the countries that have deep traditional like Vietnam, online dating just has been a

new trend for some recent years, people need time to adapt it as a normal thing in life. Especially finding partner which is such an important part in life. For dealing with the issue of attitude toward online dating, the app makers should continuous think of the solution that can change the attitude of the people. It is essentially when online dating apps or websites want to access to other country with different culture.

Surprise that the variable word - of - mouth was not support after testing and analyzing when communication has a major impact on the user. Currently that it has been one of the most effective tool that the software developers always consider the use of this approach The research has showed that word - of - mouth do not has much effect to the Intention to use online dating apps or sites. In the other word, it had certain impact on attitude of users, but not significant. Although previous studies of Shah Alam, Md. Rabiul Islam, Zafir Khan Mohd Mokhbul, Nurkhalida Binti Makmor (2018) and Zarrad H and Debabi M. (2015) proved that word - of - mouth have a positive impact on the Intention to use online dating apps or sites applications or website, the findings showed that users did not find word - of - mouth really affect they determinant and their decision did not depend on experience of the previous user. Put differently, the information provided by people who near a person do not have strong power to make that person use online dating that was showed in this study.

The third relationship was proved positive is dating anxiety and Intention to use online dating apps or sites. Same as the result of the research of Yen JY, Yen CF, Chen CS, Wang PW, Chang YH, Ko CH, (2012), with some people the hard part of meeting people, that is, approaching strangers, is much easier in an online environment. Lawson & Leck (2006) showed that one of the most frequently mentioned motivations for online dating was that it eased the fear of face-to-face rejection. In this research, the answers from the questionnaire showed that there are more than a half respondents are nervous when asking someone they like to go out for a date and almost of the respondents have anxiety in dating situation. Most of us feel a little anxious at least when they start a new relationship. It is hard for them to ask someone to go out for a date. That would be perfectly natural. Yet the fear can be debilitating if you have panic disorder or another fear condition. It leaves some people avoiding the dating scene. And normally, people feel more easy to talk behind the screen than face-to-face. As the researchers theorize, some people who have high rates of dating anxiety can feel this way because they don't trust their self- appearance or they personality in dating situation. They scare that their partners can look at their fault or weakness. Many user of online dating

prefer to use it because the degree it can defend against those problem. The marketers can take that as an insight of the user to develop the online dating apps. People are more comfortable and confident when they are near with someone who have same interest. Apps and websites can be more friendly used when it let the user select they hobbies and selectively match with the person who have the same preferences. That function can enhance the conversation between two people, avoid silent moment. Furthermore, when meeting face-to-face, the users will feel more comfortable.

The strongest relationship that the study has found is the relationship between perceive enjoyment with Intention to use online dating apps or sites. Millions of people around the world use online dating platforms for many different reasons. Several online dating systems software features lead to a generally fun and satisfying user experience. In general, perceived enjoyment is one of the biggest factor that influence the Intention to use online dating apps or sites. Specific online dating program can use scenarios have been examined that can lead to positive user interactions to increase user experience.

The last variable is the number of tasks perform on internet. Contrary to investigation of prior research (Chan, L. S., 2017) is that people who use the internet to dealing with their daily task have more tendency to use online dating. This research clearly showed that it does not have relationship with the Intention to use online dating apps or sites. This should be noticed as the Internet has become one important part of life at this time. People have been used to use it every day so lack of it would affect life. The tendency of using Internet cannot be representative of whether the person uses online dating or not.

5. CONCLUSION AND FUTURE RESEARCH

5.1. Conclusions

In this study, researcher examined the determinants of Vietnamese youths' Intention to use online dating apps or sites apps or sites. Through the results analyzed in the previously part there are some findings to summarize and discuss.

The research uses the model of Shah Alam, Md. Rabiul Islam, Zafir Khan Mohd Mokhbul, Nurkhalida Binti Makmor (2018) as a base model to investigate the determinants of Vietnamese youth' Intention to use online dating apps or sites. However, after reviewing previous studies dating anxiety and the number of tasks perform on internet is added in the model as extended predictor. So that the model had 6 factor that predicted to have positive relationship with Intention to use online

dating apps or sites. They are trust toward people online, attitude, word - of - mouth, perceived enjoyment, dating anxiety and the number of tasks perform on internet. After collecting and analyzing data from participants in many different location, we tested with 6 factors. The research shows these following result.

Firstly, influence of trust toward people online on Intention to use online dating apps or sites was positive. As can be seen in the results table, trust toward online people was the first one of four acceptable variables. The hypothesis H1 are supported. Secondly, attitude was found that it was compatible with proposed hypothesis. The results point out that people who have positive attitude toward online dating will have more Intention to use online dating apps or sites. Therefore, hypotheses H2 are supported. Thirdly, influence of word - of - mouth was denied. Although the previous study has proved it was positive, the results can be seen from the data table in the result. The hypotheses H3 are not supported. Next, this study considered perceived enjoyment may influence on decision to use online dating. Few prior studies stated that perceived enjoyment can be had in experiences of user resulting positive effect on the attitude of online dating users' Lu, Y., Zhou, T. & Wang, B. (2008). In area of this study, researchers found that user have much fun on online dating websites and applications. This reason can lead to using online dating which is to entertainment. Generally, hypothesis H4 is supported. Besides, dating anxiety was found that it was not compatible with proposed hypothesis. Finally, the impact of the number of tasks perform on internet was found not to be significant. This research found that the number of tasks perform on internet does not affect to the possibility of a person to use online dating apps and site. In general, hypothesis 6 is not supported.

5.2. Research contributions

5.2.1. Theoretical Contributions

This research is one of few researches which analyze the factors that affect the Intention to use online dating apps or sites, especially in the Vietnam context which hasn't had any research about online dating so far. So that, this research is the first research that study about the psychology of the youth toward online dating also the intention to use it in Vietnam. Moreover, this study will contribute as an example of valid model for further research with the similar concern and provide a deeper look into different components of the theory. Future researchers could also examine the causal relationships between these factors as variable for studying purpose and integrate expansion appropriation develops.

5.2.2. Practical Contributions

Through this research, a number of practical implications can draw. Being one of the few researches studying how the elements effect on online dating, especially in Vietnam context, the findings from the research and the researches discussed throughout the study have provided numerous value information for market research companies. Being able to better understand the psychology of the customer who are participating in online dating or having intention to use it is very important. So that knowing what they are looking for will help online dating applications and websites company to better design their product to meet the needs of their clients. For instant, the research had found that perceived enjoyment is one of the reason people use online dating. So in order to attract more young consumer, the producer should concentrate on examine what can bring them fun.

As it is found in this study, many respondents said that they cannot trust online dating sites, and the online dating system should be design as user-friendly as possible and make it trustable. Apps and website producer should pay more concern about the the honesty of participant and security of online dating due to the affect of trust toward online people. The results in some way proved that users would have more trust and comfortable when they use the website that provide the opponent characteristic. Although there were not a lot of researchers studying this field, it can be said that the more information the apps and sites provides to their customers, the more they use and trust in them.

The third implication is that the attitudes allow people to see how each other generally feel about online dating and its apps and website. The results indicated that more and more people have positive views of online dating. However, negative views still exist. attitude are a significant indicators to show whether people will use online dating apps or sites as seen in the theory of reasoned action. This also need to be seen as a highly considered insight for apps and website developer to look at. They some how have to change the perspective of the target consumer about online dating. Therefore, marketers can use marketing campaigns and marketing tools via various channel such as social networks, and magazines to transmit positive message and then influence the attitude of consumers toward online dating.

Although word - of - mouth do not have direct influence on intention to use online dating apps or sites, however

it is still important for marketer to consider it as a marketing tools. Maybe in long term, when the awareness about online dating are more positive, people will tend to reccomend online dating as a great solution to find potential partner.

Lastly, it is very important on to understand the current societal trends. Having a grasp on latest trends due to the influential of Internet use is in nowadays society is major implications for how information is presented and money is invested. Many people under rate this industry but online dating is a popular trend right now and it have brought high profit for corporates such as Match group and even Facebook joined in. It general, it can be an oppotunity for business and investigating.

5.3. Limitations and future research direction

Although the study provides meaningful information, it still has the limitations and further studies of this field should be addressed in the future.

Firstly, it is about the limitations of sample. The study is just conducted in Hanoi and the main participants are mainly students from the age of 18 to 22, so the results might not represent for all of the young generation in Vietnam. Therefore, future research with the similar topics should expand the scope of the survey in other major cities of Vietnam such as Hai Phong, Ho Chi Minh City, and Da Nang. If future researcher would like to conduct the similar model, it is suggested to use a wider range of sample size. Hence, the data collected might not reliable. Further researcher can spend more time to reach more respondents to acquire better data.

Secondly, the study mainly focus on researching the psychology of the youth without examining the demographic factor such as gender, level of education, or relationship status. For the recommendation of this limit, the future author should make the research consider about the demographic matter.

Finally, this research examined online dating in general, not a specific app or website so others research could try to obtain motives that focus only to a speific mobile dating applications or website. In order to discover even more specific motives, future researcher should conduct a research on one online dating website or application. For example Tinder can be a great research context because it familiar and popular. It maybe could study how other predictors relate to online dating.

6. REFERENCE

- [1] Ajzen, I. and Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*, Englewood Cliffs, NJ: Prentice-Hall.
- [2] Alam, Syed & Khan, Zafir & Makmor, Nurkhalida. (2018). Factors Affecting Intention to Use Online Dating Sites in Malaysia. *International Journal of Engineering & Technology*, 7 (4.28), pp.192-198.
- [3] Chakraborty, D. (2019), Components Affecting Intention to use online dating apps or sites Apps in India: A Study Conducted on Smartphone Users. *Asia-Pacific Journal of Management Research and Innovation*
- [4] Chan, L. S. (2017). Who uses dating apps? Exploring the relationship among trust, sensation-seeking, smartphone use, and the intent to use dating apps based on the integrative model. *Computers in Human Behavior*, 72, pp. 246-258.
- [5] Chin, W.W. (2010). How to write up and report PLS analyses. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares: Concepts, methods and applications in marketing and related fields* (pp. 655-690). Berlin: Springer.
- [6] Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Mahwah, NJ: Lawrence Erlbaum.
- [7] Coontz, S. (2005). *Marriage, a history: From obedience to intimacy or how love conquered marriage*. Viking.
- [8] Donn, J. E., & Sherman, R. C. (2002). Attitudes of practices regarding the formation of romantic relationships on the Internet. *Cyber Psychology & Behavior*, 5, 107–123.
- [9] Dylan Loh (2020), App makers cash in as Southeast Asia falls for mobile dating, *Nikkei Asian Review*, <https://asia.nikkei.com/Business/Business-trends/App-makers-cash-in-as-Southeast-Asia-falls-for-mobile-dating>
- [10] Easterby-Smith, M., Thorpe, R. and Jackson, P. (2008) *Management Research*. London: SAGE.
- [11] Enternews, 2019, Cuộc cạnh tranh của các "ông lớn" ứng dụng hẹn hò online – the competition of big players on online dating apps.
- [12] Etikan, I., Musa, S.A., Alkassim, R.S., (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), p.1.
- [13] Flug, Kyla C., "Swipe, Right? Young People and Online Dating in the Digital Age" (2016). *Social Work Master's Clinical Research Papers*. 658. https://ir.stthomas.edu/ssw_mstrp/658
- [14] Gibbs, J. L., Ellison, N. B., & Heino, R. D. (2006). Self-presentation in online personals: The role of anticipated future interaction, self-disclosure, and perceived success in Internet dating. *Communication Research*, 33, 152-177.
- [15] Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The Use of Partial Least Squares Structural Equation Modeling in Strategic Management Research: A Review of Past Practices and Recommendations for Future Applications. *Long Range Planning*, 45(5-6), 320-340.
- [16] Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., (2014). *Multivariate Data Analysis*. 7th ed, Pearson Education Limited.
- [17] Hancock, J. T., Toma, C., & Ellison, N. (2007, April). The truth about lying in online dating profiles. *In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 449-452). ACM.
- [18] Harry N. Boone, Jr. A. Boone, 2012 Analyzing Likert Data, *Journal of Extension*, 50(2), pp1-5.
- [19] Jacoby, J. & Mattel, M. S. (1971). Three-point Likert scales are good enough. *Journal of Marketing Research*, 8, 495-500.
- [20] Kang, T., & Hoffman, L. H. (2011). Why would you decided to use an online dating site? Factors that lead to online dating. *Communication Research Reports*, 28, 205e213. <http://dx.doi.org/10.1080/08824096.2011.566109>.
- [21] Katz, J. and Aspden, P. (1997), "Motivations for and barriers to Internet usage: results of a national public opinion survey", *Internet Research*, Vol. 7 No.3, pp.170-188, <https://doi.org/10.1108/10662249710171814>.
- [22] Lawson, H., & Leck, K. (2006). Dynamics of internet dating. *Social Science Computer Review*, 24(2), 189-208. doi:10.1177/0894439305283402.
- [23] Lu, Y., Zhou, T. & Wang, B. (2008) Exploring Chinese Users' Acceptance of Instant Messaging Using the Theory of Planned Behavior, the Technology Acceptance Model, and the Flow Theory. *Computers in Human Behavior*, 6 (2), 1 11.
- [24] Madden, Mary, and Amanda Lenhart. 2006. "Online Dating: Americans Who Are Seeking Romance Use the Internet to Help Them in their Search, but there is still Widespread Public Concern about the Safety of Online Dating." *Washington, DC: Pew Internet & American Life Project*.

- [25] Meredith E. M. Poley (2011) Who uses online dating: the role of personality in college students' use of the internet to find a partner, University of North Carolina Wilmington.
- [26] Teo, T. S. H and Lim, R. Y. C. 1999. Intrinsic and extrinsic motivation in Internet usage. *OMEGA: International Journal of management Science*, 27, 25-37.
- [27] Van der Heijden, H. 2003. Factors influencing the usage of websites: The case of a generic portal in the Netherlands, *Information & Management*, 40 (6), 541-549.
- [28] Walther, J. B., & Parks, M. R. (2002). *Cues filtered out, cues filtered in. Computer-mediated communication and relationship*. In M. L. Knapp & J. A. Daly (Eds.), *Handbook of interpersonal communication* (3rd ed., pp. 529-563). Thousand Oaks, CA: Sage.
- [29] Walther, J. B., Loh, T., & Granka, L. (2005). Let me count the ways: The interexchange of verbal and nonverbal cues in computer-mediated face-to-face affinity. *Journal of Language and Social Psychology*, 24, 36–65.
- [30] Yen JY, Yen CF, Chen CS, Wang PW, Chang YH, Ko CH. Social anxiety in online and real-life interaction and their associated factors. *Cyberpsychol Behav Soc Netw*. 2012.
- [31] YouGov, Hơn một nửa dân số Việt Nam từng sử dụng dịch vụ hẹn hò qua mạng – More than half of Vietnamese people using internet dating,
- [32] <https://vn.yougov.com/news/2017/11/23/internet-dating/>
- [33] Zarrad H and Debabi M. (2015). Analyzing the Effect of Electronic Word of Mouth on Tourists' attitude toward Destination and Travel Intention, *International Research Journal of Social Sciences*, 4(4), 53-60.

ZERO LEVERAGE AND PRODUCT MARKET COMPETITION

Chu Tuan Vu, Ha Son Tung

Faculty of Business Management, National Economics University

Abstract

This paper explores the impact of product market competition on capital structure, whether zero-leverage policy is explained by product market competition. Zero leverage behaviour is not an uncommon phenomenon that can be linked to a wide range of financial theories while product market competition plays a crucial role in formulating corporate decisions in private firms. Results show that the higher degree of product market competition, the more likely firms adopt zero-leverage policy.

Keywords: Zero leverage, Product market competition, Capital structure.

1. INTRODUCTION

The paper reviews the literature on zero-leverage and product market competition. This research examines how product market competition affects capital structure decisions, especially studying how product market competition explains the zero-leverage puzzle. One of the much-discussed anomalies in corporate finance is the stylized fact that firms remain debt-free for a longer period of time despite the potential benefits of debt financing predicted by dominant capital structure theories (Miller, 1977; Graham, 2000; Strebulaev and Yang, 2012). Existing theories offer potential explanations for the zero-leverage phenomenon due to financial constraint hypothesis (Faulkender and Petersen, 2006), underinvestment and financial flexibility (DeAngelo and DeAngelo, 2007), macroeconomic conditions (Baker and Wurgler, 2002; Antoniou et al, 2008) or trade-off and pecking order theories (Myers, 1984; Myers and Majluf, 1984). The main purpose of the paper is to provide new insights into the zero-leverage phenomenon through the lens of product market competition.

Debt is a very popular source of financing due to its many advantages in corporate governance such as protection against disruption to the controlling shareholders (Bruslerie and Latrous, 2012), lower cost relative to equity (Donaldson, 1961) and tax shield (Kemsley and Nissim, 2002; Modigliani and Miller, 1963). Notwithstanding the above benefits, the proportion of zero-leverage firms has increased dramatically over time. Devos et al. (2012) document an increase in the number of firms that remain debt-free for three consecutive years over the course 1990 – 2008 period. Bessler et al (2013) finds that the percentage of debt-free firms increased from just 8% in 1988 to nearly

25% in 2011 in the developed countries. In other words, one out of every four listed firms in the mature markets eschew the use of debts. More specifically, the portion of zero-leverage firms in 2011 in the United States is surprisingly high at 45% (Bessler et al, 2013). Meanwhile in the UK, 12.18% of non-financial publicly listed firms hold zero outstanding debts in the 1980-2007 period. Most recently, Ghoul et al (2018) shows strong evidence of zero-leverage policy as an international phenomenon such that increased prevalence of unlevered firms is also manifest in the developing countries.

The zero-leverage phenomenon is not clearly understood. Most previous research has been able to explain the issues of lower leverage predicted by standard capital structure but fail to account for the completely zero debt policy (Dang, 2011). Recent papers have addressed the issue of low leverage (Minton and Wruck, 2001), financial conservatism (Iona et al., 2004) and financial flexibility (Mura and Marchica, 2007). Only until 2006 that the zero-leverage phenomenon has been first identified by Strebulaev and Yang (2006) but no satisfactory explanation has been offered by the authors. Devos et al. (2008) argue that the decision to pursue low-leverage policy maybe caused by financial flexibility and managerial entrenchment. Dang (2011) is one of the first to specifically offer some theoretical justifications to the zero-leverage phenomenon based on the hypothesis of financial flexibility and the supply-demand market frictions. His empirical result also supports the underinvestment hypothesis that firms follow the conservative debt policy to build up more financial capacity to pursue future growth opportunities. However, Dang (2011) has not considered potential explanations of the agency theory as suggested by (Jensen and Meckling, 1976; Morellec

et al., 2008; Morellec, 2004). Furthermore, he focuses only on the process of corporate internal decision making but failed to take into consideration how the external factors of the market environment may influence the capital structure decisions of the firms.

Product market competition cannot be neglected when making financial structure decisions (Cestone, 1999). The seminal paper on the debt-product market competition relationship was presented by Pandley (2004). Guney et al (2010) is the first to point out that highly-leverage firms in the product markets are subject to some downsides of debt financing previously thought as favorable to the firms. To the best of my knowledge, no previous papers have specifically addressed how product market competition can rationalize the zero-leverage puzzle. Product market competition involves the circumstance that every industry is classified into one of the three categories, namely Monopoly, Oligopoly and Competitive power. At the highest product market competition, holding a high level of debts may not be the wisest solution due to the following reasons. First, firms with excessive holdings of risk debts are vulnerable to predatory threats by cash-rich rivals in the product market (Guney et al., 2010). (Bolton & Scharfstein, 1990; Brander & Lewis, 1986; Opler & Titman, 1994; Telser, 1966). Second, levered firms are required to disclose information to lenders, causing the loss of competitive advantages to outsiders (Cestone, 1999). Third, the issue of outside debt may cause bad signals to investors due to the effect of asymmetric information (Donaldson, 1961).

This paper is the first to study how product market competition can account for zero-leverage phenomenon at cross-country level. The structure is as follows. Section 2 presents the literature review on product market competition, zero-leverage phenomenon and the relationship between product market competition and capital structure financing. Section 3 reports the main empirical results and Section 4 provides conclusions.

2. LITERATURE REVIEW

2.1. Zero leverage phenomenon

The burgeoning presence of zero-leverage firms has been a persistent phenomenon for the last 30 years (Strebulaev and Yang, 2006). An increasing proportion of firms are inclined to adopt zero-leverage policy despite various benefits of debts including tax savings (Miller, 1977), agency problems control (Jensen, 1986, Jensen and Meckling, 1976) and lower financing costs relative to equity (Myers, 1977; 1984). Static trade-off theory estimates average debt ratio as low as 60% in 1994 (Leland, 1994) to as low as 10% recently (Ju et al., 2005; Morellec, 2004). Debt-free firms are generally

smaller and more profitable, report higher cash reserves and market-to-book ratios and pay more dividends (Strebulaev and Yang, 2012; Devos et al, 2012, Dang, 2011). Standard capital structure theories failed to clarify zero-leverage puzzle (Bessler et al., 2010). A growing body of literature attempts to explain the rationale behind the zero-debt puzzle. Dang (2011) argues that firms pursue zero-debt policy in order to mitigate the problems of underinvestment problems. The underinvestment hypothesis (Myers, 1977) shows that firms with risky debts tend to under-invest in projects with positive net present value because a portion of the profits from the projects flows to debtholders and thus are not fully accrued to equity-holders. Another explanation is that zero-leverage phenomenon may be caused by demand-supply market frictions when “financially constrained” firms are not able to raise external funds due to being rationed by the lenders (Stiglitz and Weiss, 1981; Dang, 2009). Marchica and Mura (2010) argues that zero leverage policy is a inter-temporal choice. While zero-debt firms incur higher capital expenditures and abnormal investment, they obtain financial flexibility at their disposal relative to similar-sized peers in the same industries. The financial flexibility hypothesis also suggests that zero-leverage choice is a result of temporary market frictions and zero-debt firms accumulate financial capacity and preserve borrowing power to finance more profitable future investment opportunities (Gamba and Triantis, 2008; Modigliani and Miller, 1963; DeAngelo and DeAngelo, 2007). Pecking order theory postulates that the cost of financing is positively associated asymmetric information, meaning that cash reserve is the preferred source of funding because the issuance of debts signals that firms have insufficient internal funds to finance new projects (Myers and Majluf, 1984). Therefore, firms choose to rely on cash over debts and equity.

2.2. Product market competition

“Product market competition is probably the most powerful force towards economic efficiency in the world” (Shleifer and Vishny, 1997). Product market competition contributes significantly to the mechanisms of corporate governance and the formation of corporate strategies (Chen et al, 2012). The implications of product market competition have been established in the literature in corporate governance (Sassi et al., 2018; Allen and Gale, 2000), managerial incentives (e.g., Schmidt, 1997; Karuna, 2007) and information disclosure policy (Verrecchia, 1983; Li, 2010; Ali et al., 2014). An important strand of literature document positive impact of product market competition on managerial incentives. Machlup (1967) argues that perfect competition reduces managerial slack in the

sense that the fear of being driven out of market enhances managerial efforts and leads to better firms' performance. In a competitive market, managerial firms are pressurized to maintain their competitive advantages by minimizing costs and maximizing productivity. More specifically, managers in the managerial firms in which there is separation of ownership and control often have no incentives to take extra work once the realized profits are above the target thresholds (Hart, 1983). Another positive aspect of competition on managerial incentives is the concept of "relative performance evaluation" (Lazear and Rosen (1981), Holmström (1982), and Nalebuff and Stiglitz, 1983). Relative firms' performance to peer groups is often taken into consideration when designing managerial rewards. Therefore, intense and healthy competition would elicit more devotion to the duties from the managers (Lazear and Rosen, 1981). Regarding the effect of product market competition on firms' information disclosure, most existing studies find that the pressures from product market competition prompt reduced willingness of the firms to disclose information to the public (Verrecchia, 1983; Clinch and Verrecchia, 1997). Verrecchia (1983) refers to the notion of "proprietary costs" by stating that any informative disclosure by the firms would be exploited at the cost of their own strategic positions and to the benefits of their rivals, discouraging them reveal private information through public disclosure. Bagnoli and Watts (2010) complements previous research that not only information quantity but information quality is compromised in product market competition. In addition to disciplining managerial misbehavior and exacerbating information asymmetry, another line of research sheds lights on the "risky effect" of product market competition. Cutthroat competition pushes the firms to continuously change and innovate their products (Aghion et al, 2005). When competition is stiff, gain is also tight (Akdogu and MacKay, 2012). Firms are also unable to divert productivity shocks to customers, leading to lower profitability and higher default risks (Tirole, 2006). Gaspar and Massa (2006) concludes that product market competition places firms into risky environment and uncertain future. Finally, there are other dark-side effects of product market competition such as corruption, child labor and earnings manipulation (Shleifer, 2004).

2.3. Product market competition and capital structure

The consequences of product market competition on capital structure decisions have been the subjects of number of studies. Valta (2012) suggests that firms operating in highly competitive industries are charged at a higher loan rate than their counterparts in non-

competitive markets. Xu (2012) shows that product market competition lowers profit margins, raises bankruptcy costs and uncertainty, increases agency costs of debts, and thus deterring firms from using debts to finance new projects.

There are several factors that give rise to my main hypothesis that product market competition could justify the phenomenon of zero-leverage behavior. Proprietary cost theory developed by Verrecchia (1983) suggests that pressures from product market competition hinder transparency by aggravating informational asymmetries. The basic logic is that firms eschew disclosing inside information to direct rivals to maintain their strategic advantages (Verrecchia and Weber, 2006; Dedman and Lennox, 2009). Boubaker et al (2018) argues that any private information disclosed to the public by the firms would be well-perceived by the competitors and strategically used at the expense of their competitive positions. In another perspective, market competition unintentionally instigates firms to make alterations to their financial statements in order to mislead the public about the firms' core competencies (Bagnoli and Watts, 2010). Arm's length public debtholders requires firms to disclose firm-specific information (Fama, 1985; Hadlock and James, 2002). The financial distress avoidance argument also states that bondholders usually place stringent covenant provisions on the firms in the event of default (Diamond, 1984, 1991; Houston and James, 1996), That not only leads to higher financial distress costs but also tie the firms to further information disclosures. The adverse impact of information leakage would lead firms confronting high pressures of competing to reduce reliance on private debt (Verrecchia, 1983).

Some firm perspectives also note that firms could switch to bank debts rather than private debts since banks have exclusive channel of communications to prevent inside information from being leaked (Yosha, 1995) and bank lenders always offer contracting flexibility to help firms survive through financial distress periods (Bolton and Freixas, 2000). However, there are other features of competition that also make bank debts an unattractive choice of financing. The first justification is labeled by Boubaker et al (2018) as the "bank monitoring substitution" effect. Chhaochharia et al (2016) indicates that corporate governance plays only a minor role in firms facing less production market competition. More specifically, product market competition is a very powerful disciplinary governance mechanism (Bloom and van Reenen, 2007; Aggarwal and Samwick, 1999) that could take over the monitoring function of banks, thus leading to lesser dependence on bank debts

(Boubaker et al., 2018). While bondholders' one usual contracting stipulation is the disclosure of information to the public, banks usually adopt high-calibre monitoring schemes that allow direct access to inside information within the firms to the detriments of shareholders ((Fama, 1985; Rajan, 1992). Banks can exert unfavorable influence on corporate insiders (Stiglitz and Weiss, 1983). Park (2000) suggests that optimal debt structure allow banks as monitoring senior lenders to retrieve full returns as we rarely see banks forgive any debt in case things go wrong. Secondly, banks charge higher loan spreads to borrowers from highly competitive industries (Valta, 2010). Because cash flows in competitive industries tend to be risky, banks take competition risks into consideration when making lending decisions (Gaspar and Massa, 2006; Irvine and Pontiff, 2009). In addition, in order to account for the risks, banks include more stringent constraints on the financing and dividend policies of firms engaging in product market competition (Garleanu and Zwiebel, 2009).

In short, internal sources of funds are the preferred solution in the product markets (Donaldson, 1984; Bolton and Scharfstein, 1990). The core idea of the predation theory is that low-leverage firms exhibit predatory behaviors that make the highly-leverage firms vulnerable to product market competition (Telser, 1966; Opler & Titman, 1994). Investors' optimal contracts are designed to control the agency problems. Specifically, investors may declare the termination of funding in case of poor firms' performance to avoid managers' discretionary usage of firms' resources in risky highly leveraged projects at the expense of investors (Bolton and Scharfstein, 1990). Predation theory suggests such threat could prove costly in long-run in product markets since the cash-rich rivals are incentivized to engage in predatory activities to make sure that firms' performance would eventually turn out to be poor. Such predatory behaviors could include price war or production increasing (Guney et al., 2009). Another argument against external financing is that product market competition could create a lot of managerial incentive problems within the firms (Donaldson, 1984). Excessive dependence on outside debts could bring firms to fierce competition in the product markets (Boubaker et al., 2018). In addition, firms will be subject to outside monitoring by debtholders (Telser, 1966).

In another argument, Fosu (2013) argues that product market competition may actually discourage the predatory threats from rivalry. In a competitive market, a debt contract is considered as a necessary condition for

predation. Bolton and Scharfstein (1990) shows that debt contracts are designed to align the interests of agents to the interests of debtholders. The requirement of an optimal contract that firms be forced into liquidation if they fail to pay periodic payments may serve as a predatory signal to other low-leverage predators. The predation lower firms' profit and accrues positive benefits to rivals. Fosu (2013), however, argues that each firm takes up only a small fraction of market share. Thus, they have no incentives to undertake predatory actions towards highly levered firms.

Leverage makes firms more vulnerable to predatory threats only in concentrated markets (Bolton and Scharfstein, 1990; Campello, 2003; Chevalier, 1995a, 1995b; Chevalier and Scharfstein, 1996). Brander and Lewis (1986) expect that the disadvantage of leverage is offset by the potential agency benefits of leverage. Therefore, the agency benefits of leverage increase with product market competition.

In addition to the predation-mitigating effects of competition, the discipline aspect of competition also strengthens the discipline effects of leverages and mitigates the agency problems of debts (Aghion et al., 1997; Hart, 1983). For example, Nickell (1996) shows a positive relationship between several measures of competition and firm performance measured as total factor productivity (TFP) growth. Furthermore, as shareholders or managers always have incentives to engage in moral hazards at the expense of debtholders, further contractual relations that reinforce the increased needs of monitoring and incentives mechanism are called for. Such behavior leads to increased costs associated with the enforcement of monitoring regulations on firms' managers. In order to secure cost advantage relative to rivals, firms use outside debt as a low-cost tool to monitor managers' behaviors. Jensen and Meckling (1976) shows that higher leverage has the potential to reduce costs and enhance firms' performance.

3. HYPOTHESIS DEVELOPMENT

Based on past theoretical predictions and empirical evidence, I can formulate the hypothesis that product market competition could account for the phenomenon of zero-leverage.

First, firm prevent information leaks by eschewing the use of debt financing to outside bank and private debtholders. Industry rivals would use information disclosure by the firms to strategically turn against them. Second, levered firms lose their competitive advantages

relative to unlevered counterparts. Chevalier (1995a) finds that increase in leverage leads to improved market value of competitors. In addition, the higher the level of debt, the more likely that new entries will enter the market and incumbent competitors will undertake further expansion. Chevalier (1995b) finds that highly-leverage firms are forced to charge higher prices than low-debt firms and prices drop when highly-leverage firms leave the markets. Therefore, highly levered firms are more vulnerable to predation from firms with less debts. In short, higher debt would lead to stiffer competition from rivals in the product market. Third, leverage has negative influence on relative-to-industry firms' sales growth in the product market (Campello, 2003) during recession. Highly leverage firms may be subject to market share's loss during industry downturn (Opler and Titman, 1994). In another development, Kovenock and Phillips (1997) find that leverage has an adverse effect on a firm's investment and is positively associated with plant closure. It is reasonable to deduce that with product market competition, leverage would not only adversely affect firms in economic boom but also during recession, decreasing firm's performance and forcing business closure in dark times.

4. DATA AND METHODOLOGY

4.1. Data

Zero leverage data is defined and obtained from the firm's financial information available from WRDS. Product market competition data is extract from Hoberg-Phillips Library at

<http://hobergphillips.tuck.dartmouth.edu>. Other control variables are all collected from Compustat.

4.2. Methodology

We estimate the following logit regression model to test the impact of product market competition on the likelihood of zero debt:

$$ZL = \beta_0 + \beta_1 * FLUIDITY + \sum \beta_n * Controls + IndustryFE + YearFE + \varepsilon, \quad (1)$$

ZL: Zero-leverage firms, where firm *i* is taken to be a zero-leverage firm in fiscal year *t* if the firm has neither long-term debt nor current liabilities at the end of the fiscal year. This is similar to the definition of Strebulaev and Yang (2013) where ZL defines firm *i* in year *t* as a zero leverage firm if in that year the outstanding amounts of both short-term debt (DLC) and long-term debt (DLTT) equal zero. DLTT is the amount of long-term debt exceeding maturity of one year and DLC is

debt in current liabilities, including long-term debt due within one year.

FLUIDITY: This is the measure of product market competition. FLUIDITY is extracted from Hoberg-Phillips Data Library. I merged the product market competition data with the Compustat data using GVKEY and YEAR.

Controls: is the list of suggested control variables described by Strebulaev and Yang (2013). All the control variables are available from Compustat (North America) database available online via WRDS. Below is the definition of the list of control variables in this paper:

Table 1: List of control variables

Variable	Description
Age	Number of years since the firm's record first appears in Compustat (Age = 0 for the first record)
Logsize	Natural logarithm of book assets adjusted to 2000 dollars
Dividend	Ratio of common dividends to book assets
R&D	Ratio of research and development expenses to sales
markettobook	Ratio of market assets to book assets (Tobin's q)
Profitability	Ratio of earnings before interests, taxes, and depreciation to Fbook assets
FLUIDITY2	Square of FLUIDITY

YearFE: Year fixed effect. These are time dummy variables.

IndustryFE: Industry fixed effect. These are dummy variables based on the 48-industry classification (Fama and French, 1997).

ε : This an error term.

All of my independent variables are lagged by one year to avoid the problem of endogeneity. The effect of non-linearity is taken into account by the inclusion of FLUIDITY square. In addition, all firm-level control variables are winsorized at the 1st and 99th percentiles to

eliminate the influence of outliers. Finally, we employ the clustered standard errors.

4.3. Main results

Table 1 reports descriptive statistics for the variables used in the regression analysis. Approximately 30% of the firms in the sample hold zero leverage. Product market competition varies widely from 0.37 to 26.72 with mean staying 7.40. In terms of other characteristics, some firms are new entries to the market while others have operated in the market for 49 years. Regarding profitability, most profitable firms earn more than 5% annual profit while least fortunate firms suffer may suffer the loss of 32%.

Table 2: Descriptive statistics

	N	Mean	SD	Min	Max
ZL	65,269	0.30	0.43	0	1
FLUIDITY	65,269	7.40	3.46	0.37	26.72
FLUIDITY2	65,269	66.82	65.48	0.14	714.18
Age	65,269	9.5	7.45	0	49
Logsize	65,269	2.30	0.84	-0.91	5.57
Dividend	65,269	0.007	0.10	0	13.10
Rd	65,269	4.83	187.45	-88.12	25691.5
markettobook	65,269	2.76	25.94	0.17	3825.3
profitability	65,269	-1.2	0.45	-32.04	5.01

Table 2 reports the number of observations, the mean, the standard deviation, the minimum value as well as the maximum of the variables used in the regression analysis.

Table 3: Correlation matrix

	ZL	FLUIDITY	FLUIDITY2	age	logsize	Dividend	rd	Markettobook	profitability
ZL	1.00								
FLUIDITY	0.071	1							
FLUIDITY2	0.053	0.962	1						
age	-0.025	-0.232	-0.191	1					
logsize	-0.182	-0.103	-0.082	0.285	1				
Dividend	0.016	-0.022	-0.024	0.054	0.01	1			
rd	-0.002	0.051	0.062	-0.012	-0.01	-0.001	1		
markettobook	0.005	0.016	0.014	-0.009	-0.039	0.002	0.004	1	
profitability	-0.026	-0.220	-0.125	0.137	0.391	0.071	-0.049	-0.042	1

Table 3 presents main regression results of the paper. For each independent variable, I report the coefficient estimate, its z-statistic in parenthesis and its statistical significance as denoted by star symbols. My baseline regression result regresses ZL on FLUIDITY, its square and all set of control variables. The pseudo R-squared is reported at 12.86%. The positive sign of FLUIDITY coefficient (at 0.123) indicates that higher degree of

product market competition could encourage the firms to adopt the zero-leverage policy, holding all the other variables equal. The results are in line with Guney et al (2009) and Strebulaev and Yang (2013). Regardless of the performance, the size, or the age of the firms, managers in a market with high product market competition would still tend towards zero-leverage policy. FLUIDITY coefficients are significant at 1% in

both models. We estimated the following model for model 2 without control variables:

$$\text{Log}\left[\frac{\text{Pr}(\text{Zero leverage}=1)}{1-\text{Pr}(\text{Zero leverage}=1)}\right] = \beta_0 + \beta_1 * \text{FLUIDITY} + \beta_1 * \text{FLUIDITY}^2 + \text{IndustryFE} + \text{YearFE} + \varepsilon \quad (2)$$

Model 2 reports results of the logistic regression without control variables. Model 1 and Model 2 produce consistent results with each other.

Product market competition ranges from 0.4 to 27.0 in the sample. Accordingly, Model 2 predicts that probability of zero-leverage firms would range from less than 1% with product market competition standing at 0.4 to 13% with product market competition at 27 points.

Table 4: Main regression results

Dependent variable = ZL	Model 1	Model 2
Constant	-1.98*** (-3.57)	-3.31*** (-4.47)
FLUIDITY	0.123*** (3.48)	0.092*** (2.62)
FLUIDITY2	-0.005*** (-2.99)	-0.004*** (2.73)
age	-0.003 (-0.56)	
logsize	-0.737*** (-12.4)	
Dividend	0.540 (0.78)	
rd	-0.0001 (-0.65)	
markettobook	-0.0007 (-0.02)	
profitability	0.570*** (4.94)	
Pseudo R-squared	0.1286	0.099
Year dummies	Yes	Yes
Industry dummies	Yes	Yes
Observations		

Notes: Z-statistics in parenthesis.

Significant level: * p < 0.1, ** p < 0.05, *** p < 0.01

This table reports results of logit regression of ZL on product market competition and a set of control variables, with year effect and industry effect included. The dependent variable ZL is a dummy variable equal to 1 if a firm has no debt (Both short-term and long-term debt are equal to zero). Time-varying independent variables are lagged by 1 year to alleviate the problem of endogeneity. Economic significance is reported along with z-statistic in parenthesis. Year and industries dummies (country dummies) are included but not reported for brevity in all models (Model 4). Standard errors are adjusted for heteroskedasticity and clustering at the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

5. REFERENCES

- [1] Aggarwal, R. K., and Samwick, A. A. (1999). The other side of the tradeoff: the impact of risk on executive compensation. *Journal of Political Economy*, 107 (1999), 65-105.
- [2] Akdoğan, E., and MacKay, P. (2012). Product markets and corporate investment: Theory and evidence. *Journal of Banking and Finance*, 36, 439-453.
- [3] Ali, A., Klasa, S., and Yeung, E. (2014). Industry concentration and corporate disclosure policy. *Journal of Accounting and Economics*, 58, 240-264.
- [4] Allen, F., and Gale, D. (2000). Corporate governance and competition. In X. Vives, Ed., *Corporate Governance: Theoretical and Empirical Perspectives*. Cambridge, U.K.: Cambridge University Press.
- [5] Aghion, P., Dewatripont, M., and Rey, P. (1997). Corporate governance, competition policy and industrial policy. *European Economic Review*, 41, 797-805.
- [6] Bolton, P., and Scharfstein, D.S. (1990). A theory of predation based on agency problems in financial contracting. *American Economic Review*, 80, 93-106.
- [7] Bolton, P., Freixas, X. (2000). Equity, Bonds, and Bank Debt: Capital Structure and Financial Market Equilibrium under Asymmetric Information. *Journal of Political Economy*, 108(2), 324-351.

- [8] Boubaker, S., Saffar, W., and Sassi, S. (2018). Product market competition and debt choice. *Journal of Corporate Finance*, 49, 204-224.
- [9] Bagnoli, M., and Watts, S. G. (2010). Oligopoly, Disclosure, and Earnings Management. *The Accounting Review*, 85, 1191-1214.
- [10] Bessler, W., Drobetz, W., Haller, R., and Meier, I. (2013). The international zero-leverage phenomenon. *Journal of Corporate Finance*, 23, 196-221.
- [11] Brander, J. A., and Lewis, T. R. (1986). Oligopoly and financial structure: The limited liability effect. *The American Economic Review*, 76(5), 956-970.
- [12] Bloom, N., and Reenen, J. V. (2007). Measuring and Explaining Management Practices Across Firms and Countries. *The Quarterly Journal of Economics*, 122(4), 1351-1408.
- [13] Chhaochharia, V., Yaniv, G., and Gustavo, G., and Roni, M. (2016). Product Market Competition and Internal Governance: Evidence from the Sarbanes-Oxley Act. *Management Science*, 63(5), 1271-1656.
- [14] Campello, M. (2003). Capital structure and product markets interactions: Evidence from business cycles. *Journal of Financial Economics*, 68, 353-378.
- [15] Chevalier, J. A., and Scharfstein, D. S. (1996). Capital-market imperfections and counter cyclical markups: Theory and evidence. *The American Economic Review*, 86, 703-725.
- [16] Chevalier, J. A. (1995a). Capital structure and product-market competition: Empirical evidence from the supermarket industry. *The American Economic Review*, 85, 415-435.
- [17] Chevalier, J. A. (1995b). Do LBO supermarkets charge more? An empirical analysis of the effects of LBOs on supermarket pricing. *Journal of Finance*, 50, 1095-1112.
- [18] Chen, C., Li, L., and Ma, M. L. Z. (2014). Product market competition and the cost of equity capital: evidence from China. *Asia Pacific Journal of Accounting Economy*, 21(3), 227-261.
- [19] Clinch, G., and Verrecchia, R. E. (1997). Competitive disadvantage and discretionary disclosure in industries. *Australian Journal of Management*, 22, 125-137.
- [20] Cestone, G. (1999). Corporate Financing and Product Market Competition: An Overview. *Giornale degli Economisti e Annali di Economia*, 58(2), 269-300.
- [21] Dang, V. (2011). An empirical analysis of zero-leverage firms: evidence from the UK. *Unpublished working paper*. University of Manchester, Manchester Business School, Manchester, England.
- [22] Donaldson, G. (1961). Corporate debt capacity: A study of corporate debt policy and the determination of corporate debt capacity. *Boston: Division of Research*, Harvard School of Business Administration, Boston, USA.
- [23] Dedman, E., and Lennox, C. (2009). Perceived competition, profitability, and the withholding of information about sales and cost of sales. *Journal of Accounting Economy*, 48, 210-230.
- [24] Devos, E., U. Dhillon., Jagannathan, M., and Krishnamurthy, M. (2008). Does Managerial Entrenchment Explain the "Low Leverage" Puzzle? Evidence from Zero-Debt Firms and Debt Initiations, *Working Paper*, University of Texas, Texas, USA.
- [25] Diamond, D. (1991). Monitoring and Reputation: The Choice Between Bank Loans and Directly Placed Debt. *Journal of Political Economy*, 99, 688-721.
- [26] Donaldson, G. (1961). Corporate debt capacity: A study of corporate debt policy and the determination of corporate debt capacity. *Boston: Division of Research*, Harvard School of Business Administration, Boston, USA.
- [27] Diamond, D. W. (1984). Financial intermediation and delegated monitoring, *Review of Economic Studies*, 51(3), 393-414.
- [28] DeAngelo, H. and DeAngelo, L. (2007). "Payout Policy Pedagogy: What Matters and Why", *European Financial Management* 13(1): 11-27.
- [29] Garleanu, N., and Zwiebel, J. (2005). Design and renegotiation of debt covenants, *Review of Financial Studies*, 22(2), 749-781.
- [30] Guney, Y., Li, L., and Fairchild, R. (2011). The relationship between product market competition and capital structure in Chinese listed firms. *International Review of Financial Analysis*, 20, 41-51.
- [31] Gamba, A., Triantis, A., (2008). The value of financial flexibility. *Journal of Finance*, 63, 2263-2296.
- [32] Gaspar, J. M., and M. Massa, M. (2006). Idiosyncratic volatility and product market competition. *The Journal of Business*, 79, 3125-3152.

- [33] Faulkender, M., and M. A. Petersen, M. A. (2006). Does the Source of Capital Affect Capital Structure? *Review of Financial Studies*, 19, 45-79.
- [34] Fama, E. F. (1985). What's Different about Banks? *Journal of Monetary Economics*. 15, 29-39.
- [35] Fosu, S. (2013). Capital structure, product market competition and firm performance: Evidence from South Africa. *The Quarterly Review of Economics and Finance*, 53(2), 140-151.
- [36] Houston, J., James, C. (1996). Bank Information Monopolies and the Mix of Private and Public Debt Claims. *Journal of Finance*, 51(5), 1863-1889.
- [37] Hart, O. (1983). The market mechanism as an incentive scheme. *Bell Journal of Economics*, 14, 366-382.
- [38] Holmstrom, B. (1982). Moral hazard in teams. *The Bell Journal of Economics* 13, 324-340.
- [39] Jensen, M.C. (1986). Agency cost of free cash flow, corporate finance, and takeovers. *Am. Econ. Rev.* 76, 323-329.
- [40] Hadlock, C. J., James, C. M. (2002). Do Banks Provide Financial Slack?. *Journal of Finance*, 57(3), 1383-1419.
- [41] Irvine, P. and Ponti, J. (2009), Idiosyncratic return volatility, cash flows, and product market competition, *Review of Financial Studies*, 22(3), 1149-1177.
- [42] Ju, N., Parrino, R., Poteshman, A., and Weisbach, M. (2005). Horse and rabbits? Optimal dynamic capital structure from shareholder and manager perspectives. *Journal of Financial and Quantitative Analysis*, 40, 259-281.
- [43] Jensen, M., and Meckling, W. (1976). Theory of the firm: Managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- [44] Karuna, C. 2007. Industry product market competition and managerial incentives. *Journal of Accounting and Economics* 43, 275-297.
- [45] Kovenock, D., and Phillips, G. (1997). Capital structure and product market behaviour: An examination of plant exit and investment decisions. *The Review of Financial Studies*, 10, 767-803.
- [46] Leland, H., 1994. Corporate debt value, bond covenants, and optimal capital structure. *Journal of Finance*, 49, 1213-252.
- [47] Lazear, E. P., and S. Rosen. (1981). Rank-order tournaments as optimum labor contracts. *Journal of Political Economy*, 89, 841-864.
- [48] Li, X. 2010. The impacts of product market competition on the quantity and quality of voluntary disclosures. *Review of Accounting Studies* 15, 663-711.
- [49] Morellec, E. (2004). Can managerial discretion explain observed leverage ratios? *Review of Financial Studies*, 17 (2004), 257-294.
- [50] E. Morellec., B. Nikolov, B., and Schürhoff, N. (2012). Corporate governance and capital structure dynamics. *Journal of Finance*, 67 (2012), 803-848.
- [51] Machlup, F. (1967). Theories of the Firm: Marginalist, Behavioral, Managerial. *American Economic Review* 57, 1-33.
- [52] Modigliani, F., and Miller, M. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Review*, 53(3), 433-443.
- [53] Minton, B., and Wruck, K. (2001). Financial conservatism: evidence on capital structure from low leverage firms. *Unpublished working paper*. Ohio State University, Columbus, OH.
- [54] Myers, S. C. (1977). The determinants of corporate borrowing. *Journal of Financial Economics*, 5, 147-175.
- [55] Myers, S. C. (1984). The capital structure puzzle. *Journal of Finance*, 39(3), 575-592.
- [56] Myers, S. C., and Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13 (2), 187-221.
- [57] Miller, M. (1977). Debt and Taxes. *Journal of Finance*, 32, 261-275.
- [58] Marchica, M., and Mura, R. (2010). Financial Flexibility, Investment Ability, and Firm Value: Evidence from Firms with Spare Debt Capacity. *Journal of Financial Management*, 39, 1339-1365.
- [59] Nickell, S. (1996). Competition and corporate performance. *Journal of Political Economy*, 104, 724-746.
- [60] Nalebuff, B. J., and Stiglitz, J. E. (1983). Prizes and incentives: Towards a general theory of compensation and competition. *Bell Journal of Economics* 14, 21-43.
- [61] Opler, T. C., and Titman, S. (1994). Financial distress and corporate performance. *The Journal of Finance*, 49, 1015-1040.
- [62] Park, C. (2000). Monitoring and the Structure of Debt Contracts. *Journal of Finance*, 55, 2157-95.

- [63] Pandey, I. M. (2004). Capital structure, profitability and market structure: Evidence from Malaysia. *Asia Pacific Journal of Economics and Business*, 8(2), 78-91.
- [64] Rajan, R. G. (1992). Insiders and Outsiders: The Choice between Informed and Arm's-Length Debt. *The Journal of Finance*, 47(4), 1367-1400.
- [65] Strebulaev, I. A., and B. Yang. (2006). The Mystery of Zero-Leverage Firms, *Working Paper*, Stanford University, California, USA.
- [66] Strebulaev, I. A. and Yang, B. (2013). The mystery of zero-leverage firms. *Journal of Financial Economics*, 109, 1-23.
- [67] Showalter, D. M. (1995). Oligopoly and financial structure: Comment. *The American Economic Review*, 85(3), 647-654.
- [68] Stiglitz, J. E., and Weiss, A. (1981). Credit rationing in markets with imperfect information. *American Economic Review*, 71, 393-410.
- [69] Shleifer, A., and Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, 52, 737-783.
- [70] Shleifer, A. (2004). Does competition destroy ethical behavior. *NBER Working Paper*.
- [71] Sassi, S. (2016). Product Market Competition: A Literature Review. *PhD thesis*. ESC Troyes, Troyes, France.
- [72] Sassi, S., and Toumi, N. (2018). Product market competition and analyst following. *Journal of Management & Governance*, 22(1), 55-88.
- [73] Schmidt, K. M. (1997). Managerial incentives and product market competition. *The Review of Economic Studies* 64, 191-213.
- [74] Telser, L. G. (1966). Cut Throat Competition and the Long Purse. *Journal of Law and Economics*, 9, 259-277.
- [75] Tirole, J., (2006). The Theory of Corporate Finance. *Princeton University Press*, Princeton, Oxford.
- [76] Verrecchia, R. E. 1983. Discretionary disclosure. *Journal of Accounting and Economics* 5, 179-194.
- [77] Verrecchia, R. E., and J. Weber. (2006). Redacted Disclosure. *Journal of Accounting Research* 44, 791-814.
- [78] Valta, P. (2012). Competition and the cost of debt. *Journal of Financial Economics*, 105(3), 661-682.
- [79] Xu, J. (2012). Profitability and capital structure: Evidence from import penetration. *Journal of Financial Economics*, 106, 427-446.
- [80] Yosha, O. (1995). Information Disclosure Costs and the Choice of Financing Source. *Journal of Financial Intermediation*, 4(1), 3-20.

CUSTOMER ANALYTICS IN E-COMMERCE: A LITERATURE REVIEW

Vu Ngoc Thanh, Tran Thi Huong

School of Economics and Management, Hanoi University of Science and Technology

Corresponding Author: huong.tranhti@hust.edu.vn

Abstract

In recent years, online shopping is one of the most popular online activities worldwide. The global trend of digitalization and the COVID-19 pandemic have made the growth speed of e-commerce greater than ever. That leads to dramatic growth and rigorous competition in the e-commerce space. In this condition, practitioners and researchers believe that data analytics, especially data from customers, is becoming one of the new and effective weapons to compete in this business field. However, most business owners have used a very small amount of their data possession. This paper aims to review and classify different methods, objectives, techniques, supported tools, indicators, and scales used in customer data analytics. To this end, authors used keyword search and cross-reference to collect research papers, then took advantage of content analysis to gain insights into the research problems, propose suggestions to e-commerce business in mining customer data, and explore the outlook for future research.

Keywords: customer analytics, e-commerce, literature review, content analysis.

1. RESEARCH BACKGROUND

1.1 The booming of e-commerce

The Internet has totally transformed trading activity worldwide, and e-commerce is becoming the prevalent channel in doing business (Adnan, 2014). eMarketer (2019), the retail e-commerce sales worldwide reached to 3.53 trillion US dollars in 2019 and are forecasted to grow to 6.542 trillion US dollars in 2023.

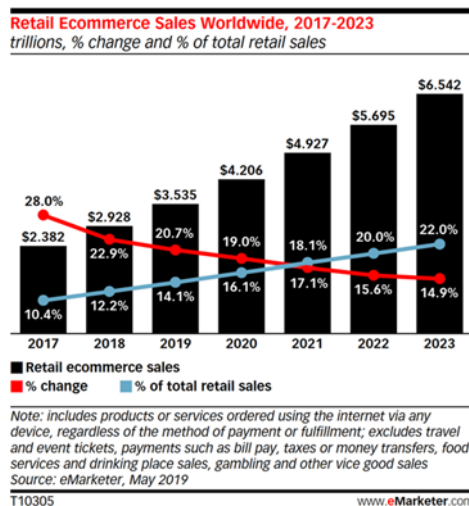


Fig.1: Retail Ecommerce Sales Worldwide 2017 - 2023

Source: (eMarketer, 2019)

According to the reports of Statista (2020) and

Digitalization and the COVID-19 pandemic reshape our world. According to TechCrunch (2020), “the pandemic has accelerated the shift away from physical stores to digital shopping by roughly five years”, the sales of department stores are forecasted to decline by over 60% while e-commerce is predicted to grow by nearly 20% in 2020.

1.2 Applications of data analytics in e-commerce

The e-commerce practitioners are witnessing the increasingly intense competition due to the mushrooming growth of buyers and sellers in the e-commerce space (Bucko et al., 2018). Data analytics is becoming one of the new and effective competitive weapons to help e-commerce businesses compete in this rigorous market. According to Arnold (2019), data analytics technologies (data visualization, data mining, machine learning, deep learning) “are getting significantly better at retrieving and transforming scattered data into actionable insights”. That is the reason why e-commerce companies, who had used only 0.5% of their data possession, “are finally starting to unclog their data pipe”. The effective application of data analytics in e-commerce can bring business owners huge benefits, for example, (i) Higher Revenues from Cross-Sell and Up-Sell Campaigns, (ii) Data-Driven Product

Research and Product Development, (iii) Enhanced Pricing Strategy (Arnold, 2019). There are six major mechanisms to enhance the deployment of data to create practical business values as follow: (i) Personalization (personalized service or customized products), (ii) Dynamic pricing to attract new customers and retain the current customers, (iii) Customer service to detect quality problems early, (iv) Supply chain visibility (traceability), (v) Security and fraud detection (through identifying fraud relating to credit cards, product returns, and identity theft), and (vi) Predictive analytics (Akter & Wamba, 2016).

1.3. Customer analytics in e-commerce

Data analytics can be applied in all e-commerce functions such as production and operations (e.g., supply chain flows), marketing (e.g., promotion), human resources (e.g., employee performance), finance (e.g., controlling fraud), and research and development (R&D) (Akter & Wamba, 2016; Davenport, 2006). In which the application of customer analytics contributes significant value to practical business.

There are quite a few literature review papers investigated bigdata application in general business (Amado et al., 2018; Baig et al., 2019; Grover & Kar, 2017; Mikalef et al., 2018; Wamba et al., 2015), or in e-commerce (Akter & Wamba, 2016; Bilgic & Duan, 2019), and application of big data in customer relationship management in general business (Ngai et al., 2009; Perera et al., 2018; Zhang & Benyoucef, 2016). However, to the best of our knowledge, there is a lack of systematic literature review on customer analytics in e-commerce.

1.4. Research questions

Understanding the importance of customer analytics in e-commerce and research gap, this paper aims to investigate research papers to gain insights into customer analytics in general and in e-commerce business in particular. To this end, we raised and researched answers for the following research questions:

- What are the different types of data, methods, objectives, techniques, metrics indicators, mediators used to gather, process, and analyze customer data in e-commerce?
- What are the potential research areas in the field of customer analytics in e-commerce?

2. RESEARCH METHODOLOGY

2.1. Data collection

We collected high-quality papers that were peer-reviewed and published between 2000 and September of 2020 by means of structured keywords search and cross-referencing to ensure the quality and reliability of this review. The keywords applied to search for articles in the database of Google scholar were: Customer (OR buyer OR consumer) AND Analytics (OR analysis, evaluation, exploration, and factor analysis) AND Ecommerce (OR Mobile commerce, electronic commerce, web/ online business, online shopping, online purchasing). We considered all articles (except for literature review papers) that evaluated/explored/analyzed customer behavior/satisfaction/loyalty/awareness in e-commerce.

Within our research, focuses, trends, methods, measurement scales, and indicators of customer analytics research are defined and classified. To this end, the units of analysis in our review relate to research papers that have new contributions to this research field, such as:

- develop and/or implement a new model/technique/indicator to analyze or understand customers in e-commerce,
- empirically investigate how practical organizations conduct customer analytics.

After carrying out screening titles, abstracts, and conclusions to choose the appropriate papers to review, altogether, we selected and reviewed 60 papers.

2.2. Data analysis

The authors used the content analysis method in investigating the collected papers. The content analysis method was defined early by Berelson in 1952 and developed by Philipp Mayring in 2000 and 2008.

This method is very good at combining rich meaning qualitative approaches with robust quantitative analyses through enabling (i) manifest content of text and documents, and (ii) uncover latent content and more profound meaning embodied in the text and document (Duriau et al., 2007; Wilding et al., 2012). Firstly, we coded selected papers according to a number of categories that were also revised during the coding process. Figure 2 presents our analytic categories that include two groups, namely descriptive analysis and content analysis. Secondly, in the analysis phase, we synthesized and linked two groups to gain insights into critical points and trends of customer analytics research in the e-commerce space.

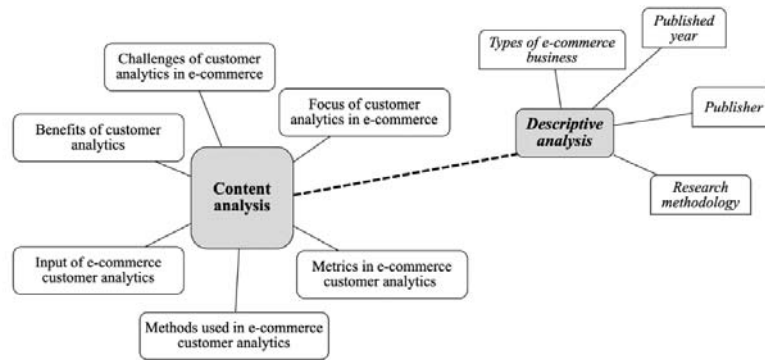


Fig.2: Categories to analyze reviewed papers

3. FINDINGS AND DISCUSSIONS

3.1. Descriptive analysis of reviewed papers

In our review, we investigated both the theoretical base and empirical base research papers. The approach used to analyze customer data ranges from qualitative (two papers), semi-quantitative (one paper), mixed method (one paper), and quantitative (56 papers). Table 2 will present more details about the customer analytics approach. Our reviewed paper investigated application of customer analytics in different types of e-commerce business areas and specific products, including general online retailers, movies website, cashback website, online traveling service, automobile, smartphones, and books. Figure 3 shows the distribution by published year of reviewed papers. In line with the prevalent of e-commerce and customer analytics, the quantity of papers has increased over time.

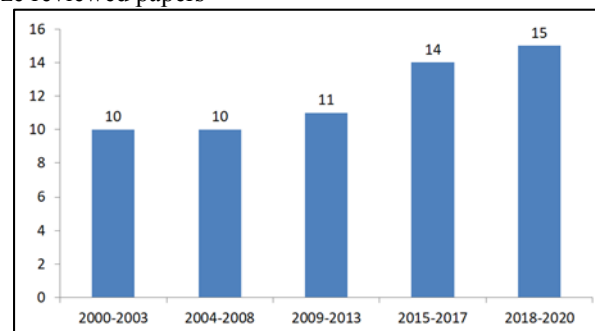


Fig. 3: Distribution of reviewed papers by published year

3.2. Metrics to analyze customers in e-commerce

In order to gain insights into customers, analysts need to define their customer metrics to collect appropriate data, build constructs, and carry out the necessary analysis. Table 1 shows the major metrics used in our reviewed papers.

Table 1: Popular metrics and components used to analyze customers

Metrics	Components/ Influencing factors			Mediators
Customer Satisfaction Customer Preference Customer Loyalty Customer Perceived Value Trust Customer experience Customer rating Buying decision Repurchase intention	<ul style="list-style-type: none"> Advertisements Product quality Brand names, and Prior shopping 	<ul style="list-style-type: none"> Perceived risks and Psychological factors (Product risks and convenience risk) 	<ul style="list-style-type: none"> Trust (<i>Security, Privacy</i>) System quality (<i>Visual appearance, Response time, Page loading speed, 24 Hour availability</i>) Content quality (<i>Up-to-date, Understandability, Timelines, Preciseness</i>) Online service (<i>Tracking order status, account maintenance, payment alternative</i>) Usability (<i>Information, Transaction, FAQs, Access Rights, Accessibility, Ease of use</i>) 	<ul style="list-style-type: none"> Purchasing intention Last-mile delivery
Mean Absolute Error (MAE) (<i>Recommendation system</i>)	<ul style="list-style-type: none"> Care Reliability Ease of use Security, Product portfolio 	<ul style="list-style-type: none"> Utilitarian value and Hedonic value perceived by consumers Price -Trust-Convenient 		

3.3. Focuses of reviewed papers in the field of customer analytics in e-commerce

In this section, the authors analyzed, classified, and synthesized reviewed papers into different categories based on their focuses and findings.

Table 2: Focuses of customer analytics in e-commerce

Focuses	Sub-objectives	Main findings and related papers	
Analyzing customer behavior	Classifying customer behavior	Analyze customer behavior in each single and cross-cases classified by three pairs of dichotomies (user & non-user, payer & non-payer, and selector & non-selector) (Jagdish N. Sheth, 2002)	
	Analyzing e-customer behavioral changes in relation to marketing activities	The relation between e-customer behavioral changes and social media, website, internet marketing planning (Irene S.Y. Kwan et al., 2005)	
	Investigating of factors influencing consumer's intention to use online shopping		Consumer's commitment to an online store is highly related to information satisfaction and relational benefit. Simultaneously, information satisfaction and relational benefit are significantly affected by product and service information quality, user interface quality, and security perception. Information satisfaction is affected more strongly by product information quality (Park & Kim, 2003)
			An E-Customer Behavior Model with Online Analytical Mining for Internet Marketing Planning (Irene S.Y. Kwan et al., 2005)
			Product involvement and Attitude have significant impact on satisfaction (Aldhmour & Sarayrah, 2016)
			Price was the primary factor for the entire population sample, and that the second factor was Trust which was closely followed by Convenience. (Anders Hasslinger et al., 2007)
			Personal characteristics, vendor/service/product characteristics, and website quality significantly affect online shopping attitudes, intention, and behavior (Na Li & Ping Zhang, 2002)
			Analyze the Role of Perceived Retail Usefulness in the relationship between Consumer Product Search and Purchase Behaviour Using Various Retail Channels (Jihuyn Kim & Hyun-Hwa Lee, 2008)
	Applying psychology in customer behavior		Both utilitarian value and hedonic value perceived by consumers in Internet information searching have a positive influence on intention to search the Internet for information and intention to use the Internet for purchase (Jae-Il Kim et al., 2004)
			This study shows the purchase intention influenced by utilitarian value and security. On the other hand, hedonic value and privacy are not the factors that affecting the purchase intention (Andriani & Sihombing, 2015)
Analyzing relationship between website/information system and customer behavior		Website security/privacy, website design, website reliability/fulfilment and website customer service are the four dominant factors which influence online shoppers' perceptions of website quality in the National Capital Region, India (Gupta et al., 2016)	
Analyzing risks perception of online customers		Higher Internet experience and the use of other remote purchasing methods are related to lower levels of perceived risk toward online shopping, which in turn results in higher online purchase rates (Miyazak & Fernandez, 2001)	
		Perceived risks and psychological factors like the fear of losing money has a negative impact on online buying behavior (Adnan, 2014; Aldhmour & Sarayrah, 2016; Javadi et al., 2012)	
Measurement of trust	Customer satisfaction towards online shopping with reference	Advertisements, product quality, brand names, and prior shopping experiences do play a significant role in customer satisfaction among online shoppers in Malaysia (Hasina Momtaz et al., 2011)	

Focuses	Sub-objectives	Main findings and related papers
customer loyalty and/ or customer satisfaction and/ or customer preference		Information quality provided in FJB Kaskus website has a direct, positive, and significant effect on customer satisfaction in conducting online shopping (Wheny Khristianto et al., 2012)
		There exists no significant association between monthly income, type of family, and level of satisfaction towards online shopping. Most of the customers are satisfied with 24 hours service towards online shopping in Namakkal District, India (Senthilkumar & Chandramohan, 2018)
		Reliability, Customer Service, Web Design, and Security are the most influential factors on customer satisfaction at Tiki.vn E-Commerce Platform (Ha Nam Khanh Giao, 2020)
	Effect of E-CRM on Customer Satisfaction	“Trust” is the most important among the online consumers in E-commerce, but Ecommerce websites have to pay attention to a secured process, discount to its members, after-sales service. (Durai & Stella, 2017)
	Influence of risk on relationships between handling of product returns and customer loyalty in e-commerce	The study found that the significance of performance in terms of product returns in explaining customer loyalty for websites that sell low-risk products and for the website that sell high-risk products (Ramakrishnan Ramanathan, 2011)
	Customer-perceived value and loyalty in the context of B2C E-Commerce	Five key dimensions of e-service quality are care, reliability, ease of use, security, and product portfolio, which are considered as substantially important to customer-perceived value (Ling Jiang et al., 2015a)
	The Impact of Satisfaction and Trust on Loyalty of E-Commerce Customers	The satisfaction does not affect loyalty while customer trust does, and that customer trust is affected by information quality (Mochammad Auditya Brilliant & Adrian Achyar, 2013)
Mediating role of last mile-delivery in e-customer’s experience and satisfaction	The last-mile delivery experience has a significant effect on the relationship between the online shopping experience and total customer satisfaction (Vakulenko et al., 2019)	
Predictive analytics of customer behavior and customer satisfaction through cluster analysis and recommendation system	Applying the cluster technique to evaluate the effect of ECRM on customers' satisfaction of e-commerce websites	Cluster analysis, which operates on customer profiles (Atcharyachanvanich & Sonehara, 2008) or either of two data structure types, data matrix, and dissimilarity matrix of ECRM system, has a significant and positive impact on customer satisfaction (Durai & Stella, 2017)
	Applying an inter-cluster analysis approach to exploring business opportunities	Author examined the customers from four viewpoints: usage, revenue, user characteristics, and services subscription, then interpreted the results of clustering from two perspectives: discovered patterns and distinctive attributes representing each cluster (Indranil Bose & Xi Chen, 2009)
	Applying the K-mean segmentation method in Customer Behavior Analysis	Authors carried out K-mean segmentation method to clustering customers of Tmall E-Commerce Shop into 4 groups then proposed different shopping service solutions for each group (Renhao Jin et al., 2016)
	Establishing dynamic framework for maintaining customer profiles in E-commerce recommender systems	Applying the clustering techniques for the recommendation process helps to reduce the system response time. The recommendation time increases as the base users increases. Merging additional users into the cluster structure provides a better structure for finding similar users. (Haruechaiyasak et al., 2005)
	Comparing different model for E-Commerce Recommender Systems	A hybrid approach performed significantly better than a collaborative approach (Zan Huang et al., 2004) The prediction quality is worse when the clustering algorithm, but the difference is small; when they increase the number of clusters, the quality tends to be inferior (Badrul M. Sarwar et al., 2002)

3.4. Methods used in e-commerce customer analytics

Depending on different objectives/focuses of customer analytics, there are various methods used in e-commerce customer analytics. These methods ranging from qualitative to quantitative, cover different techniques, and use different types of data and analytics supported tools. Table 3 presents the major trends in customer analytics practices.

Table 3: Methods used in e-commerce customer analytics

Methods	Related papers	Input/Types of data used in customer analytics
A. Qualitative	A Generic Concept of Customer Behaviour (Jagdish N. Sheth, 2002)	Ground Theory
	Using qualitative data to study consumer buying behavior towards online shopping (Rahman et al., 2018)	Primary data (survey customers)
B. Semi-quantitative	Analytic hierarchy process (AHP) (Ellatif & Darwish, 2010)	Primary data (survey customers)
C. Quantitative		
▪ Regression analysis	Factors influencing online purchase intention of smartphones: A hierarchical regression analysis (Bringula et al., 2018)	Primary data (survey customers)
▪ K-means	Applying the K-mean segmentation method in customer behavior analysis on a Tmall e-commerce Shop (Renhao Jin et al., 2016)	Secondary data (customer and transaction data of a shop on Tmall.com)
▪ EFA and/ or CFA	CFA (Bucko et al., 2018)	Primary data (survey customers)
	EFA (Gupta et al., 2016)	Primary data (survey customers)
▪ Partial Least Squares Structural Equation Modelling (PLS-SEM)	(Vakulenko et al., 2019; Yi Jin Lim et al., 2015)	Primary data (survey customers)
▪ Hierarchical Agglomerative Clustering (IAHC)	Cluster Analysis of E-Commerce Customer Profiles based on Trust Perception (Kanokwan Atcharyachanvanich & Noboru Sonehara, 2008)	Secondary data (the movie rating database obtained from the MovieLens project Website)
▪ Cluster techniques in the recommendation system	(Badrul M. Sarwar et al., 2002; Indranil Bose & Xi Chen, 2009; Kanokwan Atcharyachanvanich & Noboru Sonehara, 2008)	Secondary data (Customer's demographic information; records of the users' explicit expression of the interest on the item, such as rating; the interaction between users and items, including the examination (selection, duration, date, salary, telephone number, address, and comments))
▪ Graph model in the recommendation system	(Bae et al., 2015; Shaikh et al., 2017; Zan Huang et al., 2004)	
D. Mixed method (both Qualitative and Quantitative method)	An Analysis of the Factors Affecting Online Purchasing Behavior of Pakistani Consumers (Adnan, 2014)	Both primary and secondary data

3.5. Benefits of customer analytics in e-commerce

According to Arnold (2019), predictive analytics of customer data can significantly improve e-commerce business performance by increasing the probability of customers' access to products' info and promotions. For

example, the product recommendation engine helped Amazon drive 35% of their cumulative company revenue (Arnold, 2019). This section summarizes the benefit of customer analytics in e-commerce in literature.

Table 4: Major benefits of customer analytics in e-commerce in literature

Benefits of customer analytics	Related Paper(s)
Identifying quality problems to eliminate them through customer feedback/ survey analytics	Quality of product (Akter & Wamba, 2016)
	Quality of logistics service providers (Vakulenko et al., 2019)
	Quality of website, information system (Gupta et al., 2016; Mahmoud M. Abd Ellatif, 2007)
	Quality of customer service (Akter & Wamba, 2016; Norizan Kassim & Nor Asiah Abdullah, 2010; Wheny Khristianto et al., 2012)
Understanding customer behavior	(Aikaterini C. Valvi et al., 2013; Chung-Hoon Park & Young-Gul Kim, 2003; Mohammad Hossein Moshref Javadi et al., 2012; Renhao Jin et al., 2016)
Measuring, analyzing, determining impact factors to improve customer satisfaction, trust, and customer loyalty	(Mahmoud M. Abd Ellatif, 2007; Mochammad Auditya Brilliant & Adrian Achyar, 2013; Mustafa I Eid, 2011; Vakulenko et al., 2019)
Increasing probability that customer access and buy products through recommendation systems	(Badrul M. Sarwar et al., 2002; Bae et al., 2015; Indranil Bose & Xi Chen, 2009; Kanokwan Atcharyachanvanich & Noboru Sonehara, 2008; Shaikh et al., 2017)
Supporting pricing strategy through analyzing historical data to depict the elasticity of demand by price	(Akter & Wamba, 2016; Pin Luarn & Hsin-Hui Lin, 2003)
Evaluating new product launches campaigns	(Chan & Ip, 2011; Lipizzi et al., 2015)
Evaluating the impact of managerial factors on customers metrics	Impact of E-CRM system on customer satisfaction (Dr. Tabitha Durai & G. Stella, 2017; Mahmoud M. Abd Ellatif, 2007)
	Impact of customer profiles on business performance and customer satisfaction (Atcharyachanvanich & Sonehara, 2008; Haruechaiyasak et al., 2005)

3.6. Challenges in e-commerce customer analytics

Although customer analytics bring huge benefits to e-commerce activities, the implementation of these analytics in academia and industry is facing a lot of challenges as follows. Firstly, customer data on e-commerce platforms is unstructured (Akter & Wamba, 2016) while customer survey has a response rate and reliability quite low (Ling Jiang et al., 2015b). Secondly, using personal data of customers is a sensitive issue that tends to against the personal information protection law (Lee, 2017). Thirdly, the effectiveness of mining customer data in e-commerce depends on not only technology infrastructure but also the system thinking and business mind. That leads to considerable challenges in the human resources of technical and business analytics teams. Finally, each category of company, customer, product, or even point of time will need its own proper algorithm, techniques, and models. It requires having up-to-date research and development to find out the best solutions in customer analytics for e-commerce business.

4. CONCLUSION

This paper used keyword search and cross-references to collected units of analysis and the method of content analysis to reviewed gathered research papers from 2000 to 2020. This paper provided an overview of (i) different metrics and their components applied in customer analytics, (ii) major focuses/ objectives of research papers in literature, (iii) methods used in customer analytics and its inputs, and (iv) benefits and challenges in implementing customer analytics in e-commerce. There are several limitations of this paper, including the number of reviewed papers and the level of quantitative content analysis. As we can see that most of the review papers used quantitative approaches to analyze customers. Although the quantitative approach is good at examining the causal relationships between customer metrics and its components or influencing factors, it is weak in discovering the underlying reasons for the phenomenon. Therefore, future research can deploy qualitative approaches or combine qualitative and quantitative approaches to gain the best insights into

customers. Analytics of customer data, especially bigdata of customers, are relatively new and demanding tasks to micro and small size e-commerce enterprises. Therefore, it is necessary to research and develop analytics applications for online sellers to increase their effectiveness. Studying appropriate countermeasures for larger e-commerce businesses to organize systems to mine customer data and improve the skills as well as engagement of employees at all levels in customer data analytics is also an outlook for future research.

5. ACKNOWLEDGEMENT

This research is funded by Hanoi University of Science and Technology (Grant number T2020-PC-045).

6. REFERENCES

- [1]. Adnan, H. (2014). An analysis of the factors affecting online purchasing behavior of Pakistani consumers. *International Journal of Marketing Studies*, 6(5), 133.
- [2]. Aikaterini C. Valvi, Constantinos C. Frangos, & Christos C. Frangos. (2013). *Behaviour & Information Technology. Online and mobile customer behaviour: A critical evaluation of Grounded Theory studies*. Behaviour & Information Technology.
- [3]. Akter, S., & Wamba, S. F. (2016). Big data analytics in E-commerce: A systematic review and agenda for future research. *Electronic Markets*, 26(2), 173-194.
- [4]. Aldhmour, F., & Sarayrah, S. (2016). An Investigation of Factors Influencing Consumer's Intention to use Online Shopping: An Empirical Study in South of Jordan. *Journal of Internet Banking and Commerce*, 21(2), Article 2.
- [5]. Amado, A., Cortez, P., Rita, P., & Moro, S. (2018). Research trends on Big Data in Marketing: A text mining and topic modeling based literature analysis. *European Research on Management and Business Economics*, 24(1), 1-7.
- [6]. Anders Hasslinger, Selma Hodzic, & Claudio Opazo. (2007). Consumer Behaviour in Online Shopping. *Kristianstad University - Department of Business Studies*.
- [7]. Andriani, L., & Sihombing, S. O. (2015). *Factors Influencing Purchase Intention In Online Shopping*. Conference on Management and Behavioral Studies (CMBS) 2015.
- [8]. Arnold, A. (2019). *Here's How Data And Analytics Can Benefit E-Commerce Business Owners*. Forbes.
<https://www.forbes.com/sites/andrewarnold/2019/01/04/heres-how-data-and-analytics-can-benefit-e-commerce-business-owners/>
- [9]. Atcharyachanvanich, K., & Sonehara, N. (2008). *Cluster Analysis of E-Commerce Customer Profiles based on Trust Perception*. Research Gate.
- [10]. Badrul M. Sarwar, George Karypis, Joseph Konstan, & John Riedl. (2002). *Recommender Systems for Large-scale E-Commerce: Scalable Neighborhood Formation Using Clustering*.
- [11]. Bae, D., Han, K., Park, J., & Yi, M. Y. (2015). AppTrends: A graph-based mobile app recommendation system using usage history. *2015 International Conference on Big Data and Smart Computing (BIGCOMP)*, 210-216.
- [12]. Baig, M. I., Shuib, L., & Yadegaridehkordi, E. (2019). Big data adoption: State of the art and research challenges. *Information Processing & Management*, 56(6), 102095.
<https://doi.org/10.1016/j.ipm.2019.102095>
- [13]. Bilgic, E., & Duan, Y. (2019). E-commerce and Business Analytics: A Literature Review. *International Conference on Digital Economy*, 173-182.
- [14]. Bringula, R. P., Moraga, S. D., Catacutan, A. E., Jamis, M. N., & Mangao, D. F. (2018). Factors influencing online purchase intention of smartphones: A hierarchical regression analysis. *Cogent Business & Management*, 5(1), 1.
- [15]. Bucko, J., Kakalejčik, L., & Ferencová, M. (2018a). Online shopping: Factors that affect consumer purchasing behaviour. *Cogent Business & Management*, 5(1), 1535751.
<https://doi.org/10.1080/23311975.2018.1535751>
- [16]. Chan, S. L., & Ip, W. H. (2011). A dynamic decision support system to predict the value of customer for new product development. *Decision Support Systems*, 52(1), 178-188.
- [17]. Chung-Hoon Park, & Young-Gul Kim. (2003). Identifying key factors affecting consumer purchase behavior in an online shopping context. *Emerald Insight*, 31(1).

- [18]. Davenport, T. H. (2006). Competing on analytics. *Harvard Business Review*, 84(1), 98.
- [19]. Dr. Tabitha Durai, & G. Stella. (2017). A Study On The Effect Of Electronic Customer Relationship Management (Ecrm) On Customer Satisfaction Of E – Commerce Websites. *Journal of Marketing Strategy (JMS)*, 5(3).
- [20]. Durai, T., & Stella. (2017). A Study on The Effect of Electronic Customer Relationship Management (ECRM) on Customer Satisfaction of E-Commerce Websites. *Journal of Marketing Strategy (JMS)*, 5(3), Article 3.
- [21]. Duriau, V. J., Reger, R. K., & Pfarrer, M. D. (2007). A content analysis of the content analysis literature in organization studies: Research themes, data sources, and methodological refinements. *Organizational Research Methods*, 10(1), 5-34.
- [22]. Ellatif, M. M. A., & Darwish, N. R. (2010). Proposed Approach to Evaluate Effect ò E-CRM On Customers' Satisfaction of E-Commerce Websites. *International Journal of Intelligent Computing and Information Science*, 10(2), Article 2.
- [23]. eMarketer. (2019). *Global Ecommerce 2019*. <https://www.emarketer.com/content/global-ecommerce-2019>
- [24]. Grover, P., & Kar, A. K. (2017). Big data analytics: A review on theoretical contributions and tools used in literature. *Global Journal of Flexible Systems Management*, 18(3), 203-229.
- [25]. Gupta, K. K., Sharma, S., & Tyagi, A. (2016). *Factors Influencing Online Shoppers' Perception of Website Quality*. 7.
- [26]. Ha Nam Khanh Giao. (2020). Customer Satisfaction at Tiki.vn E-Commerce Platform. *Journal of Asian Finance, Economics and Business*, 7(4), 173183.
- [27]. Haruechaiyasak, C., Tipnoe, C., Kongyoung, S., Damrongrat, C., & Angkawattanawit, N. (2005). A dynamic framework for maintaining customer profiles in E-commerce recommender systems.
- [28]. Hasina Momtaz, Md. Aminul Islam, Ku Halim Ku Ariffin, & Anayet Karim. (2011). Customers Satisfaction on Online Shopping in Malaysia. *International Journal of Business and Management*, 6(10).
- [29]. Indranil Bose, & Xi Chen. (2009). Exploring business opportunities from mobile services data of customers: An inter-cluster analysis approach. *Electronic Commerce Research and Applications*.
- [30]. Irene S.Y. Kwan, Joseph Fong, & H.K. Wong. (2005). An e-customer behavior model with online analytical mining for internet marketing planning. *Decision Support Systems*, 41, 189-204.
- [31]. Jae-Il Kim, Hee Chun Lee, & Hae Joo Kim. (2004). Factors Affecting Online Search Intention and Online Purchase Intention. *Seoul Journal of Business*, 10(2), 2847.
- [32]. Jagdish N. Sheth. (2002). A Generic Concept of Customer Behaviour. *Journal of Customer Behaviour*.
- [33]. Javadi, M. H. M., Dolatabadi, H. R., Nourbakhsh, M., & Poursaedi, A. (2012). An Analysis of Factors Affecting on Online Shopping Behavior of Consumers. *International Journal of Marketing Studies*, 4(5), Article 5.
- [34]. Jihyun Kim, & Hyun-Hwa Lee. (2008). Consumer product search and purchase behaviour using various retail channels: The role of perceived retail usefulness. *International Journal of Consumer Studies* ISSN, 619627.
- [35]. Kanokwan Atcharyachanvanich, & Noboru Sonehara. (2008). *Cluster Analysis of E-Commerce Customer Profiles based on Trust Perception*. Research Gate.
- [36]. Lee, I. (2017). Big data: Dimensions, evolution, impacts, and challenges. *Business Horizons*, 60(3), 293-303.
- [37]. Ling Jiang, Minjoon Ju, & Zhilin Yang. (2015a). Customer-perceived value and loyalty: How do key service quality dimensions matter in the context of B2C e-commerce? *Research Gate*.
- [38]. Ling Jiang, Minjoon Ju, & Zhilin Yang. (2015b). Customer-perceived value and loyalty: How do key service quality dimensions matter in the context of B2C e-commerce? *Research Gate*.
- [39]. Lipizzi, C., Iandoli, L., & Marquez, J. E. R. (2015). Extracting and evaluating conversational patterns in social media: A socio-semantic analysis of customers' reactions to the launch of new products using Twitter streams. *International Journal of Information Management*, 35(4), 490-503.

- [40]. Mahmoud M. Abd Ellatif. (2007). *A Cluster Technique to Evaluate Effect of ECRM on Customers' Satisfaction of E-commerce websites*.
- [41]. Mikalef, P., Pappas, I. O., Krogstie, J., & Giannakos, M. (2018). Big data analytics capabilities: A systematic literature review and research agenda. *Information Systems and E-Business Management*, 16(3), 547-578.
- [42]. Miyazak, A. D., & Fernandez, A. (2001). Consumer Perceptions of Privacy and Security Risks for Online Shopping. *The Journal of Consumer Affairs*, 35(1), Article 1.
- [43]. Mochammad Auditya Brilliant, & Adrian Achyar. (2013). The Impact of Satisfaction and Trust on Loyalty of E-Commerce Customers. *ASEAN MARKETING JOURNAL*, 5(1), 51-58.
- [44]. Mohammad Hossein Moshref Javadi, Hossein Rezaei Dolatabadi, Mojtaba Nourbakhsh, Amir Poursaeedi, & Department of Management, University of Isfahan, Isfahan, Iran. (2012). An Analysis of Factors Affecting on Online Shopping Behavior of Consumers. *International Journal of Marketing Studies*, 4(5).
- [45]. Mustafa I Eid. (2011). Determinants of E-Commerce Customer Satisfaction, Trust, and Loyalty in Saudi Arabia. *Journal of Electronic Commerce Research*, 12(1), 7893.
- [46]. Na Li, & Ping Zhang. (2002). *Consumer Online Shopping Attitudes and Behavior: An Assessment Of Research*. Americas Conference on Information Systems (AMCIS).
- [47]. Ngai, E. W. T., Xiu, L., & Chau, D. C. K. (2009). Application of data mining techniques in customer relationship management: A literature review and classification. *Expert Systems with Applications*, 36(2, Part 2), 2592-2602.
<https://doi.org/10.1016/j.eswa.2008.02.021>
- [48]. Norizan Kassim, & Nor Asiah Abdullah. (2010). The effect of perceived service quality dimensions on customer satisfaction, trust, and loyalty in e-commerce settings. *Emerald Insight*, 22(3), 351-371.
- [49]. Park, C.-H., & Kim, Y.-G. (2003). Identifying key factors affecting consumer purchase behavior in an online shopping context. *Emerald Insight*, 31(1), Article 1.
- [50]. Perera, W. K. R., Dilini, K. A., & Kulawansa, T. (2018). A review of big data analytics for customer relationship management. *2018 3rd International Conference on Information Technology Research (ICITR)*, 1-6.
- [51]. Pin Luarn, & Hsin-Hui Lin. (2003). A CUSTOMER LOYALTY MODEL FOR E-SERVICE CONTEXT. *Journal of Electronic Commerce Research*, 4(4), 156-167.
- [52]. Rahman, M. A., Islam, M. A., Esha, B. H., Sultana, N., & Chakravorty, S. (2018). Consumer buying behavior towards online shopping: An empirical study on Dhaka city, Bangladesh. *Cogent Business & Management*, 5(1), 1514940.
- [53]. Ramakrishnan Ramanathan. (2011). An empirical analysis on the influence of risk on relationships between handling of product returns and customer loyalty in E-commerce. *Int J. Production Economics*, 130, 255-261.
- [54]. Renhao Jin, Song Han, Tao Liu, & Songnan Xi. (2016). Customer Behavior Analysis on a Tmall E-commerce Shop. *International Journal on Data Science and Technology*, 2(6), 57-61.
- [55]. Senthilkumar, N., & Chandramohan, KL. (2018). A Study on Customer Satisfaction Towards Online Shopping with Reference to Namakkal District. *International Journal of Current Research and Modern Education (IJCRME)*, 3(1), Article 1.
- [56]. Shaikh, S., Rathi, S., & Janrao, P. (2017). Recommendation system in E-commerce websites: A Graph Based Approach. *2017 IEEE 7th International Advance Computing Conference (IACC)*, 931-934.
- [57]. TechCrunch. (2020). COVID-19 pandemic accelerated shift to e-commerce by 5 years. *TechCrunch*.
- [58]. Vakulenko, Y., Shams, P., Hellström, D., & Hjort, K. (2019). Online retail experience and customer satisfaction: The mediating role of last mile delivery. *The International Review of Retail, Distribution and Consumer Research*, 29(3), 306-320.
- [59]. Wamba, S. F., Akter, S., Edwards, A., Chopin, G., & Gnanzou, D. (2015). How "big data" can make big impact: Findings from a systematic review and a longitudinal case study. *International Journal of Production Economics*, 165, 234-246.

- [60]. Wheny Khristianto, Imam Suyadi, & Kertahadi. (2012). The Influence of Information, System Quality, and Service Quality on Customer Satisfaction and Loyalty in Online Shopping. *International Journal of Academic Research/IJAR*, 4(2).
- [61]. Wilding, R., Wagner, B., Seuring, S., & Gold, S. (2012). Conducting content-analysis based literature reviews in supply chain management. *Supply Chain Management: An International Journal*.
- [62]. Yi Jin Lim, Abdullah Osman, Shahrul Nizam Salahuddin, Abdul Rahim Romle, & Safizal Abdullah. (2015). *Factors Influencing Online Shopping Behavior: The Mediating Role of Purchase Intention*. 7th International Economics & Business Management Conference.
- [63]. Zan Huang, Wingyan Chung, & Hsinchun Chen. (2004). A Graph Model for E-Commerce Recommender Systems. *Journal of the American Society for Information Science & Technology*, 55(3), 259-274.
- [64]. Zhang, K. Z. K., & Benyoucef, M. (2016). Consumer behavior in social commerce: A literature review. *Decision Support Systems*, 86, 95-108.

AN INTEGRATIVE MODEL TO MEASURE CUSTOMER TRUST IN E-COMMERCE: LITERATURE REVIEW AND SUGGESTIONS FOR FUTURE RESEARCH IN VIETNAM

Luu Thi Minh Ngoc¹, Hoang Trong Truong^{1*}, Vu Thi Minh Hien¹ and Nguyen Phuong Mai^{2,*}

¹ University of Economics and Business, Vietnam National University Hanoi, Vietnam

² International School, Vietnam National University Hanoi, Vietnam

*Corresponding author: hoangtrongtruong2403@gmail.com; mainp@vnu.edu.vn

Abstract

Existing literature in both developed and developing countries has proved that customer trust in electronic commerce (e-commerce) plays a significant role in shaping purchase intentions. However, even though e-commerce websites in Vietnam are growing remarkably in terms of number and revenue, contributing significantly to national economic growth, there are not many studies on customer trust in e-commerce. Thus, the antecedents of trust have not been thoroughly examined in the Vietnamese e-commerce sector. In this regard, this paper reviews existing studies of trust in e-commerce then proposes an integrative model to measure antecedents of trust in e-commerce websites. The context of e-commerce in Vietnam is also discussed to propose some implications for future research.

Keywords: customer trust, e-commerce website, Vietnam.

1. INTRODUCTION

The development of the Internet in the 20th century has paved the way for the rapid growth of e-commerce, contributing significantly to the global retail industry. In 2019, sales on e-commerce websites reached 3,500 billion dollars and were predicted to double in the next three years (Statista, 2019). With this speed, e-commerce is expected to become the future of the retail industry. Along with the explosion of e-commerce, any electronic vendor (e-vendor) will have to survive in a fiercely competitive environment. Thus, retaining customers becomes imperative for e-vendors, particularly as attracting new customers is much more expensive than for comparable, traditional, brick-and-mortar stores (Gefen et al., 2003). The critical question is what makes customers return to an e-vendor. Many studies have addressed these issues and found that trust is a prerequisite for the success of an e-business (Kim, Ferrin & Rao, 2008). Previous studies also showed that customer trust has a positive impact on their loyalty and buying intention (Choi & Do, 2018; Kooli, Mansour & Utama 2014; Al-dweeri et al., 2017). Similarly, Al-dweeri et al. (2017) indicated that if a person trusts an e-commerce website, he will form not only attitudinal loyalty but also perform behavioral loyalty such as positive word-of-mouth or repeated purchase. In other words, e-trust is vital to building customer loyalty and maintaining a continuous relationship with the consumers (Choi & Do, 2018). Therefore, improving

trust is necessary in order to increase revenue and strengthen the relationship between the firm and the customers.

Up to date, the topic of customer trust antecedents has been studied by many researchers across the globe. As a result, various factors affecting customer trust have been identified in previous research such as trust propensity, privacy, security, reputation, website quality (Kim et al., 2008; Hidayat et al., 2016; Bojang et al., 2017). As trust has been researched by scholars from different disciplines such as economic, social and psychological point of views, previous research on customer trust antecedents in the e-commerce context tends to be fragmented (McKnight & Chervany, 2002; Kim et al., 2008). For example, economists are interested in the characteristics of the trustees that make them trustworthy, while sociologists might want to examine the external environment factors affecting trust (McKnight & Chervany, 2002). Consequently, their conclusions of customer trust are different. Researchers have not yet reached a consensus when it comes to synthesizing, categorizing and forming a unified model of customer trust in e-commerce. For instance, McKnight & Chervany (2002) classified factors affecting customer trust in e-commerce into three groups, namely dispositional, institutional and interpersonal trust.

Meanwhile Kim et al. (2008) used four dimensions which are experience-based, cognition-based, affect-based and personality-oriented trust. Additionally, Kooli et al. (2014) suggested three categories which are cognitive-based, personality-based and institutional-based trust. The various dimensions create confusion, and choosing any approach might risk ignoring factors proposed by other scholars.

In the Vietnamese context, there have been only a few studies examined the determinants of e-commerce customer trust (Nguyen, 2014; Le & Vo, 2013; Choi & Do, 2018). These studies used a limited number of fragmented measurement items. In such a context, it is necessary to take a holistic view of trust and develop an integrative model to measure customer trust, especially in the Vietnamese e-commerce context where customer trust has not been well researched. Such an integrative model will lay a strong foundation for further empirical studies of customer trust antecedents in Vietnam's e-commerce websites. Therefore, this paper aims to propose an integrative research model, which is based on the review of existing literature on customer trust in e-commerce, for further empirical research in Vietnam.

The paper proceeds to develop an integrative model in the following manner. First, a literature review on customer trust is provided to highlight the diversity of definitions and significance of trust in e-commerce and the antecedents of trust. Next, a proposed research framework and measurement scales will be presented. Finally, the paper concludes with suggestions for empirical research in the future.

2. LITERATURE REVIEW

2.1. Electronic commerce

Electronic commerce (e-commerce) involves carrying on a business facilitated by the Internet and other electronic means (Mitra, 2013). An e-commerce site is a virtual place where firms and customers make transactions via computer networks and online services (Bojang et al., 2017). The development of e-commerce in Vietnam has changed shopping behaviors dramatically and brought many benefits to customers as well as businesses (Nguyen, 2018). On the one hand, customers can visit online shops from anywhere with great convenience, which saves more effort and time as compared to shopping in brick and mortar stores. With the help of e-commerce platforms, customers are more informed before making a purchase decision because of the availability of information and reviews about products online. On the other hand, e-commerce allows businesses to introduce more products to mass customers since the store space no longer limits them. Finally, managing business operations and payment

becomes more manageable thanks to information systems as all information related to transactions is updated promptly and precisely.

2.2. Customer trust

Trust is a topic that has been widely researched by scholars from different fields of study. Therefore there are various definitions of trust. Rotter (1980) defined trust as a general expectation of a person that the words, promises, or statements of others are reliable. Rousseau et al. (1998) considered trust as a psychological state in which an individual intends to accept vulnerability based on positive expectations of others' behaviors. Gefen (2000) asserted that trust is "the confidence a person has in his or her favorable expectations of what other people will do, based, in many cases, on previous interactions". Due to the variety in definitions of trust, many researchers have attempted to reach a unified definition based on previous works. The research of Bozic (2017) and Hasnain (2019) pointed out that the most popular definition of trust is from Mayer, Davis & Schoorman (1995). Specifically, trust is the willingness to be vulnerable of the trustor to the trustee's actions with the positive expectation that the trustee will perform a particular action that is not under the control of the trustor. Ferreira (2014) stated that trust is the intention of a party to put itself at risk of being vulnerable with the assumption of good behaviors of the other party. From these abovementioned definitions, it is evident that trust has two characteristics: willing to take a risk (or become vulnerable) and expectation of positive behaviors of the other party. Therefore customer trust can be described as the willingness to take risks of customers based on the positive expectation that the sellers/providers will act upon their commitments.

According to Fortes, Rita & Pagani (2017), customer trust is the determinant in forming a relationship between a buyer and a seller. Specifically, in the context of e-commerce, customers perceive a high level of risk as they are not certain about the sellers or product quality. Once trust is formed, it reduces the perceived risk and uncertainty, thus promoting buying behavior. Kooli et al. (2014) confirmed that trust positively affects buying behavior. Besides, trust is the foundation for customer loyalty and encourages repeated purchases in the future (Choi & Do, 2018; Al-dweeri, 2017).

2.3. Antecedents of customer trust in e-commerce

Many studies have been examining the antecedents of customer trust. Kim et al. (2008) surveyed 468 undergraduate students. They reported that consumer disposition to trust (trust propensity), familiarity, privacy concerns, security concerns, the information quality of the e-commerce website, and its reputation

have a strong impact on customer trust towards an e-commerce website. Meanwhile, Palvia (2009) approached trust from the perspective of the providers' characteristics. The author argued that in order to gain trust from customers, the providers must possess some desirable traits, namely competence, benevolence, and integrity. The survey with 496 business students in the US confirmed this argument. According to the research of Zaman, Jamil & Kazmi (2016) conducted on 200 e-shoppers in Pakistan, website design, customer service, reputation, security, and privacy positively influence customer trust. Hidayat et al. (2016) examined customer trust among 443 e-shoppers in Indonesia and asserted that user interface quality (website quality), information quality, customer service, security, and privacy are antecedents of customer trust. Bojang et al. (2017) investigated trust determinants of Russian consumers and concluded that perceived security, perceived privacy, third-party assurance, reputation, and website quality could influence customer online trust. Al-dweeri et al. (2017) conducted a survey on 302 e-shoppers in Jordan and found a significant link between customer service, customer satisfaction, and trust. Interestingly, this study did not support the relationship between privacy and trust, which is inconsistent with previous research. In the Korean e-commerce context, structural assurance and website quality are the main factors affecting customer trust (Lee et al. 2018). The author defined structural assurance as an institutional trust resulted from safe and secure circumstances. These include high information quality, privacy, and security protection. The findings of Falahat et al. (2019) revealed that brand recognition (reputation), customer service, security, and word-of-mouth (WOM) result in higher levels of consumer trust.

From previous research papers, it can be seen that researchers have identified numerous factors affecting customer trust in e-commerce websites. However, these works have not yet reached a consensus regarding the number of factors. Additionally, some factors are statistically significant in one research but are insignificant in others. This might be due to the difference in the context of each country. Consequently, researchers have not agreed on categorizing and integrating factors into a unified model for future research.

2.4. Vietnamese E-commerce context

In Vietnam, it was not until 2011 that the country's e-commerce market sprang up, promising many opportunities for firms and investors. According to the report of the Vietnam E-Commerce Association (2019), the scale of the local e-commerce market has reached nearly 8 billion dollars, with a growth rate of 30%. If this

trend is maintained, Vietnam will become the third-largest e-commerce market in South East Asia in 2025 (after Indonesia and Thailand). Regarding the user penetration rate, it is estimated that there are about 45 million e-commerce users in 2020, which is equal to 46.9% of Vietnam's total population (Statista, 2020). As a potential market in Asia, Vietnam has attracted many major e-commerce players such as Lazada, Shopee, Tiki and Sendo. According to the analysis of EU-Vietnam Business Network (2018), the attractiveness of Vietnamese e-commerce sector comes from the young population with rising income, and favorable government policy.

Despite the great potential to develop, Vietnam's e-commerce sector is facing many challenges such as lack of customer trust, high adoption rate of cash-on-delivery (COD) payment method, underdeveloped logistics facilities and poor technology infrastructure (EU-Vietnam Business Network, 2018; Dang, 2020). Among the mentioned issues, the lack of customer trust is quite common yet severely impacts e-commerce firms. The lack of trust is one of the reasons why customers refuse to adopt e-commerce in Vietnam. According to the Vietnam e-commerce White Book released by e-Commerce and Digital Economy Agency (2020), 40% of respondents who are e-commerce non-users stated that they do not trust the provider. Additionally, a majority of Vietnamese customers stated that they doubt the quality of products or the security of e-commerce websites (Choi & Do, 2018). The report of EU-Vietnam Business Network (2018) suggested that the lack of trust is a significant reason leading to the fact that 89% of transactions on e-commerce websites in Vietnam use COD instead of e-payment method. The relationship between the adoption of COD and the lack of trust has also been confirmed in previous study (Halaweh, 2018). It shows that many customers neither trust the quality of products nor online payment method on e-commerce websites. Additionally, Yang et al. (2018) pointed out that Vietnamese customers remain skeptical towards e-commerce platforms because they concern about unethical actions that might occur in online transactions.

It is obvious that improving trust is critical for e-commerce firms; however, factors affecting customer trust is not thoroughly studied in Vietnam. Choi & Do (2018) examined the impact of 5 dimensions of service quality on customer trust. Their results showed that usefulness, security, responsiveness and assurance positively affected customer trust. The study of Nguyen (2014) concluded that satisfaction and service quality dimensions, including ease of use, website design, responsiveness, customization and assurance have a

positive impact on trust. These research papers only approach customer trust from a service quality perspective. In addition to service quality, Le & Vo (2013) pointed out that reputation, system quality and third-party recognition are antecedents of customer trust. However, this study is narrow in scope as it only focused on youngsters in Ho Chi Minh city.

Moreover, the number of factors presented in the research is small as compared to previous research in other countries. Nguyen & Pham (2019) using the approach of Kooli et al. (2014) attempted to categorize antecedents of customer trust into three dimensions, including personality-based, cognitive-based and institution-based trust. However, this categorization ignores trustor's factor (such as trust propensity) and third party's factor (such as guarantee seals and word-of-mouth) which have been confirmed in previous research.

3. A PROPOSED INTEGRATIVE MODEL

McKnight & Chervany (2002) explained that the existence of different definitions of trust reflected varying disciplines of researchers. McKnight & Chervany (2002) had collected 65 definitions of trust in 80 articles before analyzing and categorizing them into three disciplines (psychology, sociology, and economics). According to the psychological point of view, trust is a part of personal characteristics; it is shaped by a person's culture and life experience. Since trust is personal and subjective, each individual will form a different stance to trust based on their own experience. McKnight & Chervany (2002) used the term dispositional dimension to refer to the group of customer's personal factors that affect their tendency to be willing to rely on others in general. By contrast, sociologists say that trust is situationally constructed. It is not determined by personal factors but by external factors such as environment or situation. All environmental factors are grouped and referred to as an institutional dimension. Meanwhile, from an economics opinion, trust is the willingness to rely on exchange partners. According to this viewpoint, trust only forms when the partner possesses some traits that make them trustworthy. These traits are categorized as interpersonal dimensions. In summary, according to the interdisciplinary approach of McKnight & Chervany (2002), customer trust is the combination of factors from the customer's side, the environment where the transaction takes place, and the provider's side.

The approach of McKnight & Chervany (2002) assumes that there are only two parties interacting with each other on a shared platform/system, and trust is determined by these factors. However, according to Head & Hassanein

(2002) and Bojang et al. (2017), there are three main parties involving in the transaction, including the customer, the provider, and the referee. Referees are defined as third-parties who provide objective recommendations or assessments about a particular business to customers. Their opinions heavily affect customer trust (Head & Hassanein, 2002). This research combines both points of view to propose four factors influencing customer trust in e-commerce.

3.1. Customer's personal factors

Customers' personal factors include those related to customer personality or experience that shape their tendency to trust others. Several factors on the side of customers have been identified in previous studies. First of all, customer trust is affected by trust propensity (Mayer et al., 1995, Heyns & Rothmann, 2015; Kim et al., 2008; Colquitt, Scott & Lepine, 2007). According to (Mayer et al., 1995), trust propensity refers to the tendency of the customer to trust humans in general. Trust propensity determines the level of trust that a person has to others before they interact (blind trust). This is a part of their personality and is affected by their cultural background and developmental experiences. Heyns & Rothmann (2015) suggested that individual trust propensity is the baseline level that will have an impact on one's willingness to rely on others. Trust propensity acts as a reference point to decide whether the other party should be trusted. Therefore, customers with high trust propensity are likely to trust providers, and vice versa (Lee et al., 2018).

Walczuch & Lundgren (2004) stated that individual experience with e-commerce is a factor that influences customer trust. This experience is accumulated after each time customers interact with providers. Kim et al. (2008) used the term "familiarity" to refer to customer experience. However, not all experiences can create trust in the customer. Notably, it is argued that negative customer experience makes customers lose trust and change their providers, whereas it is the satisfaction of customers that lays the basis for trust (Leninkumar, 2017). Customer satisfaction is defined as positive assessments of customers resulting from good experience with the providers. High customer satisfaction is believed to lead to customer trust (Al-dweeri et al., 2017). Fang et al. (2014) explained that individuals tend to form a firm belief based on past interaction. Customer satisfaction with the previous transaction can increase the confidence of customers to trust their providers.

Finally, customer's Internet expertise also impacts their trust in e-commerce websites. The research of Dutton & Shepherd (2006) showed that experienced users tend to

trust the Internet as a trading platform more than non-users. People who have experience using the Internet to perform transactions are more likely to trust in e-commerce platforms (Tan & Sutherland, 2004; Fang et al., 2014).

3.2. Environmental factors

The trading environment in e-commerce refers to websites or business platforms where transactions are conducted. Therefore, environmental factors include favorable conditions of those websites or platforms that facilitate a successful transaction. These factors can hinder or facilitate the transaction between the two parties.

In order to gain trust, the trading environment has to set favorable conditions for a successful transaction (McKnight & Chervany, 2002). In an online context, the trading environment should provide assurance for customers (Tan & Sutherland, 2004). On e-commerce websites, assurance comes from security features to protect the private information of customers (Hidayat et al., 2016; Bojang et al., 2017). Cheung & Lee (2001) defined security as methods to protect the safety of personal information and transaction against the invasion of a third party. Some researchers tried to separate security and privacy as two factors influencing trust (Kim et al., 2008, Bojang et al., 2017). However, we argue that the aim of security on e-commerce websites is to protect personal and transaction information from disclosure to a third party. Therefore, security should include privacy. Gao & Yao (2012) considered security as the most important factor in e-commerce as it protects customers against attacks from hackers. Security reduces perceived risks, thus promote trust in customers (Zaman et al. 2016).

According to Kim et al. (2008), information quality on e-commerce websites greatly influences customer trust. Regarding the online transaction, the lack of information is the reason for customer concerns. In particular, customers are unable to acquire all information related to products. Thus they are the disadvantaged side in the transaction. Customers always tend to believe that their providers will make use of information advantage to gain profit, which results in a loss for customers. The information provides evidence for customers' decision to trust their providers. It has been proved that if customers are provided with high-quality information, they are more likely to gain trust (Hidayat et al., 2016; Gao & Yao, 2012; McKnight et al., 2017).

Moreover, the website interface significantly influence customer trust (Hidayat et al., 2016; Zaman et al., 2016). The website interface is the exterior design of a website

in which customers directly interact when they visit an e-commerce site. Hidayat et al. (2016) asserted that the website interface provides physical evidence of the provider; thus, it decreases the level of uncertainty. Zaman et al. (2016) considered the e-commerce website to act as a bridge between customers and providers. Via the website interface, customers can assess service quality as well as the credibility of that e-commerce site. Karimov et al. (2011) stated that website cues successfully boost up customer's initial trust toward new online vendors. McKnight et al. (2017) argued that customers perceive a high level of credibility when they interact with a user-friendly website; therefore, they form a greater trust.

3.3. Provider's factors

Characteristics of providers that make them trustworthy belong to the provider's factors. According to Lee et al. (2018), when a customer (trustor) purchases goods on an e-commerce site, he faces two trustees that are the e-commerce platform provider and the merchant who sell the goods. The authors posited that the trust in the platform provider would lead to the trust in the merchant. The primary purpose of this article is to identify the antecedents of trust in an e-commerce site; therefore, the characteristics of the platform provider will be considered.

Schoorman, Mayer & Davis (2007) reported that there are three traits of providers that directly influence customer trust, including ability, benevolence, and integrity. Ability refers to the competence, advantage, or skills of providers in a specific area that helps them fulfill their commitments with customers. This means the providers are not always trusted in every field, and customers only trust whom they consider as experts in an area of interest. In an online purchase, providers are trusted if they can provide customer services or products in a proper and convenient way (McKnight & Chervany, 2002). Meanwhile, benevolence means the extent to which a provider stand on the customer's side and put their interest above his own interest. A benevolent provider always makes an effort to support customers in order to reduce risk in the transaction. Finally, integrity stands for honesty, sincerity and transparency. The influence of these three traits on customer trust is widely supported by later research (Gefen & Straub, 2004; Oliveira et al., 2017). According to Heyns & Rothmann (2015), although previous articles mentioned a variety of providers' traits, they are included in 3 traits as proposed by Schoorman et al. (2007).

Furthermore, the impact of the reputation of providers on customer trust should be taken into account.

Providers' reputation is built up by repeatedly fulfilling their commitment with customers in the past (Kim et al., 2008). Customers tend to expect and believe that the providers will continuously deliver desired outcomes. Reputation is the guarantee for the quality of services and products. Hence customers always prioritize well-known providers to reduce risks (Zaman et al., 2016). In e-commerce, customers trust providers with high reputation with an expectation that the transaction will be successfully conducted (Bojang et al., 2017).

3.4. Referees

Referees are third-party individuals, groups or agents giving unbiased assessment about a business to consumers (Bojang et al., 2017). They can exist in the form of word-of-mouth or third-party seals.

Third-party seals could be a determinant of customer trust. Aiken & Boush (2006) used the term trusted signal to refer to third-party seals. It is defined as a mark, logo, picture, or symbol that is provided by a third party to lessen concerns about the trustworthiness of a site. The seals function as privacy, security, or business credibility validators. E-commerce websites granted with a third-party seal show that they adhere to specific standards for conducting business, and a credible third-party regulator assures it. Therefore, it is likely that customers will trust an e-commerce website with third-party seals (Chang et al., 2013). However, there is a lack of consensus on the influence of third-party seals on customer trust. Some studies confirmed a positive influence (Jiang et al., 2008; Chang et al., 2013; Wu et al., 2010, Bojang et al., 2017), whereas other did not (McKnight et al., 2004; Kim et al., 2008). Until further research confirms the relationship between third-party seals and customer trust, it should be treated as a potential factor.

Ha (2004) reported that word-of-mouth (WOM) is an antecedent of customer trust in an online environment. It is defined as informal communication about business among consumers. WOM can take the form of conversation among friends, family members, or online reviews from previous customers. Through WOM, customers can decide whether to trust an e-commerce website based on others' opinions and evaluations. Positive WOM could cultivate brand trust towards an e-commerce website (Ha, 2004; Kuan & Bock, 2006; Alam & Yasin, 2010).

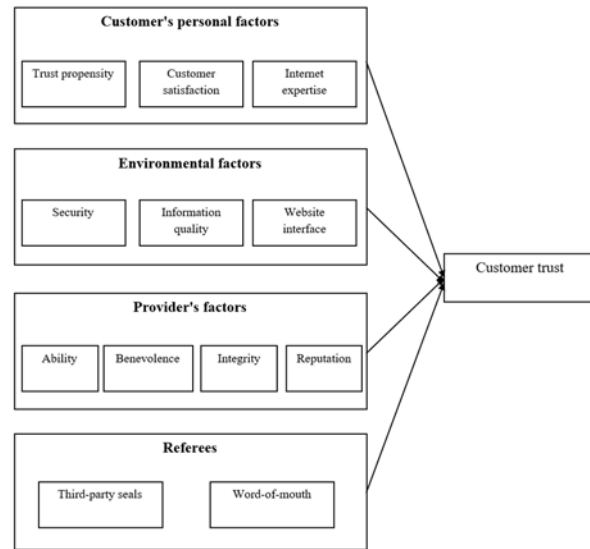


Fig. 1: An integrative model to measure customer trust

(Source: Adapted and proposed by the authors)

The proposed measurement scale of this research is adapted from previous works of Lee et al. (2018), Fang et al. (2014), Zaman et al. (2016), Kim et al. (2008), Gefen & Straub (2004), Corbitt et al. (2003), Kuan & Bock (2006) and Oliveira et al. (2017). The proposed measurement scale below can assist further empirical studies on factors influencing customer trust on Vietnam's e-commerce websites.

Table 1: Proposed measurement scales

Constructs	Measurement Items	Source
Trust Propensity	I always believe people until they show me a proper reason not to believe them	Lee et al. (2018)
	In general, I willingly believe people when I first meet them	
	It is my typical approach that I trust new people until they show I not believe them	
	I generally have faith in humanity	
	I understand that people are trustworthy in general	
Customer Satisfaction	Overall, I was extremely satisfied	Fang et al. (2014)
	Overall, I was extremely pleased	

Constructs	Measurement Items	Source	Constructs	Measurement Items	Source
	My expectations were exceeded			Browsing on this website is easy	
Internet Expertise	I know a lot about conducting purchases via the Internet	Fang et al. (2014)	Website interface	I perceive the shopping experience as if I were buying in a physical store	Zaman et al. (2016)
	I am experienced in conducting purchases via the Internet			The site has an attractive, modern and professional design	
	I am an expert buyer of products/services via the Internet			Buying is fun because the site contains images	
	I am informed about conducting purchases via the Inter				
Security	It is safe and has a privacy policy regarding customer information	Zaman et al. (2016)	Ability	The vendor is competitive	
	The site informs the customer about security and privacy policies			The vendor comprehends the market well	
	I feel safe when send personal information			The vendor comprehends the products well	
	I think the site has warrantee the safe transmission of its user's information		The vendor has the ability to offer excellent service		
	I think my rights regarding my personal details are respected		Benevolence	The intention of vendor is benevolence	Gefen & Straub (2004), Corbitt et al. (2003)
Information Quality	This website provides correct information about the item that I want to purchase	Kim et al. (2008)			
	Overall, I think this website provides useful information		If I make requests, the vendor will help me at full stretch		
	This website provides timely information on the item		I believe the vendor will look after consumers' interests		
	This website provides reliable information		Integrity	I consider the vendor is with integrity	
	This website provides sufficient information when I try to make a transaction			The product information released by the vendor is real	
	Overall, the information this website provides is of high quality			The vendors will keep their commitments	
			Reputation	The suggestions of vendors are made based on their optimal judgment	Kim et al. (2008)
				This provider is well known	
				This provider has a good reputation	

Constructs	Measurement Items	Source
	This provider has a reputation for being honest	
	I am familiar with the name of the provider	
Third-party seals	I feel safe conducting business with this provider because a third party will protect me.	Bojang et al. (2017)
	I feel safe in buying from this provider because of its seals of guarantees.	
	I feel safe in buying from this provider as it has a strong credit rating from third party companies.	
Word-of-mouth	My referral sources encourage me to purchase online from this provider	Kuan & Bock (2006)
	My referral sources recommend that I purchase online from this provider	
	My referral sources share with me their positive opinions about this provider	
Trust	I like to trust this provider	Oliveira et al. (2017)

(Source: Adapted and proposed by the authors)

4. CONCLUSION

Customer trust in e-commerce is still a salient topic that needs more investigation in a transition economy like Vietnam. Thus, identifying the antecedents of customer trust on e-commerce websites is very important as it provides business owners with solutions to consolidate their relationship with customers and achieve greater customer satisfaction and loyalty. Previous studies of e-commerce in Vietnam are limited in number and have not used a holistic approach to examine customer trust. In this regard, our paper proposes an integrative model of 12 factors influencing customer trust on e-commerce websites which are categorized into four groups (customer's personal factors, environmental factors, provider's factors, and referees). We also suggest that this integrative model needs to be tested in the Vietnamese context to validate the reliability of

measurement scales. Future empirical research might be conducted with different groups of customers to gain more thorough evidence of customer trust.

5. REFERENCES

- [1] Aiken, K. D. & Boush, D. M. (2006). Trustmarks, objective-source ratings, and implied investments in advertising: Investigating online trust and the context-specific nature of internet signals. *Journal of the Academy of Marketing Science* 34(3), 308-323.
- [2] Alam, S. S. & Yasin, N. M. (2010). The antecedents of online brand trust: Malaysian evidence. *Journal of Business Economics and Management* 11(2), 210-226.
- [3] Al-dweeri, R. M., Obeidat, Z. M., Al-dwirty, M. A., Alshurideh, M. T., & Alhorani, A. M. (2017). The impact of e-service quality and e-loyalty on online shopping: Moderating effect of e-satisfaction and e trust. *International Journal of Marketing Studies*, 9(2), 92-103.
- [4] Bojang, I., Medvedev, M. A., Spasov, K. B. & Matvevnina, A.I. (2017). Determinants of trust in B2C e commerce and their relationship with consumer online trust. *AIP Conference Proceedings* 1910, 020001, <https://doi.org/10.1063/1.5013938>
- [5] Bozic, B. (2017). Consumer trust repair: A critical literature review. *European Management Journal*, 35(4), 538-547.
- [6] Chang, M. K., Cheung, W. & Tang, M. (2013). Building trust online: Interactions among trust building mechanisms. *Information & Management*, 50(7), 439-445.
- [7] Cheung, C., & Lee, M. (2001). Trust in Internet shopping: Instrument development and validation through classical and modern approaches. *Journal of Global Information Management*, 9(3), 23-35.
- [8] Choi, Y., & Do, QM (2018). The sustainable role of the E-trust in the B2C e-commerce of Vietnam. *Sustainability*, 10(1), 1-18.
- [9] Colquitt, J. A., Scott, B. A. & Lepine, J. A. (2007). Trust, trustworthiness, and trust propensity: A meta analytic test of their unique relationships with risk taking and job performance. *Journal of Applied Psychology*, 92(4), 909-927.
- [10] Corbitt, B.J., Thanasankit, T. & Yi, H. (2003). Trust and e-commerce: a study of consumer perceptions. *Electronic Commerce Research and Applications*, 2(3), 203-215.

- [11] Dang, H. L. (2020). Vietnam's Booming E-commerce Market. *ISEAS Yusof Ishak Institute*, 2020(4), 1-11.
- [12] Dutton, W., & Shepherd, A. (2006). Trust in the Internet as an experience technology. *Information, Communication & Society*, 9(4), 433-451.
- [13] E-Commerce and Digital Economy Agency – Ministry of Industry and Trade (2020). *Vietnam E-Commerce White Book 2020*. Retrieved on 1/10/2020 at <http://idea.gov.vn/?page=document>
- [14] EU – Vietnam Business Network (2018). *E-Commerce Industry in Vietnam*. Retrieved on 30/9/2020 at <http://www.ukabc.org.uk/wp-content/uploads/2018/09/EVBN-Report-E-commerce-Final-Update-180622.pdf>
- [15] Falahat, M., Lee, Y-Y., Foo, Y-C. & Chia, C-E. (2019). A model for consumer trust in e-commerce. *Asian Academy of Management Journal*, 24(2), 93-109.
- [16] Fang, Y., Qureshi, I., Sun, H., McCole, P., Ramsey, E. & Lim, K. (2014). Trust, satisfaction, and online repurchase intention: The moderating role of perceived effectiveness of E-commerce institutional mechanisms. *MIS Quarterly*, 38(2), 407-A9.
- [18] Ferreira, A.T. (2014). Organizational trust: Mayer, Davis and Schoorman model, a review. In book: *QUAESTI, Psychology, Sociology and Pedagogy*. Publisher: University of Zilina, Slovak Republic, 253-256.
- [18] Fortes, N., Rita, P. & Pagani, M. (2017). The effects of privacy concerns, perceived risk and trust on online purchasing behaviour, *Int. J. Internet Marketing and Advertising*, 11 (4), 307-329.
- [19] Gao, H., & Yao, J. (2012). A multi-dimensional trust model in e-commerce. *2012 IEEE International Conference on Computer Science and Automation Engineering (CSAE)*, 2, 653-657.
- [20] Gefen, D (2000). E-commerce: The role of familiarity and trust. *Omega* 28(6), 726-737.
- [21] Gefen, D. & Straub, D. W. (2004) Consumer Trust in B2C E-Commerce and The Importance of Social Presence: Experiments in E-Products and E-Services. *The International Journal of Management Science*, 32, 407-424.
- [22] Ha, HY. (2004). Factors influencing consumer perceptions of brand trust online. *Journal of Product & Brand Management* 13(5), 329-342.
- [23] Halaweh, M. (2018). Cash on Delivery (COD) as an Alternative Payment Method for E-Commerce Transactions. *International Journal of Sociotechnology and Knowledge Development*, 10(4), 1-12.
- [24] Hasnain, S. S. (2019). Trust-significance, definitions and dimensions: A literature search. *Archives of Business Research*, 7(2), 26-32.
- [25] Head, M., & Hassanein, K. (2002). Trust in e-Commerce: Evaluating the Impact of Third-Party Seals. *Quarterly Journal of Electronic Commerce*, 3(3), 307-325.
- [26] Heyns, M. & Rothmann, S. (2015). Dimensionality of trust: An analysis of the relations between propensity, trustworthiness and trust. *SA Journal of Industrial Psychology*, 41(1), 1-12.
- [27] Hidayat, A., Saifullah, M. & Ishak, A. (2016). Determinants of satisfaction, trust, and loyalty of Indonesian e-commerce customer. *International Journal of Economics and Management* 10 (S1), 151-166.
- [28] Jiang, P., Jones, D. B. & Javie, S. (2008). How third-party certification programs relate to consumer trust in online transactions: an exploratory study. *Psychology & Marketing*, 25(9), 835-858.
- [29] Karimov, F. P., Brengman, M., Van Hove, L., & Van, L. (2011). The effect of website design dimensions on initial trust: a synthesis of the empirical literature. *Journal of Electronic Commerce Research*, 12(4), 272-301.
- [30] Kim, D., Ferrin, D., & Rao, H. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision Support Systems*, 44(2), 544-564.
- [31] Kooli, K., Mansour, B.K. & Utama, R. (2014). Determinants of online trust and their impact on online purchase intention. *International Journal of Technology Marketing* 5, 9(3), 305-319.
- [32] Kuan, H.H., & Bock, G.W., (2007). Trust transference in brick and click retailers: An investigation of the before-online-visit phase. *Information & Management*, 44(2), 175-187.
- [33] Le, T.D. M., & Vo, L. B. (2013). Factors influencing the trust of young customers while using e-commerce websites. *Journal of Science HCMC OU – Economics and Business Administration*, 3(1), 79-94.

- [34] Lee, S.J., Ahn, C., Song, KM & Ahn, H. (2018). Trust and distrust in E-commerce. *Sustainability*, 10(4), 1015.
- [35] Leninkumar, V. (2017). The relationship between customer satisfaction and customer trust on customer loyalty. *International Journal of Academic Research in Business and Social Sciences*, 7(4), 450-465.
- [36] Mayer, R. C., Davis, J. H. & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management. The Academy of Management Review*, 20(3), 709 -734.
- [37] Mcknight, D. & Chervany, N. (2002). What trust means in e-commerce customer relationships: An interdisciplinary conceptual typology. *International Journal of Electronic Commerce* 6(2), 35-39.
- [38] McKnight, D. H., Kacmar, C. J. & Choudhury, V. (2004). Shifting Factors and the Ineffectiveness of Third Party Assurance Seals: A two-stage model of initial trust in a web business. *Electronic Markets*, 14(3), 252-266.
- [39] Mcknight, D., Lankton, N., Nicolaou, A., & Price, J. (2017). Distinguishing the effects of B2B information quality, system quality, and service outcome quality on trust and distrust. *The Journal of Strategic Information Systems*, 26(2), 118-141.
- [40] Mitra, A. (2013). E-Commerce in India - a review. *International Journal of Marketing, Financial Services & Management Research*, 2(2), 126-132.
- [41] Nguyen, H. T., (2014). Factors Affecting Customer Satisfaction and Trust in an E-commerce setting: a Case Study of Muachung. vn in Vietnam. *AU-GSB e-JOURNAL*, 7(1), 43-52.
- [42] Nguyen, N. H. (2018). *Niềm tin người tiêu dùng trong thương mại điện tử của doanh nghiệp Việt Nam [Customer trust in e-commerce in Vietnam]*. Industry and Trade Magazine. Ministry of Industry and Trade of Vietnam. Retrieved on 6/3/2020 at <http://www.tapchicongthuong.vn/bai-viet/niem-tin-nguoi-tieu-dung-trong-thuong-mai-dien-tu-cua-doanh-nghiep-viet-nam-54479.htm>
- [43] Nguyen, T.M.A., & Pham, T.T.H. (2019). Exploring the Vietnamese Consumer's Trust in E-commerce. *VNU Journal of Science: Economics and Business*, Vol. 35, No. 5E (2019) 1-12.
- [44] Oliveira, T., Alinho, M., Rita, P., & Dhillon, G. (2017). Modelling and testing consumer trust dimensions in e-commerce. *Computers in Human Behavior*, 71(C), 153-164.
- [45] Palvia, P. (2009). The role of trust in e-commerce relational exchange: A unified model. *Information & Management* 46 (4), 213-220.
- [46] Rousseau, D., Sitkin, S., Burt, R., & Camerer, C. (1998). Not so different after all: A Cross-discipline view of trust. *Academy of Management Review*, 23(3): 393-404.
- [47] Rotter, J.B. (1980). Interpersonal trust, trustworthiness and gullibility. *American Psychologist*, 35(1), pp. 1-7.
- [48] Schoorman, F., Mayer, R., & Davis, J. (2007). An Integrative Model of Organizational Trust: Past, Present, and Future. *The Academy of Management Review*, 32(2), 344-354
- [49] Statista (2020). *E-Commerce – Vietnam*. Retrieved on 1/10/2020 at <https://www.statista.com/outlook/243/127/ecommerce/vietnam#market-revenue>
- [50] Statista (2019). *Retail e-commerce sales worldwide from 2014 to 2023*. Retrieved on 6/3/2020 at <https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/>
- [51] Tan, F.B. & Sutherland, P. (2004). Online consumer trust: a multi-dimensional model, *Journal of Electronic Commerce in Organizations*, 2(3), 40-58.
- [52] Vietnam E-commerce Association (2019). *Vietnam e-business index report 2019*. Retrieved on 6/3/2020 at <http://www.vecom.vn/tai-lieu/bao-cao-chi-thuong-mai-dien-tu-viet-nam-2019>
- [53] Walczuch, R. M. & Lundgren, H. (2004). Psychological antecedents of institution-based consumer trust in e-retailing. *Information & Management*, 42(1), 159-177.
- [54] Wu, G., Hu, X., & Wu, Y. (2010). Effects of perceived interactivity, perceived web assurance and disposition to trust on initial online trust. *Journal of Computer-Mediated Communication*, 16(1), 1-26.
- [55] Yang, Z.D., Ngo, Q.V., & Than, S.T. (2018). Development a New Scale for Consumers' Perception About the Ethics of Retailers in B2C E-Commerce in Developing Countries: Evidence from Vietnam. *Journal of Marketing and Consumer Research*, 47, 15-22.
- [56] Zaman, Y., Jamil, R.A. & Kazmi, Z. (2016). Antecedents of trust in online environment: A case of Pakistan. *Management Science Letters*, 6(3), 193-20.

GREEN MARKETING MIX: A SYSTEMATIC REVIEW OF LITERATURE

Nguyen Thi Mai Anh, Pham Thi Thanh Huong¹

¹Hanoi University of Science and Technology

Email: anh.nguyenthimai@hust.edu.vn

Abstract

Over the past decades, environmental sustainability has raised at the top of the international political agenda and has been recognized as a key driver of innovation. As a result, the number of companies developing green products has been rapidly growing and consumers have shown an increasing interest for these products. For this reason, deeply understanding Green Marketing would foster both cleaner production through the development of green products and, and sustainable consumption through the successful marketing of them (Rosa and Daniele, 2017). Green marketing has a substantial body of academic research. To this aim, this paper reviews systematically the emerged literature on green marketing. It specifically analyzes: 1) the dominant definitions of Green Marketing and their evolution over time, and 2) the characteristics of Green Marketing Mix elements. A conceptual framework of green marketing mix has been identified for future research direction based on green marketing mix. This study provides an in-depth analysis and synthesis of the body of knowledge and provide a comprehensive overview of green marketing mix, as such, it has important implications for managers, scholars, and students.

Keywords: Green Marketing Green marketing mix.

1. INTRODUCTION

In Vietnam (2018), there are about 183 industrial parks, over 60% of industrial parks do not have a centralized wastewater treatment system. In urban areas, only about 60% - 70% of solid waste is collected, infrastructure for drainage and wastewater treatment, waste, so it can not meet the requirements of environmental protection. Most of the wastewater is contaminated with grease, cleaning chemicals, dye chemicals, etc., and has not been treated directly into natural rivers and lakes. According to national center of information and data forecast, Vietnam ranked 20th in the world in the generation of plastic waste with 3.27 million tons per year and ranked among the top countries with the incomplete proportion of plastic waste, accounting for 5.76% of the total plastic waste, which is not fully treated worldwide (Jambeck et al. 2015). The average plastics consumption in 2019 was 41 kilograms per head, or 10 times higher than the 3.8 kilograms per head in 1990 (Vietnam net, 2020).

The growing international concerns about environmental sustainability and climate change are leading all companies to face the challenge of integrating environmental issues into business strategy and activities (e.g. Nidumolu et al., 2009). Successfully developing and manufacturing environmentally sustainable products or services are essential for reducing the environmental impact of industrial activities and fostering cleaner production. Marketing is fundamental for this process since marketing inputs are

essential for defining product concept and design. Marketing is essential also in this process since it can play a key role for the creation of a green market (e.g. Rex and Baumann, 2007) by communicating with consumers to increase their awareness about environmental sustainability and informing them about the benefits of environmentally sustainable products and services. Thus, marketing is very relevant for fostering both cleaner production and sustainable consumption.

Previous studies focused mainly on green marketing strategies. Other studies examined relationship between green products and intention (Laroche et al., 2001). Very few studies have examined systematically the evolution of green marketing and its green marketing mix. This is important as green marketing is understood differently for different scholars and managers. It is therefore, this study will focus on reviewing "Green Marketing" and "green marketing mix". This study will provide an in-depth analysis and synthesis of the body of knowledge and provide a comprehensive overview of green marketing mix, as such, it has important implications for managers, scholars, and students.

2. GREEN MARKETING AND GREEN MARKETING MIX

a. Green marketing and its evolution

There is no universal definition of green marketing and its dimensions. Although a common element within the definition is explicit inclusion of environmental awareness in marketing management (Qingyun Zhu and

Joseph Sarkis, 2016). In 1975, the American Marketing Association introduced the term green marketing via a workshop on “Ecological Marketing”. Green marketing has also been called environmental marketing, ecological marketing, social marketing, and sustainability marketing. It is a broad concept with three key components (Polonsky, 1997): 1) it is a subset of marketing; 2) it evaluates both positive and negative activities; and 3) it examines a range of environmental issues. This conceptual definition is only one of many for green marketing.

Green marketing comprises of two words: Green & Marketing; it is an eco-friendly idea to the need for quality, performance, affordable pricing & convenience without having a detrimental effect on environment. It is primarily an idea towards planet earth that produces a product or service that may be environmentally friendly or being manufactured in an eco-friendly way. The green marketing has evolved over a period of time. According to Peattie (2001), the evolution of green marketing has three phases. First phase was termed as "Ecological" green marketing, and during this period all marketing activities were concerned to help environment problems and provide remedies for environmental problems. Second phase was "Environmental" green marketing and the focus shifted on clean technology that involved designing of innovative new products, which take care of pollution and waste issues. Third phase was "Sustainable" green marketing. It came into prominence in the late 1990s and early 2000.

The concept of Green Marketing significantly evolved since it was first defined by Hennion and Kinnear (1976) as “concerned with all marketing activities that have served to help cause environmental problems and that may serve to provide a remedy for environmental problems”. Peattie (2001b, p.130) identified in this definition the beginning of the so-called First Age: “Ecological”. In this First Age, Green Marketing is seen as a subset of activities with a narrow field of action in an “end-of-pipe” view (Ottman, 1993); the focus is on specific environmental problems (such as, air pollution or natural resource depletion) and industries, with few companies and consumers actually changing their behavior (Peattie, 2001b).

With the growing awareness of global environmental problems and the acknowledgement of the interdependence among environment, society, and economy (starting from the end of the 1980s), marketing begins to channel its efforts not only in terms of reduction of environmental damage, but also in terms of achieving sustainability broadly. This is the so called Second Age: “Environmental” Green Marketing (Peattie, 2001b). Peattie (1995) defined this new idea of Green Marketing as “the holistic management process responsible for identifying, anticipating and satisfying

the needs of customers and society, in a profitable and sustainable way” (Peattie, 2001b). This Age is characterized by a move away from end-of pipe solutions towards “clean technology”, by the recognition that companies' socio-environmental performance may lead to competitive advantage, and by the awareness of broader global problems, such as climate change, biodiversity loss, and poverty (Peattie, 2001b).

Fuller (1999) introduced the third condition to satisfy, beyond customer needs and company goals: eco-system sustainability. Fuller (1999; p.4) defined Green Marketing as “the process of planning, implementing and controlling the development, pricing, promotion, and distribution of products in a manner that satisfies the following three criteria: (1) customer needs are met, (2) organizational goals are attained, and (3) the process is compatible with eco-systems”. According to Gheorghiu et al. (2013) eco-marketing is intended to harmonize the interests of consumers with environmental requirements. The Third Age of Green Marketing (“Sustainable” Green Marketing) requires a more radical approach: marketers should seek “to meet the full environmental costs of production and consumption to create a sustainable economy” (Peattie, 2001b). It entails moving from product ownership to product use, from products to services, from linear to closed-loop supply chains, from global distribution chains to re-localization of supply systems.

Regarding the different terms used in the literature, Van Dam and Apeldoorn (1996) and Kumar et al. (2013) explained the evolution of them and their meaning. van Dam and Apeldoorn (1996) highlighted that there are three slightly different concepts linking marketing to the natural environment (namely, ecological, green, and sustainable) that are included under the label of environmental marketing. The authors claimed that in ecological marketing environmental friendliness is motivated by moral issues, in green marketing it is driven by market pressures, while sustainable marketing can help companies to adopt a long-term perspective and value continuity profit, so contributing to find trade-offs between business objectives and environmental issues. Kumar et al. (2013) analyzed the evolution of the concept of what they call “Sustainability Marketing”, highlighting that the initial concept of ecological marketing developed into green, greener, sustainable and, finally, sustainability marketing, which incorporates all three dimensions of sustainability (economic, environmental, and social).

b. Green marketing Mix

The marketing mix strategy approach is traditional marketing management tools. Marketing mix consists of the 4Ps: product, price, place and promotion (Yudelson, 1999). It is a practical categorization used by marketers. In the following sections, a focus will be made on each of the 4 Green Ps.

Product

Many authors have tried to provide a definition for Green Products. Peattie (1995, p. 181) defined a product as "green" "when its environmental and societal performance, in production, use and disposal, while Ottman et al. (2006, p. 24) highlighted that" although no consumer product has a zero impact on the environment, in business, the terms "green products" or "environmental product" are used commonly to describe those that strive to protect or enhance the natural environment by conserving energy and/or resources and reducing or eliminating use of toxic agents, pollution, and waste". Environmentally friendly features of products could be shown in different life cycle phases: before usage, during usage, and after usage (Dangelico and Pontrandolfo, 2010), and products should be designed as "green" since the conception stage (Commission of the European Communities, 2001). Most common production strategies for green products are: recycling, reuse of the product or part of it, reducing packaging, make products more durable, repairable, compostable, healthy and safer in shipment (Mishra and Sharma, 2012). Sharma and Iyer (2012) focused their work on resource-constrained products (driven by resource scarcity and/or the willingness to use the lowest possible amount of resources in product development), finding that most consumers may accept products considered "good enough", provided that they have good environmental performance. Packaging is a key component of a product (Kotler and Armstrong, 2014) and Finisterra Do Paco et al. (2014) highlighted that sustainable packaging is the most requested quality for a Green Product. Sustainable Packaging Alliance (2010) defined sustainable packaging as effective (that achieves its functional requirements with minimal environmental and social impact), efficient (designed to use energy and materials efficiently during product life cycle), cyclic (using renewable and recycled materials), and safe (non-polluting and non-toxic). As reported by Scott and Vigar-Ellis (2014), environmentally friendly packaging's benefits are broadly based on the nature of the packaging itself. Peattie (2001b) highlighted that a shift to a more sustainable economy would require a change in the mix of products and services (replacing the use of products with the use of services) and an increase in the level of after-sales support to increase product durability.

Labeling is a very important area of consideration has been the area of eco-labels, labeling which certifies that a given product is environmentally safe or friendly. A key consideration is whether this labeling should be done by a private, independent and presumably impartial organization or whether it should be done by a government entity.

Packaging is another important part of the total product for many companies. It not only provides information but also serves as a type of promotion for the product. The packaging also is a major source of environmental waste. The demand for recycled or recyclable materials shows it is important to consumers.

Price

Price is a critical and important factor of green marketing mix. For consumers to pay more, the added features should be perceived as valuable by consumers. Green marketing should consider the improvement of various aspects such as performance, function, design, visual appeal, or taste before putting a premium price on their products.

Price and quality are two factors with close relationship. Grove et al (1996) defined Green Pricing as negating consumers' price sensitivity through their willingness to pay for environmentally friendly product. The difference between green product and other product are usually higher price and quality of materials and production cost (Peattie and Crane, 2005).

When strategize pricing, since green marketing support environmental friendliness, value can be added to the product through altering its appearance, functionality and customization, etc. (Shrama & Goyal, 2012). When comparing with traditional product of similar function, consumers are charged more for green alternatives due to their higher environmental performance (Peattie, 2001a). Still, research found out that consumers are willing to pay extra for green items. Specifically, three-quarters of European citizen agree to spend more for green product (European Commission, 2014). Similarly, Essoussi and Linton (2010) reported consumers' readiness to purchase green products of premium price with consideration regarding product's type and perceived benefits.

Besides products' features, ethic is a factor which contributes to consumers' willingness to pay for green products. Freestone and McGoldrick (2008) identified that consumers are more likely to pay for the product if they recognize the ethical characteristics of said product. However, concerning ethical factor, there is a critical point, if exceed, will make consumers believe their effort to pay more for environmental-friendly product for ethical purpose, turn into companies' benefits. Organizations should be careful not to cross that line.

Place

Place is typically associated with distribution channels and facility location. Place refers to providing products for easy access and includes intensive, selective, or exclusive distribution and franchising and it plays a big part in Green marketing mix (Kim (2002)) while Davari

and Strutton (2012) explanation of Green Place is the management strategies in term of distribution, process from production to consumption, and reverse logistics.

In the case of Green products, customers are unlikely to try and purchase green product at all cost. According to Mishra and Sharma (2012), green products are not actively sought, instead, consumers buy the green product as they see them. Therefore, it is important that these green products appeal to shoppers.

Green Place refers to management tactics related to distribution, from production to consumption, and reverse logistics (Davari and Strutton, 2012). There are numerous factors contributing to the success of Green Marketing and Esmaili and Fazeli (2015) claimed that Internet plays a key role in green distribution. Reducing packaging (in order to decrease transportation costs, optimize carriers, reduce material consumption), using integrated transportation systems, the Internet or other similar initiatives have reduced environmental impact of transportation, but the most important advances in distribution relates to reverse logistics (Polonsky and Rosenberger III, 2001). Lee and Lee Lam (2012) highlighted that reverse logistics can be considered as an additional weapon in the hands of marketers for defining the Green Marketing Mix. Reverse logistics can lead to cost savings, time saving, increased revenues, decreased inventory costs, better inventory management, a decrease in stock-out events, and a better service to customers (Lee and Lee Lam, 2012). The authors also highlighted the positive effect of using information system and technology in reverse logistics on service quality and economic performance. Another thing that marketers should carefully consider is that selling green products is not the same as selling standard products, due to new product characteristics, new requirements from customers, new regulations. For this reason, dedicated marketer teams that will manage products from production to point of sales and, then, to customers could improve distribution performance (Tomasin et al., 2013).

Promotion

Prothero et al. (1997) claimed that a successful green strategy depends upon a good communication. Pranee (2012) highlighted that advertising is growing both in quantity and in terms of its impact on people lives. Testa et al. (2011) claimed that changes in production and consumption patterns linked to environmental sustainability have strongly influenced advertising. Thorson et al. (1995) found that consumers are quite positive in their response to green advertising and a similar result was found by Purohit (2012).

Green advertising should highlight product environmental benefits, promote sustainable lifestyles, improve the green image of the brand, and reduce the information asymmetry typical of green products (D'souza et al., 2007). Most consumers are quite positive in their response to green commercials, even though the potentials of green commercials are not yet fully exploited and greenwashing could harm firm performance (Raska et al., 2015). Davis (1993) found that specific, real, and useful environmental claims have a greater effectiveness than vague messages. He also provided guidelines for presenting environmental claims, such as, ensuring that the promoted benefit has a real impact, identifying the product specific benefits, providing specific data, and defining technical terms. To do this, the associated message should also have the following characteristics: it should be clear (Pranee, 2010), easy to remember, understandable, customized to the target audience (Bickart and Ruth, 2012), it could be differentiated for country (Polonsky et al., 1997), and it should generate emotional commitment (Hartmann and Ibanez, 2013).

Papadas and Avlonidis (2014) highlighted that green claims should be honest, transparent, and credible, in order to help companies to build trustful and longlasting relationships with stakeholders, otherwise, consumers may perceive these activities as green wash and ignore the promotion or even punish the firm by boycotting products or complaining to regulators.

Tu et al. (2013) showed that green messages influence consumers' reaction to green advertising. The great focus of green advertisement on product-oriented claims denotes firms' tendency to make green claims that are more easily observable, clearly understandable, and practically useful for protecting the natural environment (Leonidou et al., 2011).

An important promotional tool for Green Marketing is represented by ecolabels (Rex and Baumann, 2007). By preventing vague and misleading assertions, ecolabels can be a useful tool to attract those target consumers whose purchase choice depends on trust and reliability of the producer (Testa et al., 2015). Indeed, the basic purpose of labeling in Green Marketing is to provide information about the superiority in environmental performance compared to other products (Hussain, 2000) and try to avoid the top-ranking reasons behind consumer skepticism towards green claims of companies: the lack of credibility (Boston Consulting Group, 2009) and unclear messages (European Commission, 2011). Rex and Baumann (2007) stated that ecolabelling should not be considered as an end in itself, rather a means to create a greener market.

c. Conceptual framework of green marketing Mix

Integrating the findings from the literature a conceptual framework as seen in Figure 1 was developed. The framework was developed to study the green marketing mix strategies. This conceptual framework is adapted from Rosa and Daniele, 2017. Green marketing mix consists of 4Ps: green product; green price; green place and green promotion. To be green product, companies should focus on bringing benefits to both consumers and

natural environment. It also important of companies to evaluate and remove the perceived gap in performance compared to traditional products. Green packaging is a key component of green product. Green price means higher price since green marketing support environmental friendliness. For green promotion, companies should clearly communicate of green products and brands characteristics to reduce information asymmetry. Communication activities should also focus on ecolables and packaging.

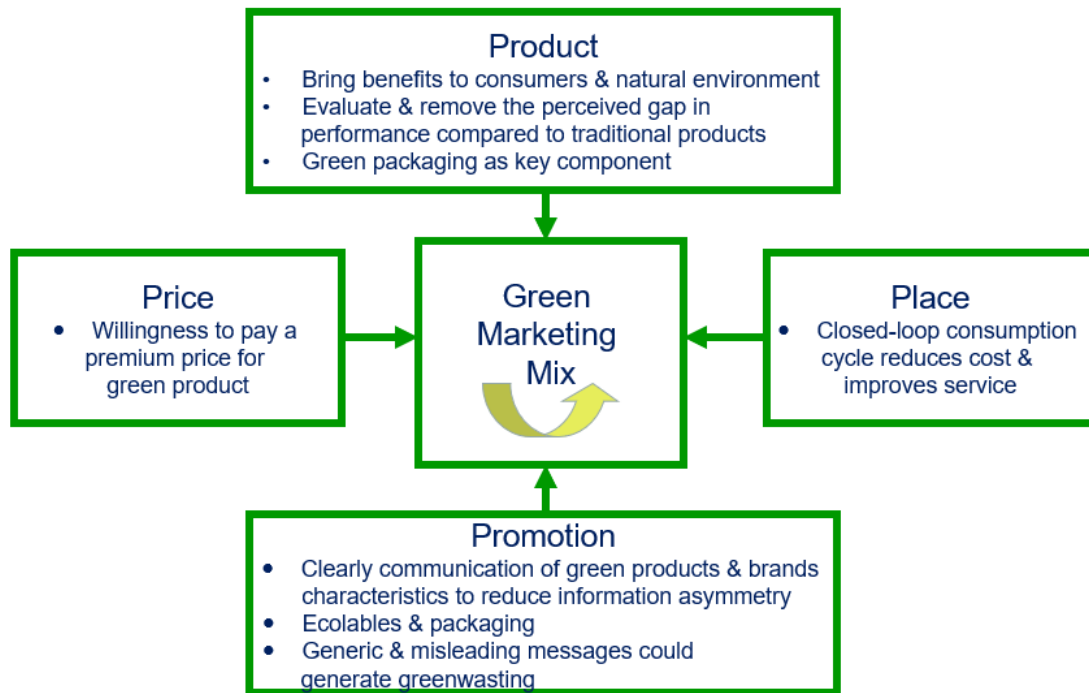


Fig. 1: Green Marketing Mix

Source: Adapted from Rosa and Daniele, 2017

3. CONCLUSION

Green marketing is a natural outgrowth of growing societal concern over the environment and is still in its infancy and likely to be a growth area because of the persistent nature of our world's environmental problems. Commitment by business organizations to improve the environment and consumer support of these efforts through the purchase of green products, are keys to the future of green marketing.

This study provides an in-depth analysis and synthesis of the body of knowledge so far produced in the field of Green Marketing and green marketing mix. Confirming that environmental sustainability is a key issue when designing, developing, and marketing new products. This study also provides clear evolution of green marketing. Marketing managers need to integrate environmental sustainability into their strategies on how to develop and implement a Green Marketing Strategy.

Further, this review highlights that some issues appear to be relevant in Green Marketing Mix element. For example, packaging plays a key role in reducing the environmental impact of both green products and logistics. In addition, being ecolabels often integrated into packaging, this serves also as a promotional tool. This means that specific attention should be devoted by companies to choose or design environmentally friendly packaging that uses environmentally friendly materials (recycled, recyclable, biodegradable, compostable) and/or minimizes the amount of materials used (eventually making packaging unneeded, such in the case of draft detergents) and that clearly communicates the environmental friendliness of the product. We hope that this study will stimulate future research and will represent a reference point for managers, scholars, and students interested in the topics of environmental sustainability, new product development, and marketing.

4. REFERENCES

- [1] Bickart, B. A., Ruth, J. A., 2012. Green eco-seals and advertising persuasion. *J. Advert.* 13, 51-67.
- [2] D'souza, C., Mehdi, T., Lamb, P., Peretiatko, R., 2007. Green decisions: demographics and consumer understanding of environmental labels. *Int. J. Consum. Stud.* 31, 371-376.
- [3] Dangelico, R. M., Pontrandolfo, P., 2010. From green product definitions and classifications to the green option matrix. *J. Clean. Prod.* 18, 1608-1628.
- [4] Davis, J. J., 1993. Strategies for environmental advertising. *J. Consum. Mark.* 10, 19-36.
- [5] Finisterra do Paço, A. M., Alves, H., Shiel, C., Filho, W. L., 2014. An analysis of the measurement of the construct "buying behaviour" in green marketing. *J. Integr. Env. Sci.* 11, 55-69.
- [6] Fuller, D. A., 1999. *Sustainable Marketing: Managerial e Ecological Issues*. SAGE Publications, Inc., London, UK.
- [7] Gheorghiu, A., Vidras, cu, P. A., Niculescu, M.D., 2013. The development of the Ecomarketing, green performance and corporate responsibility in a competitive economy. *Quality (Supplement)*, 373-377.
- [8] Hartmann, P., Ibanez, V. A., 2013. Desert or rain: standardisation of green advertising versus adaptation to the target audience's natural environment. *Eur. J. Mark.* 47, 917-933.
- [9] Hennion, K. E., Kinnear, T. C., 1976. *Ecological Marketing*. American Marketing Association, Chicago.
- [10] Hussain, S. S., 2000. Green consumerism and ecolabelling: a strategic behavioural model. *West. J. Agric. Econ.* 51, 77-89.
- [11] Hussain, S., Lim, D., 2000. The development of eco-labelling schemes. An economic perspective. In: Madu, C. N. (Ed.), *Handbook of Environmentally Conscious Manufacturing*. Kluwer Academic Publishers, Boston, MA.
- [12] Kotler, P., Armstrong, G., 2014. *Principles of Marketing*. Global Edition, 15/E. Pearson Prentice Hall, Upper Saddle River, NJ.
- [13] Kumar, V., Rahman, Z., Kazmi, A. A., 2013. Sustainability marketing strategy: an analysis of recent literature. *Glob. Bus. Rev.* 14, 601-625.
- [14] Laroche, M., Bergeron, J., Barbaro-Forleo, G., 2001. Targeting consumers who are willing to pay more for environmentally friendly products. *J. Consum. Mark.* 18, 503-520.
- [15] Leonidou, L. C., Leounidou, C. N., Palihawadana, D., Hultman, M., 2011. Evaluating the green advertising practices of international firms: a trend analysis. *Int. Mark. Rev.* 28, 6-33.
- [16] Mishra, P., Sharma, P., 2012. Green marketing: challenges and opportunities for business. *J. Mark. Commun.* 8, 35-41.
- [17] Nidumolu, R., Prahalad, C. K., Rangaswami, M. R., 2009. Why sustainability is now the key driver of innovation. *Harv. Bus. Rev.* 87, 56-64.
- [18] Ottman, J., 1993. *Green Marketing: Challenges and Opportunities for the New Marketing Age*. Ntc Business Books, Lincolnwood, Illinois.
- [19] Ottman, J. A., Stafford, E. R., Hartman, C. L., 2006. Avoiding green marketing myopia: ways to improve consumer appeal for environmentally preferable products. *Environment* 48, 22-36.
- [20] Papadas, K.-K., Avlonidis, G.J., 2014. The 4 cs of environmental business: introducing a new conceptual framework. *Soc. Bus.* 4, 345-360.
- [21] Peattie, K., 1995. *Environmental Marketing Management: Meeting the Green Challenge*. Pitman Publishing, London, UK.
- [22] Peattie, K., 2001a. Golden goose or wild goose? The hunt for the green consumer. *Bus. Strateg. Environ.* 10, 187-199.
- [23] Peattie, K., 2001b. Towards sustainability: the third age of green marketing. *Mark. Rev.* 2, 129.
- [24] Polonsky, M.J., Grove, S., Kangun, N., 1997. International environmental marketing claims. *Int. Mark. Rev.* 14, 218.
- [25] Pranee, C., 2012. Moral meaning in green marketing and socially responsible marketing. *Intern. J. Organ. Innov.* 4, 113-128.
- [26] Prothero, A., Peattie, K., McDonagh, P., 1997. Communicating greener strategies: a study of on-pack communication. *Bus. Strateg. Environ.* 6 (2), 74-82.
- [27] Purohit, H.C., 2012. Product positioning and consumer attitude towards eco-friendly labeling and advertisement. *J. Manag. Res.* 12, 153-162.
- [28] Qingyun Zhu and Joseph Sarkis, 2016. Green marketing and consumerism as social change in China: Analyzing the literature, *Production Economics.* 181, 289-302.
- [29] Raska, D., Nichols, B., Shaw, D., 2015. When descriptive norm cues fail as persuasion agents in green supermarket advertising. *J. Promot. Manag.* 21, 721-738.
- [30] Rex, E., Baumann, H., 2007. Beyond ecolabels: what green marketing can learn from conventional marketing? *J. Clean. Prod.* 15, 567-576.

- [31] Rosa Maria Dangelico and Daniele Vocalelli, 2017, "Green Marketing": An analysis of definitions, strategy steps, and tools through a systematic review of the literature, *Journal of Cleaner Production*, 165, 1263-1279.
- [32] Scott, L., Vigar-Ellis, D., 2014. Consumer understanding, perceptions and behaviours with regard to environmentally friendly packaging in a developing nation. *Int. J. Consum. Stud.* 38, 642-649.
- [33] Sharma, A., Iyer, G.R., 2012. Resource-constrained product development: implications for green marketing and green supply chains. *Ind. Mark. Manag.* 41, 599-608.
- [34] Sustainable Packaging Alliance, 2010. Principles, Strategies & KPIs for Packaging Sustainability. Framework 1.0. <http://www.documentshare.org/images/server01/20032017/373/f59e0705779f1bbb74f0bdfceca4c6a2.pdf> (Last accessed 24th July 2017).
- [35] Testa, F., Iraldo, F., Tessitore, S., Frey, M., 2011. Strategies and approaches green advertising: an empirical analysis of the Italian context. *Intern. J. Environ. Sustain. Dev.* 10, 375-395.
- [36] Testa, F., Iraldo, F., Vaccari, A., Ferrari, E., 2015. Why eco-labels can be effective marketing tools: evidence from a study on Italian consumers. *Bus. Strateg. Environ.* 24 (4), 252-265.
- [37] Thorson, E., Page, T., Moore, J., 1995. Consumer response to four categories of "green" television commercials. *Adv. Consum. Res.* 22, 243-249.
- [38] Tu, J. C., Kao, T. F., Tu, Y. C., 2013. Influences of framing effect and green message on advertising effect. *J. Soc. Behav. Pers.* 41, 1083-1098.
- [39] Van Dam, Y.K., Apeldoorn, P.A.C., 1996. Sustainable marketing. *J. Macromark.* 16, 45-56.

TAXI SERVICE QUALITY - A COMPARATIVE STUDY BETWEEN APP-BASED TAXI SERVICE AND TRADITIONAL TAXI SERVICE

Nguyen Thi Thu Thuy and Dang Thi Thu Trang¹

¹School of Economics and Management, Hanoi University of Science and Technology, Vietnam

*Corresponding author: Thuy.nguyenthithu@hust.edu.vn

Abstract

The study aims to compare the service quality of traditional taxi service and app-based taxi service. Customer surveys were conducted with customers who used both types of services. In addition, in-depth interviews were carried out with a small number of respondents to explore their perspectives on taxi service quality. Service quality attributes include tangibility, reliability, convenience, safety, and empathy. The results show that the overall service quality score of app-based taxi service rated by customers was higher than that of traditional taxi firms. It can be concluded that app-based taxi is doing better than traditional taxi in some criteria that are highly appreciated by customers for their importance. Some implications from the research results will also be presented in this paper.

Keywords: Taxi service, service quality, traditional taxi, app-based taxi.

1. INTRODUCTION

The outbreak of technology has a strong influence on almost all countries and fields, including the transport service sector. In addition to giving businesses breakthrough technologies that change the way of production, business and connection, the revolution also puts businessmen in a fiercer competitive position than ever before - competition in terms of technology. Businesses can capture the market by capturing the technology, which also means that other businesses can be knocked out of the game if they do not catch up. Ride hailing taxi is a type of business born from this 4.0 revolution. With many outstanding advantages, Ride hailing taxi quickly dominate a large part of choice of consumers. After huge data collection, Google predicts ride hailing service will reach nearly 30 billion dollars by 2025. Of which 20 billion dollars will be from online ride hailing services. Consumer adoption of ride-hailing continues to grow, with about 35 million Southeast Asians actively using it, making 8 million bookings a day, four times that in 2015. Even Liu (2014) strongly stated in his research that "The traditional transactions or the offline system will gradually be replaced by online services". Many people have argued that in this competition the customer will benefit. Not only enjoy cheaper prices but also service quality is considered by customers to be better. Contrary to the delight of customers when having more options is the standing position of traditional taxi companies. Competitive

pressure causes a series of firms to reduce revenue, even bankrupt or merge.

What will the future and growth prospects of these firms be? This is always a question that compels the transportation service operators and researchers to pay attention to. It is undeniable that customer reviews will play a role in determining opportunities for taxi transport businesses, because they are the ones who directly decide whether to use the service or not. Service quality has a decisive role to customer satisfaction and is a strategic weapon for businesses in the competitive market. One thing is for sure, businesses need to focus on increasing service quality, because service quality is the factor that most influences customer satisfaction (Cronin and Taylor, 2013; Yavas et al, 1997; Ahman and Kamal, 2002).

There are a number of studies assessing service quality service sector in general or taxi transport services in particular, but there are no comparable studies on customer satisfaction using ride hailing taxi service with traditional taxi service. Realizing that this is a topic not only new but also plays an important role in helping current taxi service businesses make strategic decisions in the context of fierce competition happening in the market.

2. LITERATURE REVIEW

Service quality is a standout amongst the most principal research subjects for the past few decades (Gallifa & Batalle, 2010). Perceived Service quality can be

characterized as the client's view of the overall quality or prevalence of an item or services regarding its expected reason. App-based taxi service has gained traction as a lifestyle enhancing solution. The service's presence is more prevalent in large cities, making taxi service industry more competitive than ever. Various studies have been carried out on this field showing different aspects of the market.

Wong and Szeto (2018) proposes an alternative methodology to evaluate the service quality of urban taxis and develops a level-of-service standard for taxi customers to monitor performance. A customer survey was conducted in Hong Kong, with the respondents invited to give specific satisfaction ratings for ten service aspects individually and an overall rating for the taxi service quality, as well as to rank the important aspects that influence the given overall rating. The ten service aspects related to the amount of time consumed when taking taxis, services and facilities provided for finding taxis, internal environments of taxis, and personal services provided by taxi drivers. A model was developed to identify the priority areas for improvement of urban taxi service quality. Based on the numerical score of overall taxi service quality, a six-level service standard, similar to academic grading, is introduced accordingly to improve the general public's understanding of the current service level. The paper discusses the potential policy implications to enhance the taxi service quality in Hong Kong, which can be applied to other metropolitan cities that provide similar urban taxi services.

Paronda et. al. (2017) present a comparative analysis of Key Performance Indicators (KPIs) of TNCs vs Conventional Taxis. The key performance indicators include travel speed, reliability, passenger expense, and quality of service. Travel diaries from regular riders of Uber, GrabCar and Conventional Taxi's ran for 30 days in order to gather data and compare its KPIs. Hence, additional surveys such as: (1) availability of vehicle check and (2) performance indicator survey were also conducted in order to validate. While TNCs are not always said to be cheaper than conventional taxis, most of them have better quality of service compared to conventional taxis.

Jinxing Shen et. al. (2015) examine the actual influence of the telephone/online booking system on the taxi service performance, based on the operational statistics of the taxi market in Suzhou City, China. Two taxi service modes, ordinary taxi service and the new dedicated taxi programs which is derived from the booking system, have been compared. The feedback from taxi drivers and customers have been collected to disclose their perspectives on the taxi booking system. The results indicate that in current operation modes, the

use of the telephone/online booking system could benefit passengers, but actually makes few differences to the taxi service providers.

Rasheed et.al. (2018) were aimed to evaluate customers' satisfaction using mobile app-based taxi service in Lahore city. Study investigated six service quality parameters that three online taxi companies i.e. Careem, Uber and A-Taxi offer to their customers. Both data primary and secondary was gathers through field survey and from companies' desks respectively. Data was analyzed through correlation and regression models to derive valid information about taxi service. Results showed that Careem was more reliable and preferred (78%) taxi service followed by Uber (75%) and ATaxi (70%). It is concluded that among six service quality factors, four i.e. convenient us of mobile app, Driver behavior, Time Reliability and Price Affordability indicated significant impact on customers satisfaction. Mobile app- based taxi service is more comfortable and safer than rickshaws. It can be further concluded that mobile app- based rides had significant impact on the growth of taxi industry. The study recommended that fare should be rational and customers should not be inappropriately swap for rides and government should develop a regulatory framework for taxi numbers, fares and service standards.

Fang He and Shen (2015) provides a systematic account of the impact of e-hailing applications' wide adoption on the taxi system, we first propose a spatial equilibrium model that not only balances the supply and demand of taxi services but also captures both the taxi drivers' and customers' possible adoption of the newly-emerging e-hailing applications in a well-regulated taxi market. We then prove the existence of the proposed equilibrium, and further provide an algorithm to solve it. An extensive equilibrium model with elastic taxi-customer demands is also proposed. Lastly, a numerical example is presented to compare the taxi services with and without the e-hailing application and evaluate two types of e-hailing applications.

Zulhelmi et.al. (2018) measured customer satisfaction level on the service attributes of Uber. Specifically, this study will address the issues of service attributes of Uber with customer satisfaction and return usage. The quantitative research approach was chosen to obtain the relevant data for this study which was conducted among Uber users who experienced Uber services at least once in Kuala Lumpur and Selangor. A total of 400 questionnaires were distributed to the users to allow for attrition rate from the sample size via google docs. The results of this study revealed that service attributes of Uber namely safety, price, convenience, and information and communications technology (ICT) do influence customer satisfaction and return usage. This study found

that it is imperative for Uber operators to improve their services and provide better services that fit the current consumer demands on public transportation.

Azudin et. al. (2018) used the SERVQUAL model to evaluate service quality levels of Uber drivers in Ipoh, a small Malaysian city. The objective was to profile small city Uber users and explore their perception towards the service. The findings revealed that there was no evidence to show that Uber services is lower in a small city like Ipoh, in contradiction to anecdotal accounts. Although reliability and responsiveness were the most significant factors in determining overall perceived service quality, these factors were not the most highly ranked among the five service quality indicators.

Mensah and Ankomah (2018) sought to examine customers' perceptions of service quality as rendered by taxi drivers in Accra and the effect of their perceived service quality on customer satisfaction. Data was collected from a cross-section of commuters in Accra. The results show that service quality had a significant effect on commuters' satisfaction with taxi services. However, the responsiveness dimension did not have a significant effect on satisfaction. It is recommended that drivers double their efforts if they are to be competitive, especially with the recent entry of Uber onto the market.

3. METHODOLOGY

3.1. Data collection

The data from customer survey and interviews will be used in this research. The target population for this study was identified as all passengers who have travelled with both types of taxi services in last three months. The questionnaire survey would be ended and the data would be neglected from analysis if they had not taken the two taxi service within the past three months. The face-to-face interviews took place in public settings such as commercial centers, parks, cafeterias and food courts in Hanoi. Customers at those places were randomly approached and given a questionnaire for self-completion. Data collection was also conducted through an online self-administered questionnaire using Google Docs, and the link shared on social media of Facebook. Respondents were directed to website containing the questionnaire via the shared link to answer/complete the answer. A total of 231 responses were received back, which indicates an overall response rate of 61.33%. About two third of the responses were collected on site during the face-to-face interviews, and the rest were collected by mail.

The questionnaire survey consists of three sections. Section A was composed of the demographic items, while sections B and C were concerned with assessing

the performance of each items. All items in section B and C were rated using a seven-point Likert/interval Scale ranging from 1 (strongly disagree) to 7 (strongly agree). Demographic information included gender, age, race, occupational status, academic qualification, monthly family income, average monthly transportation cost, and length of experience in using the MBT App. To ensure questionnaire reliability and validity, we invited three experts with at least two years of experience of working in consultation services to examine and modify the questionnaire. A pilot survey was conducted before the questionnaire was finalized, about two weeks before the main survey, and about 30 taxi customers were interviewed to verify the feasibility of the survey approach and ensure the clarity of wording in the questionnaire.

Besides, qualitative research method used as in-depth interviews was also carried out to gather more in-depth information. Customers chosen for in-depth interviews were asked for detailed explanation for their judgement raised in the questionnaire on traditional and tech-based service quality attributes.

3.2. Measures

Assessing service quality is challenging due to service's unique characteristics, such as intangible, heterogeneous, inseparable, and perishable. In this study, SERVPERF scale was employed to measure taxi service quality with some modifications that fit comparison purposes and specific characteristics of taxi service quality.

The service attributes considered consisted of tangibility, reliability, convenience, safety and empathy as description below:

Tangibility pertains to physically visible aspects used by taxi firms to communicate their image and signal quality to customers. Three questions were used to measure tangibility including (1) Vehicles is in good condition; (2) Drivers are well dressed and appear neat; (3) Internet website of the company is legible.

Reliability refers to the ability of taxi providers to provide reliable service dependably and accurately. Five questions were used to measure reliability which were (1) Drivers are dependable and reassuring; (2) Booking is not cancelled by after confirmation; (3) Providers keep general terms and conditions of service provision; (4) Clear, accurate and comprehensive information of the trips; (5) Payment methods are trustworthy.

Convenience emphasizes the ability of taxi firms to provide service at customers' convenience. Five items were used to evaluate convenience consisting of (1) Taxi service is available in my area; (2) I can book a car easily; (3) Payment method is convenient; (4) I can get

the car fast; (5) I do not have to wait long time to book and take a car.

Safety relates to the ability of taxi firms to convey confidence and trust. Four items were used to evaluate safety including (1) Details of drivers are provided; (2) The security policy is available; (3) Drivers have good driving skills and make me feel safe; (4) Drivers can be trusted.

Empathy is the understanding of customers' sentiments to make them feel important and exceptional, the caring and individualized attention taxi firms provides to their customers. Three items used were (1) feel treated individually; (2) Drivers understand my specific expectations of service; (3) Taxi firms care about my assessment of the service.

3.3. Data analysis

Descriptive statistical analysis was used to describe the basic characteristics of the data collected. This method was used to produce results on mean, median, variance, standard deviation summarizing basic information about the sample.

Service quality is measured by multiplying the weights with the perception scores:

$$SQ_i = \sum_{j=1}^k W_{ij} \cdot P_{ij}$$

Where SQ_j is the service quality of item statement j, W_{ij} is the weighting factor of item statement j to an individual i, and P_{ij} is perception of individual i with respect to the performance on item statement j.

The weighting factors is the normalized importance score:

$$W_{ij} = \frac{I_{ij} - Min}{Max - Min}$$

Where I_{ij} is the importance score obtained from the questionnaire, Min is the minimum score and Max is the maximum score of the importance score.

4. RESEARCH RESULTS

4.1. Profile of customers involved in the study

The result of demographic profile indicates that the gender of respondents was differently distributed, representing 58.3% male and 41.7% female. The dominant age group of respondents is between 41-55 years old (52.9%), followed by 25 years old and below (19.6%), 25-40 years old (21.2%), and lastly 55 years old and above (9.4%) respectively. A majority of respondents work as officer (34.8%), followed by self-employed (26.4%), students (25%), retired people (9.1%) and the others 4.7%. The income of majority of respondents is more than 20 million VND per month (46.7%), followed by 10-20 million VND per month (31.5%) and less than 10 million VND per month (21.7%). The purpose of most trips is to hang out and to go to work (43.1% and 33%), only 19.9% to go to school and 4% to other purposes.

4.2. Service quality scores

Research results show that the quality of app-based taxi service rated by customers is higher than that of traditional taxis. This result is in line with the advantages of technology taxis. App-based taxi firms can mobilize a much larger number of cars allowing them to quickly pick up and drop passengers. While app-based taxi service is assessed by customers as higher than traditional taxis regarding reliability and convenience, the latter received better score in terms of empathy. There is no significant difference in customers' perceived service quality with respect to tangibility attribute.

Table 1: The service quality scores between Traditional taxi service and app-based taxi service

		Traditional Taxi Service		App-Based Taxi Service	
		Mean	Std. Deviation	Mean	Std. Deviation
Tangibility	Q1	4.15	0.75	4.18	0.59
	Q2	3.59	0.59	4.25	0.61
	Q3	4.33	0.70	3.88	0.56
		4.02		4.10	
Reliability	Q4	3.88	0.76	4.33	0.57
	Q5	4.20	0.65	4.14	0.64

		Traditional Taxi Service		App-Based Taxi Service	
		Mean	Std. Deviation	Mean	Std. Deviation
	Q6	4.00	0.70	3.97	0.55
	Q7	3.74	0.79	3.97	0.57
	Q8	3.47	0.74	4.37	0.60
		3.86		4.16	
Convenience	Q9	3.97	0.75	4.07	0.59
	Q10	3.83	0.59	4.29	0.61
	Q11	3.90	0.70	4.16	0.56
	Q12	3.97	0.74	4.48	0.53
	Q13	3.89	0.53	4.27	0.46
		3.91		4.25	
Safety	Q14	4.27	0.79	3.86	0.68
	Q15	4.16	0.83	4.11	0.60
	Q16	4.08	0.80	3.75	0.67
	Q17	4.17	0.72	3.79	0.58
		4.17		3.88	
Empathy	Q18	4.23	0.61	3.84	0.52
	Q19	4.22	0.67	3.66	0.61
	Q20	4.21	0.68	3.92	0.53
		4.22		3.81	

4.3. The perception of service quality of different demographic groups

Taxi service quality is perceived differently by passengers according to their demographic background. Accordingly, findings from this investigation can help “portrait” traditional taxi-preferred group of customers and app-based-preferred ones depending on their

evaluation of service quality. Those who evaluated traditional taxis as higher quality are middle and old age customers with high income, high frequency of use, employees / officers with the main purpose of traveling. Meanwhile, customers more satisfied with app-based taxis are characterized by young age and low income, with the main purposes of going out and going to school.

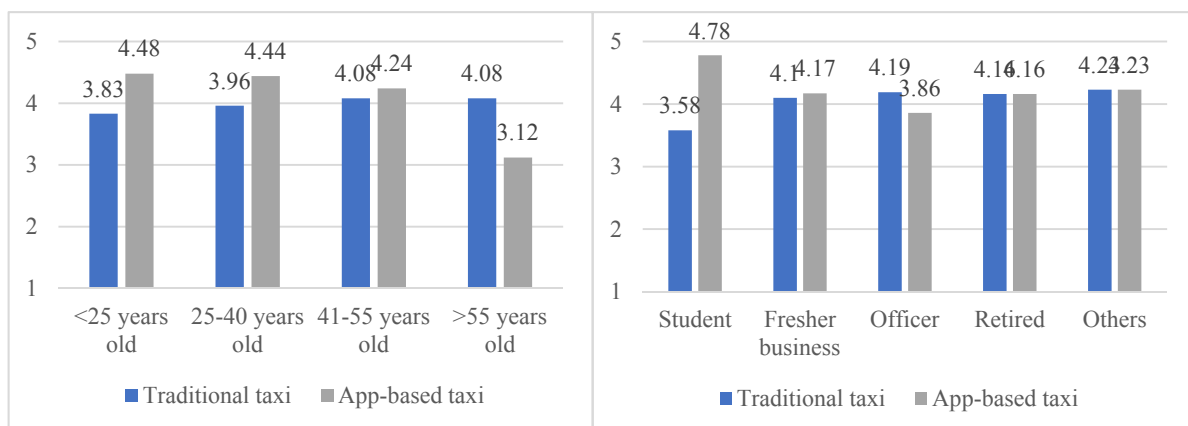


Fig. 1: The perception of service quality of different age and career groups

The results show that customers of different ages have different assessments of the service quality of the two types of taxis. Young people tend to evaluate the app-based taxi service higher score because they are familiar with technological applications. Meanwhile, seniors in general find ride-hailing application rather complicated to use. Besides, other information resources that this ride-hailing application provides, which are considered useful, are not exploited much by the senior. Customers over 55 rated only 3.42 for app-based taxi service in terms of convenience, while the group under 40 years old rated the attribute at higher level of 4.24.

Passengers with different occupations show different judgement on taxi service quality. Specifically, while students and self-employers rated tech-based taxis at higher average score, officers tend to appreciate

traditional taxi service, probably traditional taxi firms usually locate their fleets available around office buildings, hotels, hospitals and public places. Income can be seen as one of the factors affecting customers' perception of taxi service quality. Customers with high incomes of more than 20 million per month rated app-based taxi service at highest score. The score evaluated by customers at lower income levels tend to gradually decrease. High-income earners are less concerned with price differences, so the advantages of technology taxis in this case cannot be brought into play. Instead, they choose taxi companies with high service quality and professionalism. These customers share that they are more satisfied with traditional taxi services, but with select traditional firms (many customers mention Taxi Group, G7), not all firms. They are willing to pay more for a better service experience.

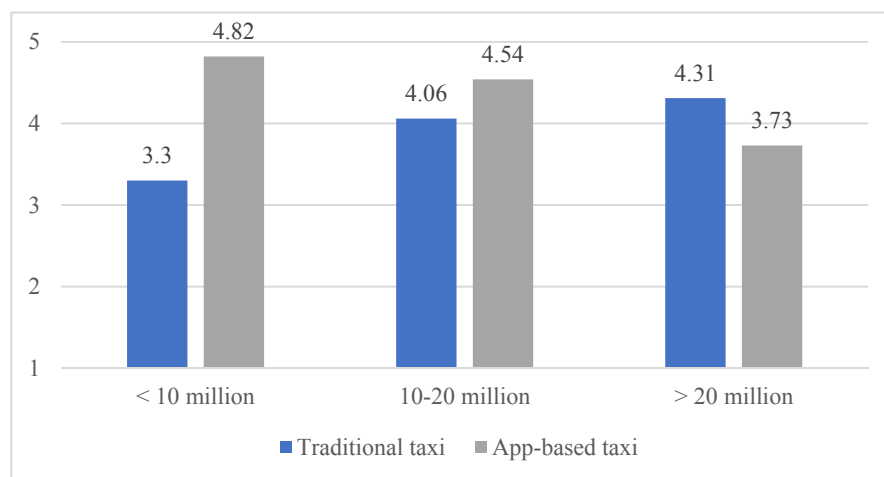


Fig. 2: The perception of service quality of different income groups

4.4. IPA Analysis

Following the IPA approach, the item statements were then used to analyse the differences between customers' perceived importance and performance in app-based taxi service selection attributes. To facilitate data interpretation, those attributes were plotted on a two-dimensional state space where the vertical axis described the importance of the selection attributes, while the horizontal axis described how well the taxi providers is performing the service. The IPA's two-dimensional state space classifies attributes into four categories or quadrants to set the priorities in allocating limited resources, typically identified as: concentrate here, keep up with the good work, low priority, and possible overkill. The importance scores are also compared with the coefficients from regression to have further contention on the research findings.

The attributes with the highest score of importance for each dimension are: Q3 of tangibility, Q6 of reliability, Q11 of convenience, Q17 of safety, and Q20 of empathy. The attributes with the lowest score of importance for each dimension are: Q2 of tangibility, Q8 of reliability, Q9 of convenience, Q15 of safety, and Q19 of empathy. Overall, convenience ranks first in terms of average importance score (4.05), while empathy has the lowest average score (3.407). Reliability and service price are evaluated as second and third positions. The importance scores obtained considerably support the highest influence of those predictors on customers' satisfaction in the regression results. While customers highly appreciate firms' attentiveness and promptness in dealing with their questions, requests, problems and complaints, they seem not to seek so much for personal attention and good communication from the driver.

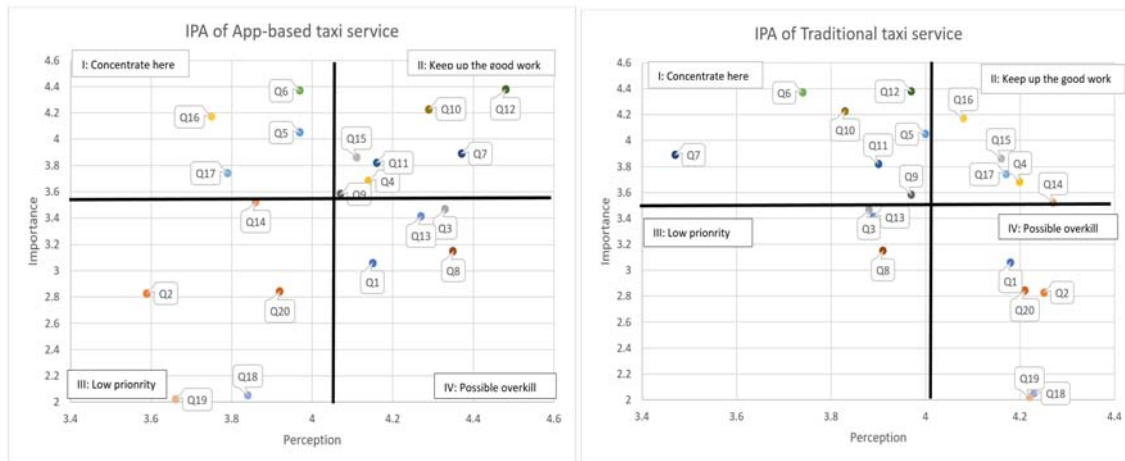


Fig. 3: The IPA analysis maps

Quadrant I (Concentrate here): Attributes are perceived to be very important to respondents, but performance levels are fairly low. This suggests that improvement efforts should be concentrated here.

Quadrant II (Keep up the good work): Attributes are perceived to be very important to respondents, and at the same time, the organization seems to have high levels of performance in these activities. The message here is to keep up the good work.

Quadrant III (Lower priority): Attributes here are rated as having low importance and low performance. Although performance levels may be low in this cell, managers should not be overly concerned, since the attributes in this cell are not perceived to be very important. Limited resources should be expended on this low priority cell.

Quadrant IV (Possible over kill): This cell contains attributes of low importance, but where performance is relatively high. Respondents are satisfied with the

performance of the organization, but managers should consider present efforts on the attributes of this cell as being superfluous/unnecessary.

5. CONCLUSION

The results indicate that customers appreciated app-based service surpasses traditional taxi service in the quality in most factors except safety and empathy. Given that traditional taxi is rated higher in these factors, they are not importance factors in evaluating taxi quality service. This study also shows the different value about taxi service quality in different customers groups. Whereby, Customers evaluating traditional taxis as higher quality are middle and old age customers with high income, high frequency of use, employees/ officers with the main purpose of traveling. Meanwhile, customers more satisfied with app-based taxis are characterized by young age and low income, with the main purposes of going out and going to school.

6. REFERENCES

- [1] Ahman, J. and Kamal, N. (2002), "Customer satisfaction and retail banking: an assessment of some of the key antecedent of customer satisfaction in retail banking", *International Journal of Bank Marketing*, Vol. 20 No. 4, pp. 146-160.
- [2] Azudin, N., Norhashim, M. and Nachiappan, G. (2018), "Service quality of Uber in a small city: A case study of Ipoh Uber drivers", *Journal of advanced research in business*.
- [3] Cronin, J. J. and Taylor, S.A. (2013), "Measuring Service Quality: A Reexamination and Extension", *Journal of Marketing*, Vol. 56 No. 3, pp. 55-68.
- [4] Fang, H. and Shen, Z.J.M. (2015), "Modeling taxi services with smartphone-based e-hailing applications", *Transportation Research Part C: Emerging Technologies*, Vol. 58, pp. 93-106.
- [5] Gallifa, J. and Batalle, P. (2010), "Student perceptions of service quality in a multi-campus higher education system in Spain", *Quality Assurance in Education*, Vol. 18 No. 2, pp. 156-170.

- [6] Liu, Z.Y. (2014), "An Analysis of Technology Acceptance Model. Exploring user acceptance and intension of taxi - hailing app in Shanghai". University of Gothenburg.
- [7] Mensah, I. and Ankimah, P. (2018), "Taxi service quality and satisfaction among commuters in the accra metropolitan area", *Aussie-Sino Studies*, Vol. 4 No. 4.
- [8] Rasheed, H. and Sherali, Z. (2019), "Autonomous cars: Research result, issues, and future challenges", *IEEE Communications Surveys & Tutorials*, Vol. 21 No. 2, pp. 1275-1313.
- [9] Shen, J., Qiu, F., Zhang, X. and An, C. (2015), "Demi-flexible operating polocies to promote the performance of public transit in low-demand areas", *Transportation Research Part A: Policy and Practice*, Vol. 80, pp. 215-230.
- [10] Wong, R. C. P., Szeto, W. Y., Yang, L. and Wong, S.C. (2018), "Public transport policy measures for improving elderly mobility", *Transport Policy*, Vol. 63, pp. 73-79.
- [11] Yavas, U., Bigin, Z. & Shenwell, D. (1997), "Service quality in the banking sector in an emerging economy: A consumer survey", *International Journal of Banking Marketing*, Vol. 15 No. 6, pp. 217-223.
- [12] Paronda, A. G. A., Regidor, J.R.F. and Napalang, M. S. G. (2017), "Comparative analysis of transportation network companies (TNCs) and conventional taxi services in Metro Manila", paper presented at 23rd Annual Conference of the Transportation Science Society of the Philippines, 8 August 2016, Quezon City, Philippines, available at: <https://vdocuments.mx/comparative-analysis-of-transportation-network-companies-tncs-.html> .
- [13] Zulhelmi, M., Suhami, A., Talib, A., Salim., Bachok., Sabaianah., Saleh, M. and Maria. (2018), "Service attributes, customer satisfaction and return usage: A case of Uber Malaysia", *Journal of Tourism, Hospitality & Culinary Arts*, Vol. 10 No. 2, pp. 1-23.

FACTORS AFFECTING INTENTION TO STUDY HIGHER EDUCATION OF UNDERGRADUATE STUDENTS IN HO CHI MINH CITY

Tran Thi Trang*, Le Tran Nguyen Nhung, Pham Thanh Huong, Nguyen Thi Ngoc Mai

Faculty of Business Administration, Ho Chi Minh City University of Technology (HUTECH),

Ho Chi Minh City, Vietnam

*Corresponding author: tt.trang@hutech.edu.vn

Abstract

The purpose of this study is to examine factors affecting undergraduate students' intentions in pursuing postgraduate study at universities in Ho Chi Minh City. Those factors are satisfaction, customer orientation of employee, personal traits and brand image. A survey was carried out on 256 participants for examining the impact in this research. SPSS statistics was applied for the study and other methods to test the effect. In addition, the results indicated that overall the factors positively influence undergraduate student's intentions. The results imply that universities should focus on these factors in their effort to concrete student's intentions to study at higher levels.

Keywords: Higher education, Intention, Planned behavior, Undergraduate students.

1. INTRODUCTION

Nowadays, education is considered as a “foundation” creating a firm fulcrum for the development of a variety of fields such as economy, society, politics, etc. Undergraduate education becomes more and more important problem in society and creates demand for further research on the profession or work of mankind. To conduct a search on search engines, Google for example, with the keyword of "graduate study", there are more than 263 million results. It shows a tremendous increase in speed and a great concern of people in this level of education.

In the market economy, the educational system has developed a new role in the transmission of knowledge, which is not merely a traditional knowledge provider. In fact, there is a close relationship between "school - students" and "business - customers". In particular, students act as buyers (customers) and are also willing to pay for the knowledge and service which they would like to receive, while the education institutes act as business units providing customers desired courses and services, such as quality training and extracurricular activities.

For studying intentions of undergraduate students at higher levels, the study of planned behavior is a method related to many theories (Ajzen, 1975; Hellier, 2003). The question of what factors influence the intention to choose an education institute has attracted many researchers. However, this mostly focuses on high school students and there is very little research

performed on postgraduate students. In Vietnam, there was a research related to the factors affecting high school students' choice of majors and schools. However, the level of interest in this behavior of undergraduate students has not really been paid enough attention, in which the research only stops at the evaluation of the graduate degree program.

Because of those reasons, “Factors affecting intention to study higher education of undergraduate students in Ho Chi Minh City” is proposed in this research. With theoretical foundations of intention, the study continues surveying and assessing the situations of the intention to study at postgraduate levels of students attending universities in Ho Chi Minh city. In addition, the analysis aims to clarify the impact of factors on the intention to further study. Since then, providing solutions and implications for universities (businesses) in the context of integration of the times.

2. LITERATURE REVIEW

2.1. Definition of planned behavior

Ajzen (1975) defined that intended behavior is an expression of willingness to perform a behavior and also a direct premise of actual behavior. The intention depends on the following factors: Attitude towards behavior, subjective norms, perceived behavioral control.

Behavioral research is intended to drive decisions about actual behavior. This has been researched in many different fields such as social psychology (Ajzen, 2002), tourism (Hsu, 2012), festivals and events (Hornig, 2013;

Shen, 2014) and successfully applied to clarify the impact of motivation on intended and actual behavior in recent years.

2.2. Satisfaction

Customer satisfaction is a driving force for re-purchase, propaganda about products, services and contributes to increasing profits for businesses (Wang, 2006). According to Seymour (1972), the major goal of education should be developing customer satisfaction, whether they are students, student's parents, alumni, or partners. Therefore, focusing on improving customer satisfaction at the university is crucial in developing customer range.

2.3. Personality traits

The most prominent personality trait theory belongs to Goldberg with five personality traits (Big-five) (1990). Scientists believed that everyone has five personality elements of the model in this research, namely including: extroversion (extraversion), conscientiousness, consensus (agreeableness), willingness to experience (openness to experience) and neuroticism (psychotic instability). As Cattell (1957) defined, personality traits are characteristics that affect individual behaviors in different situations. In addition, Costa (1992) tested the basic elements of character that are common in both genders with different age groups and different cultures in all races.

2.4. Brand image

Brand image is what comes to the consumer's mind when a brand name is mentioned. Basically, it depicts consumers' thoughts and feelings towards the brand (Stephen, 2007).

Customers deal every day with different types of products and services, so brand image is primarily responsible for brand differentiation (Morgan, 2004). Companies compete to give good ideas about their products and services to build a positive image of their brand in the minds of consumers. Therefore, a good awareness of the quality of products and services will promote the formation of a positive brand image (Tan, 2012). The source of image creation can be through direct experience with brand or brand communication (Dobni, 1990).

2.5. Customer orientation of employees

Due to the intangible and interactive nature of the service, customers often rely on employee behavior when evaluating service quality. As a result, the customer-oriented level of employee is considered an important lever for successful service companies (Bitner, 1990; Bove, 2000).

Despite its important position in the value chain, only a

few studies mentioned the customer service building the customer orientation of employees and its impact on successful service companies (Brown, 2002).

2.6. Conceptual framework and Hypothesis

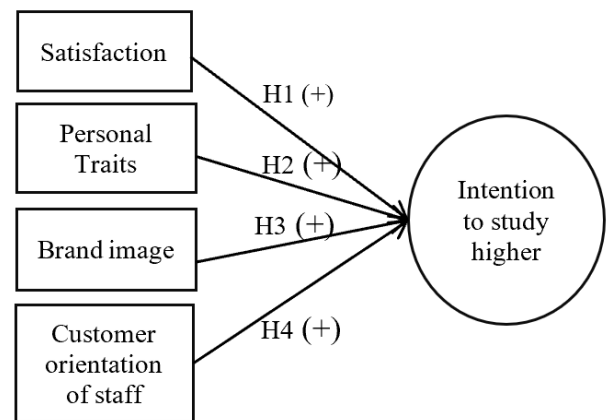


Fig. 1: Model of factors affecting Intentions to study higher education of undergraduate students

H1: Satisfaction positively impacts students' intentions to continue studying at higher levels.

H2: Personal traits positively influence the intentions to continue studying at higher levels.

H3: Brand image positively influences the intentions to continue studying at higher levels.

H4: The customer orientation of employee positively affects the intentions to continue studying at higher levels.

3. MATERIAL AND METHODS

3.1. Quantitative approach

The quantitative research has four following steps: First, the measurement instruments were built for the constructs of intentions and its dimensions. In the next step, a questionnaire is designed, including three parts: part one is an introduction; part two consists main questions in relation to the constructs; part three includes characteristic questions of participants. Then, a plan about the sample size needed, method for collecting sample is prepared. Finally, the sample data was analyzed to answer the research questions.

3.2. Data analysis techniques

In this study, data analysis went through Cronbach's alpha with SPSS program to evaluate the reliability of scales and test whether or not the scales exactly measure construct what the authors desire to measure. After that, EFA methods are applied for factor analysis in this research.

Cronbach's alpha is used first to test the reliability of measurement scales of concepts. Items with item-total correlation < 0.3 will be deleted and the standard for a scale to be chosen is Cronbach's alpha > 0.6 .

Exploratory factor analysis is appropriate when KMO > 0.5, Bartlett's test have sig. < 0.05, % Cumulative > 50%. Items with non-significant loadings and shared indicators are removed from the measurement model on a one-by-one basis. The items have factor loading < 0.4 or Cross Factor loading > 0.3 will be deleted. A factor loading is the correlation coefficient between an observed variable and its factors.

Scale is defined in terms of the following details: (1) Satisfaction; (2) Brand image; (3) Customer orientation of employees; (4) Personal Traits.

Next, we evaluate the fit of the proposed model to data and check standardized regression weight and p-value to decide whether or not to accept the hypotheses.

Finally, for testing the difference, the content of this section is to test the difference between qualitative variables and quantitative variables through T-test and ANOVA methods.

4. FINDINGS

4.1. Demographic details

This study selected the students who are studying at the university level in more than 10 universities in Ho Chi Minh City, with different genders, school years, and major groups. The estimated sample size is 300. After collecting and testing, 256 qualified questionnaires were kept. Next, the data is coded, entered, and processed.

The results showed that in 256 participants taking part in the pilot study, the majority of them are female (66,8%). Students from Ho Chi Minh City University of Technology accounted for the highest proportion with 15.23% (39 students).

Regarding the field of study, among the surveyed students, students from the business sector accounted for the majority with approximate 64% (163 students).

Table 1: Demographic detail

Classification	Frequency	Percentage (%)
Gender		
Male	85	33.2
Female	171	66.8
University		
Polytechnic	18	7.03
Foreign Trade University	29	11.33
Bank University	27	10.55
Pedagogical University	24	9.38
University of Agroforestry	19	7.42

Ho Chi Minh City University of Technology	39	15.23
Hong Bang International University	26	10.16
Saigon International University	20	7.81
RMIT Vietnam University	31	12.11
Other universities	23	8.98
School year		
1st year	13	5.1
2nd year	45	17.6
3rd year	129	50.4
4th year	58	22.7
5th year	11	4.3
Majors		
Journalism - science and social disciplines	4	1.6
Science (biotechnology, chemistry, geography,...)	15	5.9
Manufacturing and processing industry	9	3.5
Architecture and construction industry	11	4.3
Business	163	63.7
Group of information technology	29	11.3
Law and humanities group	10	3.9
Art - aesthetic - graphic industry group	7	2.7
Pedagogy group	7	2.7
Agriculture, forestry and fishery	1	0.4
TOTAL	256	100

4.2. Reliability test

For the reliability of the variable used, all were found to show satisfactory of Cronbach Alpha values of between 0.648 and 0.900 (refer Table 2). Thus, all variables are considered to be reliable.

Table 2: Reliability analysis

	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha If Item Deleted
Satisfaction: $\alpha = 0.924$				
HL1	11.105	4.550	0.770	0.920
HL2	11.199	4.466	0.874	0.884
HL3	11.180	4.501	0.813	0.905
HL4	11.164	4.600	0.843	0.895
Personal traits: $\alpha = 0.834$				
DD1	14.340	7.104	0.608	0.807
DD2	14.355	6.959	0.646	0.797
DD3	14.152	6.851	0.640	0.798
DD4	14.289	7.030	0.669	0.791
DD5	14.520	7.035	0.605	0.808
Brand image: $\alpha = 0.885$				
HA1	22.859	12.176	0.647	0.872
HA2	22.965	12.254	0.608	0.877
HA3	22.582	11.860	0.646	0.872
HA4	22.813	12.153	0.686	0.867
HA5	22.711	11.273	0.749	0.859
HA6	22.852	12.166	0.694	0.867
HA7	22.688	11.659	0.702	0.865
Customer orientation of employees: $\alpha = 0.900$				
DH1	10.293	7.369	0.775	0.872
DH2	10.277	7.393	0.720	0.892
DH3	10.293	7.000	0.819	0.856
DH4	10.281	7.121	0.798	0.864
Intentions: $\alpha = 0.648$				
Y1	7.0938	1.536	0.544	0.445
Y2	7.4727	1.560	0.448	0.564
Y3	7.3398	1.488	0.396	0.646

The approach of EFA appears to identify the variables: 4 independent variables, and intentions is the dependent variable. Hence, the items, that occurred with factor

loadings value below 0.6, will be terminated. After the second time of EFA processing, the conditions of the model are all satisfied, in which the HA1 was eliminated. As a result, the summary of EFA outcomes is summarized in table 2. In detail, the high value of KMO (0.840) indicates the appropriate model, and all values of Cronbach's Alpha of the proposed model are highly served the reliability of survey items.

4.3. Hypotheses testing

Table 3 shows that the correlation between the student intention and customer orientation of employees (DH) is 0.647(**), which indicates that they are strongly correlated and highly significant with each other. The intention is neutrally correlated with personal traits, brand image, and satisfaction in descending order.

Table 3: Correlation

		Y
DH	Pearson Correlation	0.647**
	Sig. (2-tailed)	0.000
	N	256
DD	Pearson Correlation	0.576**
	Sig. (2-tailed)	0.000
	N	256
HA	Pearson Correlation	0.511**
	Sig. (2-tailed)	0.000
	N	256
HL	Pearson Correlation	0.533**
	Sig. (2-tailed)	0.000
	N	256

Table 4: ANOVA

	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin - Watson
1	0.797 ^a	0.634	0.629	0.347	1.88

Table 4 shows that Adjusted R Square = 0.629 means that the multiple linear regression model has been built in accordance with the data set to a level of 62.9% or in other words, about 62.9% of the variation of the intended continuation can be explained by the differences of four components: Satisfaction, personal traits, brand image, customer orientation of employees.

Table 5: Coefficient

Model		Unstandardized Coefficient		Standardized Coefficient	Sig.	t	Collinearity statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0.473	0.170		2.791	0.006		
	DH	0.272	0.028	0.421	9.701	0.000	0.773	1.293
	DD	0.194	0.041	0.220	4.752	0.000	0.679	1.472
	HA	0.252	0.042	0.257	5.970	0.000	0.788	1.270
	HL	0.159	0.036	0.196	4.436	0.000	0.748	1.338

Dependent variable (Y): Intentions to study higher

Table 5 illustrates the result of the suggested hypotheses for the suggested research model. In Table 5, H1, H2, H3, and H4 are significantly supported, in which DH presents positive ($b = 0.272$) and sig. ($p < 0.005$) effect on Y, so H1 is supported. In addition, the existence relationship between DD and Y has significantly proved with $b = 0.194$ and sig. = 0.000, which implied H2 is supported. Respectively, the significant impacts between HA, HL and Y (H3 and H4) are supported with $b = 0.252$ (sig. = 0.00) and 0.159 (sig. = 0.000). Therefore, the linear regression equation has the following form:

$$Y = 0.473 + 0.421 \cdot DH + 0.22 \cdot DD + 0.257 \cdot HA + 0.196 \cdot HL$$

Finally, the study is performed to test for differences between 3 groups: gender, study year and major. The result shows that there is no mediation exist of intention to study higher between these groups.

5. CONCLUSION

5.1. Findings

This research contributes to the literature of intentions by empirically examining the intention to further study of undergraduate students in Ho Chi Minh city. The study is in agreement with foreign research findings, which showed that brand image, customer orientation of employees, satisfaction and personal traits actually impact intentions to pursue postgraduate education.

As the fact that there is a close relationship between factors of "school - student" and "business - customers", so universities should take more actions to keep their "old customers".

It can be easily seen that the most focus points should be on training and improving the service capacity of officials and employees (lecturers, consultants, supporters) in the university. Next, universities should consolidate and build the university image, including PR (publicity), student evaluation, and improvement of

rankings. Finally, improving the quality of training to make students more satisfied.

The advisory ability and orientation of school employees is a major factor affecting the intention of continuing to study at higher levels of university students. Therefore, improving the capacity and service attitude of officials and employees in the institute is imperative in promoting students to continue higher education at the university.

Focusing on Marketing is one of the most urgent requirements that the "Brand image" scale aims for. In addition, updating the trend in accordance with learners' requirements, meeting the labor market and social requirements and building relationships with outside companies, creating favorable conditions for students.

At the same time, universities need to take measures to improve facilities and equipment such as classrooms, learning equipments and libraries with sufficient materials in diverse fields of specialization. The research results also suggest an answer for how to promote higher education for students, which is the institute that needs to consider these factors when planning enrollment and high-system training activities. Specifically focus on providing all the necessary information for registration, contest submission, application form,... so that students feel easy and convenient in the registration admission and learning process at the school; pay attention to training with students who are currently enrolled in regular university systems as a potential source of students for higher education, point out the specific benefits for students from registration until after completing the graduate program at the school to undergraduate students find that this is the best choice for themselves.

5.2. Limitations and future research

The model intended to continue higher education which has been studied in many different angles, from subjective factors (schools, students) to objective factors (society, relatives). This research just derives from these

ideas and only explores and measures the satisfaction attributes, personal characteristics, brand image and customer orientation of employees without mentioning other impact factors such as quality value, perceived value, others. Therefore, the next research direction of the thesis is to study some other factors to clarify and confirm more models. Secondly, the research uses a simple random sampling method, the sample size is not large, so it limits the overall research. Finally, regarding the research method, this paper only tests the theoretical model by linear regression method but has not used other methods to determine the level of impact between factors. The above limitations show many directions for future researches. The authors hope that other studies will overcome these limitations and open up larger-scale works or time funds so that the results of the research will contribute more practical value.

6. REFERENCES

- [1] Ajzen I. M. F. (1975). Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research. *Addison-Wesley Publishing Company*.
- [2] Hellier P. K. (2003). Customer repurchase intention: A general structural equation model. *European journal of marketing*. **37** (11/12), 1762-1800.
- [3] Ajzen I. (2002). Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior. *Journal of applied social psychology*. **32** (4), 665-683.
- [4] Hsu Chia-Lin, Kuo-Chien C., Mu-Chen C. (2012), Flow Experience and Internet Shopping Behavior: Investigating the Moderating Effect of Consumer Characteristics, *Systems Research and Behavioral Science*, 29 (3), 317-332.
- [5] Jeou-Shyan Horng, Ching-Shu Su, (2013) Segmenting Food Festival Visitors: Applying the Theory of Planned Behavior and Lifestyle, *Journal of Convention & Event Tourism*, **4** (3), 193-216.
- [6] Shen B., (2014) Sustainable Fashion Supply Chain: Lessons from H&M, *Business and Management, Donghua University, Shanghai*, **6** (9), 6236-6249.
- [7] Kathy Shen, Mohamed Khalifa, (2008), Drivers for transactional B2C M-commerce adoption: Extended theory of planned behavior, March 2008, *Journal of Computer Information Systems*, **48** (3), 111-117.
- [8] Rong Wang, Michael W. Faulkender, (2006) Corporate Financial Policy and the Value of Cash, *The Journal of Finance*, **61** (4), 1957-1990.
- [9] Seymour, D. T. (1993), On Q: Causing Quality in Higher Education, Phoenix, AZ: *Orxy Press*, 42.
- [10] Raymond B. Cattell, Richard W. Coan, (1957), Child personality structure as revealed in teachers' behavior ratings, 315-327.
- [11] Robert R. McCrae, Oliver P. John, (1992), An Introduction to the Five-Factor Model and Its Applications, *Medicine Journal of personality*, **60** (2), 176-217.
- [12] Morgan, F. N. (2004). Brand Image Formation and Updating Across Multiple-Episode Experiences Within Service Networks. A Dissertation Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy, Arizona State University.
- [13] Teck Ming Tan, Tze Wei Liew, (2012) Consumer-based Brand Equity in the Service Shop, *International Journal of Marketing Studies*, **4** (4), 60-77.
- [14] Dawn Dobni and George M. Zinkhan (1990) In Search of Brand Image: a Foundation Analysis, *Consumer Research*, 17, 110-119.
- [15] Bitner, M.J. (1990), "Evaluating service encounters; the effects of physical surroundings and employee responses", *Journal of Marketing*, 54, 69-82.
- [16] Liliana L Bove, Lester W Johnson, (2000) A customer-service worker relationship model, *International Journal of Service Industry Management*, **11** (5), 491-511.
- [17] Tom J. Brown, John C. Mowen, (2002) The Customer Orientation of Service Workers: Personality Trait Effects on Self and Supervisor Performance Ratings, *Journal of Marketing Research*, **39** (1), 110-119.

THE IMPACTS OF PACKAGING ELEMENTS ON CONSUMER PURCHASE INTENTION

Pham Thi Lien^{1,*} and Ho Phuong Hong²

¹ Vietnam National University, Hanoi - International School

² Vietnam National University, Hanoi - Vietnam Japan University

*Corresponding author: Lienpt@isvnu.vn

Abstract

This study aims to measure Vietnamese instant oats packaging elements and its influences on Vietnamese consumer's buying intention. A quantitative research was conducted using an online survey to collect primary data for hypothesis testing. The questionnaire was transferred successfully to 147 respondents. The findings indicated the positive relationship between packaging elements (i.e. graphic, structural and verbal attributes) and consumer purchase intention. The moderation role of involvement level to the interaction of visual elements and purchase intention was also proved in this paper. The findings provide knowledge related to consumer behavior for relevant companies to help them in designing an effective communication tool – package. This study is one of the few quantitative researches measure the impacts of graphic, structural and verbal elements on purchase intention simultaneously. It also indicated that involvement level positively strengthens the interaction between structural package design and purchase intention. It can be used by managers and marketers to create an effective packaging to ensure their products stand out among competitors.

Keywords: Consumer's purchase decision, packaging design, graphic elements, structural element, verbal elements, involvement level.

1. INTRODUCTION

Package is the first thing customer see at store, thus, package design is used as an effective tool attracting buyer's attention and can boost consumer actual purchasing at the point-of-sale (Muhammad 2018). Accordingly, marketers should determine what visual and functional package to develop a suitable marketing strategy and enhance the relationship with targeted customers based on their needs and interest consideration (Kotler and Keller, 2008). In low involvement products, visual attributes place an important role in attracting buyer's intention (Silayoi and Speece, 2007). In this sense, based on product value perception and consuming volume, food and beverage products are considered as low-involvement products because it has low value and high volume consuming. Hence, in food and beverage products consuming, buyers tend to rely on package design to evaluate its quality while making a purchase decision. In addition, among many factors that influence consumer purchase intention, product packaging has become an effective tool to be different and attracting consumer attention and stimulating them to purchase a particular product (Olga

& Natalia, 2007), especially in the current self-service economy. However, domestic food products cannot compete with imported one due to local enterprises have not realized that packaging is a company's branding function and possible potential of packaging design as a brand communication tool (Giang Thu Quan, 2018). Thus, from perspective of Mr. Yoon Byung Soo - Director of Lotte Mart Vietnam's product strategy department, Vietnamese products food packaging is less attractive than Thailand, China or America (Giang Thu Quan, 2018). Specifically, "While the international packaging tends to simplify with courteous color, Vietnamese package is too fancy" observed Yoon Byung Soo (Giang Thu Quan, 2018). Obviously, the underdeveloped use of packaging design in Vietnamese food products is a one of the main reasons that made Vietnam food products less competitive than imported products. Vietnamese Marketers need to understand that package is a crucial element to enhance point of purchase communication. For above reasons, authors decided to study the topic "The effects of packaging attributes on Vietnamese consumers purchase intention", using instant oat as a study product.

This paper aims to quantitatively analyze the impact of packaging design on consumer purchase intention then provide Vietnamese managers a better understanding about the importance of packaging in differentiating among competitors on the shelves. Particularly, the study has the following sub-objectives:

- To measure precisely the influences of packaging elements (i.e. visual and verbal elements) on buying intention under the moderation of involvement level.
- To identify which attributes should be concentrated while designing product package.

2. THEORETICAL BACKGROUND

2.1. Packaging Elements

Packaging is not only used for logistic purpose but also as critical communication tools of products. In marketing, package is considered as the appearance of product, thus, it is the first thing consumers interact before actual goods usage in retail environments. Obviously, most of consumer buying decisions are made in the store based on packaging elements (Salem, 2018). As a result, package place the tremendous role in interacting the relationship between buyers and certain brand (Salem, 2018). According to Kotler et al. (2011), product package is illustrated as the performance of designing and creating products container which do not only keep actual products from external hazard factors but also become a “silent salesman” to increase sales volume.

There have many different definitions about the packaging elements. In the related research of Smith and Taylor (2004), they divided packaging design into six parts including “color, size, form, materials, graphic and flavor”. These elements should be considered in package design process (Vila and Ampuero, 2007). Differently, Underwood (2003) separate packaging into two main attributes i.e. structural attributes (“form, size of the containers and materials”) and graphic attributes (“color, shape, typography and image”). Obviously, similar to Underwood (2003), Smith & Taylor (2004) do not mention about verbal elements of packaging which has decisive influences on actual purchase of high-educated consumer (Mutsikiwa et al, 2013). To fill this gap, Rettie and Brew (2000) mentioned about positioning function of packaging, thus, they separated packaging to main groups: visual (e.g. color, image, shape, font, size) and verbal (e.g. brand name, slogans) elements. Additionally, according to Silayoi and Speece (2004), packaging has two major elements: visual and informational elements. Visual elements, includes graphics, size and shape of packaging, influence the affective aspect of purchase decision making of

consumer. Meanwhile, informational elements, which impact cognitive aspects, consists of product information (e.g. the name of the firm, address, country of origin, production and expiry date).

Though both Rettie & Brew (2000) and Silayoi & Speece (2004) considered the importance of informational elements, they did not mention about the environmental effects of package materials which significant influence on customer’s food purchase intention (Rundh, 2005) due to the growth of environmental concerned consumers. Not only that, they also did not indicate the role of printed language which may affect on the willingness to purchase of buyers (Salem, 2018).

Therefore, to fill above gaps, author considered the environmental influence of package materials as a part of structural elements and the language as verbal elements (Salem, 2018). As the results, based on the references of existing literature, this paper divided packaging into three main elements: graphic elements (e.g. color, shape, font, picture), structural element (e.g. size, material) and verbal elements (e.g. brand name, product information, language).

Graphic elements: Graphics elements, are factors can be seen, comprised of color combination, shape, background image and the font style used on packaging.

Structural elements: structural elements, are factors simultaneously designed to display and protect the products effectively, consist of product size design and material should be used.

Verbal elements: Verbal elements, are factors related to information or words, include brand name, the information of product and the language used on packaging. In the decision-making process, the verbal attributes influence the cognitive.

2.2. Product involvement

Product involvement, is the level of interest or effort that consumers put in purchasing a certain product, divided into two type including low and high involvement.

High involvement products, are perceived as having high value with high cost and provide long term benefits and buyers tend to carefully evaluation before purchasing it. Meanwhile, low involvement products have cheaper cost, thus, buyers do not need much time to deeply research or consider before chasing its.

2.3. Purchase Intention

Purchase intention is a mental orientation characterizing a customer’s approach to making choice. Purchase intention associates with cognitive and affective process in decision making process.

3. RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

3.1. Graphic package elements and purchase intention

Color

Color has significant influence on consumer emotion (Salem, 2018), thus, color selection process is very importance to design an attractive package. Package color assists product differentiate from other brand and enhance consumer's long-lasting memories about products. Color is an effective design tool without cost, product attributes and function adjustments.

Each packaging color of a particular product has a transferred message to consumers. Especially, for food products, package color has strong impact on customers perception about the food taste. Each buyer has different feeling and interest in package color (Mutsikiwa et al., 2013). Hence, based on their psychological status, buyers may select some colors among others choices. Additionally, consumers choose colors according to their cultural associations (Grossman and Wisenblit, 1999). Therefore, to make the right choice of color, marketers should fully understand the meanings of each colors in different cultural context (Salem, 2018).

Shape

Interestingly, many customers confirm that they have potential to purchase a certain product without reading the label or product information (Salem, 2018). Previous marketing literature proved that the shape of package associating with message affect consumer feeling and perceived quality. For instance, while male is impressed by linear angular shapes, female prefer curving line and round shape. When considering two products with the same weight, buyers tend to choose the product which has taller shape because in buyer's mindset, the higher has larger volume (Silayoi et al, 2007). Additionally, an innovative package helps products enhance the attractiveness and stand out among similar brands (Salem, 2018). Unique packaging is a competitive tool used for differentiating and consequently increase products sales volume.

Background picture

According to Salem (2018), pictures and graphics affect consumer sensory. the pictures, are printed on product packaging, describes the information related to the goods, such as products usage instructions and its functions where consumer can generally imagine what the product is. Hence, pictures on package places an important role in communicating to customer through transferring products information and imagined stimuli about products (Salem, 2018). In the other words,

packaging image is an effective instrument to convey the functions of product and assist goods to be different from alternatives.

Font Style

Font design has a significant role in catching buyer's eyes (Salem, 2018). Possibly, due to small or unclear fonts, the information of goods is ambiguously described to buyers resulting to misunderstanding and concerning about product quality. As a result, along with the development of design technology, to have an innovative font style, many companies hire experts to design a creative and attractive font style used for their logos, slogans and product package). Therefore, font style, is a powerful tool to draw consumers attention, has positive impact on consumers purchase decision.

In general, the graphic elements have significant impacts because they have a capability to influence the emotion and feeling of targeted customers (Silayoi and Speece, 2004). Thus, graphic elements positively impact on buyer's purchase intention perceived quality. Based on discussion above, the first hypothesis was established as below:

H1: Graphic packaging elements positively influence consumer's instance oats purchase intention

3.2. Structural package elements and purchase intention

Size

As package shape, buyers consider package sizes to make volume perception. Hence, the size design should meet consumer's demand (Makanjuola and Enujiugha, 2015). So, marketers should understand target's customers behavior before making product sizes decision. Additionally, package sizes strongly influence on consumer buying choice when buyers cannot clearly evaluate product quality, thus, they are potential to buying smaller one for trial usage. Meanwhile, some buyers prefer the large size of products for saving cost. Therefore, to meet different type of consumer demands, it would be better if goods are sold in various packaging size (Rundh, 2005).

Material

According to Smith and Taylor (2004), packaging material is designed according to products characteristics, functions and consumer's needs. In a research about packaging, buyers confirm that they will not purchase products which has low quality and cannot keep the freshness of foods. Obviously, the packaging material have positive affect on consumers perceived quality of products, especially, in case of food products (Silayoi & Speece, 2004). In addition, today many

consumers concern more about environmental issues (Rundh, 2005). Accordingly, buyers potentially choose products which have environment friendly, recycle and ease-reuse packaging (Rundh, 2005).

Based on previous literature review, the second hypothesis was proposed as following:

H2: Structural packaging elements positively influence consumer's instance oats purchase intention.

3.3. Verbal package elements and purchase intention

Product information

Packaging places a major role in conveying the information related to products which enhance the cognitive process of consumers (Salem, 2018). In some countries, there exist the regulations about packaging printed content, such as the name of the firm, address, country of origin, production and expiry date. Due to the increase of healthy eating trend, customer concern more about food ingredients and nutrition, thus, they more carefully consider product information available on package. The package has appropriate products information assist enhancing consumers' reliability and boosting purchase decision making process (Silayoi and Speece, 2004). In the store, package maybe the only instruments helping product communicate with buyers. Accordingly, packaging is considered as the fundamental elements in consumer purchase intention.

Brand elements

Brand elements (i.e. brand name, slogans, logos, symbols and flavor) is illustrated as the intangible treasure of the firm (Kotler & Keller, 2012). At the point of sale, buyers are willing to choose famous brand's products because in their mind, reputational brand corresponding to high quality and positively reviewed. Based on previous paper related to packaging, brand components considered as the core elements of product information (Silayoi and Speece, 2004). Brand identification helps buyers to reduce searching time when they purchase food products. With other information-related-to products, brand elements visibly evoke consumers interests and boost their purchase decision process (Mutsikiwa et al, 2013).

Language

It is obvious that using mother language on package assists buyer easily understand products functionalities and usage instructions, thus, buyers are likely to purchase products which have printed information in mother language. Hence, to globalize effectively, marketers should eliminate the language barrier which is one of the major of cultural barriers. Local people will have a positive sense that the certain foreign firm is

seriously doing business in targeted country if their language is used on package. Adopting a suitable language for information contents or packages is a very necessary mission to increase consumer purchase intention (Salem, 2018).

Whilst visual elements (e.g. color, shape, size, font, picture, material) evoke buyer's emotion and feeling, verbal elements (e.g. products information, brand elements, language) significant impact on the cognitive process of customer (Silayoi & Speece, 2004). As a result, verbal elements also have impacts on buyer's purchase intention (Salem, 2018). This led to the establishment of the third hypothesis:

H3: Verbal packaging elements positively influence consumer's instance oats purchase intention.

3.4. The effect of involvement level as a moderator

According to Solomon (2012), to make an actual purchasing a certain products, consumers are likelihood to follow four stages: "(1) problem recognition, (2) information search, (3) evaluation of alternatives and (4) product choice". Recently, Kotler & Keller (2012) added more one step which is (5) post-purchase behavior. However, this model cannot explain the consumer's impulse buying decision (Clement and Grønhaug, 2013). For example, in case of low-involvement products purchasing, obviously, above process shows its limitation. With high involvement products, buyers are likelihood to carefully search the information related to products, which follows the Kotler's purchase decision making process. For low involvement level, buyers easily are drawn by packaging design (Solomon, 2012; Silayoi & Speece, 2004).

On one hand, according to Silayoi and Speece (2004), packaging assist low involvement products evoking customer's emotional action. The expected outcome of purchase decision and the element evaluation of low involvement products are less important, thus, the role of packaging graphic and structural elements become more critical (Grossman & Wisenblit, 1999). Thus, it is possible the level of involvement has influenced the interaction between graphic or structural package elements and purchase intention, based on it, the fourth and fifth hypothesis were established as below:

H4: Involvement level is the moderator of the relationship between graphic package elements and purchase intention.

H5: Involvement level is the moderator of the relationship between structural package elements and purchase intention.

On the other hand, buyers do not care much about visual aspects when they are considering to purchase high involvement products. Accordingly, they pay more attention with package informational elements (Silayoi & Speece, 2004). Obviously, level of involvement has impacted the relationship between verbal package elements and purchase intention, based on it, authors hypothesize the following:

H6: Involvement level is the moderator of the relationship between verbal package elements and purchase intention.

4. METHODOLOGY

4.1. Sample

This research was quantitative research using online survey and convenient sampling. Along with the spreading of internet, online survey research tends to be the more cost-effective than traditional method such as paper surveys or face-to-face interviews. As a result, online survey assists researchers reduce the geographical dependence and connect to more hard-to-reach respondents in less developing time and money. Therefore, data of this study was collected by online surveys in 2019 with the criteria for participating in this study was that the respondents who are considering to buy instant oats.

To ensure the better response as well as good representation of sample, 200 people were randomly sent the link of the questionnaire via social media (Facebook, Instagram) and e-mail. However, 53 indicated that they did not plan to purchase instant oats. As a result, only 147 validate data was collected for further analysis which reflect the response rate of 73.5%.

4.2. Measures

The survey instrument is questionnaire adapted from previous studies by using five-point Likert scale (from 1 means strongly disagree to 5 means strongly agree). The authors divided questionnaire into seven sections. The first section consists of questions related to demographic information including gender, age, income and living area. In the second section, before going to packaging evaluation parts with 30 relevant questions, each participant was asked to select one of three packaging image of corresponding Vietnamese instant oats and then they were asked to evaluate only one brand they chose in the next sections. The third section includes two photos describing the front & back side of product packaging and 10 items to evaluate graphic design. The fourth section also consists of two parts including front & back side image of product packaging and 4 items conducted from Salem (2018). The fifth section includes front & back side image of product packaging and verbal

packaging design (8 items) were referred from Salem (2018). The sixth part concentrated on consumer involvement level consisting of 4 items which were conducted from Mittal (1989). Lastly, purchase intention questions were adapted from Weisstein (2017) and Pei (2014). The measurement scales were based on some most suitable previous studies with modifications. The questionnaire was adjusted according to the reviews of people who specialize and had interests in marketing field, additionally, to assurance the reliability and validity the researcher used Cronbach's Alpha coefficient test. Based on analysis results, the Cronbach's Alpha coefficients of all variables were above 0.7, which means all of them were highly reliable and validity to further analysis.

4.3. Analytical technique

To increase the validity of measurement scale through showing the constituent items load in the same factor and eliminate proposed scale which cross-load in more than a factor. Exploratory factor analysis (EFA) was conducted with Principal components method for extraction and Varimax method for rotation. All factors were extracted from measurement scales with extraction sum of squared loadings being 64.66% (greater than 50%) and the Eigenvalue is 1.168 greater than 1 cut off are statically significant (Tabachnick and Fidell, 2007). Also, the KMO index was significant at 0.853 and the Bartlett's Test of Sphericity had chi-square = 2540.660, $df = 378$ and $sig = .000$ are in the scale validity (Tabachnick and Fidell, 2007), resulting in table 1.

Table 1: Exploratory Factor Analysis Results

Condition	Value	Requirement
KMO index	0.853	$0.5 < 0.853 < 1$
Sig. (Bartlett's Test)	0.000	$0.000 < 0.05$
Total Variance Explained	64.660	$64.660 > 50\%$
Eigenvalue	1.146	$1.146 > 1$

(Data analysis by SPSS 20)

After purifying observed variable by EFA, confirmatory factor analysis was undertaken to measure the relevance of the model to primary data. The model is considered suitable for primary data if the Chi-square test has $P\text{-value} > 0.05$; If the model receives a probability value of Chi-square greater than 0.08 or GFI and CFI index close to 1 and RMSEA index below 0.08. In the research which has $CMIN/df < 3$ (with sample $n < 200$), the model is considered to be a good fit (Ketinger, Lee and Lee, 1995). In this study, the research model had degree of freedom = 339 with the results consist of Chi-Square = 478.595 at $p = .000$. The Chi-square/ $df = 1.413$, GFI = 0.826, TLI = 0.934, CFI = 0.941, RMSEA = 0.053.

The Chi-square/df (CMIN/df) was less than 2 and GFI, TLI, CFI indices (greater than 0.9) achieved satisfied values. Overall, the results in CFA strongly confirmed the reliability and validity of measurement scale of this study.

The structural equation modelling (SEM) was conducted to describe specifically the research model and investigate the relationship between independent and dependent variables as well as interaction effect of moderator of involvement level addressed in this study.

5. RESULTS AND DISCUSSION

This study analyzed two times including (1) the model without moderator and (2) the model with moderator effects.

5.1. Hypothesis testing without moderation of involvement level

The structural model contained all of three fundamental interaction had degree of freedom = 245. The results consist of Chi-Square = 388.004, Chi-square/df = 1.584, p-value = 0.000, GFI = 0.831, TLI = 0.926, CFI = 0.934, RMSEA = 0.063 (Table 2). The Chi-square/df (CMIN/df) was less than 2 and GFI, TLI, CFI indices achieved satisfied values. Hence, the structural model has satisfactory fit to collected data.

Table 2: The model fit test of structural model

CMIN/df	RMSEA	GFI	TLI	CFI
1.584	0.063	0.831	0.926	0.934

(Data analysis by AMOS 22)

The influences of packaging element on consumer purchase intention tested by SEM had analyzed results as following table.

Table 3: Research model without moderator tested by SEM

Interaction	Estimate	S.E.	C.R.	P-value
INTENTION ← GRAPHIC	0.634	0.115	5.509	0.000
INTENTION ← STRUCTURE	1.332	0.221	6.025	0.000
INTENTION ← VERBAL	0.470	0.227	2.072	0.038

(Data analysis by AMOS 22)

All P-values were less than 0.05 and β values (Estimate values) greater than 0, thus, three elements of packaging have positive influence on consumer purchase intention with the strongest impact of structural elements and the weakest impact of verbal elements at β were 1.332 and

0.470, respectively. The hypothesis testing results was summarized in the table as below.

Table 4: Hypotheses testing without moderator results

H1	Graphic packaging element positively influence consumer's instance oats purchase intention	Supported
H2	Structural packaging element positively influence consumer's instance oats purchase intention	Supported
H3	Verbal packaging element positively influence consumer's instance oats purchase intention	Supported

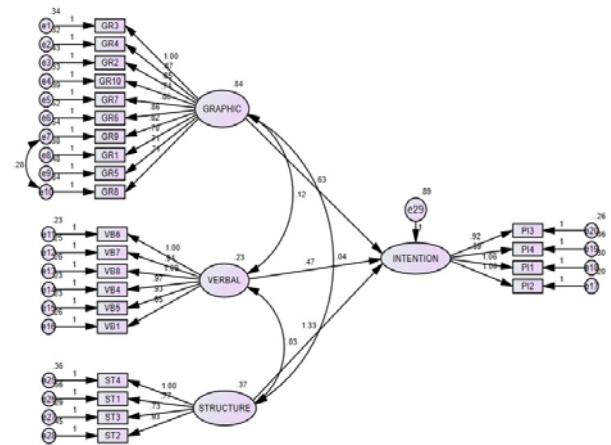


Fig. 1: Research Hypothesis structural equation modeling

(Source: Data analysis in AMOS 22)

In general, visual package elements have stronger impact on customer purchase intention than verbal elements.

5.2. Involvement Level effect testing by SEM

To measure the moderation impacts of involvement level, three interactions were calculated by multiplying independent variables and moderators (Sauer&Dick, 1993). They were presented as ZMGRxZMIL, ZMTRxZMIL and ZMVBxZMIL.

Table 5: Coding of variable computing

Coding	Equation
ZMGR	The mean value of variable "Graphic Element"
ZMST	The mean value of variable "Structural Element"

ZMVB	The mean value of variable “Verbal Element”
ZMIL	The mean value of variable “Involvement Level”
ZMPI	The mean value of variable “Purchase Intention”
ZMVBxZIL	The multiple value between the mean value of independent variable “Verbal element” and moderator “Involvement Level”
ZMSTxZIL	The multiple value between the mean value of independent variable “Structural element” and moderator “Involvement Level”
ZMGRxZIL	The multiple value between the mean value of independent variable “Graphic element” and moderator “Involvement Level”

The moderator effect on three interactions between packaging elements and purchase intention were tested by SEM in AMOS as the following figure.

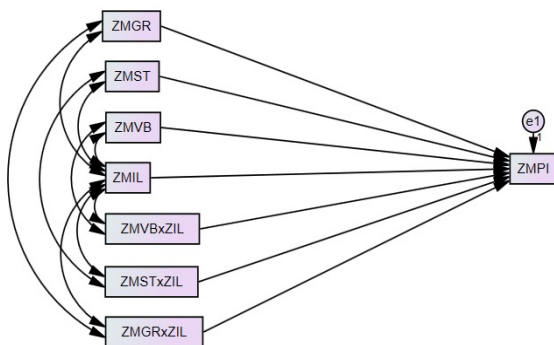


Fig. 2: Moderator Effect

(Source: Data analysis in AMOS 22)

In this model, ZMGRxZMIL, ZMTRxZMIL and ZMVBxZMIL were considered as the multiple results of moderator “Involvement level” and graphic, structural, verbal elements, respectively. To investigate the moderator effects on each package elements on purchase intention, researcher tested the interaction of above multiple variables and purchase intention by P-value consideration.

The results of SEM analysis, indicated that research model achieved the requirement of model fit, specifically shown in the table 6.

Table 6: Moderator effect model fit

CMIN/df	RMSEA	GFI	TLI	CFI
1.824	0.075	0.960	0.796	0.896

(Data analysis by AMOS 22)

Thereafter, the moderator effects of involvement level on the interaction between packaging elements and purchase intention was tested through SEM in AMOS had findings as below.

Table 7: Moderator effect

Interaction	Estimate	S.E.	C.R.	P-value
INTENTION ← ZMVBxZMIL	0.043	0.062	0.683	0.495
INTENTION ← ZMSTxZMIL	0.114	0.057	1.998	0.045
INTENTION ← ZMGRxZMIL	-0.042	0.055	-0.756	0.450

(Data analysis by AMOS 22)

One of three interactions were explored significant at the confidence level of 95%. The interaction of ZMSTxZMIL had positive effect with $\beta = 0.114$ at p-value < 0.05 (0.045). The interaction of ZMVBxZMIL and ZMGRxZMIL were not significant at p-value > 0.05. Therefore, it was possibly to support hypothesis 3 “Involvement level is the moderator of the relationship between structural elements and purchase intention”.

Generally, the results of hypothesis testing are shown in following table:

Table 8: Hypothesis testing results

H1	Graphic packaging element positively influences consumer’s instance oats purchase intention	Supported
H2	Structural packaging element packaging positively influences consumer’s instance oats purchase intention	Supported
H3	Verbal packaging element packaging positively influences consumer’s instance oats purchase intention	Supported
H4	Involvement level is the moderator of the relationship between graphic elements and purchase intention	Not Supported
H5	Involvement level is the moderator of the relationship between structural elements and purchase intention	Supported
H6	Involvement level is the moderator of the relationship between verbal elements and purchase intention	Not Supported

The analysis results proved that graphic attributes have a positive impact on consumer's buying intention for following reasons: the graphic package design has attractive and easily memorable color. These findings are similar to previous researches (e.g. Salem, 2017) which claimed that package color and image evoke consumer attention and easy to remember. Thus, understanding buyer's response to package color assist marketers and designers enhance their product's competitiveness on the shelves. Besides, package shape can make product more attractive and additionally enhance the convenience in usage, thus, convenience package shape can boost buyers purchase a certain product. Besides, for the font style used on package, it can make product more reliable and highlighted among alternative, thus, the font needs to be legible and have the appropriate size to attract buyers from distance. The findings also proved that the picture on the package has ability to evoke buyer's feeling and play a main role in transferring product's usage instruction as well as its function.

Also, structural package design has a positive impact on consumer purchase intention due to package size meet their products quantity needs and package material plays a significant role in products as well as environmental protection. In the other words, the suitable size of package stimuli consumer to purchase a certain product, therefore, it should match to consumer demands. Marketer should consider the differences of target customers in the different market to design effectively a product package. Today, consumers concern more about environmental issues, thus, they prefer environment friendly packaging along with requiring a package material is good enough to protect products itself from external attacks.

The findings also indicated that verbal elements have positive influences on consumer purchase intention due to following reasons: the brand name draw buyer's attention; the products information is clearly described; the printed information storage is easily to follow and consumers prefer package is printed in local language, thus, selecting a suitable language for product label plays an important role in transferring effectively message to consumers. These findings align to existing studies (e.g. Salem, 2018; Mutsikiwa, 2013; etc) indicated that informational element is a decisive factor while making a buying decision. Buyers often make purchase intention based on printed package information. Reading information on package makes buyers evaluate product quality even though visual elements draw their attention at the beginning.

Interestingly, involvement level has moderated influence on the relationship between structural elements and purchase intention. While the structural elements have positive effect on purchase intention, the value of its combination with involvement level is positive. In this case, the high involvement level enhances the interaction between structural element and purchase intention. In the other words, consumers pay attention in structural element when they have intention to buy a certain product with high involvement level. Therefore, in case of high involvement products, buyers highly require not only about the quality of the product itself but also its package material which has ability to protect and maintain the quality and function of the actual products during transportation process. In the other words, for high involvement products, the package material also reflects the product quality, thus, it is necessary to design a qualified package material which is consistent with the value of actual products.

Differently, involvement level is found that have no influence on the interaction between graphic element and purchase intention and the relationship of verbal element and purchase intention. This result, is in contrast with existing study (Silayoi and Speece, 2004, 2007), which caused by the different in products brand collection methods. Specifically, related previous study quantitatively did research in total food industry with various kinds of product, differently, this study focused on a certain product type – instant oats with a certain number of selected brands. Besides, participants were asked to evaluate only one brand they selected leading to the inconsistency of data which distorted the research accuracy which caused the contrary results to previous research.

6. CONCLUSION AND FUTURE RESEARCH

This study investigates the relationship between packaging elements and consumer's purchase intention with the moderation of product involvement level. The results demonstrate that packaging elements including graphic, structural and verbal elements are significantly associated with purchase intention of consumers. Further, although not strengthen affecting the relationship among graphic, verbal elements and purchase intention, product involvement level makes the interaction of structural elements and purchase intention stronger. The results of this research offer theoretical implication and practical implication as well. Theoretically, this study contributes by enhancing the literature in the influence of package design that mainly focuses on visual elements and not simultaneously analyze the effect of visual and verbal elements on

consumer purchase intention with the moderation of product involvement level. Practically, by demonstrating that involvement level has moderated influence on the relationship between structural elements and purchase intention which means that for high involvement products, the package material also reflects the product quality. As a result, this study advises marketers and designers focus more on the quality of package material which should consistent with the value of actual products. In this condition, firm could express their business's consideration and care for their customers in the positive way. Particularly, high-quality package material proves that the product quality is well protected while they are being delivered to customer. Also, it conveys a message to customer that the company respects for their selection. Thus, firms have to pay attention to package material design, especially, in case of high involvement product. Further, investing in attractive package designs with eye-catching color, various size, environmentally friendly material, easy-to-follow label and eye-spotted brand name provide firms more marketing value in the long-run.

Previous studies show the inconsistent results in analyzing the relationship among packaging design and consumer buying intention. These inconsistent results offer a further research on the significant relationship between these variables with the moderation of time pressure which strengthens the interaction of visual package design and consumer purchase intention while product involvement level boosts the impacts of verbal elements (Silayoi and Speece, 2007). Also, there are no studies that use the Vietnamese context and test the relationship between packaging and purchase intention with moderation of time pressure that provide an opportunity to conduct a research in Vietnam. Besides, due to the limited time and research scope, the number of samples in this research topic is only a representative part of the target group with the inconsistent of brand evaluation, thus, we advise future studies in nationwide analysis a certain kind of product to generate the better understanding on the role of packaging design as an effective marketing tool.

7. REFERENCES

- [1] Clement, J., K., T., and Grønhaug, K. (2013). Understanding consumers' in-store visual perception: The influence of package design features on visual attention. *Journal of Retailing and Consumer Services*, 20, pp.234-239.
- [2] Giang Thu Quan (2018). "Vietnamese consumers tend to choose healthy drinks", *Article of Vietnam Finance Magazine*, published in 07/02/2018, <http://tapchitaichinh.vn/nghien-cuu-trao-doi/nong-san-viet-kho-tieu-thu-tai-thi-truong-lon-vi-bao-bi-145692.html>
- [3] Grossman, R.P. and Wisenblit, J. Z. (1999). "What we know about consumers' color choices" - *Journal of Marketing Practice: Applied Marketing Science*, Vol. 5 No. 3, pp. 78-88.
- [4] Kettinger, W. J., Lee, C. C. and Lee, S. (1995). "Global Measures of Information Services Quality: A Cross-National Study," *Decision Sciences* (26:5), pp. 569-588.
- [5] Kotler, P. and Keller, K. L. (2012), *Marketing management*, Pearson Education.
- [6] Makanjuola, S. A., & Enujiguga, V. N. (2015). How consumers estimate the size and appeal of flexible packaging. *Food Quality and Preference*, 39, pp.236-240.
- [7] Mittal, B. (1989). "Measuring purchase decision involvement", *Psychology and Marketing* (6:2), pp.147-162.
- [8] Mohammed Z. Salem (2018). "Effects of perfume packaging on Basque female consumers purchase decision in Spain", *Management Decision*. Vol. 56. 2018, 8 (13.08.), pp. 1748-1768.
- [9] Mutsikiwa et al. (2013). "The Impact of Aesthetics Package Design Elements on Consumer Purchase Decisions: A Case of Locally Produced Dairy Products in Southern Zimbabwe", *IOSR Journal of Business and Management*, Volume 8, Issue 5 (Mar. - Apr. 2013), pp. 64-71.
- [10] Natalia Vila & Olga Ampuero (2007). The Role of Packaging in Positioning an Orange Juice, *Journal of Food Products Marketing*, 13:3, pp.21-48.
- [11] Paul L. Sauer and Alan Dick (1993), "Using Moderator Variables in Structural Equation Models", in NA - *Advances in Consumer Research*, Volume 20, eds. Leigh McAlister and Michael L. Rothschild, Provo, UT: Association for Consumer Research, pp. 636-640.
- [12] Pei, Z., Paswan, A. and Yan, R. (2014). E-tailer's return policy, consumer's perception of return policy fairness and purchase intention. *Journal of Retailing and Consumer Services* 21 (3), pp.249-257.

- [13] Philip Kotler, Veronica Wong, John Saunders, Gary Armstrong (2011), "*Principles of Marketing*", 11th European edition, Pearson Education Limited.
- [14] Rettie, R. and Brewer, C. (2000) "The verbal and visual components of package design", *Journal of Product & Brand Management*, Vol. 9 No. 1, pp. 56-70.
- [15] Rundh, B. (2005). The multi-faceted dimension of packaging marketing logistic or marketing tool? *British Food Journal*, 107 (9), pp.670-684.
- [16] Silayoi, P. and Speece, M. (2004), "Packaging and purchase decisions: a focus group study on the impact of involvement level and time pressure", *British Food Journal*, Vol. 106 No. 8, pp. 607-28.
- [17] Silayoi, P., & Speece, M. (2007). The importance of packaging attributes: a conjoint analysis approach. *European Journal of Marketing*, 41(11/12), pp.1495-1517.
- [18] Smith, P. and Taylor, J. (2004), *Marketing Communications: An Integrated Approach*, 4th ed., Kogan, London.
- [19] Solomon, M. (2012), *Consumer Behavior*, 10th ed., Pearson Education, Upper Saddle River, NJ.
- [20] P. and Zhu, Y. (2017). Examining impacts of negative reviews and purchase goals on consumer purchase decision. *Journal of Retailing and Consumer Services*, Vol.39, pp. 201-207.

EXPLORING CONSUMPTION BEHAVIOR OF VIETNAMESE STUDENTS TOWARDS ENVIRONMENTALLY FRIENDLY PRODUCTS

Nguyen Thi Thu Thuy* and Dang Thi Thu Trang

School of Economics and Management, Hanoi University of Science and Technology, Vietnam

*Corresponding author: Thuy.nguyenthithu@hust.edu.vn

Abstract

The purpose of this study is to explore factors affecting behavior of students consuming environmentally friendly products. Based on literature review, the authors propose five hypotheses covering the influence of three attributes of Theory of Planned Behavior and extend this theory with two factors including Environmental concern and Price. Data collected from student survey through both online and offline were analyzed to test the proposed hypotheses. The outcome of statistical tests demonstrates that Attitude towards the behavior, Subjective norms, Perceived behavioral control and Environmental concern exert positive impact on environmentally friendly students' behavior. Meanwhile, Price has negative effects on their environmentally friendly behavior. This study also opens up stakeholder implications for stimulating students' demand for environmentally friendly products.

Keywords: consumer behavior, environmentally friendly products, students.

1. INTRODUCTION

Over the last decade, consumer consumption of goods and services has increased tremendously across the world, leading to depletion of natural resources and severe damage to the environment (Chen and Chai, 2010). Some of the adverse repercussions of environmental damage are global warming, increased environmental pollution, ice melting, ozone depletion, and decline in flora and fauna. Realizing the threat, almost all countries worldwide have started working towards minimizing the negative/harmful impact of their business activities on the environment and society. This has led to the emergence of sustainable development which encourages the consumption of environmentally friendly products. Increasing consumption of environmentally friendly products (EFP) is trusted by many countries as one of the most practical solutions, requiring joint effort of governments, industries, and individuals, towards a more sustainable society.

Despite the effort of the governments and stimulating the consumption of marketers, increasing the consumption of environmentally friendly products among the population remains a difficult problem. The factors involved in buying environmentally friendly products such as the motivation of consumers and the rationale behind their choices continue to be difficult to understand. Consequently, the impact of environmental deprivation of human life has captured academicians and researchers' interest across the world. Findings about the

relationship between consumers' attitudes and environmentally friendly behavior are still inconsistent. So that environmentally responsible behavior is receiving increasing attention in the literature (Catlin & Wang, 2013; Leonidou, Katsikeas, & Morgan, 2013; Peloza et al., 2013; Trudel & Argo, 2013; White & Simpson, 2013). This focus is consistent with a broader interest in understanding socially responsible consumption that has persisted for several decades (e.g., Anderson & Cunningham, 1972; Antil, 1984; Roberts, 1995; Webb, Mohr, & Harris, 2008; Webster, 1975).

However, the extent to which consumers' environmentally responsible behaviors differ among individuals, and why, is not clear given that existing research has focused on responses to environmental products at the firm level (Leonidou et al., 2013) or as a result of differing situational factors (Catlin & Wang, 2013; Peloza et al., 2013; White & Simpson, 2013). Whereas, Tan & Lau (2010); Ahmad & Judhi (2008); Haron et al., (2005) and Mat Said et al., (2003) identify there is a gap between environmental issues and knowledge. Therefore, young educated consumers constitute a promising prospect for sustainable consumption for the following reasons: Firstly, young educated consumers are more receptive of new and innovative ideas than older generations (Ottman, Stafford, and Hartman 2006). They are regularly considered to be the ones driving the sustainable movement with their lifestyle and behavioral changes. Secondly, past studies show that supporters of

environmental protection tend to be younger in age (e.g., Connell et al. 1999; Martinsons et al. 1997). Thirdly, young adults nowadays have a high level of political concern and engagement (Sliwka, Diedrich, and Hofer 2006).

Based on the findings from the mentioned researchers, this study selects the student audience because of the important role of this customer group now and in the future. This research aims to identify the key antecedents that influence student's willingness to purchase environmentally friendly products. The research results will verify Theory of Planned Behavior and its extended model, thereby drawing implications for stakeholders.

2. LITERATURE REVIEW

2.1. Environmentally friendly products (EFP)

In this study, an environmentally friendly product is defined as one with at least one positive environmental attribute. An "environmental attribute" is an attribute that reflects the impact of the product on the environment. As such, environmental product attributes can be positive (i.e., the product has little to no negative impact on the environment and is considered environmentally friendly) or negative (i.e., the product harms the environment). This definition is consistent with the definition of "ethical attributes" used in past research (Irwin & Naylor, 2009; Luchs, Naylor, Irwin, & Raghunathan, 2010; Peloza, White, & Shang, 2013), with the key distinction being that environmental attributes are specifically about the environment, not more broadly about any issue that a consumer sees as relevant to their values/ethics such as child labor concerns, unsafe work environments, donations to charity, or discrimination (Mohr & Webb, 2005).

2.2. Environmentally Friendly Consumer Behavior (EFCB)

Consumer perception and attitudes regarding the importance of environmentally-friendly behavior have become increasingly important. They are expected to be more environmentally conscious and exercise their power and voice through the products they buy. This can be reflected in specific activities such as recycling, emphasizing environmental label of recycled material, and consuming only green products (Barber, 2010). Obviously, industries are damaging and ravaging the existing environmental resources. They bring more harm than good. Accordingly, a growing number of concern consumers are looking for products and services that follow practices to protect the environment. Past study from Barber (2010) specifies these concern consumers would choose the EFP against a standard product if they were been given a choice to choose. Thus, it shows that

consumers are willing to buy a product if quality is the issue.

2.3. Consumer behavior and factors affecting environmentally friendly consumer behavior

The theory of planned behavior (TPB)

The theory of planned behavior (TPB) (Ajzen, 1991) is a well-researched model that has been proved successful in predicting and explaining behaviors across a variety of domains. Previous studies have provided empirical evidence for supporting the impact of the antecedents from the TPB on consumer behavior with regard to environmentally friendly products (e.g. Chan, 2001; Ko and Jin, 2017; Cowan and Kinley, 2014; Diamantopoulos et al., 2003; Wang, 2014; Nguyen et al., 2019; Bamberg and Moser, 2007; Leonidou and Leonidou, 2011; Paul et al., 2016). Under the TPB, behavioral intention construct is at the core of the model that plays the role as a powerful predictor of the behavior (Ajzen, 2011). The TPB indicate three important antecedents of behavioral intention, including attitude toward the behavior (AT), subjective norms (SN) and the perceived behavioral control (PBC).

Attitude towards the environmentally friendly consumption

If behavior is not constrained by being expensive or difficult to perform, attitudes have a great predictive value for behavior (Stern, 2000). In such low-cost situations, general attitudes regarding environmental protection have a significant positive influence on green behavior (Diekmann and Preisendorfer, 2003). However, results concerning the influence of attitudes are inconsistent. Some studies identify a weak link between attitude and behavior which suggests a gap (Gupta and Ogden, 2009; Kollmuss and Agyeman, 2002; Peattie, 2001). In the context of organic food, attitudes account for up to more than half of the variance of pro-environmental behavior (Hauser et al., 2013; Honkanen et al., 2006; Pino et al., 2012; Tarkiainen and Sundqvist, 2009; Zhou et al., 2013) and might even be the most powerful factor to explain green buying (Kim and Chung, 2011; Tanner and Wolfing Kast, 2003). Therefore, hypothesis 1 is proposed as follows:

H1: Consumer's attitude towards the environmentally friendly consumption has positive impact on environmentally friendly consumer behavior.

Subjective norms

The TPB postulated subjective norms as a social factor influencing decision making. Social norms relate to the perceived pressure of complying with a certain behavior (Ajzen, 1991). These norms reflect a certain way of

behavior that people agree upon. They represent attitudes and values of significant others. Social norms, though, are too general to guide behavior. Consequently, they do not significantly influence behavior (Harries et al., 2016). Individuals adopt social norms by incorporating them into a personal value system. Hence, these social norms become more specific personal norms (Davies et al., 2002). Whereas social norms refer to external pressure, subjective personal norms mirror individual moral rules (Arvola et al., 2008). Moral considerations have become important factors in decision making. A growing number of consumers boycott companies because the companies apply unethical practices or sell environmentally harmful or socially unacceptable products (Thøgersen, 1999). Thus, moral considerations influence purchasing behavior. It has been demonstrated that subjective norms are important factors in the context of green behavior (Jansson et al., 2010). Such norms have a positive impact on behavior and are powerful in influencing not only current behavior, but also general consumption patterns. In sum, subjective norms refer to internal moral convictions which are based on benefits for others. Subjective norms seem to have an overall positive effect on behavior. Therefore, hypothesis 2 is proposed as follows:

H2: Subjective norms has positive impact on environmentally friendly consumer behavior.

Perceived behavioral control

Consumers are willing to choose environmentally friendly products and place high importance on green attributes, for instance when they buy food (Gadema and Oglethorpe, 2011) or dishwashers (Richter, 2010). Implementing green purchasing, however, does not just simply happen. Consumers face obstacles and difficulties hindering them from behaving accordingly. The concept of perceived behavioral control (PBC) reflects such complicating circumstances and accounts for conditions facilitating or complicating behavior (Ajzen, 2002). Judgments of PBC are shaped by beliefs concerning whether one has access to the necessary resources and opportunities to perform the behavior successfully (Ajzen, 1991). PBC reflects people's perception of control and their beliefs of being able to behave in a desired way. Hence, PBC is similar to the idea of barriers or self-efficacy (Ajzen, 2002) and stresses the importance of situational constraints (Bamberg and Möser, 2007). For the most part, studies neglect to specify constraints or barriers which might hinder consumers to carry out intended behavior. Instead, PBC is operationalized by asking direct questions about the ease or difficulty of performing a

certain action (Bamberg, 2003; Kim and Chung, 2011). This leaves considerable scope for interpretations on part of the respondents.

H3: Perceived behavioral control has positive impact on environmentally friendly consumer behavior.

However, the impact magnitudes of the three antecedents from the TPB have been inconsistent and dependent on the specific research context. So that a lot of research is conducted to explore the factors extending from this theory. In this study, we re-test the relationships between three important factors of the TPB and consumer behavior toward EFP among students in the different majors and extend this theory. Therefore, the following set of additional variables are included Environmental concern (EC) and Price (P).

Environmental concern

Environmental concern can be taken as an attitude towards facts, one's own behavior or other's behavior with consequences for environment (Weigel, 1983). It seems that the more closely involved consumers are with the environment, the more likely they are to buy green products (Schuhwerk and Lefkoc-Hagius, 1995). Chan (1996) found that individuals who were more concerned about environmental issues tended to purchase more green products, although, despite the large number of consumers who express their concerns about environmental problems, many are only willing to act if it does not involve hard "costs", such as making a sacrifice in their lifestyle (Laroche et al. 2002).

H4: Environmental concern has positive impact on environmentally friendly consumer behavior.

Price

Clearly not all consumers are willing to buy environmentally friendly products. Cost may also be a critical deterrent; environmentally friendly products have historically cost more than their traditional counterparts (Dale, 2008; Mintel, 2009), and not all consumers are willing to pay price premiums for ethical or EFP (Mintel, 2010). Clearly, some consumers are willing to purchase EFP while others are not, which suggests that there are individual differences among consumers in the value they place on conserving the environment in consumption settings. Concurrently, studies in Australia (D'Souza et al., 2006) and New Zealand (Forbes et al., 2009) identify that although the price of conventional products are more expensive, 70% of Australian and 73% of New Zealand consumers would be willing to pay more for an environmentally sustainable product.

H5: Price has negative impact on environmentally friendly consumer behavior.

3. METHODOLOGY

Samples and Data Collections

Using a quantitative approach, this study was conducted among online and offline users using self-reported survey questionnaires. Based on research by Hair, Anderson, Tatham and Black (1998) on the expected sample size, the minimum sample size is 5 times the total number of questions for the study to gain reliability. Therefore, 280 samples were surveyed, after filtering the inappropriate samples, mainly because respondents did not answer all the questions and the remaining 245 samples were analyzed including 189 samples offline and 56 samples online. Participants include various demographic characteristics.

The sampling technique established by using a simple random sampling of the public places included schools, libraries, parks, cafeterias. The constructs of the conceptual framework were operationalised by multi-item measures using 7 point Likert-Scales format, anchored by “Strongly Disagree” (1); “Disagree” (2); “Slightly Disagree” (3); “Neutral” (4); “Slightly Agree” (5); “Agree” (6); “Strongly Agree” (7).

Conceptual Framework

The conceptual framework of this research was built by adopting some of the results from previous studies. The influence of product quality and price to the customer value can be explained that a better-perceived level of product quality and price will impact the perceived level of satisfaction. All the reviews above can be described with the conceptual framework of the study.

Table 1: Literature of conceptual framework

Constructs	Literature
Attitude towards the behavior	Chan (2001); Ko and Jin (2017); Cowan and Kinley (2014); Diamantopoulos et al. (2003); Wang (2014); Nguyen et al. (2019); Bamberg and Moser (2007); Leonidou and Leonidou (2011); Paul et al. (2016); Hauser et al. (2013); Honkanen et al. (2006); Pino et al. (2012); Tarkiainen and Sundqvist (2009); Zhou et al. (2013); Kim and Chung (2011); Tanner and Wolfig Kast (2003).
Subjective norms	
Perceived behavioral control	
Environmental concern	Dunlap et al., (2000); Kilbourne and Pickett (2008); Zimmer et al. (1994); Mei et al. (2012); Lee (2008); Hui-hui Zhao et al (2012)
Price	Dale (2008); Mintel (2009); Mintel (2010); D’Souza et al. (2006); Forbes et al. (2009)

4. RESULTS AND DISCUSSION

Reliability Test

To evaluate the internal consistency of scales, Cronbach’s alpha was utilized. The alpha coefficients

for the four items are all higher than 0.7, suggesting that the items have relatively high internal consistency. SN1’s Cronbachs’ Alpha if item deleted is 0.834 > 0.777 (SN’s Cronbach’s Alpha. Therefore, SN1 was deleted out of scale. Final reliability result test is exhibited in below table 2.

Table 2: Reliability Test

	Cronbach's alpha	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Attitude towards the behavior	0.986				
AT1		12.60	4.634	0.968	0.980
AT2		12.56	4.658	0.978	0.973
AT3		12.54	4.848	0.961	0.984

	Cronbach's alpha	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Subjective norms	0.834				
SN2		14.08	8.124	0.658	0.793
SN3		13.69	8.069	0.682	0.782
SN4		13.58	8.885	0.652	0.797
SN5		14.15	8.178	0.667	0.789
Perceived behavioral control	0.894				
PBC1		9.11	8.530	0.829	0.822
PBC2		9.32	7.562	0.788	0.859
PBC3		8.80	8.603	0.770	0.868
Environmental concern	0.901				
EC1		14.47	14.537	0.712	0.896
EC2		13.95	14.591	0.790	0.869
EC3		14.25	13.639	0.827	0.854
EC4		14.08	13.867	0.788	0.868
Price	0.782				
P1		4.13	2.986	0.642	
P2		4.93	2.790	0.642	
Environmentally friendly consumer behavior	0.894				
EFCB1		10.42	11.146	0.777	0.866
EFCB2		10.07	10.536	0.781	0.858
EFCB3		10.40	8.430	0.841	0.814

Factor Analysis

Andrew et al (2009) argued that exploratory factor analysis (EFA) can also be used to measure the construct validity (mainly discriminant validity). According to them, the way to measure discriminant validity is to conduct exploratory factor analysis and looking the crossloading item.

Sample size Adequacy

Before doing the factor analysis, it is important to make sure that the number of samples will enough to cover the need of this study. In SPSS, the Kaiser-Meyer-Olkin measure of sampling adequacy, is used to check whether the sample is big enough or not. Field (2000) has reported that when the value of KMO is greater than 0.5 then the sample is regarded as adequate for the test. The following table 3. shows the result of KMO-measure of sampling adequacy and Bartlett's test of sphericity.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.850
Approx. Chi-Square		3329.466
Bartlett's Test of Sphericity	df	120
	Sig.	.000

The above table 3 is the SPSS calculation of KMO and Bartlett test. The level of KMO that is above 0.5 or closer to 1 relates to the higher level of strength in the sampling adequacy and Bartlett's Test result must be significant at the concerning Chi-Square (Cerny & Kaiser, 1977). So, in this case, the level of KMO is 0.850 (greater than 0.5) and the Bartlett's Test significance level is 0.000 at the concerning Chi-square. It means that the sampling for this scale is enough and the factors of this scale were clustered significantly or in another words it indicates that the strength of the relationship among the variables

are strong enough to do factor analysis of data. Comrey & Lee (1992) have stated that factor loading is the correlation between a variable and a factor and the key to understanding the nature of a particular factor. Generally, there are two basic types of analytical rotations: orthogonal rotations and oblique rotations which are used to rotate the factors. According to Conway & Huffcut (2003), Varimax is one of the most popular orthogonal rotation which attempts to maximize the variance of squared loadings on a factor. For this study Varimax method has been used. The following table 4 is about the factor loading of each question.

Table 4: Rotated Component Matrix^a

	Component				
	1	2	3	4	5
EC2	.859				
EC3	.849				
EC4	.847				
EC1	.780				
AT1		.906			
AT2		.904			
AT3		.902			
SN3			.812		
SN5			.790		
SN4			.769		
SN2			.736		
PBC1				.889	
PBC3				.867	
PBC2				.828	
P2					.895
P1					.881

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Multiple Regression Analysis

Multiple regression analysis was applied to test the association among service quality dimensions and customer satisfaction. The model summary discloses the following results as shown in table 5.

In order to identify the level of environmentally friendly consumer behavior, regression analysis is used for consumer's attitude towards the environmentally friendly consumption, subjective norms, perceived behavioral control, environmental concern and price. The table 6 helps to determine the relation between dependent and independent variables.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.820 ^a	.673	.666	.89186

a. Predictors: (Constant), P, AT, PBC, SN, EC

Table 6: Results of Multiple Regression Model

Model Parameters	Coefficients	Std.Error	T value	Significance
Constant		.416	-.135	.892
Attitude Towards The Behavior	.252	.068	5.320	.000
Subjective Norms	.320	.073	7.210	.000
Perceived Behavioral Control	.246	.048	5.644	.000
Environmental Concern	.138	.057	2.998	.003
Price	-.341	.038	-8.904	.000

The result indicates that Attitude towards the behavior, Subjective norms, perceived behavioral control and Environmental concern exert positive impact on environmentally friendly consumer behavior. Whereas, Price factor negatively impacts on environmentally friendly consumer behavior. Specifically, as can be seen that Price, Subjective norms and Attitude towards the behavior have highest effect. Followed by Perceived behavioral control and environmental concern. Again, this study strongly improves the theory of planned behavior. The study also shows results consistent with those of previous authors (eg. Mintel, 2010; Chan, 2001; Ko and Jin, 2017; Cowan and Kinley, 2014; Diamantopoulos et al., 2003; Wang, 2014; Nguyen et al., 2019; Bamberg and Moser, 2007; Leonidou and Leonidou, 2011; Paul et al., 2016; Kim and Chung, 2011; Tanner and Wolfing Kast, 2003; Schuhwerk and Lefkoc-Hagius, 1995; Chan, 1996). However, this result also met with disagreement about the Price factor with the results of the study of D’Souza et al., (2006) and Forbes et al., (2009). Accordingly, two results state that even though environmentally friendly products have higher prices, consumers still accept its. Maybe, with the

main subject is students not having high income, price still is a significant barrier.

5. CONCLUSION

In this study, Ajzen's TPB model with three factors Attitude towards the behavior, Subjective norms, Perceived behavioral control is expanded by two factors, namely: Environmental concern and Price for consistent results in measuring environmentally friendly consumer behavior in students. Research results not only play an important role in reinforcing the theoretical framework, but also have great practical value for policy makers and marketers in promoting the behavior of consuming environmentally friendly products among young people.

6. REFERENCES

[1] Ahmad, J., Ali, I., Grigore, G. F. and Stancu, A. (2012), “Studying consumers’ ecological consciousness – A comparative analysis of Romania, Malaysia and Pakistan”, *Amfiteatru Economic*, Vol. 14 No. 31, pp. 84-98.

- [2] Anderson, W. T., & Cunningham, W. H. (1972), "The socially conscious consumer", *Journal of Marketing*, Vol. 36 No. 3, pp. 23-31.
- [3] Arvola, A., Vassallo, M., Dean, M., Lampila, P., Saba, A., Lahteenmaki, L. and Shepherd, R. (2008), "Predicting intentions to purchase organic food: The role of affective and moral attitudes in the Theory of Planned Behaviour", *Appetite*, Vol. 50 No. 2-3, pp. 443-454.
- [4] Ajzen, I. (2002), "Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior", *Journal of Applied Social Psychology*, Vol. 32 No. 4, pp. 665-683.
- [5] Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior & Human Decision Processes*, Vol. 50 No. 2, pp. 179-211.
- [6] Ajzen, I. (2011), "The theory of planned behaviour: reactions and reflections", *Psychology & Health*, Vol. 26 No. 9, pp. 1113-1127.
- [7] Antil, J.A. (1984), "Socially responsible consumers: profile and implications for public policy", *Journal of Macromarketing*, Vol. 4 No. 2, pp. 18-39.
- [8] Barber, N. (2010), "'Green' wine packaging: targeting environmental consumers", *Int J Wine Bus Res*, Vol. 22 No. 4, pp. 423-444.
- [9] Bamberg, S., Ajzen, I. and Schmidt, P. (2003), "Choice of Travel Mode in the Theory of Planned Behavior: The Role of Past Behavior, Habit, and Reasoned Action", *Basic and Applied Social Psychology*, Vol. 25 No. 3, pp. 175-187.
- [10] Bamberg, S., and G. Möser. (2007), "Twenty years after Hines, Hungerford, and Tomera: A new metaanalysis of psycho-social determinants of pro-environmental behaviour", *Journal of Environmental Psychology*, Vol. 27 No. 1, pp. 14-25.
- [11] Catlin, J. R., & Wang, Y. (2013), "Recycling gone bad: When the option to recycle increases resource consumption", *Journal of Consumer Psychology*
<http://dx.doi.org/10.1016/j.jcps.2012.04.001>.
- [12] Cerny, B.A. and Kaiser, H.F. (1977), "A study of a measure of sampling adequacy for factor analytic correlation matrices", *Multivariate Behavioral Research*, Vol. 12 No. 1, pp. 43-47.
- [13] Chan T. (1996), Concerns for environmental issues and consumer purchase preferences: a two-country study, *J Int Consum Mark*, Vol. 9 No. 1, pp. 43-55.
- [14] Chan, R.Y.K. (2001), "Determinants of Chinese consumers' green purchase behavior", *Psychology and Marketing*, Vol. 8 No. 4, pp. 389-413.
- [15] Connell, S., J. Fien, J. Lee, H. Sykes, and D. Yencken. 1999. "'If it doesn't directly affect you, you don't think about it': A qualitative study of young people's environmental attitudes in two Australian cities", *Environmental Education Research*, Vol. 5 No. 1, pp. 95-113.
- [16] Cowan, K. and Kinley, T. (2014), "Green spirit: consumer empathies for green apparel", *International Journal of Consumer Studies*, Vol. 39 No. 5, pp. 493-499.
- [17] Conway, J. M. and Huffcut, A. I. (2003), "A review and evaluation of exploratory factor analysis practices in organizational research", *Organizational research methods*, Vol. 6, pp. 147-168.
- [18] Dale, A. (2008), "Green products gain from new price equation", *The Wall Street Journal* (June 24), B.7. <http://online.wsj.com/news/articles/SB121425785415998071>
- [19] Davies, J., Ball, S. J., David, M. and Reay, D. (2002), "'Classification' and 'Judgement': Social class and the 'cognitive structures' of choice of higher education", *British Journal of Sociology of Education*, Vol. 23 No. 1, pp. 51-72.
- [20] D'Souza, C., Taghian, M., & Khosla, R. (2007), "Examination of Environmental Beliefs and its Impact on the Influence of Price, Quality and Demographic Characteristics with Respect to Green Purchase Intention", *Journal of Targeting, Measurement, & Analysis for Marketing*, Vol. 15 No. 2, pp. 69-78.
- [21] Dunlap, R.E. et al., (2000), "Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale", *Journal of Social Issues*, Vol. 56 No. 3, pp. 425-442.
- [22] Diamantopoulos, A., Schlegelmilch, B. B., Sinkovics, R. R. and Bohlen, G. M. (2003), "Can socio-demographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation", *Journal of Business Research*, Vol. 56 No. 6, pp. 465-480.
- [23] Diekmann, A. and Preisendorfer, P. (2003), "Green and greenback: The behavioral effects of environmental attitudes in low-cost and high-cost situation", *SAGE Journal*, Vol. 15 No. 4, pp. 441-472.

- [24] Field, A. (2000), "Discovering statistics using SPSS for windows sage publications", *London*, Vol. 2, pp. 44-322.
- [25] Forbes, V., Grimm, V., Ashauer, R., Hommen, U. and Preuss, T.G. (2009), "CREAM: A European project on mechanistic effect models for ecological risk assessment of chemicals", *Environmental Science and Pollution Research*, Vol. 16, pp. 614-617.
- [26] Gadema, Z. and Oglethorpe, D. (2011), "The use and usefulness of carbon labelling food: A policy perspective from a survey of UK supermarket shoppers", *Food policy*, Vol. 36 No. 6, pp. 815-822.
- [27] Hair, J. F., Anderson, R. E., Tatham, R. L. and Black, W.C. (1998), *Multivariate Data Analysis*, 5th ed., Macmillanm, New York, NY.
- [28] Hauser, M., Nussbeck, F.W. and Jonas, K. (2013), "The impact of food-relate values on food purchase behavior and the mediating role of attitudes: A Swiss study", *Psychology & Marketing*, Vol. 30 No. 9, pp. 765-778.
- [29] Haron, S. A., Paim, L. and Yahaya, N. (2005), "Towards Sustainable Consumption: An Examination of Environmental Knowledge among Malaysians", *International Journal of Consumers Studies*, Vol. 29 No. 5, pp. 426-436.
- [30] Harris, P.R., Rowe, R., Andrews, E., Armitage, C.J. and McKenna, F.P. (2016), "Identifying beliefs underlying pre-drivers' intentions to take risks: An application of the Theory of planned behaviour", *Accident Analysis & Prevention*, Vol. 89, pp. 49-56.
- [31] Honkanen, P., Verplanken, B. and Olsen, S. O. (2006), "Ethical values and motives driving organic food choice", *Journal of Consumer Behaviour*, Vol. 5 No. 5, pp. 420-430.
- [32] Hui-hui Zhao, Qian Gao, Yao-ping Wu, Yuan Wang, Xiao-dong Zhu (2014), "What affects green consumer behavior in China? A case study from Qingdao", *Cleaner Production*, Vol. 63, pp. 143-151.
- [33] Irwin, J. R., and Naylor, R. W. (2009), "Ethical decisions and response mode compatibility: Weighting of ethical attributes in consideration sets formed by excluding versus including product alternatives", *Journal of Marketing Research*, Vol. 46 No. 2, pp. 234-246.
- [34] Jansson, J., Marell, A. and Nordlund, A. (2010), "Green consumer behavior: determinants of curtailment and eco-innovation adoption", *Journal of Consumer Marketing*, Vol. 27 No. 4, pp. 358-370.
- [35] Kim, H. Y. and Chung, J. E. (2011), "Consumer purchase intention for organic personal care products", *Journal of Consumer Marketing*, Vol. 28 No. 1, pp. 40-47.
- [36] Kilbourne, W., Beckmann, S. & Thelen, E., (2002), "The Role of the Dominant Social Paradigm in Environmental Attitudes: A multinational Examination", *Journal of Business Research*, Vol. 55 No. 3, pp. 193-204.
- [37] Kim, Y. & Choi, S.M., (2005), "Antecedents of Green Purchase Behaviour: An Examination of Collectivism, Environmental Concern, and PCEE", *Advances in Consumer Research*, Vol. 32 No. 1, pp. 592-599.
- [38] Ko, S. B. and Jin, B. (2017), "Predictors of purchase intention toward green apparel products: a crosscultural investigation in the USA and China", *Journal of Fashion Marketing and Management*, Vol. 21 No. 1, pp. 70-87.
- [39] Kollmuss, A. and Agyeman, J. (2010), "Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior?", *Environmental Education Research*, Vol. 8 No. 3, pp. 239-260.
- [40] Kristin, N. J., Andrew, B. J., Nicole, V. K., Jame, W. H. and Carl, C. C. (2009), "Multiple benefits of personal FM system use by children with auditory processing disorder (APD)", *International Journal of Audiology*, Vol. 48 No. 6, pp. 371-383.
- [41] Laroche, M., Bergeron, J. and Barbaro-Forleo, G., (2001), "Targeting Consumers who are Willing to Pay More for Environmentally Friendly Products", *Journal of consumer marketing*, Vol. 18 No. 6, pp. 503-520.
- [42] Lee, K. (2008), "Opportunities for green marketing: Young consumers", *Marketing Intelligence & Planning*, Vol. 26 No. 6, pp. 573-586.
- [43] Leonidou, C. N., Katsikeas, C. S., & Morgan, N. A. (2013), "'Greening' the marketing mix: Do firms do it and does it pay off?", *Journal of the Academy of Marketing Science*, Vol. 41 No. 2, pp. 151-170.

- [44] Luchs, M., Naylor, R. W., Irwin, J. R., & Raghunathan, R. (2010), "The sustainability liability: Potential negative effects of ethicality on product preference", *Journal of Marketing*, Vol. 74, pp. 18-31.
- [45] Martinsons, M. G., S. K. K. So, C. Tin, and D. Wong. (1997), "Hong Kong and China: Emerging markets for environmental products and technologies", *Long Range Planning*, Vol. 20, pp. 277-290.
- [46] Mei, O. J., Ling, K. C., & Piew, T. H. (2012), "The antecedents of green purchase intention among Malaysian consumers", *Asian Social Science*, Vol. 8 No. 13, pp. 246-263.
- [47] Mintel (2009), Ethical Clothing, UK- February 2009. Retrieved May 21, 2010, from <http://oxygen.mintel.com/sinatra/oxygen/display/id=393875>
- [48] Mintel (2010), "Are Americans willing to pay more green to get more green?", Retrieved January 31, 2011, from <http://www.mintel.com/presscentre/pressreleases/514/are-americans-willing-to-pay-more-green-to-get-more-green>
- [49] Mohr, L. A., & Webb, D. J. (2005), "The effects of corporate social responsibility and price on consumer responses", *Journal of Consumer Affairs*, Vol. 39 No. 1, pp. 121-147.
- [50] Nguyen, T. T. M., Nguyen, H. L. and Nguyen, V. H. (2019), "Materialistic values and green apparel purchase intention among young Vietnamese consumers", *Young Consumers (online version)*, available at: <https://doi.org/10.1108/YC-10-2018-0859> (accessed July 20, 2019).
- [51] Ottman, J. A., E. R. Stafford, and C. L. Hartman. (2006), "Avoiding green marketing myopia: Ways to improve consumer appeal for environmentally preferable products", *Environment*, Vol. 48 No. 5, pp. 22-36.
- [52] Paul, J., Modi, A. and Patel, J., (2016), "Predicting Green Product Consumption Using Theory of Planned Behavior and Reasoned Action", *Journal of Retailing and Consumer Services*, Vol. 29, pp. 123-134.
- [53] Peattie, K. (2001), "Towards sustainability: The third age of green marketing", *The Marketing Review*, Vol. 2 No. 2, pp. 129-146.
- [54] Pelozo, J., White, K., & Shang, J. (2013), "Good and guilt-free: The role of self-accountability in influencing preferences for products with ethical attributes", *Journal of Marketing*, Vol. 77, pp. 104-119.
- [55] Pino, G., Peluso, A. M. and Guido, G. (2012), "Determinants of regular and occasional consumers' intentions to buy organic food", *Journal of Consumer Affairs*, Vol. 46 No. 1, pp. 157-169.
- [56] Richter, C. P. (2010), "Automatic dishwashers: efficient machines or less efficient consumer habits?", *International Journal of Consumer Studies*, Vol. 34 No. 2, pp. 228-234.
- [57] Roberts, J. A. (1995), "Profiling levels of socially responsible consumer behavior: A cluster analytic approach and its implications for marketing", *Journal of Marketing Theory & Practice*, Vol. 3 No. 4, pp. 97-118.
- [58] Said, A. M., Ahmadun, F. R., Paim, L. H. and Masud, J. (2003), "Environmental concerns, knowledge and practices gap among Malaysian teachers", *International Journal of Sustainability in Higher Education*, Vol. 4 No. 4, pp. 305-313.
- [59] Schuhwerk M, Lefkock-Hagius R. (1995), "Green or not- green? Does type of appeal matter when advertising a green product?", *J Advertising*, Vol. 24, pp. 45-55.
- [60] Stern, P. (2000), "Toward a coherent theory of environmentally significant behavior", *Journal of Social Issues*, Vol. 56 No. 3, pp. 407-424.
- [61] Tarkiainen, A. and Sundqvist, S. (2009), "Product involvement in organic food consumption: Does ideology meet practice", *Psychology & Marketing*, Vol. 26 No. 9, pp. 844-863.
- [62] Straughan, R.D. and Roberts, J.A., (1999), "Environmental Segmentation Alternatives: A Look at Green Consumer Behavior in the New Millennium", *Journal of Consumer Marketing*, Vol. 16 No. 6, pp. 558-575.
- [63] Tanner, C. & Kast, S.W., (2003), "Promoting Sustainable Consumption: Determinants of Green Purchases by Swiss Consumers", *Psychology and Marketing*, Vol. 20 No. 10, pp. 883-902.
- [64] Thøgersen, J., Jørgensen, A. and Sandager, S., (2012), "Consumer Decision-making Regarding a "Green" Everyday Product", *Psychology and Marketing*, Vol. 29 No. 4, pp. 187-197.

- [65] Trudel, R., & Argo, J. (2013), "The effect of product size and form distortion on consumer recycling behavior", *Journal of Consumer Research*, Vol. 40 No. 4, pp. 632-643.
- [66] Tan, B.C., and Lau, T. C. (2010), "Attitude towards the Environment and Green Products: Consumers' Perspective", *Management Science and Engineering*, Vol. 4 No. 2, pp. 27-39.
- [67] Wang (2014), "Consumer characteristics and social influence factors on green purchasing intentions", *Marketing Intelligence & Planning*, Vol. 32 No. 7, pp. 738-753.
- [68] White, K., & Simpson, B. (2013), "When do (and don't) normative appeals influence sustainable consumer behaviors?", *Journal of Marketing*, No. 77 No. 2, pp. 78-95.
- [69] Webb, D. J., Mohr, L. A., & Harris, K. E. (2008), "A re-examination of socially responsible consumption and its measurement", *Journal of Business Research*, Vol. 61 No. 2, pp. 91-98.
- [70] Webster, F. E., Jr. (1975), "Determining characteristics of the socially conscious consumer", *Journal of Consumer Research*, Vol. 2 No. 3, pp. 188-196.
- [71] Weigel, R. H. (1983), "Environmental attitudes and the prediction of behavior. In Fransson, Niklas & Gorling, Tommy (1999). Environmental concern: conceptual definitions methods, and research findings", *Journal of Environmental Psychology*, Vol. 19, pp. 369-382.
- [72] Zhou, Y., Thøgersen, J., Ruan, Y. and Huang, G. (2013), "The moderating role of human values in planned behavior: the case of Chinese consumers' intention to buy organic food", *Journal of Consumer Marketing*, Vol. 30 No. 4, pp. 335-344.
- [73] Zimmer, M. R., Stafford, T. F. and Stafford, M. R., (1994), "Green Issues: Dimensions of Environmental Concern", *Journal of Business Research*, Vol. 30 No. 1, pp. 63-74.

AN EXPLORATORY INVESTIGATION INTO INCONSPICUOUS LUXURY CONSUMPTION IN VIETNAM

Nguyen Bao Ngoc¹ and Nguyen Thi Tuyet Mai^{2,*}

¹ Department of Marketing, Economic Research Institutes of Posts and Telecommunications,
Post and Telecommunications Institute of Technology

² Faculty of Business Management, National Economics University

*Corresponding author: tuyetmaisdh@neu.edu.vn

Abstract

This study aims to explore inconspicuous luxury consumption, an emerging consumption phenomenon in Vietnam. A qualitative research using semi-structured consumer interviews was conducted in Hanoi. The research findings suggest that inconspicuous luxury consumption is on the rise in Vietnam, especially among several groups of consumers. The salient motivations driving consumers to engage in inconspicuous luxury consumption include function-seeking, differentiation, and avoidance. The research results are discussed and some managerial implications are provided.

Keywords: inconspicuous luxury consumption, qualitative research, Vietnam.

1. INTRODUCTION

The growth of luxury market worldwide has gained much attention from researchers. Meaning as “extras of life” (Henly et al., 2005), luxury products provide convenience or indulgence that is higher than minimum requirements. A luxury brand regards to a branded product or service that consumers perceive to: be high quality, offer authentic value via desired benefits, whether functional or emotional; have a prestigious image within the market built on qualities such as artisanship, craftsmanship, or service quality (Ko et al., 2019). Luxury products are considered as displaying an individual’s symbol and social identity (Vickers & Renand, 2003).

In luxury landscape, conspicuous consumption and status consumption are heavyweight research streams. Rooted by Veblen (1899), conspicuous consumption was coined as “the tendency for individuals to enhance their image, through overt consumption of possessions, which communicates status to others” (O’Cass & McEwen, 2004, p.34). Related but empirically separate, status consumption refers to “the behavioral tendency to value status and acquire and consume products that provide status to the individual” (O’Cass & McEwen, 2004, p.34). In literature, products that play the role as status symbols are often luxuries (e.g., Mai & Tambyah, 2011). However, luxury is not necessary relating to conspicuousness (Eckhardt et al., 2015). According to

Han et al. (2010), patricians, the top of social class pyramid prefer inconspicuous products overt to display their wealth or status.

Inconspicuous luxury consumption has recently garnered renewed attention (Gurzki & Woisetschläger, 2017), which discuss consuming luxury products without overtly displaying wealth and social status (Eckhardt et al., 2015). Initially, inconspicuous consumption refers to the consuming of ordinary products (Smith, 2007). Recently, inconspicuous consumption is associated with luxury context, which is known as: inconspicuous luxury consumption (ILC). Inconspicuous luxury consumers are those who prefer unique, sophisticated, and subtle luxury brands whom Berger & Ward (2010) called “insiders” with hard-to-imitate tastes and preferences, distinguishing them from the mainstream.

In developed countries, inconspicuous luxury consumption has been already explored (Berger & Ward, 2010; Chung & Fischer, 2001). Besides, a shift from the conspicuous to inconspicuous consumption in some developing countries is suggested (Postrel, 2008). The rise of inconspicuous luxury consumption has been recently reported in China and Middle East (see Makkar & Yap, 2018a, 2018b; Wu et al., 2017). Although ILC is an emerging phenomenon worldwide, the number of studies on ILC is still modest (Wu et al., 2017), especially in the context of developing countries.

Being a developing and transitional economy, Vietnam is distinctive on its own aspects (Batra, 1997). It has been noted that many urban Vietnamese consumers tend to consume luxury products and services for the sake of status (Mai & Tambyah, 2011). However, it is still in question about the current status of the ILC phenomenon in Vietnam. This study, therefore, aims at answering the following research questions:

- *What are common inconspicuous luxury brands and products in Vietnam?*
- *Which groups of consumers often engage in inconspicuous luxury consumption in Vietnam?*
- *Why do Vietnamese consumers engage in inconspicuous luxury consumption?*

Following the introduction section, we first provide a literature review on inconspicuous luxury consumption. After that, the research methodology is presented, followed by the research findings. Finally, the theoretical and practical implications are discussed.

2. LITERATURE REVIEW

Inconspicuous consumption and inconspicuous luxury consumption

Inconspicuous consumption has been described as the routine consumption of “ordinary” goods and services (Francks, 2009; Khan, 2019; Smith, 2007; Sullivan, 2008). Recently, studies on inconspicuous consumption are closely linked to luxury consumption (Eckhardt et al., 2015; Makkar & Yap, 2018a, 2018b; Wu et al., 2017). Some researchers have described inconspicuous consumption as consuming luxury products without overtly displaying wealth and social status (Berger & Ward, 2010; Wu et al., 2017). In this study, we employ the definition of inconspicuous consumption by Eckhardt et al. (2015). Specifically, in the context of luxury consumption, ILC is defined as the use of subtle signals, which are unidentifiable by the mainstream but instantly observable to those that possess the needed connoisseurship to decode its meanings. This definition has been used in recent studies (Makkar & Yap, 2018a, 2018b; Shao et al., 2019). The subtle signals may be brand identification, their design, shape, discreet patterns or detailing and other aspects (Berger & Ward, 2010). Some examples of inconspicuous luxury products are noted as Birkin Bag of Hermes, Hermes tie with H pattern (Berger & Ward, 2010), or the hidden logo of Shang Xia pendant (Wu et al., 2017).

Types of inconspicuous luxury consumers

Inconspicuous consumers can afford highly priced luxury (Makkar & Yap, 2018b). Wu (2017) suggested some forms of inconspicuous consumers. First,

consumers who desire for fantasy lifestyle (Wu et al., 2017). The high-income people who lack of leisure time, often purchase expensive and luxury goods to satisfy their fantasized identity or luxury lifestyle (Sullivan & Gershuny, 2004). They engage in inconspicuous consumption to display their ideal social identity or lifestyle. Second, consumers who engage in luxury products because of aesthetics and functions (Wu et al., 2017). Third, consumers who are high in economic capital and prefer to avoid gaining attention in economic crisis context (Belk, 2011; Wu et al., 2017). Some rich people consume luxury goods inconspicuously to pretend bad luck and some dangers that come from envy or voracity (Wu et al., 2017). Fourth, consumers who want to distinguish themselves from others and employ quiet signals that are only observable to people with the requisite knowledge to decode their meaning. These people are called “insiders” (Berger & Ward, 2010). These consumers have specific-domain cultural capital, wealthy, prefer unique, sophisticated, and subtle luxury brands, and feel comfortable with quiet logos (Berger & Ward, 2010) instead of logo avoidance (Davis, 2013). They consume subtle brands to distinguish themselves with both the nouveaux riches who engage in conspicuous consumption and the poor, lower status consumers, and perceive themselves as imagined consumer cultural elites (Wu et al., 2017). Though not focused on ILC, Han et al. (2010) provided some typologies based on the level of wealth and need in status. Among these groups, “Patrician” is described as those who are high in financial means, low in their need to consume for prestige's sake, and keen to associate with other patricians, with sophisticated tastes and preferences, difficult to replicate, and distinguishing them from the mainstream.

Inconspicuous luxury consumption vs. conspicuous consumption

Inconspicuous consumption is being a part of luxury research stream which has been increasing at a rapid pace (Gurzki & Woisetschläger, 2017). The term “luxury brand” usually refers to high-quality, expensive or uncommon brands (Wu et al., 2017). Luxury products are uncommon, exclusive and reputable goods with highly symbolic and emotional value. Regarding luxury consumption, both conspicuous and inconspicuous are included in, which fostered attention within the research communities, are highlighted as a significant phenomenon (Gurzki & Woisetschläger, 2017). Rooted from an economic perspective, conspicuous consumption was regarded to the wealth wasted money on unnecessary expenditure (Veblen, 1899). By the time, conspicuous consumption is regarded as the process by which wealthy people from the upper class publicly

demonstrate their social power, status and prestige (O’Cass & McEwen, 2004). Recently, sociological definitions of conspicuous consumption include consuming luxury goods and services to publicly display their wealth as well as to maintain their social status. The conspicuous consumers consume luxury goods and services either to display their economic power as a means of their social status (Eastman et al., 1999). The nouveaux riches, elite and high-income class are the targeted group of this behavior. The wealthier consumers seek to distinguish themselves from others by consuming luxury, rare and high quality products and services which are unaffordable to the masses (Han et al., 2010). The cultural ‘elite’, thus, can make even a mundane or an easily affordable product express and exhibit their exclusive taste, by sophisticated, in-depth appreciation and appropriate communication of these “taste-symbols” which, by design, remain distinct from “status-symbols” (Chaudhuri et al., 2011). A dynamic change of conspicuousness can be concerned. Conspicuous consumption regards to an inner trait and individualistic factors that encourages consumer to engage in visible forms of consumption in order to exhibit their uniqueness (Chaudhuri et al., 2011). If conspicuous consumers send to receivers by loud signals, inconspicuous consumers decode their meanings to high cultural capital receivers by subtle signals (Gurzki & Woisetschläger, 2017).

Inconspicuous consumption vs. status consumption

Related to marketing theory, another issue is vital to intersect with inconspicuous consumption named as status consumption. Status consumption, that is, the consumption of goods and services for displaying status, is an interesting facet of consumer behavior which is of theoretical and managerial importance. This issue is developed by Eastman et al. (1999) and refers to “the motivational process by which individuals strive to improve their social standing through the conspicuous consumption of consumer products that confer and symbolize status both for the individual and surrounding significant others” (Eastman et al., 1999, p. 43). Donnerwerth & Foal (1974, p. 786) defined status as “an expression of evaluative judgment that conveys high or low prestige, regard, or esteem”. Status is a form of power that consists of respect, consideration, and envy from others and represents the goals of a culture. There are three kinds of status, namely: (1) status by definition or assignment (e.g., royalty), (2) status by achievement (an individual has higher status if he/she does a better job compared to others in his/her line of work), and (3) status by consumption (Hayakawa 1963; Brown 1991). In luxury landscape, status is gained by consumption. With the rising of inconspicuous consumption,

inconspicuous consumers tend to seek their inner hedonistic pleasure rather than displaying the wealth or social status. Rather than focusing on material possessions, inconspicuous consumption is associated with cultural capital, which is a set of skills that are learned and continually reproduced through the daily actions of these taste experts (Makkar & Yap, 2018b).

Inconspicuous consumption has been emerging as a notable phenomenon. Because of the dilution of mass-luxury with the spread of brands to the mass market, the conspicuous consumption of the nouveaux riches, and high-quality counterfeits, the meaning of traditional luxury goods has been diluted (Wu et al., 2017). Elite, upper class consumers have traditionally shied away from overt status symbols, preferring more inconspicuous brands that often use subtle signals in their design (Han et al., 2010). Previous emphasis on acquisition and exhibition of physical items has shifted to experiences and symbolic image (Firat & Venkatesh, 1993). Makkar & Yap (2018b) argued that inconspicuousness is not simply the opposite of conspicuousness. They have concerns for socially responsible consumption (Klein, 2000) or may reject authentic and counterfeit luxuries demonstrating their claims for status without patronizing luxuries (Geiger-Oneto et al., 2013). Ledbury Research identified connoisseurship and early adoption of luxuries as key motivators for inconspicuousness (Economist, 2005). Inconspicuous consumers are sophisticated, multi-layered and emotionally- driven when they comes to selecting luxury. Inconspicuousness does not require wealth or status as previously thought (Bourdieu, 1984; Han et al., 2010), but the accumulation of cultural capital is needed to ascertain taste in consumption. Berger & Ward (2010) pointed out inconspicuous luxury is used to signal to those in-the-know. However, Makkar (2018) proved that it is used subtly to avoid others’ benign or malicious envy (Belk, 2011). In general, inconspicuous consumption is not the opposite of conspicuous consumption. Inconspicuous consumers are sophisticated and multi-layered and so are their luxury fashion choices. Previous research has illustrated wealth and status as core attention in luxury, but in the emerging phenomenon of inconspicuous consumption, cultural capital along with a need for satisfaction and personal development is gaining research attention (Makkar & Yap, 2018b).

The rise of inconspicuous luxury consumption

With regard to the rising of inconspicuous consumption, some reasons have been suggested by previous studies. Many reasons come from the dilution of mass luxury production which was referred by new luxury (Eckhardt et al., 2015). This luxury has engaged in the divorce of

status and class, and availability in the mass market, low-priced accessories by high-end luxury goods makers, the production of less expensive new luxury goods, and the rising of counterfeit resulted in the death of social class, and the meaning of luxury is diluted. In addition, Patricians, who are on the top of the socio-economic pyramid and have less need to signal status to others, pay more for inconspicuously branded products, pay a premium for inconspicuousness or avoid gauche luxury consumption (Han et al., 2010). The educated elites who are high in cultural capital but not as high in economic capital will consume exclusive version of working-class products to differentiate themselves from both the moneyed elite and nouveaux riches. Because of the dilution of luxury, inconspicuous consumers have some specific motivations, including distinguishing themselves from the new luxury consumers and avoiding the envy or seeking for the functions.

Recently, inconspicuous consumption is known as an emerging phenomenon (Eckhardt et al., 2015). Until now, many studies on this phenomenon have focused on individual's perspectives in their perceived meaning, rather than the social interaction and social processing (Gurzki & Woisetschlager, 2017). Eckhardt et al. (2015) awakened academic researchers with the dilution of mass-luxury resulting in the rise of inconspicuous consumption. The role of subtle signals in luxury consumption and preferences of inconspicuous consumers is investigated in the literature (Berger & Ward, 2010). The motivations of inconspicuous consumers have been pointed out regarding identity and emotional essence perspectives (Makkar & Yap (2018b); Wu et al., 2017). A typology for inconspicuous consumers which based on their identity signaling needs and their fashion knowledge, is extended from "patrician" (Han et al., 2010; Makkar & Yap, 2018a).

Methodology used in the inconspicuous luxury consumption studies

In spite of regathering significant attention to inconspicuous consumption from academic researchers, only few empirical studies have been conducted in order to explore this emerging phenomenon. Some scant highlighted studies are named as *Forms of inconspicuous consumption: What drives inconspicuous luxury consumption in China?* (Wu et al., 2017), *Emotional experiences behind the pursuit of inconspicuous luxury* (Makkar & Yap, 2018b), and *The anatomy of the inconspicuous luxury fashion experience* (Makkar & Yap, 2018a). All chosen informants in these studies were described as wealthy, both male and female, varied in age, education and engaged in luxury consumption. Most studies employed qualitative methods with the combination of in-depth interviews, participants observation and photograph for

the purpose of triangulation (Belk, 1988). Specifically, in-depth interviews (Makkar & Yap, 2018b) and semi structure interviews (Wu et al., 2017) were applied to gather data from the informants. Each interview lasted approximately 60 to 120 minutes. The key issues raised in the interviews include consumers' luxury meanings, common luxury purchases, experiences and attitudes toward luxury brands. In order to get rich and meaningful data, some techniques were used such as stereotyping or personification to encourage informants to express their true feelings. In order to collect data in triangulation to analysis, observation and photographs were taken. Some targeted elements in observation were physical environments (informants' homes, material possession, framed photographs, magazine collections, closets and retail store environment during shopping trips), non-verbal cues as their gestures, facial, bodily expressions and repetitive behaviors.

3. METHODOLOGY

This study aims to confirm the rise of inconspicuous consumption, groups of inconspicuous consumers and their motivations engaging in inconspicuous luxury in Vietnam. As this behavior has been significantly undertaken in scholars, especially in emerging context as Vietnam, qualitative method is the most appreciated to address the research questions.

Sampling

Authors choose informants in purposive through the personal network of the authors' acquaintances. All informants were selected on the basis of their experience in purchasing luxuries, the latest purchase of inconspicuous luxury products. Our final sample is 8 luxury consumers who are various in terms of gender (i.e., both males and females), ages, occupations, and types of working organizations (i.e., both in public and private sectors). The profile of informants reflects their typical characteristics such as high levels of education and economic capital (details in Table 1).

Table 1: The interview informants' profile

Order	Gender	Age	Occupations
01	Female	32	Branding director
02	Male	38	Sale director
03	Female	42	Manager
04	Female	50	Freelancer
05	Female	43	Owner business
06	Female	31	Agency's director
07	Female	41	Program's co-Ordinator
08	Male	37	Official

Data collect

Semi-structured interview is one of the most popular techniques in qualitative research and appreciated in exploring the hidden aspects (Qu & Dumay, 2011). Authors gathered data by semi-structured interview and a list of question was prepared. The main interview questions revolved around informant's luxury purchase histories, their recent luxury purchases and experiences, their social class and their opinions on luxury brands they consumed. Six interviews were conducted in the coffee shops near the informants' houses or near their offices, one in the office and one at the participant's home. The interviews lasted from 45-70 minutes and were recorded for data analysis purpose. The data collection continued until theory framework reach saturation and no new insights appeared.

4. FINDINGS

Inconspicuous luxury consumption in Vietnam

As previously mentioned, within luxury landscape, inconspicuous consumption is defined as the use of subtle signals, which are unidentifiable by the mainstream but instantly observable to those that possess the needed connoisseurship to decode its meanings (Eckhardt et al., 2015; Makkar & Yap, 2018a, 2018b; Shao et al., 2019). Our informants expressed their preferences to fashion clothing and accessories which are invisible items or some low-key luxury brands. Based on the collected data, this phenomenon in Vietnam is still at an early stage but has a tendency of wide spreading in the society. Currently, a few groups of consumers who are high in economic capital and well-educated tend to engage more in this behavior. The following quotes from our informants illustrate this point.

Nearly 80% people don't know my handbag's brand name when I wear a Chloe handbag because my handbag doesn't have any big ring.... It is difficult for the mass to recognize.... The rest 20% [who can recognize the bags' brand] are my customers or friends who are rich-experienced in luxury fashion, and I think this type of consumers is minority. In Vietnam, they almost follow the "show-off" culture ["văn hoá phô trương"]. (Female, 31)

I usually consume luxury handbags or clothing, but [smile] not all people know I am wearing a luxury dress [she wore a red Chanel dress, Vanclief earrings and Cartier bracelet] However, I know a small group who know what I have. I think ... this group is rising because consumers are becoming very smart before purchasing anything. (Female, 41)

Groups of consumers engaging in inconspicuous consumption and their characteristics

Our informants suggested that inconspicuous consumers engage in ILC because of their passionate interest in fashion. They really love fashion. However, the levels of passionate about fashion of men and women are different. Women tend to be more passionate about fashion than men do, although all the informants expressed their interest in fashion.

I love fashion. I do spend a lot for fashion. (Female, 43)

...love fashion, be passionate about it, take time for it, learn about the meaning of each bag, the leather, and the relevant circumstances under which the bags should be used. (Female, 31)

Most our informants are rich-experienced in their specific luxury categories, except a lady, who has enjoyed luxury watches for 2 years. The others have experienced in using luxury products for more than 5 years. It is in the line with findings from Makkar & Yap (2018b) and Eckhardt et al. (2015) that inconspicuous consumption needs to accumulate to the cultural capital to ascertain taste in consumption. Inconspicuous consumers perceive luxury as a means to reach life comfort and self-fulfillment.

According to Bourdieu (1984), people draw on three different types of resources (economic, social and cultural capital) to establish symbol capital. Based on our interview data, some criteria for classifying inconspicuous luxury consumers are identified as follows.

The first criterion is economic-based. We classified inconspicuous luxury consumers into two groups. The first group includes those consumers who are affordable to purchase luxury products. This group can afford to pay for luxury products, but has economic considerations in their consumption decisions. They are not really comfortable with spending on luxury goods. And for them, luxury products are not only a passion but also are products with high liquidity. This group often falls into the middle class, with average income, interested in fashion, affordability but not really rich people, and it usually is the group of young customers, from 25 - 35 years old. They tend to purchase classic products that they can use on many occasions.

...Secondly, luxury products have liquidity. If I want a new item, I can sell the old one. Only luxury items can be sold at a good price. (Male, 37)

With a luxury product, after using it, I can resell it. It is not only for outside appearance; it is a worthy investment. For example, a Chanel bag can be sold with higher price than when I bought it. (Female, 41)

On the other hand, some wealthy consumers are comfortable with spending on brands without too much

economic consideration, and interested in fashion. This group often includes government officials, rich-kids or old-money. Some Government officials often buy expensive luxury goods or services, and very few people know prices of the expensive possessions because of their low wages (Osburg, 2013). The findings from our interviews share some similarities.

Those people who have a lot of money, they can buy [luxury products] without thinking. It is their collection. I know many people like that. Some women can buy 10 to 20 bags [luxuries] at a time. (Female, 32)

For example, I can spend 100 to 150 million dong on shopping, but some people can spend 1 to 2 billion on bags. Sometimes they buy inconspicuous bags just to try on, to mix match the style. (Female, 31)

Beside economic capital, we classified inconspicuous consumers based on cultural capital. Cultural capital consists of a set of “socially rare and distinctive tastes, skills, knowledge and practices” (Holt, 1998). In the field of consumption, cultural capital influences one’s preferences and tastes for particular product categories and/or brands. In this study, we suggest that cultural capital is the level of shift from conspicuousness to inconspicuousness in luxury consumption. The first group includes consumers who began their luxury experience with an inconspicuous product. Two of our eight informants engaged in luxury consumption first by a quiet product. The reason may come from their personalities such as being humble. They may not want others to pay attention to the luxury products they own. We suggest this group to be called as “born in inconspicuous”. The followings are some of our informants’ opinions.

I think it depends on the personality because I do not want to attract attention or be the topic people talk about. (Female, 31)

If you look at my Louis Vuitton bag, you won't be able to recognize the brand name. There is no logo or anything to identify it. I think that my job position is not suitable to use such brand name items. (Female, 41)

The next group was categorized as transitional consumers. These consumers have experienced in conspicuous consumption before enjoying inconspicuous consumption. They experience almost all collections, and gradually know which products are right for them, and how to style the products. This group is usually rich, uses brand name for longtime, has a lot of experience with brand name. Many of these consumers belong to the older group, or a group of young people who have the opportunity to study abroad, especially in European countries, and have more exposure to the

brands. When they return, they bring those brands back to Vietnam. There are several reasons for this shift, for example, changes in political institutions lead many government officials to change their consumption habits. They like branded products but do not want to show off or a brand that is too well known (e.g., Louis Vuitton, Rolex, and Hermes).

When I was in Europe, I like these brands. My friends usually use these brands [she was talking about her friends]. (Female, 31)

As people with taste and to have that taste in Vietnam, they have to experience a lot. They have the access, and actively reach out to the world, via Facebook, via Instagram, through magazines, through YouTube, review and do a lot of research. (Male, 37)

The last one is the group of consumers who purchase both conspicuous and inconspicuous products in parallel, depending on circumstances and preferences. The highlights of this group are that they actively learn about fashion, accept changes and often pioneer in fashion. They often have fashion products before they become popular in the market.

I sold a Devaux bag. When I bought it, it was still unpopular, but it is on trend now and I sold it for a good price. (Female, 31)

Motivations to engage in inconspicuous luxury consumption

Aesthetics and function seeking

The nature of luxury is described as “...beauty; it is art applied to functional items. Like light, luxury is enlightening...” (Kapferer, 1997). Functional and aesthetic appreciation are embraced by luxury consumption (Wiedmann et al., 2009). When being asked about luxury meaning and her luxury consumption, our informants share their thoughts as follows.

To me, luxury's value comes from your understanding about the product. You will never consume a handbag or a cloth if you don't know its function. I always focus on material of luxury products, what types of leather and textiles before purchasing something... (Female, 43)

Each stitch on your clothes show its sophistication and subtly. Let's try and I am sure you will never purchase any sloppy items anymore. That's the preeminence of luxury fashion, you know... (Female, 50)

One of our informants showed her preference toward luxury brands because of its aesthetics and designs. All the clothes she bought may fit her body well, and bring her the comfort. Her emphasis on quality and functionality was addressed and also the quality of the

design, which involves simplicity and suitability. Project their privately held reflective, specifically, function-seeking, identities drive our informants to engage in inconspicuous consumption.

Differentiation

Past research has pointed out a type of inconspicuous luxury consumer who desires to differentiate themselves from the mass: the nouveau riche, counterfeit or renter luxury, and the poor (Wu et al., 2017). The following opinion from an informant is a good illustration. She wants to distinguish herself with conspicuous consumers and the poor.

My style doesn't follow the mass or trend....I am different from others, I surely....If you want to talk about the trend of majority, I am not your target...(Female, 41)

The lady talked about how to distinguish her Chanel dress and black Vanclief earrings with the pride of knowledge. Her emphasis also focused on someone who wore fake Vanclief earrings when they didn't know the difference between an authentic one and a fake one.

Counterfeit products have diluted the market which brings consumers a differentiation. An informant shared her opinion: *"I feel confident and happy when I wear it [her Devaux handbag]. It is also a subtle way to associate with my consumers because I know about some special brands, my items, leathers..."* (Female, 32). She constructed her project partially public identity when she said: *"....I know why my partners prefer to chat with me than my colleagues do...."*

Partially public reflective identities refer to the identity that is both self-projected and perceived by others (Wu et al., 2017). Consumers with domain-specific capital often prefer projecting their partially public identity with subtle elements as long as these markers can be perceived by insiders (Berger & Ward, 2010). Consumers of this group distinguish themselves from the mainstream inconspicuously.

Avoidance

Previous research has identified a type of inconspicuous consumers who avoid products with clear brand identifiers because they reject ostentatious status symbols or feel guilty about being conspicuous consumers (Berger & Ward, 2010). Most our informants mentioned about the group of inconspicuous consumers as those who have high economic capital and engage in high quality, expensive products. Due to the sensitivity of financial resources, no one needs to know how they earn much money while their salary is low. Thus, because of economic crisis, some businessmen avoid to public their financial resource. Some informants are afraid of gaining attention, arising from envy or

greediness. Consequently, they consume less conspicuous – but still high-quality, luxury goods.

Officials, they can't show off, but they still like to use branded goods. For example, their outfit may look normal, but it can be a Hermes tie, or a Zegna suit that cost up to 200 to 300 million dong. (Male, 38)

Like the group of officials and businessmen, no one would say they use branded products [luxury]. In the context of difficult economic conditions, no one wants others to know that they use famous branded products... (Female, 50)

5. DISCUSSION AND IMPLICATIONS

Belong to luxury consumption research area; this study explores inconspicuous consumption in Vietnam. Through analysis of exemplary quotes from collected data, some findings were drawn. First of all, ILC is a new emerging phenomenon in Vietnam. This study is among first pioneer research to explore ILC in Vietnam. This is one of a few studies on ILC, especially in the context of Vietnam, a transitional economy. Using qualitative methods to explore ILC, the research results confirm that ILC exists in Vietnam and it is on the rise in the coming time. This result is consistent with the findings of Wu et al. (2017) in the context of China, and Makkar & Yap (2018a, 2018b) in the context of UAE. Vietnam, China and UAE are emerging countries which share some similarities. Inconspicuous products relate to selected line products of well-known Western high-end brands or some niche brands while it has not been researching directly in the ILC literature. We categorized some inconspicuous consumer groups in Vietnam based on economic capital, cultural capital and some other demographic aspects. In the literature, Wu et al. (2017) have suggested four types of inconspicuous consumers based on their motivations to engage in ILC, including avoidance, functional seeking, differentiation and fantasy lifestyle. Regarding motivations of ILC, our research findings suggested only three salient motivations, of which fantasy lifestyle was not mentioned by our informants.

From theoretical perspective, this research is expected to provide some valuable contributions to inconspicuous consumption literature. Among empirical research on ILC, this research provide an overview of ILC and the current situation in Vietnam. Inconspicuous products relate to selected line products of well-known Western high-end brands or some niche brands while it has not been researching directly in the ILC literature. We categorized some inconspicuous consumer groups in Vietnam based on economic capital, cultural capital and some other demographic aspects. In the literature, Wu formed 4 types of inconspicuous consumers by their

motivations engaging in ILC: avoidance, functional seeking, differentiation and fantasy lifestyle (Wu et al., 2017). Regarding to motivation of ILC, our data set pointed out three motivations that are different from past research. Most of our informants reported that they have no information about this group. Generally, this research has provided another view on ILC in an emerging context.

These research results can assist luxury brands in developing marketing strategies that are suitable for target groups of customers. The classification of customer groups is useful for the business in segmenting the market and selecting target customers. In terms of products, businesses can develop products based on the insights of their customers, enhance subtle signals in their products, and be more refined in their design and material choice. In addition, in promotion policies, brands need to focus on setting more sophisticated communication goals with this customer group, instead of mass media campaigns. It needs to increase product value and increase customer experience. In addition, this is also a suggestion for Vietnamese brands in brand development, to compete with long-standing European brands.

6. LIMITATIONS AND FURTHER RESEARCH DIRECTIONS

Although this study provides a valuable overview and deeper understanding of the inconspicuous luxury consumption, it is not without limitations. The limited number of interviewed informants is acknowledged. The age range of our informants is from 31 to 50. It is expected to widen the age range and research scale to ensuring trustworthiness. Additionally, we classified consumer groups based on limited number of criteria. Hence, in some case, an overlap between groups may happen. In future research, we may want to conduct a quantitative research to examine the factors influencing ILC and test the hypotheses in the context of Vietnam, a transitional economy in Asia.

7. REFERENCES

- [1] Belk, R. (2011). Benign envy. *AMS Review*, 1(3-4), 117-134. <https://doi.org/10.1007/s13162-011-0018-x>
- [2] Belk, R. W. (1988). Possessions and the Extended Self. *Journal of Consumer Research*, 15(2), 139. <https://doi.org/10.1086/209154>
- [3] Berger, J., & Ward, M. (2010). Subtle Signals of Inconspicuous Consumption. *Journal of Consumer Research*, 37(4), 555-569. <https://doi.org/10.1086/655445>
- [4] Chung, E., & Fischer, E. (2001). When conspicuous consumption becomes inconspicuous: The case of the migrant Hong Kong consumers. *Journal of Consumer Marketing*, 18(6), 474-487. <https://doi.org/10.1108/07363760110404378>
- [5] Davis, F. (2013). *Fashion, Culture, and Identity*. University of Chicago Press.
- [6] Eastman, J. K., Goldsmith, R. E., & Flynn, L. R. (1999). Status Consumption in Consumer Behavior: Scale Development and Validation. *Journal of Marketing Theory and Practice*, 7(3), 41-52.
- [7] Eckhardt, G. M., Belk, R. W., & Wilson, J. A. J. (2015). The rise of inconspicuous consumption. *Journal of Marketing Management*, 31(7-8), 807-826. <https://doi.org/10.1080/0267257X.2014.989890>
- [8] Firat, A. F., & Venkatesh, A. (1993). Postmodernity: The age of marketing. *International Journal of Research in Marketing*, 10(3), 227-249. [https://doi.org/10.1016/0167-8116\(93\)90009-N](https://doi.org/10.1016/0167-8116(93)90009-N)
- [9] Francks, P. (2009). Inconspicuous Consumption: Sake, Beer, and the Birth of the Consumer in Japan. *The Journal of Asian Studies*, 68(1), 135-164. <https://doi.org/10.1017/S0021911809000035>
- [10] Geiger-Oneto, S., Gelb, B. D., Walker, D., & Hess, J. D. (2013). "Buying status" by choosing or rejecting luxury brands and their counterfeits. *Journal of the Academy of Marketing Science*, 41(3), 357-372. <https://doi.org/10.1007/s11747-012-0314-5>
- [11] Gurzki, H., & Woisetschlager, D. M. (2017). Mapping the luxury research landscape: A bibliometric citation analysis. *Journal of Business Research*, 77, 147-166. <https://doi.org/10.1016/j.jbusres.2016.11.009>
- [12] Han, Y. J., Nunes, J. C., & Drèze, X. (2010). Signaling Status with Luxury Goods: The Role of Brand Prominence. *Journal of Marketing*, 74(4), 15-30.
- [13] Henly, J. R., Danziger, S. K., & Offer, S. (2005). The contribution of social support to the material well-being of low-income families. *Journal of Marriage and Family*, 67(1), 122-140. <https://doi.org/10.1111/j.0022-2445.2005.00010.x>
- [14] Khan, H. (2019). Effects of personal dispositions, familiarity and consumption situation on Western brands' packaging. *Journal of Consumer Marketing*, 36(6), 715-727. <https://doi.org/10.1108/JCM-07-2018-2778>

- [15] Ko, E., Costello, J. P., & Taylor, C. R. (2019). What is a luxury brand? A new definition and review of the literature. *Journal of Business Research*, 99, 405-413. <https://doi.org/10.1016/j.jbusres.2017.08.023>
- [16] Mai, N. T. T., & Tambyah, S. K. (2011). Antecedents and Consequences of Status Consumption Among Urban Vietnamese Consumers. *Organizations and Markets in Emerging Economies*, 2(1), 75-98. <https://doi.org/10.15388/omee.2011.2.1.14291>
- [17] Makkar, M., & Yap, S.-F. (2018a). The anatomy of the inconspicuous luxury fashion experience. *Journal of Fashion Marketing and Management: An International Journal*, 22(1), 129-156. <https://doi.org/10.1108/JFMM-08-2017-0083>
- [18] Makkar, M., & Yap, S.-F. (2018b). Emotional experiences behind the pursuit of inconspicuous luxury. *Journal of Retailing and Consumer Services*, 44, 222-234. <https://doi.org/10.1016/j.jretconser.2018.07.001>
- [19] Naomi Klein | No Logo. (n.d.). Retrieved July 31, 2020, from <https://naomiklein.org/no-logo/>
- [20] O’Cass, A., & McEwen, H. (2004). Exploring consumer status and conspicuous consumption. *Journal of Consumer Behaviour*, 4(1), 25-39. <https://doi.org/10.1002/cb.155>
- [21] Osburg, J. (2013). *Anxious wealth: Money and morality among China’s new rich*. Stanford, CA: Stanford University Press.
- [22] Postrel, V. (2008, July 1). *Inconspicuous Consumption*. The Atlantic. <https://www.theatlantic.com/magazine/archive/2008/07/inconspicuous-consumption/306845/>
- [23] Roy Chaudhuri, H., Mazumdar, S., & Ghoshal, A. (2011). Conspicuous consumption orientation: Conceptualisation, scale development and validation. *Journal of Consumer Behaviour*, 10(4), 216-224. <https://doi.org/10.1002/cb.364>
- [24] Shao, W., Grace, D., & Ross, M. (2019). Consumer motivation and luxury consumption: Testing moderating effects. *Journal of Retailing and Consumer Services*, 46, 33-44. <https://doi.org/10.1016/j.jretconser.2018.10.003>
- [25] Smith, M. L. (2007). Inconspicuous Consumption: Non-Display Goods and Identity Formation. *Journal of Archaeological Method and Theory*, 14(4), 412-438.
- [26] Sullivan, O. (2008). Busyness, Status Distinction and Consumption Strategies of the Income Rich, Time Poor. *Time & Society*, 17(1), 5-26. <https://doi.org/10.1177/0961463X07086307>
- [27] Sullivan, O., & Gershuny, J. (2004). Inconspicuous Consumption: Work-Rich, Time-Poor in the Liberal Market Economy. *Journal of Consumer Culture*, 4(1), 79-100. <https://doi.org/10.1177/1469540504040905>
- [28] Vickers, J. S., & Renand, F. (2003). The Marketing of Luxury Goods: An exploratory study – three conceptual dimensions. *The Marketing Review*, 3(4), 459-478. <https://doi.org/10.1362/146934703771910071>
- [29] Wang, S. (2016). Niche Brand. In M. Augier & D. J. Teece (Eds.), *The Palgrave Encyclopedia of Strategic Management* (pp. 1-4). Palgrave Macmillan UK. https://doi.org/10.1057/978-1-349-94848-2_499-1
- [30] Wiedmann, K.-P., Hennigs, N., & Siebels, A. (2009). Value-based segmentation of luxury consumption behavior. *Psychology & Marketing*, 26(7), 625-651. <https://doi.org/10.1002/mar.20292>
- [31] Wu, Z., Luo, J., Schroeder, J. E., & Borgerson, J. L. (2017). Forms of inconspicuous consumption: What drives inconspicuous luxury consumption in China? *Marketing Theory*, 17(4), 491-516. <https://doi.org/10.1177/1470593117710983>

STUDENTS SATISFACTION ON THE JOINT EDUCATION PROGRAM IN BUSINESS MANAGEMENT AND ADMINISTRATION BETWEEN NATIONAL ECONOMICS UNIVERSITY, VIETNAM AND DONGSEO UNIVERSITY, KOREA

Do Minh Diep, Do Ngoc Diep

National Economics University, Hanoi, Vietnam

Abstract

The research assesses the satisfaction level of students majoring on the joint education training program in Business Management and Administration between National Economics University, Vietnam and Dongseo University, Korea. Based on SERVQUAL model (Parasuraman et al, 1988), the paper measures the recent level of satisfaction of full-time students on the current training program by conducting a survey to students from Intake 1 to intake 4. The results indicate students' satisfaction on educational service in Faculty of Foreign Languages is at an acceptable level generally. This paper indicates four factors have pleased students in the program, including Curriculum, Lecturers' profession, Class Facilities and Course Exam and Evaluation. Meanwhile, other factors of Library, Textbook, Training information and Management staff do not meet students' expectation. This result shows new requirements of students in new joint education program training in Vietnam.

Keywords: student satisfaction; SERVQUAL, educational service quality.

1. INTRODUCTION

It is difficult to set, to monitor and to measure the performance of service quality due to intangible characteristics (Thakkar, Deshmukh, & Shastree, 2006). It is even more difficult when it comes to service quality in education sector (Quinn, Lemay, & Johnson, 2009). While the students should be satisfied as in other service sectors, academic freedom must be maintained. Moreover, an education institute can have many different types of customers, thus many kinds of stakeholders are involved. Besides, instructional areas are unique in comparison to typical service businesses, while administrative and supporting areas may function in a similar way.

Education in general and higher education is an essential factor to boost economic growth for any nation (Brunat 2006). Investment on education and prosperity of a nation has a clear positive correlation (Coleman 2005). Demand for education is no doubt increasing, and the awareness about available alternatives. Thus, expectation from service users towards the service providers in education is developing (Petruzzellis and Romanazzi 2010). As a result, the higher education sector is constantly changed, partly to adapt the students'

increasing expectation, partly because knowledge is updated every day (Sohail and Shaikh 2004).

To meet the expectation of students in a more and more competitive world, education institutions cannot ignore the importance of student' satisfaction (Hill, 1995). Student' satisfaction reflects an educational institute's quality; therefore, it will affect the decision of potential students on choosing an education program (Petruzzellis & Romanazzi, 2010). For higher education institutes, student' satisfaction helps them to assess their overall performance.

As in other nations, Vietnam also has its higher education system renovated significantly in recent years. Universities and colleges compete in many ways, from developing infrastructure to develop new program. Developing a joint program with a foreign education institute is a good method, because it not also boosts the program's attractiveness among students but also gives a chance to learn from the foreign partner's experience in running higher education program. However, running a joint program is different compared to normal program. Student' satisfaction of a joint program might be unique. Thus, what are the main factors influencing student's satisfaction attracts large attention from researchers and managers.

National Economics University (NEU) is one of the leading universities in Viet Nam in the field of economics, business and public management. NEU always looks for university partners to cooperate in many areas, especially in joint degree program. Meanwhile, Dongseo University (DSU) is known as leaders in internationalization in Korea and Asia. In 2013, DSU was ranked by Quacquarelli Symonds with The Chosun Ilbo among the Top 50 Asian universities for internationalization. DSU is expanding its global program such as joint degree programs with distinguished universities in foreign countries. In Vietnam, DSU has chosen to cooperate with NEU as both universities are young and dynamic.

The 2 universities signed the memorandum of understanding (MoU) in 2016, established the joint degree program NEU-DSU in business administration. The joint program is a 4-year program with 2 years in NEU and 2 years in DSU. The MoU's effect lasts for 5 years; thus, the program will end in 2021 with the 5th intake. After that, both universities will assess the quality of the joint program to decide that the joint program is qualified to continue or not. Students' satisfaction is one of the main factors to decide. However, there is clearly huge difference between the 2 universities in many terms, therefore this research is conducted first with NEU. To be more specific, this research focuses only on the students' experiences during their 2 years at NEU's campus.

2. THEORETICAL BACKGROUND

2.1. Nature of students' satisfaction

Customer satisfaction is usually used in marketing. "Customer satisfaction is a final psychological state resulting from the disconfirmed expectancy related to initial consumer expectation" is the definition of Oliver (1981, p.27). Meanwhile, Churchill and Surprenant (1982, p.491) defined customer satisfaction as follow: "The conceptual response by the consumer to the purchase and use of a product which comes from the comparison of the rewards and cost of purchase relative to expectations." In general, customer satisfaction is the number of customers or the overall percentage of total customers whose experience with a service exceeds a particular satisfaction goal.

Hill (1995) states that general student expectations and their expectations toward higher educational institutes such as the teaching methods and the quality of the lecturers are quite stable. Besides, Telford & Masson (2005) find out that students' expectations and values may affect their perceived quality of educational services. Meanwhile, Voss et al. (2007) argue that some variables such as students' participation, the clarity of

role and their motivation to participate in courses will have positive impact on students' expectations' and values'.

Until students' needs and expectations are met, education services can be stated as qualified enough. As said before, more and more higher education institutes pay attention to this issue as they want to overcome the many challenges of competitive market and a rapidly changing world. As such, students' expectations have changed much from the past and are still changing.

It is certain that determinants of student satisfaction in a college or university will impact the student college experience in the business field. Many studies that examine student satisfaction in higher educational institutions from a more customer-oriented perspective contribute to the planning of colleges and universities' manager. Keaveney and Young (1997) build a set of independent variables and self-reported experiential assessments to measure student satisfaction.

2.2. The measurement models of students' satisfaction

Whenever the expectations of customers toward a certain company or product are met or exceed, the customers may feel satisfied. This satisfaction will lead to the urge to buy more of the same product, or more products of the same company, which is called loyalty.

To assess customer perceptions of service quality in service and retailing organizations (Parasuraman et al, 1988). The service quality here is defined not as the real quality, but through the viewpoint of customers, or customers' judgement about a certain factor of service. After SERVQUAL (a model of five dimensions of service quality which are Reliability, Tangibles, Responsiveness, Assurance and Empathy) is introduced, it has been widely used to assess customer perceptions of service quality in service and retailing organizations (Furrer et al, 2000; Parasuraman et al, 1988).

As said, Parasuraman et al. in a research in 1988 has summarized five dimensions for the identification of service quality:

- Physical/tangible feature refers to physical facilities, organization accommodations and staff appearances.
- Reliability refers to the ability to perform services precisely and reliably.
- Responsibility refers to disposition to quickly serve the clients.
- Assurance refers to knowledge and politeness of the staff and their ability to produce reliability and assurance.
- Empathy refers to personal attention to each client.

SERVQUAL have been applied to assess students' satisfaction in higher institution services before. Although it is true that several customers and stakeholders need to be satisfied (including students, alumni, parents, employer and government), the student should be focused, as they are the one experienced the service. Many researchers have conducted study of students' satisfaction and how to improve the satisfaction level, highlighting the importance of this kind of research.

In Vietnam, students' satisfaction and its affecting elements have also been researched. The author Tran Xuan Kien (2006) in the study "Assessment of student satisfaction of the quality of education at the University of Economics and Business Administration – Thai Nguyen University" used SERVQUAL scale containing 5 components (facilities, staff and lecturers' enthusiasm, lecturer team, commitment, and concerns for students) to examine students' satisfaction. Regarding this topic, when researching on student satisfaction at the Ha Long College of Arts, Culture and Tourism, the author Nguyen Van Ha (2010) pointed out five basic elements used in evaluation, including: curriculum, lecturer team and teaching methods, faculty and schools, teaching equipment, quality and quantity of support staff and other supporting services. Meanwhile, the author Nguyen Thuy Linh analyzed and measured the level of student satisfaction attending the business administration undergraduate program at Hung Vuong University. This level is measured by 13 observed factors including common skills, knowledge and attitude of lecturer, the relevance of training programs, teaching

method, and library system, physical facilities of faculty and institutes, learning environment, textbooks, assessments, training information, appropriateness in training structure, management and program contents.

To put in a nutshell of those previous studies in Vietnam, the quality of education is determined by curriculum, professional abilities and the enthusiasm of lecturers, supporting equipment for learning, learning environment, the responsiveness of staff, library, textbook and training information, examination and assessment. The educational attributes are measured by a set of criteria belonging to SERVQUAL dimensions.

2.3. Factors affecting the level of students' satisfaction on training program

Student's satisfactory on a higher education institute can be shown in a specific training program in which the student studies. A training program including core elements: curriculum, faculty staff, textbook, key equipment; and environment and process elements: library, training information, supportive facilities, exam and assessment (Khanchitpol Yousapronpaiboon, 2013).

Studies on students' satisfaction on training program points the variety of factors affecting as well as the differences in level of affecting of each factor based on educational context. Based on SERVQUAL dimensions, a set of forty criteria are used to measure seven educational attributes.

This research aimed at examining the factors influencing students' satisfaction. Therefore, the examined relationships are hypothesized in the conceptual model below.

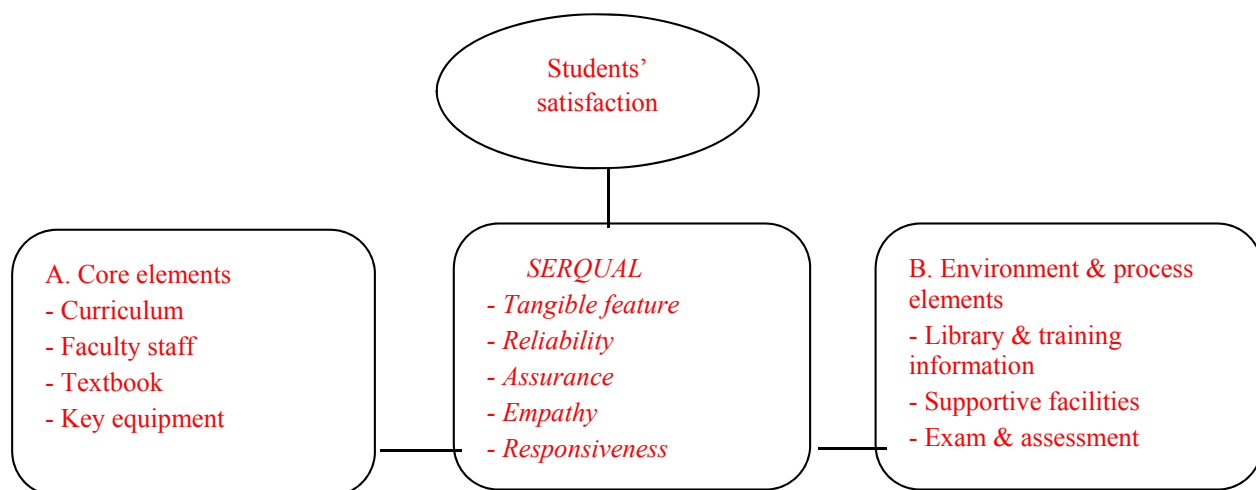


Fig. 1: Final diagram of students' satisfaction on training program of Faculty of Foreign Languages at NEU (Source: developed by the authors based on study of Khanchitpol Yousapronpaiboon)

These five dimensions of SERQUAL model are chosen as independent variables, the students' satisfaction is chosen as the dependent variable (Khanchitpol Yousapronpaiboon, 2013). Five dimensions in SERVQUAL dimensions (Tangible feature, Reliability, Assurance, Empathy, Responsiveness) are measured in factors of a training program: Core elements (curriculum, faculty staff, textbook, key equipment) and Environment and process elements (Library and training information, Supportive facilities, Exam and assessment). Then in order to obtain data regarding the students' satisfaction, a 43 item SERQUAL questionnaire (five dimensions) was employed. Responses were on a 5-point Likert scale from "strongly dissatisfied" (1) to "strongly satisfied" (5).

3. RESEARCH METHODOLOGY

3.1. Overview of the formation and development of National Economics University and Dongseo University

3.1.1. National Economics University, Vietnam

Founded in 1956, National Economics University is one of the leading universities in Economics, Public Management and Business Administration in Vietnam.

NEU places a high priority on the quality of teaching and the employment preparation for students in an increasingly competitive, international environment. With over 1236 faculty members and staffs including 17 professors, 124 associate professors, 178 Ph.Ds and 433 masters, NEU currently offers training to nearly 45,000 students annually at Bachelor, Master and Ph.D levels. Through our establishment and development, NEU always keeps its proud position as:

- One of the top quality economic and business institutions in Vietnam;
- A prestigious center for economic research;
- A consulting center in economic and management.

NEU is not only a recognized institution providing high-quality human resource to Vietnam's society but also a faithful partner of the government, non-governmental organizations and reputed research institutes and universities all around the world.

3.1.2. Dongseo University, Korea

Dongseo has become a hub university in Asia with a global network of over 230 international sister schools and industry affiliates.

This vast global network enables Dongseo students to study and work in locations all around the world. Also,

Dongseo University sends 100 students annually to each of its branch campuses in the U.S. and in China to improve their linguistic competencies while expanding their global perspectives.

Various programs already in place at DSU have served as benchmarks for other leading universities. These include convergence education curriculums encouraging interdisciplinary cooperation, class selling programs in which the university and its industry partners work together to meet one another's expectations, and virtual learning educational strategies such as O2O and VOICE which enhance on-site learning capabilities.

Dongseo University is first in its region and top-4 nationally in career placement ('Na'-Group, 2015). DSU is a model 21st century institution of higher education that creates talented and responsible graduates by offering students access to the best facilities and curriculums in an ideal learning environment. Among similarly sized universities, it has the highest career placement ratio in the region of Busan, Ulsan, and Gyeongnam province. It also ranked in the top-7 nationally. This is in part due to DSU's strong commitment to industry-academia cooperation and to providing students with the practical skills they need to succeed in the workplace.

3.2. Research methodology

In terms of the characteristics of students in general and the joint education program students in particular, dimensions in SERVQUAL model were adapted to measure the satisfaction of the students. Then, qualitative methods were taken out such as in depth interview with the coordinators, assistants, lecturers and students of the program about the current situation and demand. Besides, focus group method was used with 6 students in the program to explore the specific characteristics of training service in the educational program between National Economics University and Dongseo University. They were asked and discussed questions about their satisfaction on training service. Then, they were deeply interviewed and discussed about the factors they were satisfied or dissatisfied with during studying there.

Moreover, quantitative methods were also carried out as 60 survey questionnaires on students' satisfaction were delivered both directly and via email to students from Intake 1 to 4. They assessed their satisfaction on the training criteria on scale from 1 to 5 (1-strongly disagree and 5-strongly agree). Based on the results of the survey, the authors analyzed current satisfaction level of the joint program students and proposed recommendations.

4. DATA ANALYSIS AND DISCUSSION

4.1. Respondents' profile

From 60 respondents in this research, 25% were male and 75% were female. They are from Intake 1 (starting their study from 2016) to Intake 4 (starting their study from 2019). The number of observations in the sample accounts for about 83% of the total number of students currently attending the joint program.

4.2. Students satisfaction on the curriculum

1	There is a clear training objective in the curriculum.	4.05
2	The curriculum meets student expectation in terms of English.	3.57
3	The curriculum meets student expectation in terms of Business Management and Administration knowledge.	4.03
4	The subject contents are clear and specific.	3.78
5	The subject contents are not overlapped.	3.78
6	The arrangement of subjects in each semester is suitable.	3.70
7	The total number of credits of all subjects is suitable.	4.05

Students in the program were quite satisfied with the clear objective (4.05). The training has met the expectation in terms of specialized knowledge in Business (4.03); however, it was supposed to upgrade the students' language proficiency more as it has only been at the acceptable level so far. Subjects in the curriculum are suitable in the number of credits but still need improving in contents to avoid being overlapped and too general. The arrangement of the subjects was also a problem when students were required to fulfill several subjects at the same time.

4.3. Students satisfaction on the professional abilities and the enthusiasm of lecturers

8	Lecturers are highly qualified, have intensive knowledge about their teaching area.	4.22
9	Lecturers have good teaching skills, make lessons easy to understand, and continuously update new teaching methods.	3.92

10	Lecturers are creative in teaching which increases students' interest in lessons.	3.95
11	Lecturers of specialized subjects have experience/ practical studies related to the subjects.	3.92
12	Lecturers inspire students.	3.89
13	Lecturers are friendly and nice to students.	4.05
14	Lecturers are on time and meet the teaching schedules.	4.00
15	Lecturers are good at making use of technology equipment and IT software to support teaching.	3.92
16	Lecturers provide sufficient information and reference materials.	3.95
17	Lecturers are willing to instruct students in scientific research or support in any kinds of student competitions.	4.14

It is well noted that lecturers in this program are all highly qualified so that students evaluated this criteria at 4.22. Learners in the program also appreciate their lecturers' willingness to provide instructions in researching, especially in student competitions. Besides, teachers' teaching creativeness and inspiration have not been satisfied. Students did not fulfill their demand in terms of practical cases and reference materials.

4.4. Students satisfaction on the supporting equipment for learning and learning environment

18	The class size is suitable.	4.27
19	Class equipment and facilities (classroom, sound system, light, air condition, projector...) meet requirements for both teaching and learning condition.	4.03
20	There is friendly atmosphere in class.	4.11
21	The studying time/schedule is suitable for students.	3.70
22	Students have opportunities to take part in extracurricular activities, clubs or competitions.	3.49

Overall, the small class size (about 20 students) and classroom conveniences has pleased the program learners. The learning atmosphere was evaluated at 4.11,

which shows that students felt friendly and comfortable in class. However, the schedule was not really suitable and there were limited chances for undergraduates to participate in additional activities.

4.5. Students satisfaction on the responsiveness of management staff

23	Administrative team (Board of management, in-charge teachers, and assistants) understands all student requirements.	3.51
24	Administrative team (Board of management, assistants) actively solves all student requirements.	3.84
25	Assistants have good attitude and respect students.	3.92
26	Staff always help students.	3.68

Obviously, learners surveyed did not satisfy with the management staff performance. All criteria mentioned were only at the acceptable level. It is noticed that the staff understanding of students' requirements was assessed at 3.51. The frequency of assistance from administrative team did not meet the students' expectations (3.68).

4.6. Students satisfaction on the library, textbook and training information

27	Library is visited by students frequently.	3.62
28	Library is equipped with diversified books and reference materials.	3.78
29	Library has large enough space, seating place for student's demand.	4.03
30	Faculty/university website provides good, updated and sufficient information (schedule, information, job opportunities, activities...).	3.92
31	Faculty/university website posts information about the program and its staff.	3.51
32	Textbooks are printed in high quality.	3.38
33	Textbooks are priced reasonably.	3.62
34	Textbooks are continuously updated.	3.62
35	Students receive training information about subjects (optional, specialized subjects, contents, objectives, textbooks) before registering.	3.86

Although the university library is available for students, it is not highly evaluated by the program participants. Students seldom visit the library and do not satisfy with the materials diversity. The website channel was evaluated the lowest in satisfaction. Textbooks are supposed to be higher quality and more updated.

4.7. Students satisfaction on the examination and assessment

36	Lecturers evaluate the studying results accurately.	3.81
37	Students are informed about studying results for each subject and semester quickly, on time.	4.11

Lecturers' studying evaluation was evaluated at the acceptable level of satisfaction (3.81). Besides, students satisfied with the time of receiving studying results.

4.8. Students satisfaction level

38	Students are trained about ethics in business environment.	4.19
39	Students are trained about professional working methods.	4.08
40	Students are trained about necessary academic knowledge.	4.08
41	Knowledge acquired from courses helps students increase their own confidence in looking for a job after graduation.	4.14
42	You will introduce NEU – Dongseo program to future students.	4.45
43	In general, you are satisfied with training activities and learning environment in the joint educational program between NEU and Dongseo University.	4.27

In general, the data showed that students were satisfied with the training service. Learners felt pleased and would like to introduce the program to others in the future. The training program were evaluated satisfactorily in terms of academic knowledge and ethics in business. Graduated students from the program felt confident to look for a job.

5. CONCLUSION AND RECOMMENDATIONS

As a result of data analysis, there are four factors evaluated "satisfied" by students' satisfaction: curriculum, lecturers' profession, class equipment and

facilities, exam and evaluation. Among these factors surveyed, there are two factors that students did not feel satisfied, "Management staff" and "Library, textbook and information". National Economics University has set up its own modern library. However, the number of books and material is still limited. Moreover, students are not fully informed of the library or know about the resources there. Also, there is not enough room for students to read the books in the library while few books are available for borrowing home. On the other hand, although the managing officers of the program holds several meetings with students annually, the discussion is not always effective. Students' demands are changing dramatically so that official meetings between members in the whole program do not catch up with. Private meetings between management staff, lecturers and students are till occasional and normally happen face to face. It poses the problem of time consuming. There has been no official channel to communicate between the program and its students. Their recommendations or proposal are hardly reached the board of management. Lack of feedback from current students diminishes the understanding of management board about students' demands. Although the faculty website is considered as one of the most important communicating channels, it is not paid well attention. Little information about the program in general is posted with seldom updates.

This result shows new requirements from students in higher education environment in Vietnam. Nowadays, students seem to expect more supportive and informative studying environment which motivates their self-study process rather than traditional knowledge-providing system. This research on factors affecting students' satisfaction in the joint educational program between NEU and Dongseo University contribute to restricted knowledge about student satisfaction in higher education in Vietnam, especially in current background of critical innovation in higher education system. As the higher education is more market-based, higher institutions should enhance their students' satisfaction to create their competitive advantage. The following recommendations can be applied in other institutions with the same major of foreign languages in Vietnam.

5.1. Building up an effective administrative staff

Faculty staff including the Board of Management, administrative staff, and in-charged lecturers are directly responsible for assisting students. Meetings of the

program with students should be held more often. The senior students could take part in these meetings occasionally. The network of students in all intakes are supposed to be maintained and expanded. The program website or Facebook page can play another role as a channel in communicating between them.

It is strongly advised that the program equip more books and materials for their own students. It is also required more space so that students and lecturers can seat and work together. The library management could be more professional as students in the program can work part time as the librarian.

5.2. Create more opportunities for practical field trip or internship

The website or Facebook page needs being continuously updated the information of job opportunities. There is a suggestion to show profiles of cooperated companies or organizations there so that students know more clearly and are able to contact them directly to gain more information. Job opportunities from cooperated or related enterprises and extra curriculum activities can also be provided there.

6. REFERENCES

- [1] Anne Metter Sonne. Determinants of customer satisfaction with professional services – A study of consultant services.
- [2] Bitner, M. J, Booms, B. & Mohr, L. A. (1994). Critical service encounters: the employees' viewpoint. *Journal of Marketing*, 58, 95-106.
- [3] Brunat, E. (2006). The importance of higher education to attract investment and contribute to sustain economic growth and competitiveness in Kaliningrad. *Baltic Rim Economic, Bimonthly Review*, 3f 2006.
- [4] Cetina, I. (coord.). (2009). *Marketing serviciilor. Fundamente so domeniului de specializare*. Bucurcesti: Editura Uranus.
- [5] Chua, C. (2004). *Perception of quality in higher education*. AUQA Occasional Publication.
- [6] Churchill, Gilbert and Carol Suprenant (1982). An Investigation Into the Determinants of Customer Satisfaction. *Journal of Marketing Research*, Vol. 19, 491-504.

- [7] Coleman, S. (2005). The impact of Human Capital Measures on Firm Performance: A comparison by Gender, Race, and Ethnicity. *The Journal of Entrepreneurial Finance & Business Ventur*, 10(5), 38-56.
- [8] Danjuma, I. & Rasli, A. (2012). Factors affecting service quality in Nigeria technological universities. *International Journal of Business and Management Tomorrow*.
- [9] ECSI Technical Committee (1998). *European Customer Satisfaction Index*.
- [10] Foundation and Structure for Harmonized National Pilot Projects. Report Prepared for the ECSI Steering Committee (October).
- [11] Fornell, C. (1992). A National Customer Satisfaction Barometer: The Swedish Experience. *Journal of Marketing*, 56 (January), 6-21.
- [12] Fornell, Claes, et al. (2006). Customer Satisfaction and Stock Prices: High Returns, Low Risk. *Journal of Marketing*, Vol. 70, 3-14.
- [13] Forough Abaari, A. A., Yarmohammadian, M.H. & Esteki, M. (2011). Assessment of quality of education a non-government university via SERVQUAL model. *Procedia – Social and Behavioral Sciences*.
- [14] Hill, F M. (1995). Managing service quality in higher education: the role of the students as primary consumer. *Qual Assur Educ*.
- [15] Ibrahim, M. Z, Ab Rahman, M. N & Yasin, R. M. (2012). Assessing Students Perceptions of Service Quality in Technical Educational and Vocational Training Institution in Malaysia. *Procedia – Social and Behavioral Sciences*.
- [16] Khanchitpol Yousapronpaiboon (2013). SERQUAL: Measuring higher education service quality in Thailand. *Procedia – Social and Behavioral Sciences*, 116 (2014), 1088-1095.
- [17] Keaveney, S.M. and Young, C.E. (1997). "The student satisfaction and retention model (SSRM)". Working Paper, University of Colorado, Denver, CO.
- [18] Ma Cam Tuong Lam (2011). "Factors affecting student's satisfaction on facilities and supporting equipment". MBA Thesis, Vietnam National University.
- [19] Moore, J.C. (2009). A Synthesis of Sloan-C Effective Practices: December 2009. *Journal of Asynchronous Learning Networks*, 13(4), 73-97.
- [20] Nguyen Thuy Linh (2012). Student satisfaction for undergraduate program at the Business Administration faculty of Hung Vuong University. MBA thesis, National Economics University.
- [21] Nguyen Van Ha (2010). Student satisfaction on training service at Ha Long College of Arts, Culture and Tourism. MBA Thesis, National Economics University.
- [22] O' Leary, P. F., & Quinlan, T. J. (2007). Learner-Instructor Telephone Interaction: Effects on Satisfaction and Achievement of Online students. *The American Journal of Distance Education*, 21(3), 133-143.
- [23] Oliver, R. L. (1981). Measurement and Evaluation of Satisfaction Processes in retail Settings. *Journal of Retailing*, Vol.57, 25-48.
- [24] Parasuraman A., Zeithaml V. A., Berry L. L, 1985. A conceptual model of service quality and its implications for future research. *Journal of Marketing*, Vol. 49, No.3, pp.41-50.
- [25] Petruzzellis, L., & Romanazzi, S. (2010). Educational value: how students choose university. *International Journal of Educational Management*, University of Bari Bari, Italy, 24(2), 139-158.
- [26] Sohail, M., & Shaikh, N. (2004). Quest for excellence in business education: A study of student impressions of service quality. *International Journal of Educational Management*, 18(1), 58-65.
- [27] Szmigin, I. T. D. (1993). *Managing Quality in Business – to – Business Services*. City University Business School, London, UK.
- [28] Sweeney, J.C., & Ingram. D. (2001). A Comparison of Traditional and Web-Based Tutorials in Marketing Education: An Exploratory Study. *Journal of Marketing Education*, 23(1), 55-62.
- [29] Telford, R. & Masson, R. (2005). The congruence of quality values in higher education. *Qual Assur Educ*.

- [30] Thakkar, J., Deshmukh, S.G., & Shastree, A. (2006). Total quality management (TQM) in self-financed technical institutions: A quality function deployment (QFD) and force field analysis approach. *Quality Assurance in Education*, 14(1), 54-74.
- [31] Ullah, Muhammad Hamid, Muhammiad Ajmal, and Fazular Rahman. Analysis of quality indicators of higher education in Pakistan.
- [32] Vũ Trí Toàn. (2007). A Study on Educational Quality in Faculty of Economics and Management applying SERVQUAL model (Nghiên cứu về chất lượng đào tạo của Khoa Kinh tế và Quản lý theo mô hình chất lượng dịch vụ SERVQUAL). Báo cáo Nghiên cứu Khoa học. Trường Đại học Bách khoa Hà Nội.
- [33] Vũ Thị Quỳnh Nga. (2008). Factors affecting students' evaluation on teaching performance (Một số yếu tố ảnh hưởng đến việc đánh giá của sinh viên đối với hoạt động giảng dạy). Luận văn Thạc sĩ Quản lý giáo dục. Viện Đảm bảo chất lượng giáo dục. Đại học Quốc gia Hà Nội.
- [34] Yi, Y. (1991). A critical Review of Customer Satisfaction, In: V. Zeithaml (Ed.). *Review of Marketing 1990*, 68-123. Chicago, IL: American Marketing Association.

Section 5
**OPERATIONS, INNOVATION,
AND ENTREPRENEURSHIP**

HOW INTERMEDIARY SERVICES SUPPORT DEVELOPMENT OF ABSORPTIVE CAPACITY IN SMEs?

Alireza Ansari Vaghef and Utz Dornberger*

International SEPT Competence Center, Faculty of Economics, Leipzig University, Germany

*Corresponding author: alireza.ansari@uni-leipzig.de

Abstract

In the past decades, scholars have addressed the importance of intermediary organizations as facilitators of technology transfer in an innovation system. They used the intermediary term in different contexts of the innovation system. Although many studies underlined the importance of intermediaries, there is not much discussion on the functions of intermediaries in the innovation system. This paper aims to highlight the importance of intermediaries in increasing the absorptive capacity of firms. To do so, we present a framework to describe the functions of intermediaries and their services with absorptive capacity, which is a critical factor in the transfer of knowledge and technology success of a firm.

Keywords: Innovation System, Intermediary Organizations, Absorptive Capacity.

1. INTRODUCTION

In past decades countries emphasized innovation promotion as a lever for economic growth. Therefore, scholars have introduced the innovation system term, which describes ecosystems in which innovation occurs (Freeman 1982; Lundvall, 1985). Since then, other scholars (Carlsson & Stankiewicz, 1991; Lundvall & Barras, 1998; Lundvall et al., 2002; Lundvall, 2010) have developed the term. According to the innovation system theory, innovation efforts do not happen in isolation. They are mainly driven by interaction among various actors who exchange knowledge and technologies and actors who support the exchange process. Ortega-Argilés et al. (2009) address such exchange is much more important for SMEs. However, knowledge and technology transfer is a complex phenomenon, and it does not lead to innovation if the transferred knowledge or technology has not been fully absorbed and utilized. Studies indicate technology absorption requires firms to develop their absorptive capacity. But, capacity development is not an easy task for SMEs due to the scarcity of resources. Moilanen et al. (2014) emphasize the impact of non-R&D SMEs' collaboration with National R&D institutes (e.g., Universities) on the absorptive capacity of SMEs. They argue consultancy and training activities of the R&D institutes can support the development of absorptive capacity in the firms. Hence, it is crucial to understand how intermediary organizations in an innovation system can support such capacity development process companies.

This paper aims to address the gap in understanding the role and functions of intermediaries in the development of absorptive capacity. Besides, it seeks to develop a typology and framework of the functions of the intermediaries within different dimensions of technology absorption capacity. The operationalization of the framework in the SME context, especially in the developing world, provides researchers and policymakers a detailed overview of gaps between intermediaries' service and the required services to develop each absorptive capacity dimension.

2. INNOVATION SYSTEM

In the 1960s and the 1970s, international organizations such as Organization for Economic Co-operation and Development (OECD) recognized that difference between countries' economic growth rate is related to differences between research systems in the countries. However, it was not clear how different research systems can lead to different economic growth rates.

Various researchers tried to develop a concept that can systematically explain this phenomenon. Christopher Freeman and IKE-group made an essential contribution to form a concept in Aalborg at the beginning of the 1980s (Freeman, 1982; Lundvall, 1985). Freeman presented a profound overview of the innovation process. IKE contributed to "national production systems" and "industrial complexes" concepts and explained the importance of vertical linkage in the outcome of innovation (Lundvall, 2007). Later Freeman (1987) and

then Lundvall (Freeman & Lundvall, 1988) spread the concept of 'national innovation system' in the literature. Since then, scholars have developed the concept further and focused on innovation systems not as a national concept but also in different levels of the economy, e.g., technological (Carlsson & Stankiewicz, 1991), regional (Cooke, 1998), and sectoral (Breschi & Malerba, 1997). The "Helix system" concept generated another classification of the innovation system theory. The concept aims to explain communication, networking, and institutional arrangements in an innovation system.

Etzkowitz and Leydesdorff (2000) introduced the Triple Helix-concept of the innovation system in which they explained how to configure the main spheres of an innovation system (university, industry, and government). They explain that the triple helix model (in which hybrid organizations link university, industry, and government) can be an optimum configuration mode instead of the statistic model (in which the government controls university and industry) or the laissez-faire model (in which there is a distinct borderline among university, industry, and government).

After Etzkowitz and Leydesdorff, various authors tried to develop the helix system model, and they created the "Quadruple Helix" model in which the market (society, media, etc.) appeared as a new sphere (Carayannis & Campbell, 2009; Leydesdorff, 2012; Ivanova, 2014). However, there were not many discussions on the context of intermediary organizations that support the innovation project.

3. ABSORPTIVE CAPACITY

To produce service and products and be competitive, firms require resources and capabilities which they can utilize to increase their productivity and profitability (Hurtado-Ayala & Gonzalez-Campo, 2015). On this basis, Wernerfelt (1984) introduced the "Resource and Capabilities Theory", which was further developed by some other authors (Barney, 1991; Grant 1991; Peteraf, 1993). According to this theory, companies own specific resources and capabilities that make them competitive (Hurtado-Ayala & Gonzalez-Campo, 2015). SMEs, due to lack of resources, rely more on more reliable and cheap external knowledge rather than rely on their in-house R&D efforts to innovate (Spithoven et al. 2013). The flexibility of SMEs in the adaptation of such knowledge can give a competitive advantage to them compare to large bureaucratic firms (Ortega-Argilés et al. 2009). Scholars (Haro-Dominguez et al., 2007; McAdam et al., 2009) consider the absorptive capacity as a vital factor that can assure successful adaption of knowledge in companies. They also suggest absorptive capacity can enhance SMEs' responsiveness (Liao et al., 2003), collaborations with external organizations (Muscio, 2007).

Various authors have studied Absorptive Capacity (ACAP) since the 90s. The first literature on ACAP in social sciences and economics was developed in 1990 by Cohen. However, since then, various authors have tried to contribute to developing the concept and its implementation (Gao et al., 2017). In the past two decades, scholars have studied ACAP and measured it as a variable affecting firms' R&D (Cohen & Levinthal, 1989,1990; Dinar,2014; etc.), networking (Xiong & Bharadwaj, 2011; Schildt et al., 2014; etc.), innovation (Mowery & Oxley, 1995; Lin et al.,2016; etc.) and performance (Park & Rhee, 2012; Martins, 2014; etc.).

Cohen and Levinthal were the pioneers in defining ACAP. They defined absorptive capacity as "[...] *an ability to recognize the value of new information, assimilate it, and apply it to commercial ends*" (Cohen & Levinthal 1990, p.128). They consider ACAP an organizational capacity, which belongs to the behavioral and learning science arena. They mention that ACAP is "[...] *the ability to evaluate and utilize outside knowledge is largely a function of the level of prior related knowledge*" (Cohen & Levinthal 1990, p.128).

In contrast, Zahra and George (2002) describe this capacity as a dynamic capability. Therefore, they suggest redefining the ACAP concept. They conceptualized ACAP into two main sub-components: potential and realized. The potential component covers two dimensions: "*acquisition*," which was added by Zahra and George, and "*assimilation*," which was mentioned before by Cohen and Levinthal (1990). The realized component includes two dimensions: "*transformation*," which Zahra and George offered as a new dimension, and "*exploitation*," which was suggested by Cohen and Levinthal (1990) previously.

In the past decade, several authors modified or redefined Cohen and Zahra concept. However, there is still not a widely acceptable concept which can define ACAP, and scholars reformulate the concept according to their research context (Gao et al., 2017). However, the four-dimensional concept is the most popular approach in the operationalization of ACAP.

3.1. The Role of Absorptive Capacity in Technology Transfer Success

Zahra and George (2002) and other researchers have discussed ACAP as a concept as well as its relationship with different factors (such as innovation performance and firm's performance) of the company's growth (Cohen & Levinthal, 1989; Lin et al., 2016). Nevertheless, not many studies have focused on analyzing the role of institutions (such as intermediaries) in assisting the enhancement of ACAP. Moreover,

studies discussed ACAP mainly on knowledge management or organizational studies, and not many studies explored ACAP in the technology transfer domain (Gao et al., 2017).

The studies that analyzed absorptive capacity in the technology transfer domain mainly considered absorptive capacity as an organizational capacity that has a mediating effect on technology transfer (Guan et al., 2006; Srivastava et al., 2015), external and internal technology acquisition (Haro-Dominguez et al., 2007; McAdam et al., 2009) and innovation performance (including new product development, commercialization, organizational innovation, etc.) of firms. These studies consider that absorptive capacity can impact the performance of an organizational or product innovation via affecting the performance of staff and managers in recognizing opportunities for technology transfer and implementing efficient technology transfer projects.

3.2. Absorptive Capacity Determinants in Technology Transfer

Mowery and Oxley (1995) suggest that investments in training, competitive policies, technology transfer channels, sector-specific support, and trade restrictions impact ACAP of enterprises in an innovation system.

At the firm level, scholars mentioned various factors directly or indirectly related to the firms' R&D activities. These factors are R&D efforts (Griffith et al., 2004), FDI (Girma, 2005), knowledge extent and R&D centrality (Zhang et al., 2007), use of IT (Dong & Yang, 2015), and market competition intensity (Min et al. 2019, 2020) as the factors impacting ACAP of a firm. Another critical factor that scholars consider influential on a firm ACAP is the firm's size and age. Shleifer and Vishny (1990) discover that once firms become public, their R&D investment decreases, and therefore it negatively affects their ACAP. However, Zou et al. (2018) conduct a meta-analysis and find that ACAP and a firm's size and age do not have a direct positive relationship in all cases, and it can change in different stages. They suggest that in small firms, ACAP has a positive and significant relationship with the firm size. But once the firms grow or become mature, their ACAP does not increase necessarily. Finally, internal factors such as employee skills and motivation (Minbaeva & Michailova, 2004), firm's efficiency, scope, and degree of flexibility (Van Den Bosch et al., 1999) impact ACAP in firms.

4. INTERMEDIARY ORGANIZATIONS

Scholars have used the intermediary term in different concepts. Howells (2006) categorizes intermediary research into four fields, technology transfer and diffusion, innovation research, NIS, and service organizations. But, the concept is still broad, and there is no unique definition for the term. In his study, Howells addresses 23 terminologies and definitions used to describe these actors. Researchers discussed intermediaries from two perspectives: organizational and functional (Howells, 2006). The first view aims to distinguish the types of organizations that act as intermediaries in an innovation system. The second view emphasizes the functions of intermediaries and their role in the complex process of innovation. Howells (2006) reviewed the innovation system literature on the intermediary term since the 1980s. In his study, Howells indicates that authors used various names in describing intermediaries, e.g., third parties (Mantel & Rosegger, 1987), brokers (Aldrich & von Glinow, 1992) to innovation intermediaries (Howells, 1999), regional institutions (McEvily & Zaheer, 1999), etc.

4.1. Intermediaries in National Innovation Systems

Watkins (2015) describes three shifts in which intermediary term was merged and developed in the literature of National Innovation System (NIS). The studies in the first shift (starting from 1982) discussed a few types of intermediaries (including knowledge and network intermediaries, research councils and funding bodies, etc.), without explaining the functions of intermediaries and their role in NIS. In the second shift (starting from 1995), literature introduced more intermediary types (including industry associations) and various roles of intermediaries, especially in the transfer of knowledge or technology. In the third shift (starting from 1999), the literature has emphasized the role of intermediaries in innovation systems, and the context of surveys extended to the developing world.

Borrás (2004) defines different institutions and their functions in NIS. He explains the knowledge generation role of the education system (including research institutions, testing laboratories, research funding programs). He emphasizes that intermediary organizations such as technology parks, innovation networks, professional associations, knowledge brokers, incubators, entrepreneurship promotion centers, and Non-Governmental Organizations (NGOs) have a critical role in a NIS. They support knowledge diffusion, actor's orchestration, innovation guidance, knowledge devotion, technological variety reduction, risk reduction, and knowledge application supervision in an innovation system.

4.2. Intermediaries and Technology Transfer

The first studies on the role of intermediaries in the innovation system were in technology transfer (Howells, 2006). Hägerstrand (1952) and Rogers (1962) discussed the importance of intermediaries in diffusion and adaptation of knowledge and technology. In the past two decades, studies have defined different functions for intermediaries in the technology transfer process. Crawford (1984) suggests that intermediaries can develop product prototypes to facilitate technology transfer from university to industry. Bessant and Rush (1995) indicate that intermediaries such as Technology Brokers, University (Liaison Departments), Regional Technology Centers, Innovation Agencies, and Cross-national Networks (Technology Transfer Associations) can support firms in technology identification, development of skills and human resources, financial support, strategy development and implementation in business and innovation as well as providing knowledge about new technology (via education, building knowledge transfer linkages). The other roles of intermediaries are intellectual property management and consultancy (Benassi & Di Minin, 2009), technology assessment and evaluation (Howells, 2006), contract negotiation, and licensing arrangements (Shohet & Prevezer, 1996).

4.3. Intermediary Services and Absorptive Capacity

The firm's capability to transfer a technology successfully lies onset of capabilities to "absorb and assimilate the new inputs of technology" (Bessant, J. & Rush, H., 1995). Capacity development is an internal and incremental process that happens via learning by doing. Cohen and Levinthal (1989) mention that ACAP is "[...] the ability to evaluate and utilize outside knowledge is largely a function of the level of prior related knowledge". They believe that "At the most elemental level, this prior knowledge includes basic skills or even a shared language but may also include knowledge of the most recent scientific or technological developments in a given field." Nonetheless, the lack of financial and human resources makes it difficult for smaller companies to conduct various experiences to obtain intricate technical knowledge (Muller, E., & Zenker, 2001; Zou et al. 201). Therefore, external support can be crucial. In this regard, knowledge brokers as the facilitators of knowledge transfer assist firms in conducting the transfer process more manageable. On these bases, firms can run more transfer activities and experience and learn more from them; therefore, they develop their absorptive capacities (Pawlowski & Robey, 2004).

Intermediaries enable technology absorption in a firm in two ways. First, they offer essential services when the firm lacks internal capabilities to absorb technology.

These services are mainly training or education, and they directly focus on capacity building (Bessant, J. & Rush, H., 1995). Second, intermediaries provide facilitation services to promote capacity development in the firm. These services are knowledge absorption consultancy (e.g., knowledge coding), business development consultancy (enabling the company to utilize the knowledge in its business), and they indirectly affect the capacity development process. These types of services can support capacity building by providing the firm a chance to understand technical knowledge and therefore conduct more knowledge or technology transfer activities, as these activities can lead to internal capacity development to absorb knowledge or technology (Alavi & Leidner, 2001; Szulanski, 1996). For instance, analyzing technology gaps and sources (as a part of the transfer process) can assist a firm in learning more about external sources of new technology. Therefore, it can contribute to the development of a firm's capacity to recognize and acquire special knowledge or technology. Bessant (1995) mentions the role of consultant intermediaries in supporting SMEs through their transfer process and developing managerial capabilities in technology transfer and absorption. Preissler (2016) presents different functions (e.g., providing access to expert knowledge or resources and executive qualification) that intermediaries can have in building capacities in German firms.

To understand the functions of intermediaries' function and their role in ACAP development, we categorized intermediary services mentioned in the literature into four categories, each impacting a dimension of ACAP. The services that lead to a better understanding of opportunities for technology transfer (e.g., networking, access to information about technology trends), or to measure the value of new technologies for the firm (e.g., technology evaluation) can impact on the capacity of the firm to acquire technology (first dimension of ACAP). Training and consultancy services related to contract negotiation for technology patenting or licensing or formalizing informal transfer collaborations and brokering services are the most common services that intermediaries offer. These services can lead to the development of assimilation capacities in firms (second dimension of ACAP). The capacity building services related to knowledge management (e.g., codifying tacit knowledge), as well as consultancy and training on innovation management (e.g., developing a market-oriented product, service, or process from absorbed technology), can impact firms' capacity to transform assimilated technology into an innovative offer (third dimension of ACAP). Finally, the services that support companies in developing a new product or prototype (e.g., access to labs, consultancy of new product design) and selecting appropriate suppliers for the new product,

process, or service can impact the capacity of the firms in the exploitation of the absorbed technology (fourth dimension of ACAP). Various intermediaries offer these services. The table below summarizes the literature on

intermediaries' function and links them with the respective dimension of the ACAP.

Table 1: Intermediaries Function in Development of ACAP dimensions in Innovation System

ACAP Dimension	Intermediary Function	Organization Type
Acquisition	<ul style="list-style-type: none"> • Technology evaluation (Mantel & Rosegger, 1987) • Training (Bessant, J. & Rush, H., 1995) • Networking (Events, Platforms) (Turpin et al., 1996; Hansen et al., 2000; Chesbrough, 2006) • Access to technological information in one area that is potentially valuable (Hargadon & Sutton, 1997) • Facilitating a recipient's measurement of the intangible value of knowledge received (Millar & Cho, 2003) 	<ul style="list-style-type: none"> • Consultancy firms (in technology assessment) • Technology brokers • Universities • Technology transfer centers
Assimilation	<ul style="list-style-type: none"> • Support in contract negotiation for patenting or licensing (Watkins & Horley, 1986) • Brokering (finding the right partner) (Watkins & Horley, 1986; Turpin et al., 1996; Hansen et al., 2000; Chesbrough, 2006) • Helping to formalize informal collaborations in terms of contractual and licensing arrangements (Shohet & Prevezer, 1996) 	<ul style="list-style-type: none"> • Consultancy firms (in Patent management) • Technology transfer centers • Universities (liaison offices or technology parks)
Transformation	<ul style="list-style-type: none"> • Codifying tacit knowledge (Muller & Zenker, 2001) • Knowledge Management Trainings • Support in adapting specialized solutions on the market to the needs of individual user firms (Stankiewicz, 1995) • Capacity building in Innovation Management (Preissler, 2016) 	<ul style="list-style-type: none"> • Training Organizations • Consultancy firms (in innovation and knowledge management) • Universities (providing training and degree program in innovation management)
Exploitation	<ul style="list-style-type: none"> • Selecting suppliers to make components for the technology (Watkins & Horley, 1986) • Providing access to Laboratories (Preissler, 2016) • Capacity building in Innovation Management (Preissler, 2016) • Prototyping (Hargadon, 1997) • Supports in the development of new products (Colombo, Dell'Era & Frattini, 2015) 	<ul style="list-style-type: none"> • Universities (technology parks) and research centers • Product design firms • NDP service providers

6. CONCLUSION

Recently scholars addressed the importance of intermediaries in the development of such capacity. Nevertheless, there is no comprehensive model that defines intermediaries' function in enhancing ACAP development in a firm. In this paper, we try to fill this

gap by categorizing intermediary services in technology absorption in each dimension of ACAP. Further research is needed to examine this categorization and develop a tool that can analyze intermediaries' contributions to the development of the absorptive capacity of firms. Besides, future studies should design a comprehensive model to explain how intermediaries assist the development of

ACAP in a regional, sector, and national innovation system.

This paper also contributes to the development of a practical evaluation framework for policymakers and intermediaries in innovation systems. The regional and national policymakers can apply this framework as a benchmark tool to analyze the existing intermediary services with the services required to boost the absorptive capacity of the firms. Later they could design a promotion strategy to encourage existing intermediaries to modify their service portfolio or to encourage the establishment of new intermediary organizations that can offer services in line with ACAP development. Besides, intermediary organizations shall use this framework as a self-assessment tool to design a new service portfolio for their organizations.

7. REFERENCES

- [1] Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS quarterly*, 107-136.
- [2] Aldrich, H. E., & Von Glinow, M. A. (1992). Business start-ups: The HRM imperative. *International Perspectives on Entrepreneurial Research. North-Holland, New York*, 233-253.
- [3] Ayala, A. H., & González-Campo, C. H. (2015). Measurement of knowledge absorptive capacity: An estimated indicator for the manufacturing and service sector in Colombia. *Journal of Globalization, Competitiveness & Governability/Revista de Globalización, Competitividad y Gobernabilidad/Revista de Globalização, Competitividade e Governabilidade*, 9(2), 16-42.
- [4] Barney, J. (1991). Firm Resources and sustained competitive advantage. *Journal of Management*, 1(1), 7-21.
- [5] Benassi, M., & Di Minin, A. (2009). Playing in between: patent brokers in markets for technology. *R&D Management*, 39(1), 68-86.
- [6] Bessant, J., & Rush, H. (1995). Building bridges for innovation: the role of consultants in technology transfer. *Research policy*, 24(1), 97-114.
- [7] Borrás, S. (2004). System of innovation theory and the European Union. *Science and Public policy*, 31(6), 425-433.
- [8] Breschi, S., & Malerba, F. (1997). Sectoral innovation systems: technological regimes, Schumpeterian dynamics, and spatial boundaries. *Systems of innovation: Technologies, institutions and organizations*, 130-156.
- [9] Carayannis, E. G., & Campbell, D. F. (2009). "Mode 3' and' Quadruple Helix": toward a 21st century fractal innovation ecosystem. *International journal of technology management*, 46(3-4), 201-234.
- [10] Carlsson, B., & Stankiewicz, R. (1991). On the nature, function and composition of technological systems. *Journal of evolutionary economics*, 1(2), 93-118.
- [11] Carlsson, B. (2006). Internationalization of innovation systems: A survey of the literature. *Research policy*, 35(1), 56-67.
- [12] Cohen, W. M., & Levinthal, D. A. (1989). Innovation and learning: the two faces of R&D. *The economic journal*, 99(397), 569-596.
- [13] Cohen, W., & Levinthal, (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly* 35(1), 128-152.
- [14] Cooke, I. I. E., & Mayes, P. (1996). *Introduction to innovation and technology transfer*. Artech house.
- [15] Crawford, N. K. (1984). Transferring Technology from Universities to Small Firms. *Industrial Management & Data Systems*, 84(7/8), 5-9.
- [16] Del Carmen Haro-Domínguez, M., Arias-Aranda, D., Lloréns-Montes, F. J., & Moreno, A. R. (2007). The impact of absorptive capacity on technological acquisitions engineering consulting companies. *Technovation*, 27(8), 417-425.
- [17] Dinar, Z. (2014). Transboundary pollution, R&D spillovers, absorptive capacity and international trade. *International Journal of Economics and Financial Issues*, 4(3), 501-513.
- [18] Dong, J. Q., & Yang, C. H. (2015). Information technology and organizational learning in knowledge alliances and networks: Evidence from US pharmaceutical industry. *Information & Management*, 52(1), 111-122.
- [19] Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university-industry-government relations. *Research policy*, 29(2), 109-123.

- [20] Freeman, C. (1982), "Technological infrastructure and international competitiveness", Draft paper submitted to the OECD Ad hoc-group on Science, technology and competitiveness, August 1982, mimeo.
- [21] Freeman, C. (1987), *Technology policy and economic performance: Lessons from Japan*, London, Pinter Publishers.
- [22] Gao, S., Yeoh, W., Wong, S. F., & Scheepers, R. (2017). A literature analysis of the use of Absorptive Capacity construct in IS research. *International Journal of Information Management*, 37(2), 36-42.
- [23] Grant, R. M. (1991). The Resource-based Theory of Competitive Advantage: Implications for Strategy Formulation. *California Management Review*, 33(3), 114-135.
- [24] Girma, S. (2005). Technology transfer from acquisition FDI and the absorptive capacity of domestic firms: An empirical investigation. *Open economies review*, 16(2), 175-187.
- [25] Griffith, R., Redding, S., & Reenen, J. V. (2004). Mapping the two faces of R&D: Productivity growth in a panel of OECD industries. *Review of economics and statistics*, 86(4), 883-895.
- [26] Guan, J. C., Mok, C. K., Yam, R. C., Chin, K. S., & Pun, K. F. (2006). Technology transfer and innovation performance: Evidence from Chinese firms. *Technological Forecasting and Social Change*, 73(6), 666-678.
- [27] Hägerstrand, T. (1952). The propagation of innovation waves. *Lund Studies in Human Geography, Series B 4*, 23-19.
- [28] Howells, J. (1999). Research and technology outsourcing and innovation systems: an exploratory analysis. *Industry and Innovation*, 6(1), 111-129.
- [29] Howells, J. (2006). Intermediation and the role of intermediaries in innovation. *Research Policy*, 35(5), 715-728.
- [30] Ivanova, I. (2014). Quadruple helix systems and symmetry: a step towards helix innovation system classification. *Journal of the Knowledge Economy*, 5(2), 357-369.
- [31] Leydesdorff, L. (2012). The triple helix, quadruple helix,..., and an N-tuple of helices: explanatory models for analyzing the knowledge-based economy?. *Journal of the Knowledge Economy*, 3(1), 25-35.
- [32] Lin, H., Zeng, S., Liu, H., & Li, C. (2016). How do intermediaries drive corporate innovation? A moderated mediating examination. *Journal of Business Research*, 69(11), 4831-4836.
- [33] Liao, J., Welsch, H., & Stoica, M. (2003). Organizational absorptive capacity and responsiveness: An empirical investigation of growth-oriented SMEs. *Entrepreneurship Theory and practice*, 28(1), 63-86.
- [34] Lundvall, B. Å. (1985), *Product Innovation and User-Producer Interaction*, Aalborg, Aalborg University Press.
- [35] Lundvall, B. Å., & Freeman, C. (1988). *Small countries facing the technological revolution*. Pinter Publishers.
- [36] Lundvall, B. Å. (2007). National innovation systems-analytical concept and development tool. *Industry and innovation*, 14(1), 95-119.
- [37] Lundvall, B. Å. (Ed.). (2010). *National systems of innovation: Toward a theory of innovation and interactive learning* (Vol. 2). Anthem press.
- [38] Malmberg, A., & Maskell, P. (1997). Towards an explanation of regional specialization and industry agglomeration. *European planning studies*, 5(1), 25-41.
- [39] Mantel, S. J., & Rosegger, G. (1987). The role of third-parties in the diffusion of innovations: a survey. *Innovation: Adaptation and growth*, 123-134.
- [40] Martins, J. (2014). Operating Factors That Help to Improve Performance in Subsidiaries with Low Absorptive Capacity. *Journal of East-West Business*, 20(3), 162-183.
- [41] McAdam, R., McAdam, M., & Brown, V. (2009). Proof of concept processes in UK university technology transfer: an absorptive capacity perspective. *R&d Management*, 39(2), 192-210.
- [42] McEvily, B., & Zaheer, A. (1999). Bridging ties: A source of firm heterogeneity in competitive capabilities. *Strategic management journal*, 20(12), 1133-1156.
- [43] Min, J. W., Kim, Y., & Vonortas, N. S. (2020). Public technology transfer, commercialization and business growth. *European Economic Review*, 103407.
- [44] Min, J. W., Vonortas, N. S., & Kim, Y. (2019). Commercialization of transferred public technologies. *Technological Forecasting and Social Change*, 138, 10-20.

- [45] Minbaeva, D. B., & Michailova, S. (2004). Knowledge transfer and expatriation in multinational corporations. *Employee relations*.
- [46] Moilanen, M., Østbye, S., & Woll, K. (2014). Non-R&D SMEs: external knowledge, absorptive capacity and product innovation. *Small Business Economics*, 43(2), 447-462.
- [47] Mowery, D., & Oxley, J. (1995). Inward technologies transfer and competitiveness: The role of national innovation systems. *Cambridge Journal of Economics*, 19(1), 67-93.
- [48] Muller, E., & Zenker, A. (2001). Business services as actors of knowledge transformation: the role of KIBS in regional and national innovation systems. *Research policy*, 30(9), 1501-1516.
- [49] Muscio, A. (2007). The impact of absorptive capacity on SMEs' collaboration. *Economics of Innovation and New Technology*, 16(8), 653-668.
- [50] Ortega-Argilés, R., Vivarelli, M., & Voigt, P. (2009). R&D in SMEs: a paradox?. *Small business economics*, 33(1), 3-11.
- [51] Park, T., & Rhee, J. (2012). Antecedents of knowledge competency and performance in born globals: The moderating effects of absorptive capacity. *Management Decision*, 50(8), 1361-1381.
- [52] Pawlowski, S. D., & Robey, D. (2004). Bridging user organizations: Knowledge brokering and the work of information technology professionals. *MIS quarterly*, 645-672.
- [53] Peteraf, M. A. (1993). The cornerstones of competitive advantage: a resource-based view. *Strategic management journal*, 14(3), 179-191.
- [54] Preissler, S. (2016). Wissens-und Technologietransfer Dienstleistungen. In Interorganisationaler Wissens-und Technologietransfer. *Springer Gabler, Wiesbaden*, 55-97.
- [55] Rogers, E.M., (1962). Diffusion of Innovations. *The Free Press, New York*.
- [56] Shleifer, A., & Vishny, R. W. (1990). Equilibrium short horizons of investors and firms. *The American Economic Review*, 80(2), 148-153.
- [57] Schildt, H., Keil, T., & Maula, M (2012). The temporal effects of relative and firm-level absorptive capacity on inter-organizational learning. *Strategic Management Journal*, 33, 1154-1173.
- [58] Shohet, S., & Prevezer, M. (1996). UK biotechnology: institutional linkages, technology transfer and the role of intermediaries. *R&D Management*, 26(3), 283-298.
- [59] Spithoven, A., Vanhaverbeke, W., & Roijakkers, N. (2013). Open innovation practices in SMEs and large enterprises. *Small business economics*, 41(3), 537-562.
- [60] Srivastava, M. K., Gnyawali, D. R., & Hatfield, D. E. (2015). Behavioral implications of absorptive capacity: The role of technological effort and technological capability in leveraging alliance network technological resources. *Technological Forecasting and Social Change*, 92, 346-358.
- [61] Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17, 27-43.
- [62] Todorova, G., & Durisin, G. (2007). Absorptive capacity: Valuing a reconceptualization. *Academy of Management Review*, 32(3), 774-786.
- [63] Van Den Bosch, F. A., Volberda, H. W., & De Boer, M. (1999). Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and combinative capabilities. *Organization science*, 10(5), 551-568.

THE NOTION OF MEANINGFUL WORK IN SOCIAL ENTREPRENEURSHIP

Wee Chan Au^{1*} and Andreana Drencheva²

¹ Department of Management, School of Business, Monash University Malaysia, Bandar Sunway, Malaysia

² Management School, Sheffield University Management School, Sheffield University, Sheffield, UK

*Corresponding author: au.wee.chan@monash.edu

Abstract

This study focuses on the construction of meaningful work within the social entrepreneurship context. In light of the hidden costs of meaningful work, this study challenges the problematic assumption that work in the social sector is inherently meaningful. Drawing on in-depth interview data with 40 social entrepreneurs in Malaysia (MSEs), findings of the study demonstrates that social entrepreneurs sought after meaningfulness at work that aligns with their values, and the experience of meaningful work is realized when a positive change takes place. Results also show that work-life balance and emotional wellbeing of social entrepreneurs could be at the expense of their pursuit of meaningful. Finally, our findings highlighted the importance to draw a clear boundary between work and nonwork sphere, as well as seeking support to ensure the hidden costs of meaningful work do not counter the meaningfulness MSEs experiences at work.

Keywords: Meaningful work, social entrepreneurship, Malaysia.

1. INTRODUCTION

By drawing upon the notion of the calling and prosocial behavior, this study focuses on the construction of meaningful work within the social entrepreneurship context in Malaysia. In light of the hidden costs of meaningful work, this study challenges the problematic assumption that work in the social sector is inherently meaningful. Research shows that experiencing one's work as meaningful affects attitudes and behaviors (Bunderson & Thompson, 2009). Meaningful work and the experience that one's work as making a positive difference in the lives of others has a positive implication on one's wellbeing (Bolino & Grant, 2016). For example, it may buffer against emotional exhaustion (Grant & Campbell, 2007), holding negative self-evaluations (Grant & Sonnentag, 2010), and brings about emotional benefits beyond the work domain (Sonnentag & Grant, 2012). This study aims to provide insights into how social entrepreneurs make sense of their work as meaningful and how the experience of meaningful work could affect their behaviors and sustaining the social entrepreneurship career.

2. LITERATURE REVIEW

2.1. Social entrepreneurship as meaningful work

Traditionally, the pursuit of work and career that fulfills a higher calling and meaningful work is often associated directly with work in the nonprofit sector (Anheier &

Salamon, 2006; Dempsey & Sanders, 2010). Social entrepreneurship, where business expertise and market-based skills are applied to meet a social objective (Austin et al., 2006) has been on the rise. An increasing number of young individuals engaged and build their career in social entrepreneurship (Bosma et al., 2016). Amidst such backdrop, questions about what constitutes meaningful work in the social entrepreneurship context become increasingly significant. With the increasing popularity of social entrepreneurship to address social problems with entrepreneurship mechanism, it is therefore important to understand meaningful work in the social entrepreneurship context.

Our interest in the experience of meaningful work among social entrepreneurs emerged from their work not merely for an economic purpose but primarily for their passion and commitment toward a social mission. Social entrepreneurship offers a compelling vision of meaningful work centered on solving pressing social problems (Dempsey & Sanders, 2010). However, even with high task significance where one's job has a positive impact on others (Hackman & Oldham, 1976), one may not necessarily experience meaningfulness at work (Grant, 2008; Grant et al., 2007). This is because in the social entrepreneurship context, owing to the nature of the social mission and level of integration in the business model, social entrepreneurs across organizations may experience meaningful work differently. For example, one may not have direct

contact with beneficiaries, thus not directly see or experience the impact of their work on others. Accordingly, he or she may not experience the same level of meaningful work as compared to peers who have direct interactions with beneficiaries due to the design of their business models (i.e., integrated) or the nature of the social issue (e.g., working with refugees vs taking positive climate action).

Meaningful work in social entrepreneurship can be drawn upon the notion of calling and prosocial behavior (impact). The Protestant work ethic (Weber, 1930) was the foundation of contemporary understandings of work as fulfilling a higher calling (Bell & Taylor, 2003). Beyond economic and career advancement reasons, work inspires a sense of significance, purpose or transcendent meaning (Bunderson & Thompson, 2009). Researchers investigating callings viewed work as one's calling with its personal and social significance (Pratt & Ashforth, 2003; Wrzesniewski, 2003). In particular, callings are "associated with the belief that the work contributes to the greater good and makes the world a better place." (Wrzesniewski, 2003, p. 301). Another similar concept is prosocial impact, which refers to the experience of making a positive difference in the lives of others through one's work (Grant & Sonnentag, 2010). Past studies suggest that when individuals experience their work as meaningful, in particular when their work has enhanced the welfare of others, they are likely to perform better at work (Bolino & Grant, 2016; Grant, 2008).

2.2. Hidden costs of meaningful work

While work in the social sector, including nonprofit and social entrepreneurship, is associated with meaningfulness and significance. Past studies identified the potential cost of engaging in meaningful work (Bunderson & Thompson, 2009; Dempsey & Sanders, 2010). For example, self-sacrifice, underpaid and unpaid labor, a troubling account of work/life balance at the expense of individual's health, family and other aspects of social reproduction (Dempsey & Sanders, 2010) are some of the common byproducts and side effect of the pursuit of meaningful work.

Furthermore, compassion fatigue and stress are commonly identified as the byproduct of meaningful work (Bolino & Grant, 2016). Researchers suggest that individuals are likely to experience sadness, anxiety, psychological distress, and suffering if one cares too much when his or her work involves close interpersonal contact with beneficiaries (Adams et al., 2006). Furthermore, meaningful work which exposes one to the suffering of others and the inability to help may also bring about negative emotion and burnout (Klimecki & Singer, 2012; Schulz et al., 2007). In particular, Bunderson and Thompson (2009, p. 50) identified the

double-edged nature of meaningful work in the neoclassical version of calling – as "a source of transcendent meaning, identity, and significance as well as of unbending duty, sacrifice, and vigilance". In sum, this line of the literature suggests that the hidden costs of meaningful work may counter the meaningfulness one experiences at work.

3. METHODOLOGY

Research design

This study adopts a qualitative examination of meaningful work in the social entrepreneurship context. The research team conducted in-depth interviews with 40 MSEs in Malaysia. The MSEs shared how they got into social entrepreneurship, how they think and feel about their work, how they think and feel about their work in making a positive change to society. Interviews lasted an average of 50-60 minutes and were recorded and transcribed verbatim.

Although we did not begin our investigation with a focus on meaningful work, narratives reflecting social entrepreneurship as meaningful work frequently emerged during the interviews. The unintended negative consequences of such meaningful work were also widely identified and discussed by the MSEs. Accordingly, it became apparent that if we were to understand why individuals are dedicated to social entrepreneurship as a career, which is less rewarding financially, we needed to better understand their perception of meaningful work. A more in-depth content analysis of each interview was undertaken to articulate the MSEs' meaningful work and how they cope with the unintended negative consequences so that the overall meaningfulness outweighs the hidden costs of being involved in social entrepreneurship career.

4. FINDINGS AND DISCUSSION

4.1. Meaningful work aligns with one's values

Doing work and pursuing a career that aligns with one's values was one of the key dimensions of meaningful work among the MSEs. Some MSEs chose to venture and stay with social entrepreneurship career despite other more lucrative career options in terms of financial gain.

For me, I cannot, I am not okay the state of the world being so unequal [...] I was actually already looking for a part-time job that was more meaningful to me [...] and when I found out ABC, I am like, this seems like super down my alley, it's kind of make sense because this is what I have been doing all my life anyway, so I join them part-time. Then, after 8 months, I decided that I will join full time [...] ... When doing this, I feel really good, I was confident enough to take a very [brave]... out of my comfort zone kind of steps, to be more in line with my values [Alya].

[Between] dedicating your life towards improving a very established system versus being a social entrepreneur where you work at the grassroots and try to come up with creative solutions, that impact people... I did qualify as a lawyer last year, but I eventually decided, not to practice and to come out and join X [name of co-founder]... my personal goal is to see this company succeed. Because as long as it succeeds and starts making a difference in... and also showing other agencies how recruitment can be done better. I feel like, for me personally, I would be satisfied [...] There was a traumatic experience, to see the agency reinforcing all these bad practices [...] you know [with] this element of control, fear and intimidation [...] Um... and it really justified the reason why we want to enter into this industry [Min].

4.2. Meaningful work is realized when a positive change takes place

Meaningful work is subjective, and MSEs have difficulty in quantifying and measuring meaningfulness. However, the positive changes on the beneficiaries serve as a signpost for MSEs that their work is meaningful.

By seeing their lives being changed drastically, from people who cannot pay for rent to people who can pay rent on time. Yes. That's awesome. [Yuan]

I decided to stay on as I can see [the] potential in the work that we do... that I started to see [a] difference, the children [are] changing, and [we are] making [an] impact. Then I see that it's working. I think I'll keep on doing ABC as long as there's still potential in it, in terms of the work we do, there's a need for it. [Yee]

So, I'm really happy when I see like, like the student who used to come only once in a while, now they come every day, their attendance is much better. And yeah, it's good to see their pro- their progress. When you say, "oh, we're gonna do movie night", they're so happy, and they all come. And see that whatever we do makes them happy, it seems to help, so that's great. [Sue]

4.3. Meaningful work at the expense of work-life balance

The MSEs were dwelled into the meaningful work to the extent that their work is prioritized over their work-life balance. Most of them did not have a clear boundary between work and nonwork spheres; they committed to work whenever possible.

Work-life balance? Non-existent (laughter). It's hard, it's hard. Because of the work that I am doing, personally, it resonates with my [value], I feel my larger purpose in calling. So I often feel the work-life balance [boundary] is very blurred. Because even in my free time, I could be going for events that are work-related, I'm talking to people work-related stuff, but I don't feel like

I'm working. For example, I was in Cape Town two weeks ago for a workshop, one week for work, one week for leisure. But the one week for leisure also I was meeting maker spaces people I was meeting other up-cyclists, having coffee. [Mohan]

MSEs also shared that they do not practice mental separation between work and nonwork spheres. Even when they are at their personal space, they could not help but keep thinking about the meaningful works that they are doing.

Even when I am doing things outside of ABC, I actually think back, "Can I do this as a classroom activity? or am I able to do this with the students?" So every time I learn something new, I always think like, "oh, I am able to apply with the students. Or how can I modify it [for the students]?"... I don't feel like it's a chore or something, it's something very natural that I do. Anything that I experience personally outside of work, I always try to see how can I bring it to ABC or help my team. (Yee)

I always talk about the kids (the beneficiaries), the gym... but it's not burdening me, in the sense that it's part of me. I don't have to separate like work, and then switch. No. It's ingrained in me. It's part of my life. (Faruz)

4.4. Meaningful work could be emotionally draining

While some MSEs did not find it burdensome to have inseparable work and nonwork spheres, some other MSEs, especially those working with vulnerable communities, found it emotionally draining and challenging with their meaningful works.

Everyone says like, "your company is like your baby". Sometimes, I am like, "oh, I am not giving enough to the company. I need to treat the company like my child". Like, it is already 11pm, should I just work an extra hour and a half?... For 2 weeks, I feel really sick because I didn't sleep much. It wasn't just [about] sleeping, [it's about] turning off. I wanted to go to bed by 11pm, but I keep thinking all the things, this employer, that employer, how do I convince this. I wasn't sleeping well for the 2 weeks. Then I felt really sick, I couldn't do any work for a week. [Alya]

I started to develop anxiety. Especially when we started to pilot solution, there were so many things that we were working on was out of our control. We had to work with partners that were very uncooperative... So it leads to a lot of anxiety, and maybe too much emotional investment into the beneficiaries that we are serving, caring too much about workers' personal life and personal circumstances in the Philippines. It used to just break me, I would cry so much after coming back from work, knowing that I couldn't do anything more for them. I guess

these are the unintended negative consequences that came up of this work. [Chen]

As most social enterprises were working with limited resources, overwork was common among the MSEs. MSEs were also under the constant pressure to make sufficient revenue so that the social initiatives could be sustained over time. In the long term, such meaningful work could make MSEs feel overwhelmed.

It's quite demanding... a lot of the work is in the weekends; a lot of the programs are on the weekends... I definitely do see the fact that I don't spend enough time with loved ones, like my grandparents, parents and friends. Even my health sometimes, we do a few nights of coffee nights and rushing things out. [Mohan]

Burnout... Sometimes it felt like you are... it's like an endless chasing... there were times where every month we were facing almost zero bank account or very low money and then we are like, "Chase the next sales! Chase the next sales!"... That was when you start questioning, "Is this going to be sustainable long-term? Am I wasting my time? What if I do something else? that might be better... use of my energy and my effort?" And you feel demotivated because no matter how hard you try, you seemed to keep having challenges. That's how it's like, how I felt... [Lian]

We always want the best for our beneficiaries; we want them to be happy, we want them to be productive, we want them to have good mental health. Then we forgot that we also need that... Whatever you wish for other people, you must have it for yourself, or else you will burn out...I [make sure] don't make the mistake that I did in the first 4 years in ABC. I felt I was losing my own identity because I didn't have work-life balance..... I didn't set the boundaries for the first four years in ABC. Everything was so interlocked; there was just no boundaries. Of course, depression set in, anxiety set in, self-doubt. And I had really bad anxiety issue. Which my doctor said, "you have to do something". (Parveen)

4.5. Intentionally keep a distance to protect oneself

To protect oneself from feeling drained, hence sustaining emotion and energy to continue with the meaningful work in the social enterprise, some MSEs intentionally drew boundaries, physical, mental or digital boundaries, between their work and nonwork spheres.

When I ended up only working, say after 5 days, I'm like, "I don't even want to go to the centre, I don't want to see anybody, like too much!". For me, I live here, 100% immersed into it [...] At the beginning, I was like giving 100% of my time to the centre. At some point, I was always pissed and tired, because it's too much effort all the time, all the time. (Sue)

When I go out of the office, I don't actually like talking about ABC work with other people. If people ask me about it, I feel quite drained, to be honest... This is already something I do every day, on calls with workers, on calls with employers, it's a constant sales pitch. So when I go for social events and people start asking me like "Oh, you started ABC didn't you?". I try as much as I can, not to engage too much. I want to involve myself in other social activities and other social conversations as well, beyond ABC. That's how I sort of keep my balance. [Min]

Being in our position, work really never ends. Even when going to the gym is supposed to be a happy nonwork place, but that's where connections are made. So, I do end up talking about work, which I used to hate it. But now it's like, I've kinda realized that I need to do it because that's how I build my network... Normally, I just give a very broad, general answer, and then I would say things like "here's my card...you can just drop me an email. We'll continue". So that's how I find myself setting my boundary. [Fiona]

In the beginning, our team was communicating on WhatsApp, and sending emails on weekends or midnight and things like that. But I refrained myself from doing that because I felt that if I'm serious and if I want to do this [for] long-term, I cannot injure myself in the short-term, I better protect myself. (chuckles) [Lian]

4.6. Protect and support mechanism

MSEs also shared that some mechanism had to be in place to ensure one's mental health was not sacrificed for meaningful work. For MSEs who have co-founders, they constantly sought out support and looked after each other to ensure the sustainability of the founding team's mental health was not discounted while ensuring the sustainability of the social enterprise.

Anyhow, it is important to learn how to set boundaries between work and taking time to look after yourself, whether it's time to go to the mosque, whether it's time to something more spiritual... I take time off, quiet time, going away [a] little bit, for a few hours or days. Talk to other people... Sometimes there are frustrations, the biggest help in this work is spiritual engagement. For me it's very helpful going to the mosque, reading the Quran, reflecting on certain passages, doing #solah# (prayer) or just remembering God and reflecting on the (long pause) blesses that I already receive. This is very helpful, in this environment particularly. [Kamal]

It has been a bit intense, work wise. But 3 of us, we recognized the importance of taking a break. If not, you [will] get burnt out. This kind of job or industry requires us to be resilient for a long period of time... I was in Vietnam 2 weeks ago, for 1 week... my co-founder is like, "we are going to cover your work. You need time off".

One of them is going [off] the week after our launch; we will cover for her. For me, that's really important. [Alya]

For MSEs who were the solo founders, they identified the journey in pursuing a career of meaningful work to be lonely at times. With the growing and maturing social entrepreneurship ecosystem in Malaysia, they started to get more support from fellow social entrepreneurs.

This social enterprise journey is very lonely. Everyone is everywhere, [I think] a lot of people are going through the same thing, but there is no connection. It's only now that we have the chamber of social entrepreneur development, then we have the moral support. It's only now that we have a support system. Before this, it is a very lonely journey, and sometimes I feel tired, lethargic, start questioning, self-doubt, am I doing the right thing? [...] My family don't understand what was I doing, my father was like, "Why are you quitting your job to this? How are you going to survive?" [For] the longest time, my late father has this thought that I was going to fall flat on my face...the social enterprise industry is still fairly new... After I long while, I have that support system, if I need help, I know who to call, who is also in the social enterprise industry... the whole ecosystem for the social enterprise is evolving, it's actually getting better, so is not as lonely anymore. Now [if] you really want to rant, you can call somebody and rant, where you can also ask for advice, now for guidance. [Parveen]

5. CONCLUSION

Narratives of the MSEs demonstrate social entrepreneurship as a key source of meaningful work, hence a rewarding career choice. Meanwhile, the MSEs also identify the potential cost of meaningful work in terms of work-life imbalance and emotional exhaustion. MSEs highlighted the need to draw clear boundaries as a protective mechanism, as well as seeking support whether it is spiritually, or from team members or externally to ensure their emotion and mental health is not at the expense of the meaningful work in social entrepreneurship. Recognizing that social entrepreneurship and the notion of meaningful work differ across cultural and economic context (Anheier & Salamon, 2006; Dempsey & Sanders, 2010), this study adds insights from the Malaysian context which has been under-represented so far in researched published in journals based in the Global North.

6. ACKNOWLEDGMENTS

This study was funded by grant AH/R005354/1.

7. REFERENCES

- [1]. Adams, R. E., Boscarino, J. A., & Figley, C. R. (2006). Compassion Fatigue and Psychological Distress Among Social Workers: A Validation Study. *American Journal of Orthopsychiatry*, 76(1), 103-108. <https://doi.org/10.1037/0002-9432.76.1.103>
- [2]. Anheier, H. K., & Salamon, L. M. (2006). The nonprofit sector in comparative perspective. In W. W. Powell & R. Steinberg, *The Non-Profit Sector: A Research Handbook* (pp. 89-114). New Haven, CT.
- [3]. Austin, J., Stevenson, H., & Wei-Skillern, J. (2006). Social and commercial entrepreneurship: Same, different, or both? *Entrepreneurship Theory and Practice*, 30(1), 1-22. <https://doi.org/10.1111/j.1540-6520.2006.00107.x>
- [4]. Bell, E., & Taylor, S. (2003). The elevation of work: Pastoral power and the New Age work ethic. *Organization*, 10(2), 329-349.
- [5]. Bolino, M. C., & Grant, A. M. (2016). The Bright Side of Being Prosocial at Work, and the Dark Side, Too: A Review and Agenda for Research on Other-Oriented Motives, Behavior, and Impact in Organizations. *Academy of Management Annals*, 10(1), 599-670. <https://doi.org/10.5465/19416520.2016.1153260>.
- [6]. Bosma, N., Schött, T., Terjesen, S. A., & Kew, P. (2016). *Global Entrepreneurship Monitor 2015 to 2016: Special Topic Report on Social Entrepreneurship* (SSRN Scholarly Paper ID 2786949). Social Science Research Network. <https://papers.ssrn.com/abstract=2786949>
- [7]. Bunderson, J. S., & Thompson, J. A. (2009). The call of the wild: Zookeepers, callings, and the double-edged sword of deeply meaningful work. *Administrative Science Quarterly*, 54(1), 32-57. JSTOR.
- [8]. Dempsey, S. E., & Sanders, M. L. (2010). Meaningful work? Nonprofit marketization and work/ life imbalance in popular autobiographies of social entrepreneurship. *Organization*, 17(4), 437-459. <https://doi.org/10.1177/1350508410364198>.
- [9]. Grant, A. M. (2008). The significance of task significance: Job performance effects, relational mechanisms, and boundary conditions. *Journal of Applied Psychology*, 93(1), 108-124. <https://doi.org/10.1037/0021-9010.93.1.108>

- [10]. Grant, A. M., & Campbell, E. M. (2007). Doing good, doing harm, being well and burning out: The interactions of perceived prosocial and antisocial impact in service work. *Journal of Occupational and Organizational Psychology*, 80(4), 665-691.
<https://doi.org/10.1348/096317906X169553>
- [11]. Grant, A. M., Campbell, E. M., Chen, G., Cottone, K., Lapedis, D., & Lee, K. (2007). Impact and the art of motivation maintenance: The effects of contact with beneficiaries on persistence behavior. *Organizational Behavior and Human Decision Processes*, 103(1), 53-67.
<https://doi.org/10.1016/j.obhdp.2006.05.004>
- [12]. Grant, A. M., & Sonnentag, S. (2010). Doing good buffers against feeling bad: Prosocial impact compensates for negative task and self-evaluations. *Organizational Behavior and Human Decision Processes*, 111, 13-22.
- [13]. Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance*, 16(2), 250-279.
[https://doi.org/10.1016/0030-5073\(76\)90016-7](https://doi.org/10.1016/0030-5073(76)90016-7)
- [14]. Klimecki, O., & Singer, T. (2012). Empathic distress fatigue rather than compassion fatigue? Integrating findings from empathy research in psychology and neuroscience. In B. Oakley, A. Knafo, G. Madhavan, & D. S. Wilson (Eds.), *Pathological altruism* (pp. 368-384). Springer.
- [15]. Pratt, M. G., & Ashforth, B. E. (2003). Fostering meaningfulness in working and at work. In K. S. Cameron, J. E. Dutton, & R. E. Quinn, *Positive Organizational Scholarship: Foundations of a New Discipline* (pp. 309-327). Berrett-Kohler.
- [16]. Schulz, R., Hebert, R. S., Dew, M. A., Brown, S. L., Scheier, M. F., Beach, S. R., Czaja, S. J., Martire, L. M., Coon, D., Langa, K. M., Gitlin, L. N., Stevens, A. B., & Nichols, L. (2007). Patient Suffering and Caregiver Compassion: New Opportunities for Research, Practice, and Policy. *The Gerontologist*, 47(1), 4-13.
<https://doi.org/10.1093/geront/47.1.4>
- [17]. Sonnentag, S., & Grant, A. M. (2012). Doing good at work less good at home, but not right away: When and why perceived prosocial impact predicts positive affect. *Personnel Psychology*, 65(3), 495-530. <https://doi.org/10.1111/j.1744-6570.2012.01251.x>
- [18]. Weber, M. (1930). *The Protestant Work Ethic and the Spirit of Capitalism* (T. Parsons, trans.). Scribner's.
- [19]. Wrzesniewski, A. (2003). Finding positive meaning in work. In K. S. Cameron & R. E. Quinn (Eds.), *Positive Organizational Scholarship: Foundations of a New Discipline* (pp. 296-308). Berrett-Kohler.

EXPLORING ENTREPRENEURIAL ORIENTATION – PERFORMANCE RELATIONSHIPS IN THE BANKING SECTOR

Mohammed Aliyu Dantsoho^{1*} Nasiru Abdullahi² and Adamu Ado Abubakar³

^{1, 2, 3} Department of Business Administration, ABU Business School, Ahmadu Bello University Zaria, Nigeria

*Corresponding author: madantsoho@gmail.com

Abstract

Over the past three decades, the nature and various impacts of the entrepreneurial orientation (EO) within small and medium businesses have been discussed among scholars and practicing managers. However, less effort has been made to investigate the impacts of EO within established firms such as the banking sector. This literature gap can limit the application of the most published findings on EO – performance relationships across firms and industries. The aim of this research was to examine how EO manifest in the Nigerian banking sector in relations to bank performance. Purposive sampling was used to collect data from the bank managers, 315 participants were used for the final analysis with the aid of SmartPLS 3. The result shows that Proactiveness, Innovativeness and Competitive aggressiveness are significantly related to the bank performance in Nigeria, whereas Risk-taking and Autonomy dimensions were insignificant. Individually, the result indicates that proactiveness is the most important EO dimension in the Nigeria banking sector, followed by innovativeness and competitive aggressiveness. Reasons for this finding could be due to the nature of the industry in terms of regulations, customer sophistication and competitive intensity. Our findings hence, confirms recent assertions that EO dimensions are independent of each other, they may occur in different combinations depending on the context which EO is applied. That is, the most suitable EO conceptualisation can include features that are deemed 'desirable or essential' (Gupta & Dutta, 2018: 167), to the performance of a firm in a given culture and industries (Wales, 2020). In light of these findings, this study brings new insights to the ongoing discussions on EO – performance relationships.

Keywords: Entrepreneurial orientation, Performance- relationships, Banking sector, Nigeria.

1. INTRODUCTION

The past three decades have seen the growing interest on the concept of entrepreneurial orientation (EO) with varying degree of findings (Miller, 1983; Rauch, Wiklund, Lumpkin & Frese, 2009; Miller, 2011; Wales, 2016; Linton, 2016; Wales, Gupta, Marino & Shirokova, 2019). Despite all this, investigating what influence entrepreneurial behaviour in a given context has not been adequately addressed (Pittino, Visintin & Lauto, 2016). Hence understanding factors or genesis behind firm entrepreneurial behaviour in a given industry is an important field of inquiry (Wales, 2016). On the EO – performance relationships the dominant conceptualisation is that of Miller (1983) using Covin and Slevin's (1989) instrument (Wales et al., 2019). However, one notable limitation of this approach is the assumption that risk-taking, proactiveness and innovativeness are what make up an organisation to be entrepreneurial. That is if any one of these dimensions is absent than a firm is

considered to be less entrepreneurial (Miller, 2011). Scholars that adopt this conceptualisation strongly assumed that firm must employ proactiveness, innovativeness and risk-taking simultaneously to improve its entrepreneurial success in a given market or industry (Rauch et al., 2009; Miller, 2011). For instance, Wiklund and Shepherd (2011) emphasise the role of EO as a single dimension by focusing on entrepreneurial risk-taking. Other scholars have called on the need to return to the Miller (1983)/Covin and Slevin's (1989) conceptualisation to stabilize EO construct.

Consistence with this approach Lomberg, Urbig, Stockmann, Marino and Dickson (2017) indicate that there is unique variance explained by the combined effect of proactiveness, innovativeness and risk-taking of EO far from any other variance explained by the individual dimension or the combination of any two. Surprisingly, the undesirable effect of EO derived from this approach is largely ignored (Wales, 2016). The

second approach is that of Lumpkin and Dess (1996) and put forwards by scholars such as George and Marino (2011). Under this, EO is viewed as a “profile construct” (Polites, Roberts & Thatcher, 2012: 32). Although this approach does not require EO dimensions to occur simultaneously (Covin & Wasles, 2016), the dominant logic here is that EO conceptualised to include proactiveness, innovativeness and risk-taking, autonomy and competitive aggressiveness. Thus, described as a tendency to directly and intensely contest in the competitive environment to outpace rivals and the capacity to be self-directed in the search of entrepreneurial opportunities (George & Marino, 2011; Covin & Wales, 2016; Pittino et al., 2016).

We argue that these theoretical fallacies are the reasons for what is now termed as “potential downsides of EO” (Wales, Covin & Mosen, 2020). However, we are not alone in this, as several scholars also are of the view that this approach could lead to a misleading or incomplete conclusion about EO performance relationships (George & Marino, 2011; Miller, 2011; Wales, 2016; 2020). One notable submission is that although EO is popularly known through the use of Miller’s (1983) conceptualisation “other dimensional designs are certainly possible to better capture a specific context or phenomena (Wales et al., 2019: 96) which EO construct is applied (Wales et al., 2020). More so, entrepreneurship has not been a singular act but rather a managerial philosophy for decision making and practices, and a strategic posture considered to be entrepreneurial in a given context (Wales, 2016). Consistent with this argument is that “being entrepreneurial” could mean many things depending on the firm and industry (Miller, 2011; Covin & Wales, 2020).

Our motivation for this study is not just to add to the volume of literature on the EO – performance relationships but to carefully examine how EO manifest in the Nigerian banking sector, that has been describes with intense regulations, competitive intensity and customer sophistication (Dantsoho, 2016). We hope that this will help researchers in this field of enquiry to address some theoretical and methodological limitations from the existing studies (Covin & Wales, 2019). Our argument is on the fact that EO was initially developed and tested in advanced countries and researches have shown that, research constructs originally developed in advanced economy “are challenged when applied to emerging markets and may benefit from further consideration and adaptation” (Bruton Ahlstrom & Obloj, 2013; Wales et al., 2019: 96). More so, other scholars recently acknowledge that research on EO constructs in the emerging markets progresses at a slower pace (Gupta & Batra, 2016; Shirokova et al., 2016; Tang & Tang, 2012; Wales, Shirokova, Sokolova,

2016).

Although, Niemand, Rigtering, Kallmünzer, Kraus and Matijas (2017) attempted to fill this literature gap in the banking sector but their work started and end within the German banking industry. Their findings may thus not be used to address the peculiarities of banks operating in developing economies that are faced with persistence economic crisis, political instability and intense regulations.

This study seeks to examine the EO – performance relationships in the Nigerian banking sector while taking into account of its unique characteristics of being highly regulated, intensely competitive and sophisticated customer’s behaviour (Dantsoho, 2016).

The rest of the paper was organised as follows. Section two examines literature related to EO – performance. Section three described the methodology of the study. Section four is consist of data analysis and discussion of findings. Section five, presents a conclusion, recommendations and direction for future research.

2. THEORY AND HYPOTHESES DEVELOPMENT

The philosophical foundation of this study is based on Resource-based View (RBV) thinking which emphasises on the need of the firm to gather organisational resources that are valuable, rare, imperfectly and non-substitutable (VRIN) for building a competitive advantage that yields superior performance (Barney, 1991). Organisational resources are defined to include “all assets, competence, capabilities, firm attributes, organizational processes, information, knowledge, and others that are under the control of the firm that makes the it “able to develop and implement strategies aimed at improving the firm’s efficiency and effectiveness” (Barney, 2002: 276). The joint creation and exploitation of resources by the firm and its clients are the basis of RBV thinking used to underpin the study. Building on the assumption of resources-based view (RBV) approaches this study is aimed at predicting and explaining how an individual bank can use the tactics and strategies associated with EO construct to achieve superior performance in the digitalise banking services.

Previous research found that companies facing volatility and obstacles are expected to benefit from the entrepreneurial behavior (miller, 1983; Covin & Slevin, 1989; Lumpkin & Dess, 1996; Rauch Wiklund, Lumpkin & Frese, 2009; Wales, 2012). These actions are likely to come from a firm’s entrepreneurial orientation (EO) (Miller, 2011). EO has been defined differently by different authors. Lumpkin and Dess (1996) Described EO as the strategic focus of a company, questions about particular entrepreneurial elements of decision taking,

processes and activities. In terms of several behavioral dimensions, Ireland, Covin and Kuratko (2009) defined EO as the state or quality of the organisation strategic posture. Based on Rauch's *et al.* (2009) conceptualisation, EO represents policies and practices that form the basis of business decisions and actions.

Anderson, Covin and Slevin, (2009) also Identified EO as a strategic orientation at the firm level that captures the strategic practices, managerial philosophies and firm activities of a company that are entrepreneurial in nature. It is described as a kind of strategic position of a company that shows proactiveness, innovativeness, and risk-taking (Miller, 1983; Covin & Slevin, 1989). Others scholars extend this definition to include autonomy, and competitive aggressiveness (Lumpkin & Dess, 1996). In their contribution, George and Marino (2011: 1002) argue that EO is best operationalised as a reflective construct suggesting that "EO represents a larger concept than simply the sum of its dimensions and that these dimensions are merely reflections of this larger, unobservable construct that represents the firm's strategic posture." EO dimensions are discussed below.

Lumpkin and Dess (1996) described proactiveness as an opportunity-seeking and forward-looking activity for the introduction of new products, services or technological capabilities on the market ahead of competitors in anticipation of future demand, which may lead to new ventures and renewals. It is assumed that being proactive can makes a firm to be receptive to market signals, become aware of the customers' needs, through careful monitoring and environmental scanning. This results in advanced decision making, profitability and overall performance of a firm (Hughes & Morgan, 2007).

Innovativeness is characterized as predisposition and willingness to engage in creative behaviour, through the introduction of new products or services, or technological breakthroughs (Dess & Lumpkin, 2005). Innovativeness can come in varieties of ways. It may be new to the world or just new in a given context (Teece, 2016). It is said to be present as companies aggressively seek the introduction of innovative concepts, goods or procedures (Lumpkin & Dess, 1996; Hurley & Hult, 1998). Innovativeness is one of the most crucial aspects for performance. Corporate entrepreneurship (CE) activities (Lassen & Nielsen, 2009) as well as new ventures creation and performance outcomes (Kandemir & Hult, 2005). Therefore, without innovativeness, there is no CE regardless of the presence of other firm resources (Covin & Miles, 1999; Karimi & Walter, 2015).

According to Aminu, Mahmood and Muharram (2015), Risk-taking as an EO feature is about decisive behavior by venturing into the unknown, borrowing aggressively,

or spending substantial capital in projects in an unpredictable business setting (Rauch, Wiklund, Lumpkin, & Frese, 2009). It is the degree of the capacity and readiness of the managers to invest significant and costly resources into an unpredictable or unknown (Wang, 2008). These risk-taking may take the form of desire for risk, interpretation of risk and inclination to risk.

Moreover, risk-taking includes activities such as high borrowing and a high percentage of resources being committed to uncertain projects or unknown markets (Lyon, Lumpkin & Dess, 2000). Therefore, risk-taking can be to mean a firm approach to investing the company's resources in market or initiatives where the result is highly uncertain (Miller, 1983; Wiklund & Shepherd 2003; Zahra & Covin 1995; Rauch, et al., 2009).

Lumpkin and Dess (1996) defined competitive aggressiveness to mean the tendency of a firm to directly and intensively challenge its competitors to achieve entry position or improve its situation by outperforming the rivals. In the banking sector, acting aggressively may lead a particular bank to take initiatives such as cutting transaction costs, increasing its products and services offering via online platforms as well as adopting aggressive marketing strategies to expanding its customer base. As competitive aggressiveness is seen as a firm response to create competitive advantage (Zehir & Karaboga, 2015).

This implies that the higher the firm's ability to engage aggressively, the greater the potential to recognize technological breakthroughs and business prospects for improved product and service growth. In this study, competitive aggressiveness is operationalised to mean responses of banks to achieve superior performance in the market by challenging the status quo through the internet, mobile technology and other computing platforms to bring in the new innovative products and services to potential customers through wider channels.

Autonomy refers to independent action undertaken by entrepreneurial leaders or teams directed at bringing about a new venture and seeing it to fruition (Rauch *et al.*, 2009). Entrepreneurial orientated firms are said to emphases on the autonomous actions of the employees, in the cause of risk-taking, proactiveness, innovativeness and acting aggressively to complete a certain task (Lumpkin & Dess, 1996) something which practically difficult within the banking sector.

3. METHODOLOGY

This study employed exploratory approach to examine the determinants of EO of banks in Nigeria. An exploratory study is designed to identify possible relationships between variables, which can best be described as the basis for the theory building (Henseler, 2018). The population of the study consists of managers in the banking industry who have adequate knowledge and experience of the phenomena under study. The research questionnaire was administered to randomly selected banks in Nigeria. PLS-SEM was used to test to examine the measurement model which include internal consistency reliability, convergent validity (CV), and discriminant validity (DV) of the EO dimensions conceptualised as a reflective construct. PLS-SEM technique was considered due to the exploratory nature of the current study (Richter, Sinkovics, Ringle & Schlager, 2016) where little is known about the EO dimensions that are relevant to entrepreneurial activities in the banking sector in Nigeria. Therefore, prediction was the primary focus of this research (Hair *et al.*, 2017).

More so, Wold (1980) as the inventor of PLS, considered model building to be the core task of PLS through exploratory study. A researcher can design an exploratory study using SEM “on the joint basis of his rudimentary theoretical knowledge, his experience and intuition about the problems explored, and the data that are at his disposal” (Wold, 1980: 70). In this study, PLS is considered a tool for modelling and thus suitable for exploration of the phenomena (Henseler, 2018).

The measurement scale for EO with 12 items was adapted from the previous study (Zheng, Li & Xu, 2014). Bank performance was measured using 16 integrated items adapted from (Wu, Tzeng & Chen, 2009).

4. RESULTS AND DISCUSSION

As discussed in the earlier section, this study composed EO proxies in terms of conceptual definition, and indicators, that the researcher can have confidence, knowledge or skill covered by these dimensions (proactiveness, innovativeness, risk-taking, autonomy and competitive aggressiveness).

4.1. Assessment of Measurement Model

The assessment of measurement model starts with the analysis of the internal consistency and validity of the construct through composite reliability (CR) convergent validity (CV), and discriminant validity (DV) of the EO dimensions conceptualised as a reflective construct. The result of this analyses is presented in Table 1.

Table 1: Internal consistency and convergent validity

	Items Loadings	Composite Reliability (CR)	Average Variance Extracted (AVE)
Proactiveness		0.921	0.697
PRO1	0.916		
PRO2	0.829		
PRO3	0.693		
Innovativeness		0.816	0.527
INN1	0.623		
INN2	0.665		
INN3	0.867		
INN4	0.621		
Risk-Taking		0.893	0.677
RSK1	0.850		
RSK2	0.856		
RSK3	0.715		
RSK4	0.853		
Competitive Ag			
CA1	0.919		
CA2	0.882		
CA3	0.888		
Autonomy		0.868	0.687
AUT1	0.795		
AUT2	0.827		
AUT3	0.858		
Performance		0.847	0.536
PER2	0.675		
PER3	0.768		
PER4	0.693		
PER6	0.731		
PER7	0.630		
PER8	0.626		

Table 1 indicates that both indicator loading, the internal consistency and convergent validity of all the five EO

dimensions have been established. As can be seen, indicators loadings are above 0.60 for the exploratory study and the CR of all the EO dimensions exceeds the benchmark of 0.7 (Hair, Jr, Hult, Ringle & Sarstedt, 2017). Likewise, the convergent validity of all the dimension of the EO construct was achieved as each of them has an AVE above 0.5 (Hair, Hult, Ringle, & Sarstedt, 2014).

Both Fornell and Lacker (1981)'s criteria and Hetrotrait Monotrait (HTMT) ratio of the correlation (Henseler, Ringle & Sarstedt, 2015) can be used for the assessment of DV. However, HTMT criteria was used in the current study because it has an advantage against Fornell and Lacker criteria as it takes the serial mean of the item correlation against the construct correlation (Hair et al. 2017).

Under this, the threshold values of establishing HTMT should be less than or equal to 0.85 (Henseler et al., 2015) and 0.90 as suggested (Franke & Sartedt, 2019). The serial mean of all the EO dimensions were found to be; proactiveness (0.55), innovativeness (0.404), risk-taking (73), competitive aggressiveness (0.79) and autonomy (0.89) respectively. DV is established as the serial mean is within the benchmark of 0.85 and 0.9. Figure 1 present a graphic result of the PLS Algorithm.

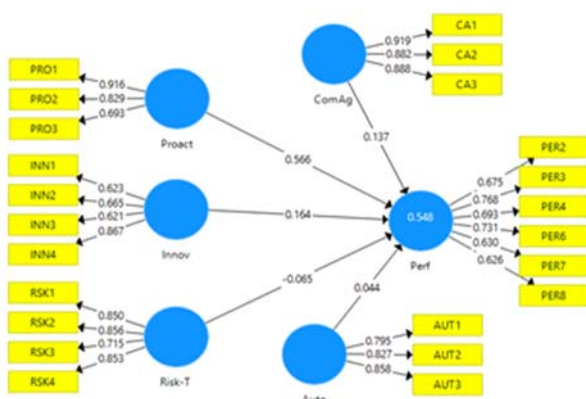


Fig. 1: PLS Algorithm

4.2. Assessment of Structural Model

Based on Hair et al.'s (2020) guideline, assessment of structural model start with collinearity diagnosis to make sure it does not bias the structural model result. Under this, the variance inflation factor (VIF) are used to assess the collinearity among the construct and VIF above 5 are considered to be a problem as it indicates collinearity (Hair et al., 2017). The result for collinearity diagnosis shows that collinearity is not an issue as the VIF values for all the construct ranged from 1.539 to 2.992. Next is the result of the size and significance of path coefficients is presented in Table 2.

Table 2: Size and Significance of the Path Coefficients

Hypotheses	Beta	STDEV	T Statistics
Proact -> Bank-Perf	0.560	0.048	11.858
Innov -> Bank-Perf	0.172	0.073	2.253
Risk-T -> Bank-Perf	-0.064	0.054	1.213
ComAg -> Bank-Perf	0.140	0.065	2.090
Auto -> Bank-Perf	0.042	0.067	0.652
P & C- interval	P Values	0.025	0.975
Proact -> Bank-Perf	0.000	0.477	0.656
Innov -> Bank-Perf	0.025	0.028	0.308
Risk-T -> Bank-Perf	0.226	-0.161	0.057
ComAg -> Bank-Perf	0.037	0.003	0.257
Auto -> Bank-Perf	0.515	-0.074	0.188

The result in Table 2 indicate the relationships between proactiveness, innovativeness and competitive aggressiveness is significant, risk-taking and autonomy were found to be insignificant. However, verifying whether the relationships between constructs are truly significant or not, can be done through the confidence interval of both the lower and upper bound values and if the lower bound shows a sign of negativity (-) it simply indicates that the relationship is not truly significant despite the presence of p-value and t-statistics (Wood, 2005). This analysis is also presented in Table 4.3. Consequently, hypotheses 1, 2, and 4 are supported while hypotheses 3 and 5 are not supported.

The R² value stood at 55%, indicating that the explanatory power of the model was found to be moderate (Hair et al., 2017). The effect size (f²) suggested that values ranging from 0.2, 0.15 and 0.35 indicate small, medium and large effect size. The result of f² statistics is presented in Table 4.11. while the structural model predictive relevance through the Q² value of the in-sample prediction (Geissier, 1974) the criteria for assessing Q² is based on blindfolding

procedure which the result produce Q^2 value of 0.19 indicating that the model has a medium predictive relevance (Hair, et al., 2017). Also, the predictive power of the model was assessed using PLSpredict (Shmueli, Ray, Estrada & Chatla, 2016). The result is shown in Table 3.

Table 3: PLSpredict (Qpredict)

	Model:	PLS	Linear
Items	Q^2 predict	RMSE	RMSE
PER7	0.032	0.705	0.731
PER6	0.085	0.639	0.641
PER4	0.073	0.623	0.625
PER2	0.267	0.609	0.569
PER8	-0.005	0.712	0.713
PER3	0.605	0.447	0.367

The rule of thumb says that PLS model should be compared with the linear model and if the PLS model has lower values it can say that the model has a higher predictive power (Shmueli, et al., 2016; Shmueli, Sarstedt, Hair, Cheah, Ting, Vaithilingam & Ringle, 2019). From Table 3 it can be seen that the PLS model has lower values than the linear model and therefore, the model has a moderate power. The IPMA analysis also indicates that proactiveness is the most important construct (0.45) followed by innovativeness (0.15), and competitive aggressiveness (0.12) to bank performance in Nigeria. Again, Risk-taking and autonomy appeared to less important or even detrimental to bank performance (-0.05, 0.04) respectively.

4.3. Discussion of Findings

The current study has found that proactiveness, innovativeness and competitive aggressiveness are the EO dimensions that are relevant and essential to the entrepreneurial behaviour of banks in Nigeria. Although, EO has often been seen as a reflective and aggregated measurement (Miller, 1983; Covin & Slevin, 1989) of the three sub-dimensions. Recent studies have suggested the importance of investigating the sub-dimensions of EO that may have a different effect on other variables (Lumpkin & Dess, 1996; Miller, 2011; Wales, 2012; 2015).

The current findings are therefore, in line with Miller's (2011) submission that the EO dimensions can be more telling than the aggregated measure because the sub-dimensions can play different roles depending on the specific situation or industry which EO is applied (Linton & Kask, 2016; Wales et al., 2019; Wales, 2020).

Hence, as Linton and Kask, (2016) argued that "innovativeness might be more crucial than risk-taking for a certain strategy and vice versa." Likewise, the effect of EO as a research construct presents different results depending on the context which it is applied (Lumpkin & Dess, 1996). It is on this basis that, this study argues that, risk-taking and autonomy dimensions of EO were not significant and therefore not very essential in the Nigerian banking sector due to the industry situation such as insolvency, non-performing loan, inability to reach wider customer base to extend their credit and deposit facilities. This is in line with the fact that "the effects of autonomy differ across international cultural contexts and task environments within a configurational model (Yu, 2019).

The issues of regulation is also another area of concern to business owners and managers. For instance, autonomy is conceptualised to mean employee ability to perform tasks independently. But in the banking sector, because most of their activities are defined by regulations, there is a restriction to what managers can do with depositors' money. Furthermore, at the branch level, a bank officer, for instance, does not have the autonomy to execute certain transaction once it reaches a certain amount despite the magnitude of the expected profit on it. Under this, these entrepreneurial managers have to seek the permission of their superior to execute such transactions. This is although such managers may have seen the opportunity in terms of profit and other gains from such investment. But because they do not have the autonomy they have to wait for the permission of superiors and that is the limit as far as the autonomy dimension is a concern. This finding is therefore confirmed Yu (2019) assertions that autonomy is a complex construct and therefore may not necessarily link to firm performance at all time and or industries.

As regards to risk-taking, defined as the ability and willingness for the entrepreneurial manager to commit large and risky resources into an uncertain or unknown venture (Wang, 2008). It is therefore conceptualised to mean a firm eagerness to engage large percentage firm's strategic assets into some projects where the outcome may be highly uncertain (Miller, 1983; Wiklund & Shepherd, 2003; Zahra & Covin 1995; Hughes & Morgan, 2007; Rauch et al., 2009). Although successful risk-taking is expected to provide a promising return in terms of profits margin (Lumpkin & Dess, 1996), risk-taking has also been linked with entrepreneurial failure (Wales, 2016).

In the Nigeria banking sector, there are certain risks with an expected high return that are beyond the limit of a single manager due to regulation issues. That is to say that there is a limit to what they can do, they cannot just venture into any kind of risks despite expected return. For instance, an investment that can jeopardize depositor money is strictly prohibited. So based on the regulatory framework, our finding suggests that banks managers and owners cannot just venture into any kind of risk in anticipation of high return. But this does not mean to say that risk-taking and autonomy are not relevant since risk-taking is the core tenet of entrepreneurship, but because of these predicaments within the sector, risk-taking and autonomy could be relevant but are not necessary to the performance of EO construct in this sector. Overall, this finding is in line with suggestions that the most appropriate composition of an EO construct are dimensions that are considered “desirable or important” (Gupta & Dutta, 2018: 167), in a given culture, firm and industries (Wales, 2016).

Equations should be written using Microsoft Equation and numbered consecutively as they appear within the text. Equations should be centered horizontally and numbered with Arabic numerals enclosed in parentheses as shown in the example below. They should be cited in the text as, for example, Eq. (1), or Eqs. (1)-(3) (for plural). Equations should be punctuated with commas or periods when they are part of a sentence.

5. CONCLUSION

Existing studies on EO have frequently pointed to the fragmentation of literature on its dimension and measurement due to lack of well-defined theoretical argument toward EO construct. A limitation that has prevented a rigorous and integrated research output in this perspective. This problem has also led to many inconsistent empirical findings on the effect of EO performance - relationships. Therefore, as some researchers (George & Marino, 2011) contended that academic fields of inquiry make progress when there is consensus on the key building blocks and constructs as a platform for the accumulation of knowledge (Randerson, 2016). Other scholars also criticised the existing approach; by asking questions such as “what behaviours other than innovation, proactiveness, and risk-taking can be considered to be entrepreneurial?”

This study offers a constructive solution by conducting an exploratory study to determine the most common EO dimension that is relevant and essential in the banking sector of the developing country Nigeria. We expect

these findings to be applied to other firms and industries with similar characteristics to that of Nigeria. This study recommends future research to focus on examining the effect EO in terms of proactiveness, innovativeness and competitive aggressiveness on bank performance. Other studies may consider the role of regulation either as a boundary condition or a mechanism between EO and bank performance in countries with similar characteristics with that of Nigeria. This will help in the development of EO construct. Although this study contributes to the development of literature in this direction, but it did not end without some limitations such the used of cross-sectional research design and the used of only quantitative data to analyse the findings. Further studies can augment this through the use of longitudinal research approach and a mixed method approach.

6. REFERENCES

- [1]. Anderson, B. S., Kreiser, P. M., Kuratko, D. F., Hornsby, J. S., & Eshima, Y. (2015). Reconceptualizing Entrepreneurial Orientation. *Strategic Management Journal* 36 (10): 1579-1596.
- [2]. Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99-120.
<http://dx.doi.org/10.1177/014920639101700108>
- [3]. Barney, J. B. (2002). *Gaining and Sustaining Competitive Advantage*, International Edition, published by Prentice Hall, Upper Saddle River, NJ.
- [4]. Bruton, G. D., Ahlstrom, D., & Obloj, K. (2008). *Entrepreneurship in emerging economies: Where are we today and where the research should go in the future*. *Entrepreneurship theory and practice*, 32(1), 1-14.
- [5]. Covin, J. G., & Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments. *Strategic Management Journal* 10, 75-87.
- [6]. Covin, J. G., & Wales, W. J. (2019) *Crafting high-impact entrepreneurial orientation research: Some suggested guidelines*. *Entrepreneurship Theory and Practice* 43(1), 3-18.
- [7]. Dantsoho, M. A. (2016). *Dynamic information technology capabilities (DITC) and organisational performance: the mediating effects of process improvement in Kaduna state* (Unpublished MSc Thesis). Ahmadu Bello University Zaria.

- [8]. Dess, G. G., & Lumpkin, G. T. (2005). The Role of Entrepreneurial Orientation in Stimulating Effective Corporate Entrepreneurship. *The Academy of Management Executive*, 19(1), 147-156.
<http://dx.doi.org/10.5465/AME.2005.15841975>
- [9]. Franke, G. R., & Sarstedt, M. (2019). Heuristics versus statistics in discriminant validity testing: comparison of four procedures. *Internet Research*, in press.
- [10]. Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- [11]. Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika*, 61(1), 101-107.
- [12]. George, B. A., & Marino, L. (2011). The epistemology of entrepreneurial orientation: Conceptual formation, modeling, and operationalization. *Entrepreneurship Theory and Practice*, 35, 989-1024.
- [13]. Gupta, V. K., & Batra, S. (2016). Entrepreneurial orientation and firm performance in Indian SMEs: Universal and contingency perspectives. *International Small Business Journal*, 34(5), 660-682.
- [14]. Gupta, V. K., & Dutta, D. K. (2018). The rich legacy of Covin and Slevin (1989) and Lumpkin and Dess (1996): A constructive critical analysis of their deep impact on entrepreneurial orientation research. In: Javadian G, Gupta VK, Dutta DK, et al. (eds) *Foundational Research in Entrepreneurship Studies*. New York: Palgrave Macmillan, pp.155-178.
- [15]. Gupta, V. K., & Gupta, A. (2015). The concept of entrepreneurial orientation. *Foundations and Trends in Entrepreneurship*, 11(2), 55-137.
- [16]. Hair, J. F., Jr, Hult, G. T. M., Ringle, C. M. & Sarstedt, M. (2014). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. 1st ed., SAGE Publications Ltd, Thousand Oaks, CA.
- [17]. Hair, J. F., Jr, Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. 2nd ed., SAGE Publications, Inc.
- [18]. Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43, 115-135.
- [19]. Henseler, J. (2018). Partial least squares path modeling: Quo vadis?. *Quality & Quantity*, 52(1), 1-8.
- [20]. Ireland, R. D., Covin, J. G., & Kuratko, D. F. (2009). Conceptualizing corporate entrepreneurship strategy. *Entrepreneurship theory and practice*, 33(1), 19-46.
- [21]. Karimi, J., & Walter, Z. (2015). The Role of Dynamic Capabilities in Responding to Digital Disruption: A Factor-Based Study of the Newspaper Industry. *Journal of Management Information Systems* 32(1), 39-81. DOI: 10.1080/07421222.2015.1029380.
- [22]. Kandemir, D., & Hult, G. T. M. (2005). A conceptualization of an organizational learning culture in international joint ventures. *Industrial marketing management*, 34(5), 430-439.
- [23]. Lomberg, C., Urbig, D., Stöckmann, C., Marino, L. D., & Dickson, P. H. (2017). Entrepreneurial orientation: The dimensions' shared effects in explaining firm performance. *Entrepreneurship Theory and Practice*, 41(6), 973-998.
- [24]. Niemand, T., Rigtering, C, Kallmünzer, A., Kraus, S., & Matijas, S. (2017). Entrepreneurial and digitalization in the financial service industry: a contingency approach. In *Proceedings of the 25th European Conference on Information Systems (ECIS)*, Guimarães, Portugal, June 5-10, 2017 (pp.1081-1096).
- [25]. Randerson, K. (2016). Entrepreneurial orientation: Do we actually know as much as we think we do? *Entrepreneurship & Regional Development*, 28, 580-600.
- [26]. Rauch, A., Wiklund, J., Lumpkin, G. T., & Frese, M. (2009). Entrepreneurial orientation and business performance: an assessment of past research and suggestions for the future, *Entrepreneurship. Theory Practice*, 33 (3), 761-787.
- [27]. Sinkovics, R. R., Richter, N. F., Ringle, C. M., & Schlaegel, C. (2016). A critical look at the use of SEM in international business research. *International Marketing Review*.
- [28]. Shmueli, G., Ray, S., Estrada, J. M. V., & Chatla, S. B. (2016). The elephant in the room: Predictive performance of PLS models. *Journal of Business Research*, 69(10), 4552-4564.
- [29]. Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., Ringle, C. M., (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing*, in press.

- [30]. Shirokova, G., Bogatyreva, K., Beliaeva, T., et al. (2016) Entrepreneurial orientation and firm performance in different environmental settings: Contingency and configurational approaches. *Journal of Small Business and Enterprise Development*, 23(3), 703-727.
- [31]. Tang, Z., & Tang, J. (2012). Entrepreneurial orientation and SME performance in China's changing environment: The moderating effects of strategies. *Asia Pacific Journal of Management*, 29(2), 409-431.
- [32]. Wales, W. J., Shirokova, G., Sokolova, L., et al. (2016) Entrepreneurial orientation in the emerging Russian regulatory context: The criticality of interpersonal relationships. *European Journal of International Management* 10(3), 359-382.
- [33]. Wales, W., Gupta, V. K. Marino, L., & Shirokova, S. (2019). Entrepreneurial orientation: International, global and cross-cultural research. *International Small Business Journal: Researching Entrepreneurship*, 37(2), 95-104.
- [34]. Wales, W. J., Covin, J. G., & Monsen, E. (2020). Entrepreneurial orientation: The necessity of a multilevel conceptualization. *Strategic Entrepreneurship Journal*, 1-48.
- [35]. Yu, A., Lumpkin, G. T., Praveen Parboteeah, K., & Stambaugh, J. E. (2019). Autonomy and family business performance: The joint effect of environmental dynamism and national culture. *International Small Business Journal*, 37(2), 153-185.
- [36]. Wiklund, J., & Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal* 24(13), 1307-1314.
- [37]. Zahra, S. A. & Covin, J. G., (1995) .Contextual influences on the corporate entrepreneurship performance relationship: A longitudinal analysis, *Journal of Business Venturing*, 10(3), 43-58.
- [38]. Zehira, C., Esin Can, E., & Karaboga, T. (2015). Linking entrepreneurial orientation to firm performance: the role of differentiation strategy and innovation performance. *Procedia Social and Behavioral Sciences*, 210, 358-367.
- [39]. Baker, R. C. and Charlie, B. (2001), "Non-linear unstable systems", *International Journal of Control*, 23, (4), 123-145.
- [40]. Hong, K. S. and Kim, C. S. (1993), "Linear stable systems", *IEEE Trans. on Automatic Control*, 133, (3), 1234-1245.
- [41]. Shiler, Z., Filter, S. and Dubowski, S. (2007) "Time optimal paths and acceleration lines of robotic manipulators", *Proceedings of the 26th Conference on Decision and Control*, ISBN N XXXX, 98-99.
- [42]. Young, M. (2009) *The Technical Writer's Handbook*, Mill Valley, Seoul, Korea.

OPERATIONAL MODEL AND MECHANISM OF SCIENCE AND TECHNOLOGY INCUBATION CENTER IN VIETNAMESE UNIVERSITIES AND RESEARCH INSTITUTES

Tran Van Binh¹ and Le Vu Toan^{1,2}

¹ School of Economics and Management, Hanoi University of Science and Technology, Hanoi, Vietnam

² Vietnam Institute of Science Technology and Innovation, Ministry of Science and Technology, Hanoi, Vietnam

Corresponding author: binh.tranvan@hust.edu.vn

Abstract

The process of applying research results from academic sector to industries always facing many difficulties and pitfalls. Between invention and product development is “the valley of death”, which destroys the development effort from the original idea to the end market. Bridging support is needed to improve the transfer of research from research institutes, universities to businesses and technology development organizations. In this study, the research team proposes STIC (Science and Technology Incubation Centers) model at universities and research institutes of Vietnam to serve knowledge transfer, commercialize inventions and promote innovation.

Keyword: Incubation; S&T enterprises; Knowledge transfer; Commercialization; Incubator model; STIC.

1. INTRODUCTION

Transferring S&T products from laboratories of university, research institutes into the industries plays an important role in developing national economy (Franco & Pinho, 2019; Lee, 1996), which is also the top goal of universities and research institutes in both developed and developing countries (Aaboen et al., 2016; Anderson et al., 2007; Rogerson, 2002), is the “third mission” of universities (Gulbrandsen & Slipersæter, 2007). However, they need to be incubated up to certain technological readiness level to be commercialized (Kusuma et al., 2015), and the Incubator models and commercialization of S&T products are considered viable. There are many established specialized structures for this endeavor, such as TLOs (Technology Licensing Offices), TTOs (Technology Transfer Offices), TTC (Technology Transfer Center), IPO (Intellectual Property Offices), ILO (Industry Liaison Office), ITTO (Innovation and Technology Transfer Office, Intellectual Property Office (Licensing Office); Value Creation Center (Cellule de Valorisation); Incubator (Incubator) and S&T Park; etc.... In this research, the research team proposes STIC (Science and Technology Incubation Centers) model at universities and research institutes of Vietnam to serve knowledge transfer, commercialize inventions and promote innovation. STIC will be helpful for promoting the commercialization of research results from universities to business.

It should be added that the incubation model likes STIC are common with developed countries, but has a long tradition. In Vietnam, the incubator model at university has been established since 2003, such as the CRC Incubator of Hanoi University of Science and Technology, and the Hanoi HBI Incubator, etc. However, there has been increasing of interests in this topic recently. Some studies show that the research results of scientists have only just been successful at the laboratory scale (L. M. Huong et al., 2009), but facing many difficulties and barriers to industries (de Wit-de Vries et al., 2019; L. M. Huong et al., 2009; Tam, 2020), including the lack of intermediaries to support the process of transferring research results to industry. (Luat & Kha, 2015). In addition, S&T incubation activities also face barriers from the current legal framework (Dao Thanh, 2017; Duong et al., 2017). Besides, there are very few studies that provide suitable models for Vietnam, which is contrary to practical needs.

Authors address this gap by presenting a systematic literature review on the incubator models at universities and research institutes. Reviewing results from existing studies allows the research team to extract experiences that suit the context of Vietnam's. At a further step, from the past experiences in operating the management of technology incubators at universities and related studies,

the research team is going to propose and discuss the model of “S&T Incubation Center at Universities and Research Institutes”.

Our tasks are to add to the existing researches in four important ways as follows: First of all, at hours create a panorama from research ideas to S&T enterprises. Secondly, clarifying the process of searching, incubating and commercializing an S&T product. Thirdly, proposing the S&T incubator model at universities and research institutes. Here, research team also define the organizational model, operational principles and benefit-sharing among participating actors. Finally, authors try to address one of the biggest drawbacks of current Incubation Centers, which is the lack of sustainability in the financial model, with proposals to finance sustainable operations.

2. LITERATURE REVIEW

Universities and research institutes are the key organizations in society performing the role of creating new knowledge. It is turned into practice by in many different ways, continuing to create new knowledge and added values to society. On the one hand, universities and research institutes are also seeking ways to improve the research implementation process, making the research results be closer to the practical needs (Duc, 2019; Hien, 2017; Nguyen & Van Gramberg, 2018). On the other hand, they put more resources into fostering linkages with people who use knowledge and facilitate technology transfer (Chian et al., 2017; Etzkowitz et al., 2000; Gulbrandsen & Slipersæter, 2007; Wong et al., 2007). However, there is still a gap between the laboratory and the industries, and scientists are still confused and find it difficult to transform research results into an industrial setting. In many cases, the new technology inventions have failed to cross the valley of death to reach the market (Kusuma et al., 2015). This obstacle often occurs in the process of turning from scientific ideas into products and commercialize them. Understanding how to transform an academic idea to break into the market is the overriding theme.

There are many different ways to transfer technology, some of them are just for the purpose of knowledge transfer, others towards licensing for using technology or the transfer ownership to a company or others. On a more proactive and complex level, it requires universities, research, institutes need more financial investment and greater management efforts is establishing S&T enterprises based on their own S&T products (Roberts & Malonet, 1996). Roberts and Malone have developed the S&T incubator model from universities, government laboratories, and R&D organizations including 5 structures: invention – disclosure – evaluation – protection – new venture creation – product development – incubation – business

development – sales/IPO; and participation of key subjects: development – incubation – business development – sales/IPO. S&T enterprises are one important policy of the Government, universities and research institutes (Wright et al., 2006). It is worth noting that, in during certain times, the self-establishment of S&T enterprises is seen as a key solution when S&T products are impossible to transferred, set up a new S&T enterprise which have enough potential to attract more investors to call for financial investment. Now it seems that many S&T enterprises have become large, contributing profits and images to academic institutions, some reaching up to multinational corporations scale. It should be emphasized that a successful commercialization process must be the process of building large enterprises may compete in the future instead of merely considering the number of S&T enterprises are set up.

The literature reviews also recognize that technology incubation is an important means in facilitating the process of a S&T product from academic sector into industry (McAdam & McAdam, 2008; Mian et al., 2016). A technology incubator provides the important support to a technology transfer mechanism, which is an integral part of the startup ecosystem, is platform in incubating S&T enterprises (Mian et al., 2012), bring a significant source of income for universities (Jamil et al., 2015). Incubators provide resources and facilities, support new entrepreneurs in a variety of ways, such as co-working spaces, advanced equipment, management support, market connectivity and access, patent and protect intellectual property rights, connect and access investors, access financial resources, promote entrepreneurship

Universities and research institutes are at the central location to grow a country's economic because of their active role in research and development, innovation, incubation and commercialization of S&T products. Incubators at universities have made it to the top during long period in providing location, human resources and capital finance, innovation and commercialization (Chandra & Medrano Silva, 2012; Paul et al., 2018; Somsuk et al., 2012).

Researchers also witnessed that the commercialization process of S&T products is motivated and influenced by incubators (Bình & Tuấn, 2005; Chandra & Medrano Silva, 2012; Palumbo & Dominici, 2013; Rossi & Rosli, 2015), especially in the form of S&T enterprises (L. M. Huong et al., 2009; Palumbo & Dominici, 2013). Therefore, countries, including Vietnam, always try to finalize the policies to support and develop incubators formed on S&T products from universities and research institutes. Both Vietnamese planners and scholars are interested in many different aspects of the S&T incubation model, from the theoretical point of view

((Binh & Tuan, 2005; Dao Thanh, 2017; Duong et al., 2017), policies (Duong et al., 2017; Thủy et al., 2020) to practical issues such as organizational model (Binh, 2015; Binh et al., 2019; N. T. M. Huong et al., 2010) and financing mechanisms for incubation.

3. DISCUSSION

Transforming from a S&T product idea in a laboratory to practical production is a process consisting of many steps (Roberts & Malonet, 1996), each with different morphologies and the joining of many different subjects.

In this process (Figure 1), the incubation of S&T products is a must. The research results of scientists have only just been successful at the laboratory scale. With a few laboratory instruments, a few chemicals plus an erudite head, a scientist can find the technological process of making a cosmetic product be useful. But bringing this process into the production on an industrial scale requires a combination of many scientific sectors, from mechanical engineering, automatic control to industrial fine arts. Therefore, an incubation process is simply understood is a mandatory process for a S&T product to transfer from the laboratory to the industry. The biggest drawback so far is that money is only invested in focusing mainly on laboratory research but limit investment in incubation. A number of projects in the experimental production stage have invested, but following model of funding and then allowing the scientists to manage themselves in the state of no factory, no production workers, no cross-industry linkage, no linkage with enterprises or investors. This leads to a very modest success rate.

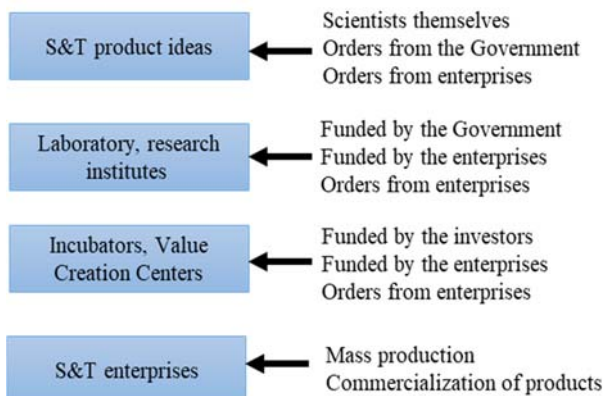


Fig 1: Entities involved in the process from S&T product ideas to enterprises

In this context, it is necessary to develop incubators next to or within universities and research institutes. Incubation Center has the mission of “**Accompanying and supporting scientists in creating added value and incubating to the industrial scale of S&T enterprises and products**” and the mission of:

- Creating linkages between the universities and the business community, investors.
- Selection, preliminary assessment, project construction support, financial sources, and support for scientists to improve the value of S&T products before being transferred.
- Incubating to an industrial scale of S&T products and S&T enterprises

3.2. The process of finding, incubating and commercializing a S&T product

The following diagram describes the process and steps of searching, incubating and commercializing an S&T product. The process consists of 4 steps:

Incubation is a process divided into 4 phases:

- Pre-seed
- Seeds
- Incubation team
- Incubation enterprise

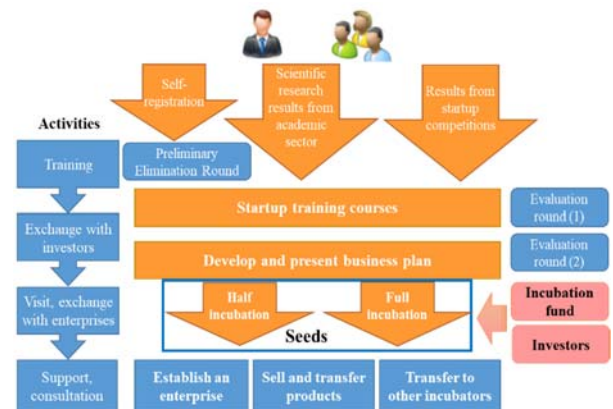


Fig 2: Process and steps incubation

Pre-Seed:

- Business ideas, S&T products finished on a laboratory scale, the results of accepted scientific research topics.
- Authors of scientific works are allowed to participate in the Center’s Start-up training course to complete their business ideas.
- Authors of scientific works will protect their business ideas through start-up competitions or Evaluation Board.

Seeds:

- Seed teams which are selected as seeds STIC will be provided with funding source for an incubation.
- The teams will continue to participate in training courses to complete business ideas, identify customers, create business models, and improve presentation skills
- The teams must develop a feasibility study report for their project.

- The teams present and protect feasibility reports of their project in front of the Evaluation Board.

Incubation team:

- The teams which are selected to be members of STIC for incubation will be provided with funding for the 3-to-6-month incubation process at the Center.
- The teams are assigned an office.
- The funding sources for the teams ensure to cover the following costs: Salaries for team members, expenses for market research, and product finishing.
- The research team continues to participate in training courses on management skills, technology improvement, etc.
- Depending on the nature of the product and the wishes of the authors, the finished product at this stage can be transferred to the investment stage to establish an enterprise or for sale or transfer.
- For products expected to be invested, the research team must develop and protect the business plan.

Investment team:

- These are the teams that investors choose to contribute capital to establish an enterprise.
- The value of the research team’s product will be determined to be included in the value of the project’s equity.
- A capital contribution contract will be signed between the research team and investors participating in the project.
- The selected teams will be provided with incubation services by the Center for a period of from 12 to 24 months.

3.3. Organizational and operational model of Science and Technology Incubation Centers

STIC is an applied research implementation unit, with such partners participating in the implementation of the Center as:

Domestic and foreign S&T organizations. These partners participate in the Center’s operations through the orders of technology incubation tasks.

Domestic and foreign enterprises. In the process of production and business activities, enterprises have a need to innovate technology, innovate products, and a need to decode to master imported S&T products.

Investors, they are individuals or organizations wishing to seek and access research projects and produce S&T products. Invest capital in incubation processes to gain priority access to potential projects. This is an aspect that the Center can exploit from this group of partners.

Scientists, they can come from many different S&T organizations, Universities and research institutes. This

is the Center’s most important resource. There is a need to create a flexible mechanism to attract this group’s participation. This can be considered as one of the prerequisites for the success of the Center.

Each partner has different functions, duties, roles and interests in the STIC.

S&T organizations, enterprises, and investors are the ones who commit to finance incubation activities. They provide the STIC with:

- Funding for incubation activities.
- Facilities and infrastructure for technology improvement activities of incubation teams.
- Advisory services to incubation teams.

STIC is responsible for:

- Ensuring facilities to receive incubation teams.
- Searching, selecting and providing support services and incubating seeds, projects.
- Managing seed teams on behalf of the investor.
- Ensuring the interests of all parties involved in the incubation process.

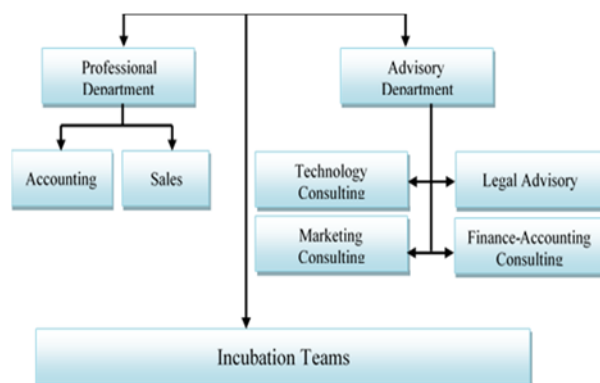


Fig 3: Organizational and operational model of STIC

Benefits of the parties involved:

- Investors:
 - Have the right to appoint a representative to participate in the Evaluation Board and select incubation teams.
 - Have priority to select potential teams at the investment stage.
- Incubation teams:
 - Be provided with incubation consulting services to improve technology, business model and enterprise establishment.
 - Be invested with funds corresponding to each incubation stage.
 - Be facilitated to exchange with investors in the incubation process.

c) STIC:

- Be funded for incubation activities through estimates approved by investors.
- Receive a share of profits from successful incubation projects in the form of cash or % shares.

The STIC should be organized and operated according to the model of an S&T enterprise with the following proposed organizational structure:

Principles of implementing activities of STIC

Every year, the S&T Council of the Center will select topics/themes, projects, ideas of S&T products to be incubated and deployed in research and application at the Center. The characteristic of the topics and projects put into incubation is that they have been successful on a laboratory scale. The Center is responsible for research, incubation and test production on an industrial scale to transfer to the production facilities or as a basis for building projects calling for investment. Thus, once built, *the STIC will become the focal point to select topics and incubation projects originated from the university itself or from a group of outside scientists, to carry out bidding procedures for incubation funds from the Ministry of Science and Technology or source funding from investors, implement and monitor the incubation process.* The incubation teams may or may not be the staff of the STIC but are under the supervision of the Center's operations, performance evaluation and product quality control.

Once incubation projects are selected and the funding is available, the scientists in the team will enjoy the full implementation services from setting up an office, the schedule of using machines and laboratory equipment, using the premises deployed in the experimental workshop, using a team of technicians and workers of the Center to a "one-stop" service for administrative procedures. Concentrating on the implementation of incubation activities at the STIC allows the following benefits to be achieved:

- Save time and costs for research and development activities because common facilities and services can be used;
- Increase efficiency of research and development activities as incubation teams do not have to spend time doing administrative procedures, budget settlement procedures. Such tasks are often time-consuming and are haunting for scientists. These activities are carried out by the specialized departments of the STIC for all teams;
- Increase efficiency in using the STIC's facilities. With the concentrated investment in interdisciplinary laboratories, the STIC can plan

detailed usage for the teams. This helps to increase the equipment exploitation coefficient, thereby increasing the efficiency of the invested facilities;

- Control the incubation process of teams, control costs according to the incubation purposes, and avoid arbitrary expenses. Control the quality of incubation processes.

Funding sources for the STIC's activities can come from:

- Scientific research and technology incubation contracts from the State and international organizations;
- Application research and technology decoding contracts from domestic and foreign individuals, organizations and enterprises;
- Money invested from the universities' enterprises or from outside investors.

Once an S&T product has been successfully incubated, the group of authors can propose a move to the enterprise incubation stage. That is the group of authors wishing to set up enterprises to produce and commercialize their own products. The Center can assist the authors in continuing the enterprise incubation process by providing start-up services, finding investment partners, training management skills and leasing facilities, etc. until enterprises can "stand on their own" in the market.

3.4. Create financial resources to ensure sustainable operations

One of the biggest drawbacks of current Incubation Centers is the lack of sustainability in the financial model. Normally, the Centers are established with funding from domestic and foreign projects. When the project ends, all funding sources are exhausted, the operation of the Centers also fades. Financial solutions to ensure the sustainable operation of Incubation Centers at universities are the core issue of the national start-up strategy.

As hereinabove mentioned, the partners participating in the Incubation Centers include domestic and foreign investors and enterprises. These partners should be gathered in the form of an Investors Club. In the start-up ecosystem, they are Angel Investors or Venture Capitalists (Binh et al., 2019; Giang & Toan, 2020). They are interested and looking for investment opportunities in S&T start-ups. To have access to good projects, they need to join the Club and commit to donate to the STIC. In order to have a basis to advocate for funding, the Center needs to submit a financial plan every year. This plan is built on the content of seed-searching activities, the number of selected incubation teams, training and consulting activities for the teams.

The financial needs of a university incubator can be divided into three categories:

- Finance for the STIC's operations;
- Funding for incubation teams; and
- Investment finance for incubation teams.

The financial needs for regular activities of the STIC can be mobilized from:

- Expenses of the university in the form of salaries and insurance for their staff who are assigned to manage the Center, costs of electricity, water and administrative services, etc.
- Funding sources from the Ministry of Education & Training, the Ministry of Science & Technology, the Authorities of the province and city where the university is located. Funding can be calculated according to the number of incubation teams that are active each year at the Center or in the form of sponsorships for competitions, start-up training courses.
- Funding from the Investors Club.

Funding from the university, the management agencies can account for about 50% of the funding need for the regular operation of the Center, the remaining amount of 50% will be mobilized from the Club.

Incubation teams are selected through startup competitions or results from scientific research topics. These teams need to be financed with a workplace, research on market positioning, continue to improve their products to an industrial scale, etc. Funding needs for these teams are determined by the number of teams selected by the Center for the annual incubation. Funding sources can be mobilized:

- Mainly from investors through the Club. They will choose the projects to support and fund;
- The rest of the teams are funded by the Ministry of Education & Training, and the Ministry of Science & Technology.

During the incubation process of the Center, the teams must find investors to contribute capital to establish enterprises. Success in finding investors is regarded as success in a project. The incubation team will be then "graduated" and be qualified to leave the STIC.

4. CONCLUSION

Evidence to date indicates the vast majority of university inventions fail to be commercialized, ending up in the Valley of Death prior to reaching industry (Auerswald & Branscomb, 2003; Beard et al., 2009).

The S&T enterprise incubation center model is the bridge for research results at universities and research institutes to cross the Valley of Death to reach industry. Considering the characteristics of universities and research institutes in the context of Vietnam, authors propose STIC-an S&T enterprise incubation center model that can bring into play the strengths of the participants, while mobilizing resources for the transfer of research results from laboratories to industries.

5. REFERENCES

- [1] Aaboen, L., Laage-Hellman, J., Lind, F., Öberg, C., & Shih, T. (2016). Exploring the roles of university spin-offs in business networks. *Industrial Marketing Management*, 59, 157-166. <https://doi.org/10.1016/j.indmarman.2016.03.008>
- [2] Anderson, T. R., Daim, T. U., & Lavoie, F. F. (2007). Measuring the efficiency of university technology transfer. *Technovation*, 27(5), 306-318. <https://doi.org/10.1016/j.technovation.2006.10.003>
- [3] Auerswald, P. E., & Branscomb, L. M. (2003). Valleys of death and Darwinian seas: Financing the invention to innovation transition in the United States. *Journal of Technology Transfer*, 28(3-4), 227-239. <https://doi.org/https://doi.org/10.1023/a:1024980525678>
- [4] Beard, T. R., Ford, G. S., Koutsky, T. M., & Spiwak, L. J. (2009). A Valley of Death in the innovation sequence: an economic investigation. *Research Evaluation*, 18(5), 343-356. <https://doi.org/10.3152/095820209X481057>
- [5] Bình, T. V. (2015). Đề xuất mô hình gắn kết các hoạt động NCKH, CGCN của các trường đại học, viện nghiên cứu với doanh nghiệp. *Tạp chí Khoa học và Công nghệ Việt Nam*, 11(680).
- [6] Bình, T. V., Toàn, L. V., & Khuyên, N. V. (2019). Nhà đầu tư thiên thần và vai trò đối với các dự án khởi nghiệp sáng tạo. *Tạp chí Khoa học và Công nghệ Việt Nam*, 17-20.
- [7] Bình, T. V., & Tuấn, P. M. (2005). Vườn ươm công nghệ - Mô hình trợ giúp đưa các ý tưởng KH&CN vào sản xuất. *Tạp chí Hoạt động Khoa học*, 3.
- [8] Chandra, A., & Medrano Silva, M. A. (2012). Business Incubation in Chile: Development, Financing and Financial Services. *Journal of Technology Management & Innovation*, 7(2), 1-13. <https://doi.org/10.4067/S0718-27242012000200001>

- [9] Chian, L. M., Kowang, T. O., Heng, L. H., & Fei, G. C. (2017). A Review of Technology Commercialization in Public Universities Malaysia and the Way Forward. *Advanced Science Letters*, 23(9), 8433-8437. <https://doi.org/10.1166/asl.2017.9905>
- [10] Dao Thanh, T. (2017). Một số vấn đề lý luận trong nghiên cứu thúc đẩy hình thành doanh nghiệp công nghệ thông qua vườn ươm doanh nghiệp công nghệ. *VNU Journal of Science: Policy and Management Studies*, 33(4). <https://doi.org/10.25073/2588-1116/vnupam.4125>
- [11] de Wit-de Vries, E., Dolfsma, W. A., van der Windt, H. J., & Gerkema, M. P. (2019). Knowledge transfer in university-industry research partnerships: a review. *Journal of Technology Transfer*, 44(4), 1236-1255. <https://doi.org/10.1007/s10961-018-9660-x>
- [12] Đức, N. M. (2019). Nâng cao hiệu quả quản lý hoạt động nghiên cứu khoa học ở các trường đại học hiện nay. *Tạp chí Tổ chức nhà nước*. <https://tcnn.vn/news/detail/46043/Nang-cao-hieu-qua-quan-ly-hoat-dong-nghien-cuu-khoa-hoc-o-cac-truong-dai-hoc-hien-nay.html>
- [13] Dương, P. Đ., Trường, Đ. T., Anh, N. T. N., & Hiền, N. T. (2017). Ươm tạo doanh nghiệp công nghệ ở Việt Nam: Một tiếp cận phân tích cơ sở pháp lý. *VNU Journal of Science: Policy and Management Studies*, 33(1). <https://doi.org/10.25073/2588-1116/vnupam.4067>
- [14] Etzkowitz, H., Webster, A., Gebhardt, C., & Terra, B. R. C. (2000). The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm. *Research Policy*, 29(2), 313-330. [https://doi.org/10.1016/S0048-7333\(99\)00069-4](https://doi.org/10.1016/S0048-7333(99)00069-4)
- [15] Franco, M., & Pinho, C. (2019). A case study about cooperation between University Research Centres: Knowledge transfer perspective. *Journal of Innovation & Knowledge*, 4(1), 62-69. <https://doi.org/10.1016/j.jik.2018.03.003>
- [16] Giang, N. T. H., & Toàn, L. V. (2020). Quỹ đầu tư mạo hiểm cho hoạt động khởi nghiệp đổi mới sáng tạo ở Việt Nam: Thực trạng và giải pháp. *Tạp chí Kinh tế và Dự báo*, 736.
- [17] Gulbrandsen, M., & Slipersæter, S. (2007). The Third Mission and the Entrepreneurial University Model. In *Universities and Strategic Knowledge Creation*. Edward Elgar Publishing. <https://doi.org/10.4337/9781847206848.00011>
- [18] Hiền, P. V. (2017). Một số giải pháp nâng cao chất lượng hoạt động nghiên cứu khoa học trong các cơ sở giáo dục đại học. *Tạp chí Lý luận Chính trị*, 3. <http://lyluanchinhtri.vn/home/index.php/dao-tao-boi-duong/item/2187-mot-so-giai-phap-nang-cao-chat-luong-hoat-dong-nghien-cuu-khoa-hoc-trong-cac-co-so-giao-duc-dai-hoc.html>
- [19] Hương, L. M., Bình, T. V., & Toàn, L. V. (2009). *Nghiên cứu đề xuất mô hình và giải pháp phát triển hệ thống các doanh nghiệp trong các trường đại học tại Việt Nam*.
- [20] Hương, N. T. M., Bình, T. V., & Toàn, L. V. (2010). *Nghiên cứu đề xuất mô hình và giải pháp phát triển hệ thống các doanh nghiệp trong các trường đại học tại Việt Nam*.
- [21] Jamil, F., Ismail, K., & Mahmood, N. (2015). A review of commercialization tools: University incubators and technology parks. *International Journal of Economics and Financial Issues*, 5, 223-228.
- [22] Kusuma, C., Sutopo, W., Yuniaristanto, Hadiyono, S., & Nizam, M. (2015). Incubation scheme of the university spin off to commercialize the invention in Sebelas Maret University. *Lecture Notes in Engineering and Computer Science*, 2, 841-844.
- [23] Lee, Y. S. (1996). 'Technology transfer' and the research university: a search for the boundaries of university-industry collaboration. *Research Policy*, 25(6), 843-863. [https://doi.org/10.1016/0048-7333\(95\)00857-8](https://doi.org/10.1016/0048-7333(95)00857-8)
- [24] Luat, H. N., & Kha, N. T. (2015). Commercialization of research results from universities to businesses in Vietnam: Current situation and solution. *Journal Science and Technology Policy and Management*, 1. <http://vietnamstijournal.net/index.php/JSTPM/article/view/148/269>
- [25] McAdam, M., & McAdam, R. (2008). High tech start-ups in University Science Park incubators: The relationship between the start-up's lifecycle progression and use of the incubator's resources. *Technovation*, 28(5), 277-290. <https://doi.org/10.1016/j.technovation.2007.07.012>
- [26] Mian, S., Fayolle, A., & Lamine, W. (2012). Building Sustainable Regional Platforms for Incubating Science and Technology Businesses. *The International Journal of Entrepreneurship and Innovation*, 13(4), 235-247. <https://doi.org/10.5367/ije.2012.0100>

- [27] Mian, S., Lamine, W., & Fayolle, A. (2016). Technology Business Incubation: An overview of the state of knowledge. *Technovation*, 50-51, 1-12. <https://doi.org/10.1016/j.technovation.2016.02.005>
- [28] Nguyen, H. T. L., & Van Gramberg, B. (2018). University strategic research planning: a key to reforming university research in Vietnam? *Studies in Higher Education*, 43(12), 2130-2147. <https://doi.org/10.1080/03075079.2017.1313218>
- [29] Palumbo, F., & Dominici, G. (2013). *University Incubator as Catalyst of Resources for Academic Spin-Offs: The Case of Arca Consortium*. June.
- [30] Paul, U. I., Aderonke, O., & ... (2018). University incubators: A pathway to entrepreneurial society. *Covenant ...*, 6(6), 153-160. <http://journals.covenantuniversity.edu.ng/index.php/cjoe/article/view/1171>
- [31] Roberts, E. B., & Malonet, D. E. (1996). Policies and structures for spinning off new companies from research and development organizations#. *R&D Management*, 26(1), 17-48. <https://doi.org/10.1111/j.1467-9310.1996.tb00927.x>
- [32] Rogerson, S. (2002). Knowledge transfer from university to industry: problems and lessons learned - an overview. *Proceedings 26th Annual International Computer Software and Applications, February 2002*, 525-525. <https://doi.org/10.1109/CMPSAC.2002.1045057>
- [33] Rossi, F., & Rosli, A. (2015). Indicators of university-industry knowledge transfer performance and their implications for universities: evidence from the United Kingdom. *Studies in Higher Education*, 40(10), 1970-1991. <https://doi.org/10.1080/03075079.2014.914914>
- [34] Somsuk, N., Laosirihongthong, T., & McLean, M. W. (2012). Strategic management of university business incubators (UBIs): Resource-based view (RBV) theory. *2012 IEEE International Conference on Management of Innovation & Technology (ICMIT)*, 611-618. <https://doi.org/10.1109/ICMIT.2012.6225876>
- [35] Tâm, Đ. T. T. (2020). *Nghiên cứu và chuyển giao khoa học công nghệ từ trường đại học đến doanh nghiệp*. Tạp chí Tài chính. <http://tapchitaichinh.vn/tai-chinh-kinh-doanh/nghien-cuu-va-chuyen-giao-khoa-hoc-cong-nghe-tu-truong-dai-hoc-den-doanh-nghiep-318250.html>
- [36] Thủy, Đ. Q., Thơ, N. T., Vân, P. T. H., & Anh, rần T. V. (2020). Hoàn thiện chính sách về cơ sở ươm tạo, cơ sở kỹ thuật, khu làm việc chung hỗ trợ doanh nghiệp nhỏ và vừa khởi nghiệp sáng tạo. *Tạp chí Khoa học và Công nghệ Việt Nam*. <https://vjst.vn/vn/tin-tuc/3267/hoan-thien-chinh-sach-ve-co-so-uom-tao--co-so-ky-thuat--khu-lam-viec-chung-ho-tro-doanh-nghiep-nho-va-vua-khoi-nghiep-sang-tao.aspx>
- [37] Wong, P.-K., Ho, Y.-P., & Singh, A. (2007). Towards an “Entrepreneurial University” Model to Support Knowledge-Based Economic Development: The Case of the National University of Singapore. *World Development*, 35(6), 941-958. <https://doi.org/10.1016/j.worlddev.2006.05.007>
- [38] Wright, M., Lockett, A., Clarysse, B., & Binks, M. (2006). University spin-out companies and venture capital. *Research Policy*, 35(4), 481-501. <https://doi.org/10.1016/j.respol.2006.01.005>

SOME THEORETICAL ISSUES IN POLICIES TO FORM BUSINESS INCUBATORS AND UNIVERSITY SPIN-OFFS IN VIETNAM

To Hong Duc* and Pham Tuan Anh

Department of Science Technology and Cooperation Development, Hanoi Metropolitan University, Hanoi, Vietnam

*Corresponding author: thduc@hnmu.edu.vn

Abstract

The concept of “business incubator” and “university spin-off” have appeared in Vietnam for more than 10 years. In several developed countries, establishing business incubators and university spin-offs plays an important role in transferring scientific research results and contributing to national science and technology resources development. In the context of international economic integration and competitive market, producing products from research results is becoming an urgent requirement not only for private sectors but also for public research institutes or universities. Vietnamese Government's policy is transforming the scientific and technology research institutions to operate under the enterprise mechanism. However, business incubation and university spin-off now have not been recognized and evaluated comprehensively in Vietnam yet. Therefore, this article focuses on sharing some findings and observations regarding the current situation of forming the business incubations and university spin-offs in Vietnam. Additionally, assess the legal framework for business incubation and university spin-off in Vietnam, then gives some recommendation for government's policies to form and promote these models

Keywords: Business incubator, University spin-off, Commercialize research results, Technology transfer.

1. INTRODUCTION

In the national innovation system, enterprises especially small and medium-sized enterprises (SME), show their essential role in connecting the Government to R&D organizations (Universities, research institutes) and the market. The SMEs in the developing countries including Vietnam seem lack of the resources to scale up and develop effectively. These countries have found a lot of difficulties while innovating SMEs, creating job opportunity, and making benefit from this model. Many studies have shown that technology business incubators in universities has been becoming effective for innovating and creating new spin-off enterprises.

Business incubator is a model that comprehensively designed to support and create favorable conditions for startups and newly established businesses. Besides, it helps S&T enterprises can be developed through the provision of shared services, training, and financial support, equipment and workshops. Incubator activities have made new opportunities for strengthening the links of SMEs with domestic and foreign partners. The business incubation model has established a coherent business service system instead of single service support models. Through business incubators, together with the establishment of information sharing systems, the

linkages between incubators and other stakeholders have been strengthened, contributing to improving operational capacity, competition for businesses in the context of integration. It is also an important component of the entrepreneurial ecosystem [6].

Meanwhile, establishing spin-off companies in universities demonstrates commercialization of technology that allows scientists reap the long-term benefits of owning their intellectual property and universities, thereby gaining economic benefits. The business model in universities has become popular in developed countries as it ensures scientists as well as universities with durable profits in terms of economics, research and training [23].

Therefore, this paper examines the basis of university spin-off enterprise and business incubator formation. Their impact as a systematic component of the innovation system is extremely necessary, especially when they are considered in accordance with perspective of innovation policy. The results of the research also contribute to the development of spin-off businesses in order to promote the commercialization of R&D results as a component of the infrastructure of the national innovation system.

2. LITERATURE REVIEW

2.1. DEFINITION OF universities Spin-off and business incubator

University spin-off

Shane [19] defined a university spin-off “as a new company founded to exploit a piece of intellectual property created in an academic institution”. His definition includes three important aspects of a university spin-off. First, a new and independent company has to be incorporated, i.e., a new legal entity has to be formed. Second, the products or services the company offers are based on intellectual property. Shane noted that this piece of intellectual property does not have to be protected (for example: by patents or copyrights or licensed). Many spin-offs exploit intellectual property without any protection. Finally, the intellectual property exploited has to be created in an academic institution. Meanwhile, Pirnay et al. [16] reported that research-based spin-off companies have been defined as new ventures based on the transfer of technology or academic knowledge developed by public research organizations with a focus on the commercialization of the research results. In this context, spin-offs are discussed from various perspectives, that is, from the university or firm level, for instance. Despite the increasing attention paid to the spin-off process and activities, however, most authors do not give a strict and clear definition of a research-based spin-off, thus making it difficult to compare the results of different studies.

In Vietnam, Vu Cao Dam defined a S&T enterprise, or spin-off enterprise is a unit with a function of implementation which can start from the stage of prototype making, pilot making, incubation, and finally is release technologies and sell (transfer) them to industrial enterprises. Spin-offs are businesses formed by one (or a group) of scientists - founders with entrepreneurial spirit separated from the parent organization (universities, research institutes, national laboratory) to start a new independent business career. The parent organization supports spin-off businesses by enabling the transfer of knowledge, competencies [27].

Business Incubators

The concept of business incubators (business incubators) originated in the United States in the early 1950s by the mayor of Watertown, New York - Frank Mancuso used an old workshop incubate eggs then supplying area for start-ups enterprises. According to the Oxford dictionary, “incubator” is a device that provides heat for incubating eggs, raising premature children or raise bacteria.

According to the United Nations Industrial Development Organization (UNIDO) [30], “Technology Business Incubator (TBI) is an organization that systematically conducts the process of creating new

businesses, providing them with a comprehensive system and enjoys services to operate successfully”. TBIs do not necessarily include all equipment and services, but through a combination of the resources of external service providers to ensure to ensure that businesses in TBI can operate.

According to the National Business Incubation Association (NBIA) the incubator is an environment and program with a number of important characteristics such as: it provides a comprehensive list of business support services follow the request of the customer companies; it has an director that coordinates staff, outside experts and organizations to provide business support services; it helps businesses grow once they reach the program’s target [30].

The United Kingdom Business Incubation (UKBI) [31] defines “incubation is the physical manifestation of the process that encourages people to begin to form and develop a business, providing for that business resources for success and creating an environment for business growth”

2.2. The importance of university spin-off and business incubators

University Spin-off

Tomas Coates [24] reported funding programs of the Innovate UK between periods of 2011 – 2018 show that the total funding received by university spin-offs is nearly three hundred fifty eight millions pounds. The number of spin-offs were funded is 801. Each spin-off was averagely funded four hundred forty seven thousand pounds. Seed Enterprise Investment Scheme (SEIE), funding activities in the period of 2011 – 2018 show that the number of spin-offs receiving SEIE funding increases every year. From 2,025 in 2011 to 3,470 in 2017. Higher Education Innovation Fund (HEIF) for the external investment raised, total raised period 2008 – 2010 is nearly 3 billion pounds and period 2016 – 2018 this figures increase up to nearly 3.8 billion pounds. The employment of active firms increase from 16,500 in period 2004 – 2006 to 23,300 in period 2016 – 2018.

Roberts et al. [18] reported that all spin-offs of Massachusetts Institute of Technology (MIT) annually contribute 10 billion USD to the economy. Cohen estimates the economic value added of all U.S. university spin-offs created between 1980 and 1999 to be 33.5 billion USD. McQueen and Wallmark [10] have showed that the 10 to 15 companies originating annually from the Chalmers University, Sweden, have contributed more than 100 million USD to the economy between 1964 and 1991.

Along with value-creation, these enterprises can employ a considerable amount of people. About 280,000 jobs have been created from university spin-offs since 1980”

in the U.S. economy [15]. A gross effect of 300,000 jobs created through MIT spin-offs [18]. ETH Zurich's spin-offs created since their incorporation close to 2,500 direct jobs in 2013 and 122 of the ETH spin-offs produced revenues of 585 Million EUR in 2013 alone. Since 1992 the number of created jobs per ETH spin-off has increased from 2 up to 5 jobs per spin-off in 2013 [29].

More than national development, these companies especially foster the local economy. The large number of companies founded near MIT is sometimes considered as the Route 128 phenomenon [18]. Similar agglomerations and new industrial clusters can be found in Silicon Valley, Munich, and various other locations all over the world [7]. The formation and growth of spin-offs can also lead to a diversification of the region, which can lead to economic stability through reduced dependencies on individual companies or industries.

Besides encouraging economic development, university spin-offs can be regarded as instruments to support their incubator and the university itself. Universities profit directly from license agreements and royalties generated from their inventions. Jensen and Thursby indicated that between 1991 and 1997, license agreements in the U.S. have increased by 70 to 75 percent, and royalties have more than doubled. The reports noted that this effect is mainly due to university spin-offs rather than established companies. As a direct effect of the Bayh-Dole Act, "the number of universities actively engaged in technology transfer has increased by eight times since 1980 to now more than 200" [8]. Universities not only change policies towards greater commercialization of inventions but also intend to increase interactions with industries. As a result, companies as well as spin-offs invest in university technology and participate in university research. Thereby, spin-offs play an important role in transferring results from basic science into applied science inventions. Finally, in addition to direct funding of university technology described above, university spin-offs support additional research in a more general way. Various examples of spin-offs were described in financing the development of university laboratories, donating equipment, and paying for the education. Moreover, spin-offs also play a role in attracting and retaining faculty through financing mechanisms [20].

Business incubators

China is considered a country with the system of business incubator growing very fast (10% per year) in a short time from 1987 to the present. If in 2001 China had 280 incubators, by the end of 2008, the number of incubators would have reached 548. Total area of incubators about 20.08 million m². There are 4,143 companies have been established from these incubators, in including 1,989 of those that have left the business

incubators to become startups enterprises and more than 50 listed enterprises on the stock market. It is noteworthy that over the past 20 years, Chinese business incubators have created a much larger number of jobs than the United States, corresponding to 792,590 employees (2001 – 2008) compared to about 500,000 (1980 – 2001). The calculations also show that China's incubators have helped increase the commercialization rate of scientific research from 25-30% to over 70%, the number of intellectual property rights increased significantly. Quality of human resources have been enhanced with the contributions of many overseas Chinese students and scholars. According to statistics, a quarter of Chinese small and medium technology enterprises come from business incubators [22].

Israel is considered as a Silicon Valley in the Middle East area. The Israeli economy develops with an immigration policy and implements economic policies in line with the new investment policy in technology, education, agriculture, cybersecurity... besides venture capital policies. In 2005, Prime Minister Benjamin Netanyahu completed the clearance of state intervention in the Israeli financial industry and successfully built an ecosystem suitable for startups ecosystem. Up to now, the establishment and development of Israeli start-ups is taking place very strongly with about 700-800 startups being established each year and on average, each startup announces its dissolution or transfer of ownership. Property has 2 startups registered for new establishment. By the end of 2014, Israel has more than 5,000 startups operating in the fields, including about 3,500 startups operating in the field of high technology [26].

Business incubation officially started in the US in the 1960s, and then developed in the UK and Europe through the various forms involved (eg, innovation centers, science parks). It is recognized as a way of responding to a wide range of socioeconomic and economic policy needs which may include: (1) Employment; (2) Support for small businesses with high growth potential; (3) Technology transfer; (4) Promote innovation; (5) Strengthening the linkage between universities, research institutes and the business community developing industrial clusters; (6) Evaluation of corporate risk profile. In the US, incubators often have a close relationship with universities that have a strong focus on technology. This is also the first generation of incubators that the US Government focuses on building with high technology fields such as new materials, environmental technology. Incubators provide a space and general service for startup business, provided by universities, research institutes and businesses. University incubators are located at universities and are supported on all sides by universities, even with government support and private foundations. Technology transfer and product commercialization are the dual goals of incubators of

this kind, while also creating a pervasive, multi-dimensional impact on the university and the startup community [5].

2.3. Incubation strategies to promote the university spin-offs

Clarysse et al. [1] identified three different models within the incubation strategies for the promotion of the creation of university spin-offs (Figure 1).

First is the Low Selective model. The most important goals in this strategy are to maximize the number of university spin-offs created, their profitability being a secondary objective. According to Clarysse et al., although this model generates a great number of firms and jobs, in most cases these firms are not growth-oriented but survival-oriented.

The Supportive Model is the second model identified and a good example of this is the Catholic University of Louvain. Within this model, spin-off creation is considered to be an alternative to patent licensing in the commercialization of research results. Thus, the technology transfer office (TTO) analyzes the opportunity's characteristics and decides if its commercialization fits better with the creation of a patent license or a firm. If they decide to promote the creation of an university spin-off, this has to meet some requirements, such as a minimum expected benefit. As a consequence, the number of firms created in this model is lower than in the Low Selective model. On the other hand, resource availability is higher in this model and the TTO is not only involved in the company's creation, but also in the following stages of company development [1].

The Incubator is the third model. The IMEC (InterUniversity Institute for Microelectronics, in Lovain), TTP (The Technology Partnership, in Cambridge, United Kingdom) and Scientific Generis (also in Cambridge) provide good examples of this model. The principal goal of this model is to identify entrepreneurial opportunities to be exploited by the creation of spin-offs, which are expected to have explosive growth in the future and to become leaders in their field. Selection criteria are significantly more demanding in this model and, as a consequence, the number of spin-offs created is considerably lower than in previous models; however these firms are both market- and growth-oriented [1].

Along with these three models, Clarysse et al. identify two suboptimal situations, where the strategies fail to perform as expected: (1) resource deficiency, when strategy goals do not match the availability of resources since goals become too ambitious when faced with scarce resources; (2) Competence deficiency, when resources match goals but the parent organization has

not developed the capabilities needed to perform the incubation activities due to a lack of knowledge or experience on the part of the staff.

The three incubation models are graphically represented in Figure 1. The level and complexity of activities are presented along the vertical axis, while the level and heterogeneity of resources are shown along the horizontal axis. The figure shows the combination of resources and activities in each incubation model. The two sub-optimal situations are also represented in the figure, showing how an unmatched combination of activities and resources may give place to a non-successful strategy.

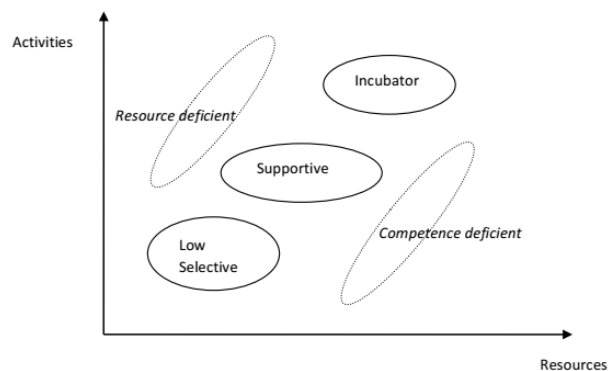


Fig. 1: Typology of spin-offs strategies and outcomes [1]

3. METHODOLOGY

3.1. Research target and scope

Research Target

- Research on the theoretical basis of the environment conducive to the development of business incubators and spin-off enterprises in universities.
- Surveying and evaluating the current situation of the impact of state supportive policies on the development of business incubators and university spin-off by studying the current situation, difficulties and problem business incubators and university spin-off of Hanoi University of Science and Technology (HUST) and VNU, University of Science (VNUS).
- Proposing a number of specific policy to develop business incubators and university spin-off in Vietnam.

Research scope

- Scope of space: business incubators and spin-off enterprises in universities in Vietnam; case study at HUST and VNUS.
- Scope of time: from 2015 to now.
- Scope of content: policy measures to develop business incubators in universities in Vietnam (research at HUST and VNUS).

3.2. Research question

Key question

What policy measures should be taken to develop business incubators and spin-off firms in universities in Vietnam?

Specific questions

- What roles do business incubators and spin-offs in universities play in promoting the application of scientific research results into reality?
- Is the current situation operation of business incubators and spin-off effective in the University?
- What difficulties incubators and spin-off in universities have faced in the development process?
- What policies should be used to develop business incubators in universities in Vietnam?

3.3. Research Method

- *Document research methodology:* Firstly, collecting, analyzing and synthesizing documents on business incubators and university spin-off theory and policy measures to provide theoretical arguments, the role of university or enterprises. Additionally, analyzing and synthesizing practical documents provided by business incubators and university spin-off of HUST and VNUS. In addition, the author learns through foreign documents to synthesize the development and experience of countries with strong developments in the field of business incubation and university spin-off. Finally, research and analyze some legal documents to find out the legal basis for establishing business incubator and S&T enterprise in Vietnam.

- *In-depth interview method:* in-depth interview with incubators and university spin-off leaders of HUST and VNUS to collect information about the current situation, difficulties and expectations about supportive policy measures in developing business incubators and spin-off in Vietnamese universities.

4. RESULTS AND DISCUSSION

4.1. The legal basis for establishing business incubator and S&T enterprise in Vietnam

Technology business incubator

In Vietnam, the terms "Technology incubation" and "Technology business incubation" have appeared in legal documents starting in 2006 according to which: Clause 19, Article 3 of the Law on Technology Transfer 2006 stipulated: "Technology incubation: is the supporting activity to create, complete technologies with prospects of practical application, commercialization from the technology idea or results of scientific research and technology development".

Clause 20, Article 3 of the 2006, Law on Technology Transfer regarding technology business incubation

states: "Technology business incubation is the activity of supporting organizations and individuals to perfect their technologies, mobilize investment capital, and manufacturing, trading, marketing, performing legal procedures and other services required to set up an enterprise using newly created technology" [11].

From articles above, business incubator can be classified as follows (see table 1):

Table 1: Classification of Business incubator and Technology business incubator [2]

Business incubator	A department that provides facilities, work areas and consulting or support services to nurture the growth of spin-offs or start-ups with the goal of creating jobs and growing businesses of local economy.
Technology business incubator	A type of incubation focuses on incubating technology-based enterprises
Technology incubator	A special type of Business Incubator focuses on incubating businesses based on a technology area.
High technology business incubator	A special form of Tech Incubators that focus on incubating hi-tech or new and advanced technology businesses.

S&T enterprise

In Vietnam, currently, there are only regulations for S&T enterprise, have not had any specific those for spin-off. S&T enterprise is an enterprise with a high content of scientific research and technology development, creating high-quality and added value products and services, capable of forming a manufacturing or new service industry or modernize existing production and service.

Clause 1, Article 58 of the Science and Technology Law stipulates: "S&T enterprise is an enterprise that produces, trades S&T services to create products and goods from scientific research results and technology development" [12].

Article 2 of the Government's Decree No. 96/2010/ND-CP date 20/09/2010 indicated that "S&T enterprise is an enterprise whose primary activity is producing and trading products and goods are formed from the results

of scientific research and technology development by enterprises having the legal ownership and right to use; performing S&T tasks. S&T enterprises perform production, business and other services in accordance with the law" [17].

According to Clause 4, Article 3 of the Law on High Technologies, High-tech enterprise means an enterprise that produces high-tech products, provides hi-tech services and conducts hi-tech research and development activities.

Points a and b, Article 75 of the Law on Investment and Article 1 of the Prime Minister's Decision No.19/2015/QĐ-TTg date 15/06/2015, High-tech enterprises are S&T enterprise which manufacturing hi-tech products on the State's list of hi-tech products encouraged for development [2].

4.2. Survey at BK-Holding Incubator, HUST

Report of some activities to promote incubation of BK-Holdings Incubator

Table 2: Some creative start-up contest was held (Source: report of BK-Holding Incubator)

Year	Activity	Object	Number of participants
2015	German Vietnamese Best Business Idea Award	Students of HUST or Alumni graduate within 2 years	67
2016	German Vietnamese Best Business Idea Award	Students of HUST or Alumni graduate within 2 years	75
	LOTTE Startup Award	Vietnamese start-ups	50
2017	BK Smart up for life Contest	Students of HUST	140
	German Vietnamese Best Business Idea Award	Students of HUST or Alumni graduate within 2 years	75
2018	BK Smart up for life Contest	Students of HUST	75
	Panasonic IoT Innovation Idea Contest 2018 (PIC 2018)	Students of universities in Vietnam	300
	SDG Innovation Incubators	Young start-ups of HUST	120

Table 3: Some training incubation activities from 2016-2019 (Source: Report of BK-Holding Incubator)

Type of activities	Quantity of events	Number of Participants
Conference about entrepreneurship and technology innovation:	115	14300
Training mentors (start-up advisors)	4	395
Personal investor training	4	345
Training program for Incubator Managers	4	350

Table 4: Some projects of BK-Holdings Incubator (Source: Report of BK-Holding Incubator)

No	Name of Projects	Scope of activities	Year of incubation
1	Hachi	Greenhouse cultivation	2016
2	Mubahi	Electronics and Telecommunication	2017
3	VEO	Travel services	2017
4	Nami	Finance support	2018
5	Etady	Building a social network on traffic	2018
6	Vadi	Traffic assistance software	2018
7	BK-face	Face recognition software	2018
8	Opticapt	Household appliances (smart refrigerators)	2018

Overview of incubator in HUST

In 2008, HUST established *Bach Khoa Hanoi Technology Investment and Development One Member Company Limited* (BK-Holdings), which is the first business model established in a university in Vietnam. The target of BK Holdings is to mobilize resources from domestic and foreign organizations or individuals to participate in the research, incubation and

commercialization of the University's S&T products. Currently, BK-Holdings Incubator is specializing in assisting students to startup with a modern working space of about 1200m². It is a regular address for bright innovation activities to create and launch the most vibrant startups in universities. The BK-Holdings Incubator supports technology authors who have the idea to create businesses but do not have capital, as well as support authors with technology creation ideas and application. It also helps investors to find opportunities to invest and turn "Job seekers" become "Job creators". Project participants are various. They can be students, young employees of businesses, young staff in universities with ideas and technologies wishing to apply their technology into real life or business establishment.

Limitation exists of BK-Holding Incubator

Financial problems: The general director of BK-Holding Incubator Nguyen Trung Dung said that BK-Holding is a public unit, income of the incubator is very small, and the maintenance is still mainly supported by other resources of BK-Holdings or Hanoi University of Science and Technology (HUST). The application for funding from the relevant ministries is also very difficult due to the lack of mechanisms, especially the financial resources for the implementation of S&T tasks of the vocational institute are still very modest. This is the big difficulties when incubator implements activities to support business incubation and scientific tasks. Although there are active donor organizations, they only fund follow the projects. End of the project is out of funding. Besides that, financial resources and funds for incubation are not diversified and difficult to access, especially for incubators in the start-up process, the disbursement mechanism is still inadequate because of lack of guiding documents.

Human resource problems: Human resources is also one of the major difficulties for the BK-Holdings Incubator. The progress of implementing the incubator is often slow because of this problem. Many part-time staffs have limited time for incubator's work. Most of these people work at the school, only part-time at the incubators, therefore the focus of resources is not much. One more reason is low salaries make it difficult to find professional managers. Only those who are dedicated to their career and passion for incubation can operate in this field. Besides that, Entrepreneurship of staffs is still low because they mainly do their training task, they always think that if they fail in the incubation activities, they still return to their main work so they don't have motivation to develop and be passionate about the incubation activities. [13].

4.3. Survey at Natural Science Co., Ltd of Hanoi University of Science, Vietnam National University (VNU-HUS-NS)

Report of S&T tasks

Author made an in-depth interview the director of VNU-HUS-NS Assoc. Prof. Dr. Nguyen Quang Huy, he reported that from 2015 to the end of 2018, VNU-HUS-NS implemented 126 Science & Technology services with a total budget of VND 85.035 billion VND. These contracts mainly focus on the fields as follow: (1) Investigation, survey and plan of sustainable use of resources for localities; (2) Technologies of environmental pollution treatment; (3) Establishment geological and geomorphic mapping of zones; (4) Sample analysis, building thematic databases

There are many successful contracts which promoted S&T and technology transfer capacity of the company such as: (1) Contract "Overall survey on biodiversity of lagoon ecosystems Vietnam Coastal Lagoon" with the Department of Resource Exploitation and Protection, Ministry Agriculture and Rural Development; (2) Contract "Strategic environmental assessment Master plan for socio-economic development of Quang Ninh province to 2020, vision to 2030" with People's Committee of Quang Ninh province; (3) Technology transfer contract of "Installation and transfer of continuous digital technology for weather and ocean waves forecasting in Quang Ngai province" with the meteorological station of Quang Ngai province under the project: Building a technological system the number of consecutive weather and wave forecasts, improving the capacity of natural disaster prevention and mitigation in Quang Ngai province.

Review of limitation of VNU-HUS-NS

In the process of interview, Assoc. Prof. Dr Nguyen Quang Huy said that the establishment of VNU-HUS-NS aims to commercialize technology and scientific knowledge from research results. However, this establishment did not come from any specific research and implementation directions. It based on the mechanical coupling of existing units. These units, which had an independent autonomy process long before the merger. Therefore, it is difficult to control and not to have the connection and synergy with each other.

The production and business activities mainly benefit from the available results without investing in exploiting and developing a key technology. The patent registration has not been paid attention due to psychological concerns about current domestic protection policies.

Most of the leading officials work on a part-time basis, do not have full-time officials, are fluent in the business environment, so they face many difficulties in operating

and developing the market. Only small quantity of scientific staffs has a good entrepreneurship, a lot of experience, however their age is quite high, even nearing retirement age. Succession team is not strong enough, so it has a significant impact on the operation of the company.

The system of facilities is mainly based on availability, with no new investments. Main production and business activities have to hire more grounds outside the school, lack of preferential conditions of the school and the State on land and factory rents. Therefore, the production and business are still small and medium scale, operating in moderation.

The charter capital of the company is small, so it is difficult to meet the requirements of partners when signing technology transfer production and business contracts. The firm also does not have collateral to borrow bank loans to serve production and business activities. On the other hand, because the company was established in the form of Limited, the capital mobilization is completely dependent on the loan capital but cannot use the form of share contribution.

Attracting investors and venture capital is very limited because there is no effective connection channel. The parent organization also does not have many policies that really focus and create breakthroughs for the company, supporting institutions such as technology transfer offices or incubator are also incomplete.

4.4. The limitation of supporting policies in Vietnam

Unreasonable regulations on funding sources for the implementation of programs: All programs are mainly funded by the following sources: state budget; science and technology development fund and mobilizing the social resources. Actually, these funding sources are not much and to be spent on many other activities and programs. Moreover, these are activities related to venture capital, so it is difficult to carry out settlement procedures after finishing operations in accordance with regulations on spending for S&T using the State budget: "Funding for implementing the program must be used for all purposes and ensure efficiency according to the approved cost estimates and current financial management regulations" (Circular No.19/2013/TT-BKHCN). [3]

On the other hand, policies for supporting capital for scientific enterprise are not good too. For example, there are not legal documents directly addressing the form of venture capital. There are only a few regulations related to this activity such as the Fund's regulations and Investment Fund Management Company. Vietnamese Ministry of Finance reports in 2016 that current financial source for scientific research almost comes from the State budget, which accounts for about 75%, more than

20% from foreign sources, and the rest is from other sources, funding for scientific research from private sectors are very limited with only 1%. Meanwhile, Vietnamese Ministry of Science and Technology indicated in 2016 that loans from banks face many difficulties because of fluctuations in foreign exchange rates. The innovative businesses in the early stage of development, operating in the first 3-5 years, most focused on research, testing new markets and completing technology to meet the needs of the Market. During this time, they almost have no profits, even no revenue but a very lack of capital. Therefore, the support for corporate income tax within the first 5 years will not have too much effect on them. Preferential credit from commercial banks for startups will be very difficult without government support and regulations on transactions to ensure the use of the intellectual property. Most programs only support when the business has been established and operated for a while but has not supported the steps of forming and developing startup ideas. The current programs and projects focus on technology research and application, but the stage from when the technology is completed to the introduction of technology has not been supported yet.

On December 1, 2011, the Prime Minister issued Decision No. 2133 / QD-TTg approving the overall planning for development of the Vietnam Academy of Science and Technology until 2020 and orientations to 2030, requesting "Promote the application of results of scientific research and technological development to production and social life; commercialize science and technology products through the science and technology market. Encourage support for technology incubation, spin-off business incubation activities, establishment and development of spin-off businesses". The government also set the goal of developing 15 spin-off firms by 2020, with a vision to reach 20 spin-off enterprises by 2030. The goal is very good but so far, unclear laws and regulations make Vietnam's "spin-offs" only operate primarily in the field of science and technology services, consulting, but not explosive development from real technology transfer like the spin-off concept in the world [13].

Although, the Vietnamese Government has issued a lot of policies which mentioned above to develop science and technology enterprises, especially Decision No. 68/1998/QD-TTg allowing pilot establishment of enterprises in universities and institutes. Many such companies were established. However, these companies are only performing science and technology activities. Their nature is not a spin-off business model like in the world. For example, at some famous universities in Vietnam such as Hanoi University of Science and Technology, Hanoi University of Science (VNU, Hanoi), University of Construction... have established many

enterprises like university spin-offs for years with purpose supporting technology transfer activities. However, in reality, the main fields operation of these enterprises are consulting, supervision, quality verification, providing training services, developing human resources while important activity is technology transfer from scientific research results is very limited [21]. The main reason for university spin-off is working improperly as the nature of this model due to first of all is the lack of a legal framework. So far hardly found a single law that directly regulates spin-offs. For example, Decree No. 13/2019 / ND-CP on science and technology enterprises has officially been issued and came into effect on March 20, 2019, which is the most noticeable document giving clear legal issues on the process of formation, operation and development of science and technology enterprises. Unfortunately, the above document does not directly mention the concept of spin-off or the originating enterprise, making this type become vague in reality. This explains why businesses formed from universities and research institutes, though having been born right after the development policy; do not have a clear and appropriate mechanism to operate according to the standards substance of university spin-off [14].

4.5. Recommendation of appropriate policies to form the business incubators and universities spin-offs

Recreate the Linkage between Research, Training, and Production in the Science Technology Innovation (STI) System

The link between universities, research institutes, and businesses has been a popular trend in the world and is considered an effective solution. The reality is that research plays an important role for universities to create new knowledge that contributes to S&T human resource training. It is important for businesses with technology transfer to apply technological achievements in production and to form a value chain within the STI system. With such importance, Resolution 2 of the 8th Central Committee Conference confirmed that:

“Universities must be centers for scientific and technological research, transfer and application of technologies to life” and “ensuring the combination of research institutes and universities, linking research-development with production business”. Conference 6 of the IX Central Committee set the task of “improving the quality of education efficiency”, “improving the quality and efficiency of science and technology activities”, and “strengthening the association of universities with the Research institute and enterprise.”

In Article 1, Decision No. 418/QĐ-TTg of the Prime Minister dated 11 April 2012 on Science and Technology Development Strategy for the period 2011 to 2020, it

stated: *“To develop science and technology together with education and training is a top national policy, a key motive for rapid and sustainable national development. Science and technology must play the leading role in creating a breakthrough in production force, reforming the model of growth, enhancing the competitiveness of the economy, speeding up the industrialization process and modernizing the country”.*

Universities, research institutes, and enterprises cooperate so as to use disseminate research results for teaching, as well as the service of production and business activities. The functions of these three stakeholders are complementary to each other. Research activities in research institutes will provide knowledge for teaching activities. Scientific results will be commercialized and marketed thanks to the production of the business. Training activities will contribute to the dissemination of S&T knowledge and S&T human resources for research institutes and enterprises. Enterprises will apply research results directly to the production and business activities of enterprises. In the context of Vietnam, research, training, and production functions are not merely the linkage between the symbiotic relationships between the institutional, school, and enterprise components in the STI system, but also the integration of these activities within the same organization. For example, the formation business incubators, spin-offs, and startup technology enterprises in universities to implement scientific research results into practice, as the HUST and the VNUS did. Likewise, the formation of universities in research institutes such as the Academy of Social Sciences from the Vietnam Academy of Social Sciences and the Hanoi University of Science and Technology under the Vietnam Academy of Science and Technology. This is a good premise, as they are the pioneering models that can create a strong link between research, training, and production in Vietnam’s STI system. In addition, the reconstruction of this link will attract financial resources, training, and high-quality S&T human resources.

Promoting STI Activity in Enterprises

Promoting STI activities in universities is one of the most important ways to form a linkage between institutes and industrial sectors. This can be done by increasing investment in human and financial resources for research in the university sector, such as higher salaries and research funding, as well as formulating policies to form the create business incubators and spin-offs in universities, thereby enhancing the research function for the universities [4].

Enterprises are the nucleus of innovation. Recreating the scientific and production linkages is a fundamental way for Vietnam’s STI system to integrate into the world. In the early 1980s, when the state created conditions for

enterprises to make a three-part plan under Decisions 25/Gov and 26/Gov, and concurrently to institute signing contracts under Decision 175/Gov, technology institutes and technology universities responded actively. This was followed by Decision 51/Ministry Council allowing spin-off production and Decision 134/Ministry Council, which provides additional conditions for voluntary individuals and groups to promote further linkages between institutes/schools with manufacturing facilities. Institutions were thinking of self-accounting. The Ministry of Mechanics and Metallurgy even made decisions for enacting eight self-accounting pilot institutes. According to the Decree 115/2005/ND-CP, the institutes explained that they would become basic research institutes to take the subsidy regime in order to avoid self-reliance and self-responsibility. This has really become a problem. Therefore, the task of reconstructing the relationship between research and production is very urgent and difficult. On such a basis, there should be policies such that the institutes and universities would convert themselves into alternative options, in order for the organization itself to be the most profitable. They can establish with many spin-off. The premise for this model began after the government issued Decision 51/HDBT in 1983 and Decision 134/HDBT in 1987. On the other hand, institutes could become institutes of technology with spin-off production. This phenomenon has become popular with a number of institutes of technology in Vietnam that were recently established. Moreover, institutes can become engineering enterprises. In the present official documents, this type of technology enterprise is referred to as "S&T enterprise" and is defined as the type of enterprise that uses research results to produce goods. In addition, the institutes can become consultative organizations with a wide spectrum of activities ranging from legal consultancy, technology consultancy, and investment consultancy to construction contracting

Some other policy solutions

In order for business incubators to thrive, creating a premise for successful and developing start-up projects, a number of solutions need to be implemented:

Firstly, the government needs to develop and improve the legal framework and policies on the establishment and operation of incubator facilities. Besides, authorities should formulate and promulgate incentive mechanisms, policies to encourage the establishment and development of incubators, especially financial support policies; prioritize the development of a number of types of incubators, such as technology business incubators, startup incubators, etc. In addition, it is also necessary to promote and expand the network of units involved incubator; effectively integrate private and business development programs with incubator development programs. The government also needs to promote the development of the stock market, one of the channels to

attract investment in incubators; mobilize investment resources to increase operational efficiency and operation of incubators [25].

Secondly, the government needs to invest in innovative start-ups with stable and long-term financial support for incubators, such as the establishment of the Incubation Support Fund; invest in some important incubation centers to avoid spreading. In addition, connecting start-up ecosystems, introducing pre-feasible research results and topics for commercialization through incubator operations.

Finally, it is necessary to develop and promulgate incentive policies for incubator managers and operators. Focusing on professional training for nursery managers and operators; regularly grasp the needs and aspirations of businesses to design practical and effective support services; strengthening infrastructure and techniques to meet the needs of businesses; diversify services and improve service delivery quality of nurseries to meet the diverse needs of businesses; It is important to recognize the development of a nursery system as an effective tool to support and grow potential the SMEs.

5. CONCLUSION

Innovation and technology are now at the center of entrepreneurship, the place for creating new technology ideas can be considered the "nucleus" of the whole creative startup ecosystem. It is the research and development facilities, in which, especially universities, where not only contribute breakthrough technology ideas, but also human resources. Developing business incubator is tremendously important to transfer scientific research results and contribute to the promotion of national science and technology resources. In the world, the establishment of university spin-offs and incubators has strongly taken place as an indispensable trend with its development motivation. In Vietnam, the development of spin-offs and incubators need to be actively paid more attention by the policymakers, educational managers as well as scientists... In fact, it is difficult to set a standard university spin-offs or business incubators model that can be applied to all universities, especially in developing countries like Vietnam, where social resources are very limited. However, as mentioned above, they are methods that are good for the effectiveness of technology transfer activities from the scientific research results [21]. In the new context, when the innovation index is used to assess a country's development level, the innovative enterprises in universities are extremely important. It not only contributes to the social economic improvement but also creates strong resources for the progress of scientific research and high-level training, closely linked to real life.

6. REFERENCES

- [1]. Clarysse B., Wright M., Lockett A., Van de Velde E. and Vohora A., (2005). Spinning-out New Ventures: A Typology of Incubation Strategies from European Research Institutions. *Journal of Business Venturing*, 20, 183-216.
- [2]. Dao Thanh Truong, Pham Dai Duong (2017); Some Theoretical Issues in the Study of Promoting the Formation of Technology Enterprises through Technology Business Incubator; *VNU Journal of Science: Policy and Management Studies*, [S.l.], Vol.33, No.4, Nov, 2017; ISSN 2588-1116.
- [3]. Dao Thanh Truong, Pham Dai Duong, Nguyen Thi Ngoc Anh, Nguyen Thuy Hien (2017); Technology Business Incubation in Vietnam: An Approach to Legal Analysis; *VNU Journal of Science: Policy and Management Studies*, Vol.33, No.1; ISSN 2588-1116.
- [4]. Dao Thanh Truong. (2016). *Chính sách Khoa học, Công nghệ, và Đổi mới (STI) của Việt Nam trong xu thế hội nhập quốc tế: Thực trạng và giải pháp* [Science, Technology, and Innovation Policies of Vietnam in the Trend of International Integration: Situations and Solutions]. Hanoi: Thế Giới Publishers.
- [5]. Elena Scaramuzzi (2002), *Incubators in Developing Countries: Status and Development Perspectives*, InfoDev Program, World Bank, Washington DC.
- [6]. Fred Smith, E E Falk, and E Hilliard (2001), *Technology Business Incubation, a Role for Universities*, The Australian Academy of Technological Sciences and Engineering.
- [7]. Garvin, D. A. (1983) Spin-offs and the New Firm Formation Process. *California Management Review* 25(2): 3-20.
- [8]. Jensen, R., Thursby, M. (2001), Proofs and Prototypes for Sale: The Licensing of University Inventions. *American Economic Review* 91(1): 240-259.
- [9]. Khoi Nguyen (2015), *Phân tích thực trạng và đánh giá nhu cầu tham gia vườn ươm doanh nghiệp công nghệ Trường Đại học Cần Thơ*, *Tạp chí Khoa học Trường Đại học Cần Thơ*, số 38(2015).
- [10]. McQueen, D. H., Wallmark, J. T. (1991), *University Technical Innovation: Spin-Offs and Patents*, in Goteborg, Sweden. In: *University Spin-off Companies*.
- [11]. National Assembly of Vietnam (2006), *Law on Technology Transfer No.80/2006/QH11*.
- [12]. National Assembly of Vietnam (2013), *Law on Science and Technology No.29/2013/QH13*.
- [13]. Nguyen Trung Dung (2018), *Spin-off trong trường đại học Việt Nam – hành trình còn lắm chông gai*; <http://khoahocphattrien.vn/khoa-hoc/spinoff-trong-truong-dai-hoc-vnhanh-trinh-con-lam-chong-gai/2018041311113900p1c160.htm>. Access date: 16/08/2020.
- [14]. Nguyễn Thị Thúy Hằng (2019), Hoàn thiện khung khổ pháp lý cho doanh nghiệp Spin-off trong trường đại học ở Việt Nam hiện nay; *Tạp chí Công Thương* <http://tapchicongthuong.vn/bai-viet/hoan-thien-khung-kho-phap-ly-cho-doanh-nghiep-spin-off-trong-truong-dai-hoc-o-viet-nam-hien-nay-63956.htm>. Access date: 17/08/2019.
- [15]. Perez, M. P., Sanchez, A. M. (2003): The Development of University Spin-Offs: Early Dynamics of Technology Transfer and Networking. *Technovation* 23(10): 823- 831.
- [16]. Pirnay, F., Surlemont, B., and Nlemvo, F. (2003). Toward a typology of university spin-offs. *Small Business Economics*, 21(4), 355-369.
- [17]. Prime Minister (2010) Decree No. 96/2010/ND-CP dated 20/09/2010 of the Government amending and supplementing a number of articles of Decree No. 115/2005/ND-CP dated 05/09/2005 regulations on self-responsibility mechanism of science and technology organizations and Decree No. 80/2007/ND-CP dated 19/05/2007 of the Government on S&T enterprises.
- [18]. Roberts, E. B., Malone, D. E. (1996); *Policies and Structures for Spinning Off New Companies from Research and Development Organizations*; *R & D Management* 26(1): 17-48.
- [19]. Shane, S. (2004a), *Academic Entrepreneurship: University Spin-offs and Wealth Creation*. Edward Elgar Publishing, Cheltenham
- [20]. Shane, S. (2004b): *Government Policies to Encourage Economic Development Through Technology Transfer*. United States Government Printing Office, Washington, D.C.: 103-123.
- [21]. Ta Hai Tung (2018), *Doanh nghiệp khởi nghiệp sáng tạo trong trường đại học: Bắt đầu từ sự thay đổi nhận thức*; <http://tiasang.com.vn/-doi-moi-sang-tao/Doanh-nghiep-khoi-nghiep-sang-tao-trong-truong-dai-hoc-Bat-dau-tu-su-thay-doi-nhan-thuc-11292>, access date: 30/03/2018.
- [22]. Tang Mingfeng; Baskaran Angathevar; Pancholi Jatin and Muchie Mammo (2011), *Technology Business Incubator in China and India: A comparative Case Study*, *African Journal of Science, Technology, Innovation and Development*.

- [23]. To Hong Duc, Phan Thi Thuy Hang (2019), *the effectiveness of spin-offs at developed countries and experiences for Vietnam*, International conference on management and business (COMB 2019), University of Economics, The University of Da Nang. ISBN: 987-604-84-4583-6.
- [24]. Tomas Coates (2019), *Developing University Spinouts in the UK, Key Trends in Spinout Activity, Investments and Investor Involvement*
- [25]. Tran Ngoc Diep (2008), *Improve efficiency of "Technology business incubator" in Hoa Lac Hi-Tech Park*, Master Thesis of the major: Science and Technology Management, University of Social Sciences and Humanities, VNU.
- [26]. Van Anh Q.T. (2019); *Technology policy to improve the business incubator at Ha Noi of universities in revolution 4.0*; Master Thesis of the major: Science and Technology Management, University of Social Sciences and Humanities, VNU.
- [27]. Vu Cao Dam (2006), *Lại bàn về doanh nghiệp Khoa học và Công nghệ*, Tạp chí Hoạt động khoa học, số 10/2006.
- [28]. Vu Cao Dam. (2016). *Paradox and Escape*. Hanoi: The Gioi Publishing House.
- [29]. Vanessa Pinter (2015): *Overview and analysis of the performance of Spin-offs at the Swiss Federal Institute of Technology Zurich and their effect on the Swiss Economy*.
- [30]. UNIDO (1999), Component 3, *Technology Business Incubators and Technology Parks, Indepth evaluation of selected UNIDO activities on development and transfer of technology*.p.3.
- [31]. United Kingdom Business Incubation (UKBI) (2003), *Benchmarking framework for business incubation: final report*, January 2003, UK Business Incubation, p.2.

PROPOSING A SYSTEM OF KEY PERFORMANCE INDICATORS (KPIs) IN VIETNAM TECHNOLOGY UNIVERSITIES: A CASE STUDY FOR ACADEMIC STAFF

Pham Thi Kim Ngoc* and Doan Hai Anh

School of Economics and Management, Hanoi University of Science and Technology, Hanoi, Vietnam

Hanoi, Vietnam

*Corresponding author: ngoc.phamthikim@hust.edu.vn

Abstract

There are various methods and tools that are applied to measure the growth of an organization such as MBO, KPIs, The Balanced Scorecards (BSC), 360 degree, etc. KPIs (Key Performance Indicators) is one of the most effective methods to measure the growth and to evaluate the performance of individuals and units within an organization (Parmenter, 2007). The purpose of this research is to develop a system of key performance indicators in Vietnam technology universities based on Balanced Scorecard approach. In this article, academic staff is chosen for case study. Focus groups were used to come up with the operational performance indicators through a series of meetings and discussions. A questionnaire was then designed to rate the favorability of the chosen KPIs and Fuzzy Conjoint Model was used to analyse the findings. The results are that 16 key performance indicators were developed under 5 main aspects: teaching and supervision, research and innovation, publication, consultancy and services.

Keywords: technology universities, balanced scorecard, key performance indicators, academic staff.

(This paper is on of renew Internation journal).

TECHNOLOGY INNOVATION OF VIETNAMESE ENTERPRISES

Trinh Thu Thuy^{1,*}, Trinh Minh Tam²

¹ Hanoi University of Science and Technology, Hanoi, Vietnam

² Vietnam Centre for Science and Technology Evaluation, Ministry of Science and Technology, Hanoi, Vietnam

*Corresponding author: thuy.trinhthu@hust.edu.vn

Abstract

In recent years, a system of financial incentives for technology innovation and technology transfer has been implemented in Vietnam. A number of new preferential policies are reflected in the Law on Science and Technology (2013), which stipulates funding from the state budget for the implementation of science and technology tasks. With the technology level, financial potential of the business is limited, the capacity of self-research is still modest. How can we increase technology innovation for Vietnamese enterprises? In the framework of a report, the authors propose a number of groups of solutions to improve the legal mechanism; creating a mechanism to link businesses with research and development organizations; building an information system on domestic and foreign technology markets; to form venture capital funds ... to contribute to promoting technology innovation in Vietnamese enterprises.

Keywords: Technology, innovation technology, enterprise.

1. INTRODUCTION

1.1. Rational of the paper

In recent years, a system of financial incentives for technology innovation and technology transfer has been implemented in Vietnam. A number of new preferential policies are reflected in the Law on Science and Technology (2013), which stipulates funding from the state budget for the implementation of science and technology tasks. Enterprise projects that apply the results of performing scientific and technological tasks to create new products or improve product productivity, quality and competitiveness can be supported up to 30% of total capital; support up to 50% of investment capital for projects implemented in socio-economic difficult and extremely difficult regions; support up to 50% of the investment capital for projects to perform national-level scientific and technological tasks in the State's priority and key sectors. All the mentioned incentives are aimed at enhancing potentials of science and technology. Technological innovations contribute to promoting technology transfer in Vietnamese enterprises. This main purpose of this paper is to:

- (i) Analyze the current situation of technology innovation in Vietnamese enterprises.
- (ii) Find out challenges and causes of technology innovation in Vietnam
- (iii) Propose some recommendations to promote technological innovation for Vietnamese enterprises.

1.2. Overview of Technology Innovation

According to the United Nations Industrial Development Organization (UNIDO), technology is the application of science to industry by taking research results and processing it systematically and methodically. According to the Asia-Pacific Economic and Social Commission (ESCAP, 1989), technology is the systematic knowledge of technical processes for processing materials and information; Technology includes the skills, knowledge, equipment, methods and systems used in creating goods and delivering services. According to the Organization for Economic Co-operation and Development (OECD, 1996), technology is understood as a set of techniques, which are themselves defined as a set of actions and selection rules that guide work. Sequential application of such techniques that, according to human understanding, will achieve a predetermined result in a given situation. According to the World Bank (WB, 1985), technology is the method of converting resources into products, including three elements: information and methods; means and tools using methods to perform the transformation; understanding how the method works and why.

In Vietnam, some materials used in research and teaching in recent years, concept of technology often refers to constituent elements of technology, based on the views of Sharif (1986) and Ramanathan. (1995). Accordingly, a technology consists of 4 components:

- (i) Technical part technology contained in objects such as machines, equipment, vehicles and infrastructure;
- (ii) The human part: technology is contained in the human technology skills, it includes knowledge, experience learned and accumulated in the process of using technology;
- (iii) Information: technology contained in the documented data forms for use in technology activities;
- (iv) Organizational part: technology contained in the institutional framework to build up an organizational structure such as regulations on powers, responsibilities, and the coordination of individuals in technology activities.

The Law on Science and Technology (2000, amended 2013) and the Law on Technology Transfer (2017) in Vietnam explain that “Technology is solutions, processes and technical know-how with or without the tools and means used to convert resources into products”. This is an important legal corridor for technology activities in Vietnam.

Up to now, there are many perspectives on innovation, based on different approaches, and have attracted the attention of many scholars around the world. According to Joseph Schumpeter (1934), innovation is the process of commercializing new elements or combining old elements in industrial organizations, involving new materials, new processes, new markets or a new organizational structure. According to Allan Afua (2003), innovation is the process of using new knowledge to provide new products and services to meet the needs of customers. Katz (2007) said that innovation is the process of creating, developing and implementing successfully new and unique ideas, including introducing new products, processes and methods for businesses, leading to success in production and

business activities, creating value for stakeholders, promoting economic growth and improving income.

According to the OECD, technological innovation, including product innovation or new manufacturing process innovation or technological improvements in products or manufacturing processes (Oslo Manual, 1995). Technological innovation occurs when new products (innovating or improving products) are introduced to the market or new technology is used in the manufacturing process (innovating or improving the manufacturing process). Technological innovation includes many different activities such as science, technology, organization, finance and commerce. An enterprise is considered to be technological innovation if it produces a new product or manufacturing process or has improvements in product or process technology during the review period.

At the enterprise level, there are four distinct types of innovation: product innovation, process innovation, marketing innovation and organizational innovation. Accordingly, compared to the previous definition, marketing and organizational innovation have broadened the range of innovative elements (Oslo Manual, 2005).

Technological innovation follows a linear model, which dominates the industrial and scientific policies of the years before the 1890s, and the initiators of this approach are Veblen, TB (1857-1929). The simplest linear model is called Science and Technology Push. This model is based on the scientific logic that is the basis, knowledge, and premise to create technology. In fact, most recent technological breakthroughs have been based on earlier scientific discoveries. The second linear model was born, called the market pull model, also known as the market pull. Martin, Michael J. C (1994) generalized the above two models into a linear model of "push technology" and "pull market".



Fig. 1: “Science and Technology Push” linear model (Martin, Michael J. C., 1994)

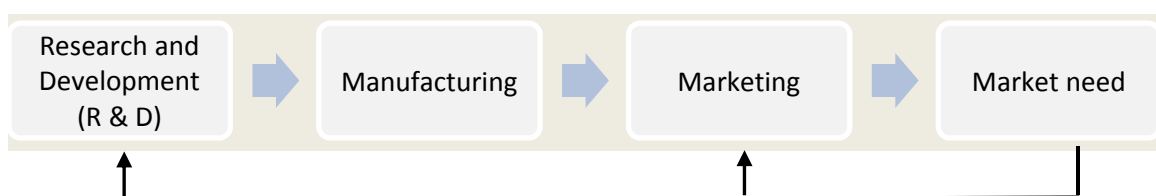


Fig. 2: “Science and Technology Pull” linear model (Martin, Michael J. C., 1994)

The new linear model focuses only on the role of the first innovation stimulants. In the combined interaction model that shows the result of the simultaneous coordination of knowledge of functional parts that drives innovation, it attaches the linear models together and emphasizes technological innovation as the result of the interaction between the market, the science and the organization's capabilities. The essence of this model is the integration of the whole system, taking the business as the subject, linking the elements of the innovation system. According to Freeman, C. (1982) and Dosi, G

(1982), innovation systems are formed on the partnership network between the public and private sectors, built on the basis of creating linkages and between the parties of government, universities, research institutes and enterprises, in which business plays a central role. In the innovation system, businesses are influenced by competitive factors: competitors, sources of innovative ideas for customers, partners and allies, universities, patents, at the same time taking into account the conditions for innovation, infrastructure, investment in assets, equipment, etc.

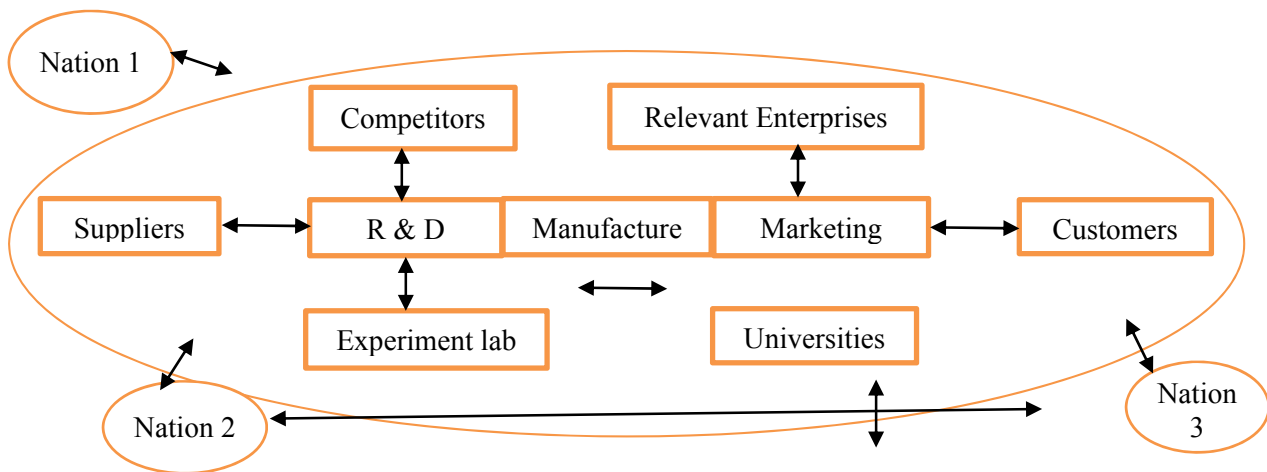


Fig. 3: Technology innovation by linkage network (Millko. K and et. al., 2010)

2. TECHNOLOGY INNOVATION OF VIETNAMESE ENTERPRISES

2.1. Government incentive policies for enterprise's technology innovation

In Vietnam, there are also key national economic and technical programs. These programs provide direct capital support to businesses operating in specific sectors. Support may even be extended to state services including consulting, technology transfer or training. In addition, National Programs of Science and Technology were developed as part of the 5-year plan.

The National Technology Innovation Fund was established under Decision 1342/QĐ-TTg dated August 5, 2013 with a charter capital of VND 1,000 billion from the State Budget. This is a financial fund, not for profit, with the function of preferential lending, loan interest support and guarantee for loans, supporting capital for enterprises transferring research and technology innovation.

In recent years, a system of financial incentives for technology innovation and technology transfer has been implemented in Vietnam. A number of new preferential

policies are reflected in the Law on Science and Technology (2013), which stipulates funding from the state budget for the implementation of science and technology tasks. Enterprise projects that apply the results of performing scientific and technological tasks to create new products or improve product productivity, quality and competitiveness can be supported up to 30% of total capital; support up to 50% of investment capital for projects implemented in socio-economic difficult and extremely difficult regions; support up to 50% of the investment capital for projects to perform national-level scientific and technological tasks in the State's priority and key sectors.

In addition, there is also an equity capital of enterprises to invest in innovation and technology transfer: Enterprises established and operating under the law may deduct up to 10% of their taxable income to set up a development fund of science and technology (Article 17, Law on Corporate Income Tax).

Besides value added tax incentives, import and export taxes, and corporate income tax under the Investment Law, the Law on Corporate Income Tax allows businesses to use their own capital to invest in science and technology, income tax reduction up to 10% and

rapid depreciation for equipment formed from technology investments.

Although the promulgated policies are quite complete, the practical and policy gaps have not shown signs of narrowing. Although there are new policy points related to innovation and technology transfer, the effectiveness of implementation and implementation results have not changed significantly. This shows that there is a need for a policy study with a more comprehensive approach to identify and evaluate the impact of policy on innovation and technology transfer activities of enterprises.

2.2. Current situation of technology innovation of Vietnamese enterprises

According to the Report of the World Intellectual Property Organization (WIPO, 2019), Vietnam's global innovation/ innovation index ranks 42 out of 129 countries. With this ranking, Vietnam ranks first in the group of 26 low-middle-income countries, 3rd in ASEAN, after Singapore and Malaysia.

Compared to 2018, two indicators related to science, technology and innovation increased strongly. In which, total spending on research and development increased by 5 ranks (inputs); 8-tier increase in products based on knowledge and technology (output). The index of the market development level increased by 3 steps; credit increased 4 ranks; increase labor productivity by 3 levels.

According to the survey results of the Institute of Scientific Evaluation and Technology Valuation, in the period 2010 - 2015, 48% of enterprises have invested in buying new machinery, equipment and technology. However, up to 8% of enterprises have barely changed their machinery and equipment since 2000 (15 years without buying any new machinery and equipment, only repairing and maintaining). Among enterprises that buy new machines, equipment and technology, only 15% invest in new technology, the rest buy new machines and old technology. For these enterprises, about 50% of new technology comes from developing countries, partly reflecting the weak financial potential of Vietnamese enterprises. Self-research capacity of businesses is also very limited. Also, according to the survey results, only 6% of enterprises have the ability to innovate on their own.

Regarding the origin of machinery and equipment used by enterprises: 60% are originating from developing countries (mainly China and Vietnam), about 30% of enterprises have machinery originating from G7 so many of them are old machines, manufactured in the 1980s and 1990s in Japan.

Regarding the situation of human resources in enterprises, with the surveyed enterprises, 86% of enterprises have a technical department but only 21%

will arrange R&D people. For small businesses, most of the R&D department is not separated into a department but rather a group undertaken by the owner of the business and a few associates, often only with technical innovations or regulations process and improve products; There is rarely any technological innovation.

In terms of staff qualifications, staff and worker skills: employees of 48.5% of businesses with university degrees or higher account for over 20% of the total workforce and 26% of businesses with university degrees or higher. over 10%. Regarding the workforce of enterprises: 61% of enterprises have a number of trained workers greater than 40% and 39% of enterprises have a workforce of high-level workers and have been with the company for a long time.

In terms of funding for R&D activities in the enterprises surveyed within the mandate, 82% of businesses do not spend money on research activities. Among firms that spend on R&D, 17% have spending more than 10% of their revenue. At present, only about 3% of enterprises dare to invest heavily in technology research and development activities with a rate greater than 10% of annual revenue.

The cost of training and retraining for professional qualifications and skills of staff and staff is also modest (24%). In fact, the survey of most companies shows that training in enterprises in the form of senior staff mentoring newcomers and this guidance is considered a mandatory task for team leaders/shift leaders/team leader without any additional funding allowance. Therefore, this self-training activity does not cost the business. Only when, according to the requirements of the profession, of the authorities, the enterprise can send people to study and fully bear the funding for this activity.

Survey results also show that, nearly 60% of enterprises have applied management standards according to international standards in production and business. This number shows that the application rate is quite high, but how effective it is to apply, it requires in-depth surveys. The remaining 40% of businesses are mainly located in small and micro enterprises. According to field observations, most of these businesses have a small number of employees, small capacity, low turnover, and often outdated machinery. Enterprises are also aware of and well-behaved in waste treatment. All enterprises located in industrial zones abide by the regulations on waste treatment. For businesses located in small or scattered clusters, the execution is coping.

The development of an enterprise cannot come continuously in the medium term but is tied to the effectiveness of the development strategies set by the business leaders. According to the survey results, 89%

of enterprises have strategies on products and markets; 68% of businesses have a technology strategy. Thus, technology strategy has not been given due attention or enterprise potential is too weak to be equipped with new machinery, equipment and technology. This fact also partly reflects the health of the business.

3. CHALLENGES FOR ENTERPRISES'S TECHNOLOGY INNOVATION IN VIETNAM

3.1. Fundamental difficulties

In general, all businesses have demands for technology innovation to support technology improvements, maintain and enhance competitiveness. However, businesses face certain obstacles in technology innovation such as: difficulties in capital and inability to raise capital, difficulties in high quality personnel, difficulties in access to sources of information, legality and techniques of technology innovation. According to the survey results of 118 manufacturing businesses with competitive advantage, businesses face many difficulties in technology innovation, as follows:

- Difficulties in capital and inability to raise capital during technology innovation process (47.5% agree and 13.6% strongly agree).
- Difficulties in high quality personnel during technology innovation process (51.7% agree and 11.9% strongly agree).
- Difficulties in making agreements with inventors and related parties during technology innovation process (51.7% agree and 11% strongly agree).
- Difficulties in valuing and evaluating of technology innovation (54.2% agree and 18.6% strongly agree).
- Difficulties in selecting technology innovations that can be commercialized (56.8% agree and 16.1% strongly agree).
- Difficulties in determining forms of cooperation with the parties during technology innovation process (66.9% agree and 12.7% strongly agree).
- Difficulties in determining ownership and interests during technology innovation process (52.5% agree and 19.5% strongly agree).
- Difficulties in applying technology innovation to create products supplying to the market (65.3% agree and 21.2% strongly agree).

Furthermore, when being asked "How effective are policies promoting technology innovation towards economic and social development?", the survey results of 68 people (inventors, investors, experts, managers) show that: 27.9% believe that those policies are effective and highly effective; 20.6% believe those policies are of average effectiveness and up to 51.5% believe that they are of low and very low effectiveness (mean 2.74 and standard deviation 1,045) (Trinh Minh Tam, Nguyen Huu Xuyen, 2017).

Although businesses have high demands for technology innovation, they still have many difficulties and thus need Government's/States' support in the first stage to successfully create and apply technology innovation. The survey results also show that businesses wish to receive support from the State through policies that promote businesses in applying technology innovation such as: policies to encourage investments, tax and credit incentives, training, policies to promote supply-demand in technology innovation, policies to encourage public-private cooperation in technology innovation, policies to support development of technology infrastructure.

3.2. Causes of difficulties

Until now, Vietnam has not had a separate policy for technology innovation. Policies have only been integrated in legal documents and in programs/projects/schemes about science and technology and promoting the development of industries with competitive advantage.

Policies promoting technology innovation have not received much attention from businesses, inventors, investors; at the same time, the quality of technology innovations is still average, the number of Vietnamese technology innovations being protected is small; the majority of technology innovations only solve problems that arise in single production, so the efficiency is not high. Tax and credit incentives, direct support and sponsorship, training have not really been highly effective during technology innovation process. The speed of technology innovation in businesses is still slow, especially there are few start-up businesses relying on investment, exploitation and commercialization technology innovation.

Intermediaries in the science and technology market have not really developed, sources of technology innovations are limited in both quantity and quality, there are few businesses that enhance productivity and business position through application of technological advances, even though businesses are highly aware and have demands for technology innovation.

Cooperation and joint activities in technology innovation have not developed, businesses' capacity is still limited; at the same time, many inventions are protected not for technology innovation but to prevent competitors in the industry. Moreover, the procedures to receive incentives are complicated, the incentives are not high, policy implementation and control still have certain limitations therefore haven't created motivation for businesses to innovate technology.

4. PROMOTING TECHNOLOGY INNOVATION FOR VIETNAMESE ENTERPRISES

To overcome above mentioned difficulties in order to promote technology innovation for Vietnamese

enterprises, some policies should be considered such as follows:

Firstly, the State must perfect the legal mechanism to help enterprises transfer technology more easily and with high efficiency. Reform policies on the import of machinery and equipment imported from abroad. Besides, it is also necessary to check and test carefully to avoid the situation of importing old and outdated equipment and machinery from abroad affecting the economy and environment.

Second, create a mechanism for the connection between business and research and development organizations.

Third, have policies to encourage the formation of organizations providing technology information and information to help businesses have opportunities to update technology information, select and formulate plans for technology innovation and It provides equal information to all businesses of different ownership sectors.

Fourth, the State needs to closely link the technology innovation activities of enterprises with the planning and development of socio-economic policies of the country. Such policies may be tax rates reduction or tax reduction in certain years, loans with preferential interest rates, information, etc.

Fifth, improve the quality of technology innovation project appraisal. Relevant agencies must evaluate investment projects in order to improve capital investment efficiency. At the same time, issue policy documents on the construction and evaluation process of projects and standards for a technology innovation project. Some procedures for testing and evaluating technology transfer are aimed at helping businesses make technology transfer easier.

Sixth, the State needs to continuously build an information system on domestic and foreign technology markets. Use communication tools to bring information to the business quickly and accurately. From there, businesses can learn more about new technologies in the country and in the world.

Seventh, the State needs to soon set up a fund "Venture Capital" to support enterprises to invest in new technologies, but with high risks. When innovating technology, enterprises have to face a big difficulty, which is capital, but it is not certain to innovate technology to bring high efficiency right after investment. In general, technological innovation forces businesses to take risks. Therefore, the State needs to create a "Venture Capital" fund in order to create motivation for enterprises when implementing technological innovation, in addition to helping enterprises solve some immediate difficulties.

Eighth, the State encourages enterprises to develop new products and upgrade existing products through the establishment of a product development support fund. These are important products of economic and export significance. In this way, businesses that want to be able to do that are forced to find new technologies to ensure the production of new products with higher quality and lower production costs.

5. REFERENCES

- [1] Derakhshani, S (1983). "Factor affecting success in international transfer off technology – A synthesis, and a test of new technology contingency model", *Developing Economies*, Vol.21, 1983, 27-45.
- [2] Dosi. G (1982). "Technological paradigms and technological trajectories: A suggested interpretation of the determinants and directions of technical change", *Research Policy*, 1982, Vol. 11, issue 3, pages 147-162.
- [3] Freeman C (1982). "*Innovation and long cycles of Economic Development*", Paper presented at the International Seminar on Innovation and Development at the Industrial Sector 1982.
- [4] Jeanner, J. and Liander, B. (1987). "Some patterns in the transfer of technology within multinational corporations", *Journal of International Business Study*, 1987, 108-118.
- [5] Martin, Michael J. C (1994). "*Managing Innovation and Entrepreneurship in Technology-based Firms*", Wiley-IEEE. p. 44.
- [6] Nguyen Dinh Phuc, Nguyen Trung Thanh, Trinh Minh Tam (2017). "Situation and solutions to promote technology transfer service in Vietnam", *Science and Technology Journal of Vietnam*, Vol. 6, 2027.
- [7] Trinh Minh Tam (2016). "Building capacity evaluation method of technology innovation of enterprises", Report of Ministerial research topic, Vietnam Centre for Science and Technology Evaluation, Ministry of Science and Technology, 2016.
- [8] Trinh Minh Tâm, Nguyen Huu Xuyen (2017). *Patent exploitation and innovation. From theories to practice*, Publishing House of National economics University, Hanoi, 2017.

THE APPLICATION OF ARTIFICIAL INTELLIGENCE TECHNOLOGY IN SUPPLY CHAIN MANAGEMENT IN VIETNAM

Tran Thi Thu Hai^{1,*}, Dinh Phuong Hoa²

¹ The School of Business Administration, University of Economics and Business, Vietnam National University, Hanoi, Vietnam

² The School of Business Administration, University of Economics and Business, Vietnam National University, Hanoi, Vietnam

*Corresponding author: tranhai.dbl@gmail.com

Abstract

Artificial Intelligence (AI) is known today for the development and creation of intelligent and thinking machines. It carries the ability to imitate, learn and replace human intelligence. Since the late 20th century, AI has shown great promise in improving human decision-making processes and later productivity in various business endeavors due to its ability to recognize business models, find out business phenomena, as well as information and analyze data intelligently. In Vietnam, as a developing economy, the application of science and technology, especially AI technology, in production and management is still being researched and implemented. On the other hand, although widely accepted as a decision aid tool, AI is still limited to use in supply chain management (SCM). To explore the potential benefits of applying AI to SCM, this study gives the urgency of using AI technology in the current 4.0 technology age in Vietnam to solve real problems which related to SCM. Therefore, this article evaluates success in AI applications to SCM through analyzing specific data on the current situation of AI application in the supply chain in Vietnam.

Keywords: artificial intelligence; supply chain management; blockchain technology.

1. INTRODUCTION

After 30 years of reform – “Doi moi”, Vietnam has had a strong development, becoming an integrated, dynamic and attractive economy in Southeast Asia in particular and Asia in general. In the context of development and international integration, along with the strong development of the industrial revolution 4.0, Vietnam has determined to focus on developing artificial intelligence (AI) technology - a spearhead. It is expected to be the most impressive growing technology industry in the next 10 years of Vietnam. Especially the development of AI technology in supply chain management in Vietnam is experiencing new breakthroughs and opportunities.

Artificial Intelligence (AI) is coming to life intensely, replacing many manual, labor-intensive jobs. In the world, the major powers have built their own development strategies for AI, taking AI technology as the core for the acceleration of the economy (Di Vaio & Varriale, 2020). In Vietnam, the Government has determined that AI technology is a breakthrough and need to be researched. The Ministry of Science and Technology focuses on advising and orienting to promote technology development, in which resources

are concentrated for the development of artificial intelligence (AI). At the same time continue to approve key science programs, support research and development of artificial intelligence technology, link researchers, investors, businesses, promote research and application of AI.

On the other hand, in this era of fierce competition, greater demand uncertainty, higher supply risks and increasing intensity of competition, supply chain excellence often depends on ability of the organization in integrating and coordinating all end-to-end processes of purchasing raw materials or components, converting them into finished goods and delivering them to customers. Since such capabilities can be enhanced by increasing visibility in closed supply chain processes, many leading cutting-edge organizations have attempted to enrich their information sources and share (Bouchard et al., 1988). Real-time information with supply chain partners. As a result, SCM is becoming more information intensive and its focus is on asset replacement and manual number handling by information (Min, 2010). Recognizing the growing importance of information to supply chain success, scholars have explored various ways to better manage information and leverage information to make business

decisions joint better. Artificial intelligence (AI) has been around for decades but has yet to be fully utilized in the SCM field.

With the arguments and the urgency of the topic about the application of AI technology in SCM, this paper will analyze the theoretical framework based on factors that directly affect SCM and the main outstanding factors when applying AI to solved the case of SCM in Vietnam including Managers and AI policy makers; The application of Blockchain technology; The employee’s technology skills; Supplier involvement; and Multidimensional data sources.

In order to be able to smoothly apply and develop AI technology, managers must have a background knowledge of AI in innovating science and engineering policies within the organization with the requirements and challenges of the regional and global economy. Some Vietnamese enterprises currently apply AI policies to the SCM system but have not yet met the set expectations. Therefore, researching how to manage as well as AI policies in SCM is extremely important for businesses in particular and Vietnamese economy in general to be able to integrate with the world in the era of 4.0 technology today. This is also a question raised in many times of meetings of the Government of Vietnam.

Blockchain technology can dramatically transform many activities and operations in the supply chain requiring the increasing attention of scholars and practitioners (Kamble et al., 2019; Zheng et al., 2018). Indeed, the increasing use of new technologies, particularly the application of artificial intelligence (AI) will affect SCM (Kamble et al., 2019; Saberi et al., 2018). In fact, the author found that blockchain technology allows people to elevate and track goods and passengers in real time from their origins through the overall SCM. In the general supply chain, blockchain technology allows all stakeholders in the operation to know who is potentially developing what action by identifying and demonstrating the timing and location of those actions. One of the most directly related benefits of blockchain technology to SCM is the provision of viable solutions for identity management (Kshetri, 2018). Indeed, the breakthrough technologies have been making important changes and changing all business models from start to finish in the main economic sectors in Vietnam. Due to blockchain technology, SCM global in general and SCM Vietnam in particular are being re-argued, redesigned and reshaped to suit the context of the emerging economy. The adoption of these new technological solutions is revolutionizing the traditional processes used to create value. The advent of blockchain technology brings more flexibility in terms of space and time. New technology is bringing operations, manufacturing, and sales closer, and it is driving

significant change by rethinking, redesigning, and reshaping the SCM.

By using the methodology of quantitative, this article will analyze the factors affecting the application of AI in SCM in Vietnam, data analysis and encoding necessary information related to the proposed theoretical framework. The results of effectively utilizing AI technology in SCM in the context of the developing and integrating economy of Vietnam currently.

2. LITERATURE REVIEW

When implementing this study, the authors selected the main factors affecting SCM and AI in the case of Vietnam.

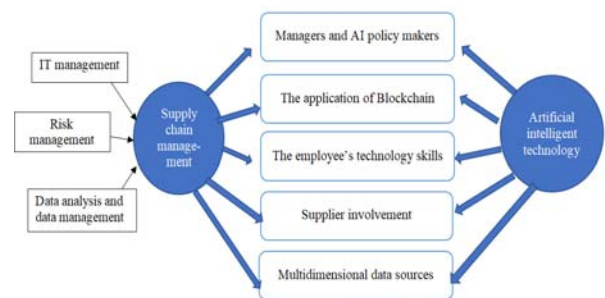


Fig.1: The theoretical framework of supply chain management combined with AI technology application (adapted from Pervaiz, 2020; Di Vaio & Varriale, 2020; Baryannis et al. 2019)

2.1. Supply chain management (SCM)

According to the research of Di Vaio and Varriale (2020), supply chain is often summarized as a network of organizations from supplier to end user, intending to synchronize supply and demand through the concerted efforts of stakeholders. This leads to SCM as this management perspective consists of managing and integrating a set of essential business systems selected from customers through single vendors, managing operations and the data that complements the motivation for customers and other stakeholders through the collaborative efforts of supply chain members. (Kshetri, 2018).

Supply chain management is understood as the work that is prepared and tested for the purpose of persuading the acquisition (Pervaiz, 2020), and all appropriate application and logistics operations. In terms of meaning, SCM is a combination of relationships with people participating in activities (Baryannis et al., 2019). These individuals can be providers, mediators, outside expert organizations, and clients. On the other side, the flexible chain coordinates the board skillfully and smoothly, requiring the board within and between the companies to have an appropriate coordination and decision-making.

Understanding supply chain management practices is helpful for understanding advance arrangements. This is also essential in the design of each and every flow data with operational logistics. Both internally and externally transmit data horizontally by a group and between companies.

However, there is also an argument by Baryannis et al. (2020) that SCM and logistics management are not significantly different. Looking at both theory and practice, the SCM covers all logistics operations and processes between departments and between companies. In contrast, logistics management is a part of SCM (Li et al., 2017), including activities to help manage the flow of goods effectively. Therefore, it is a fact to accept that when doing research about SCM, logistics management is included in the SCM process.

It can be seen that some of the main factors impact SCM and they are used properly by employing internal and external means to deliver efficiency such as risk management, information technology management, data analysis, and confidential data management (Pervaiz, 2020; Di Vaio & Varriale, 2020; Baryannis et al. 2019). Indeed, it cannot be denied that the idea of starting a supply chain is logically expressed, convincing the performance and competitive advantage of the organization.

Moreover, supply chain is the aspect that very few Vietnamese enterprises mention or do not have many real studies on this area (Phan et al., 2019). Truong et al. (2017) also argue that it is easy to explain because of two main reasons that many managers believe that it is "a very normal aspect of the organization". First, the executives (e.g. directors, CEO, etc.) argue that more focus should be on marketing, on sales, on market exploration (Phan et al., 2019; Truong et al., 2017; Li et al., 2017). Especially in the context that the business is weak, comprehensively from marketing, to sales, to market development, distribution channel etc. It can be mentioned that the non-stop vortex of competition with competitors. And businesses accidentally forget about a weapon of silent competition - the supply chain. The real supply chain can help more than the organizations think. The second cause is lack of information and transparency in the entire supply chain (Vuong et al., 2019). Vuong et al. (2019) report that when asking a senior manager of a business about how efficient the supply chain they are running, the answer is usually "Good, I don't see any problem". But when asked, "How good is it? Which basis do you think is good?" then the answer will be very general. This is also a common problem for many Vietnamese businesses. Therefore, the importance to apply the supply chain logically and methodically is what businesses in Vietnam should apply in conjunction with AI technology.

2.2. Artificial intelligent technology (AI)

In the past few decades, Artificial Intelligence (AI) is a new technology and science. This is considered a scientific achievement in theories, devices, growth and applications. Besides the internet of things, AI simulates human intelligence through image recognition, computer robots, speech recognition, expert systems and natural language processing (Min, 2010). With the support of Artificial Intelligence and linked computer technologies, organizations and companies are adopting more and more to understand the characteristics of human intelligence and the design of possible computer systems and create knowledge related to problem solving. Therefore, AI needs to be able to learn and understand new concepts, learn from experience, make inferences, draw conclusions, imply and interpret symbols in context (Pervaiz, 2020).

In other words, Artificial Intelligence (AI) is a general period used to define computerized approaches, provide knowledge, reason, self-study (Min, 2010; Baryannis et al., 2019), and make decisions to make machines operate smarter, helping to run business operations more efficiently.

In the context of enterprises developing supply chains at the moment, especially in developing countries like Vietnam, AI is both an opportunity and a big challenge (Vuong et al., 2019). If businesses can apply AI to the implementation of SCM, the opportunities for development and integration will be very high. However, from a macro perspective, when AI research and applications are still limited in Vietnam, it is imperative that businesses use a lot of human resources and time, as well as update technical technologies to be able to apply and deploy AI technology (Di Vaio & Varriale, 2020), which in this case specifically serves SCM. Indeed, not only in Vietnam but in the world, besides being widely accepted as a tool to support business decisions, AI is still limited in application in SCM.

2.3. Artificial Intelligent in supply chain management

AI can bring enormous benefits to supply chain operations. These include cost savings through reduced redundancy and risk reduction, improved forecasting, faster deliveries through more optimized routes, and improved customer service, etc. However, many arguments admit that AI has yet to reach widespread adoption (Di Vaio & Varriale, 2020; Pervaiz, 2020; Min, 2010). In contrast, the increase in funding, development and acquisitions of startups and artificial intelligence technology. Developed economies and developing countries like Vietnam have increased the use of AI for commercial purposes. Simulated intelligence can comfortably develop good items and improve functionality, quality and cost in terms of production

(Pervaiz, 2020). It can improve analytical maintenance through activities such as managers and AI policy makers, blockchain technology, the employee's technology skills, supplier involvement and multidimensional data sources, etc.

Many organizations are applying computer theory in board chains flexibly, especially in the retail e-commerce industry in major cities of Vietnam (Hanoi, Danang, Ho Chi Minh city). Despite the fact that capabilities with AI are frequently talked about, there is small direction toward conventional parts of AI adoption. As there is more research showing that all organizations are not equipped to progress with innovation (Min, 2010; Baryannis et al, 2019), the challenges cannot be ignored when monitoring various exercises of the flexible table chain while applying AI simultaneously.

On the plus side, AI has grown rapidly in recent years by creating value chains for supply chain management. Indeed, AI is contributing to the growth of enterprise revenue and cost savings in existing industries. It can be seen that companies are using a variety of applications in their day-to-day operations. AI can streamline every aspect from demand to supply with minimal human involvement (Di Vaio & Varriale, 2020). It is also effective in the correct planning that will make supply chain management processes more reliable now and in the future in the era of technology 4.0.

2.4. Managers and AI policy makers

While the application of blockchain technology brings many benefits, especially in improving business operations, these new technological solutions do not guarantee the best performance in electronic matters, efficient and sustainable. According to Di Vaio and Varriale (2020), regulators and policy makers need to work together to create a real forum within their collaborative network, which has a common culture and mutual trust.

Indeed, Baryannis et al. (2019) believe that while technology seems to dominate the operations, production and competition of an economy, managers are always at the forefront in implementing policies related to update science and technology, especially AI technology to handle business activities.

Currently, in Vietnam at present, there are many managers who are afraid to change and apply new technology because of the traditional style. This inadvertently creates a lag in the operation and general operation of the whole business for its stakeholders (Phan et al., 2019).

The contribution of policy makers will be highly decisive in running a business. They must be aware of changes resulting from the implementation of digital

technology and must adopt appropriate action policies to avoid infringement of economic and social rights (Bocken et al., 2014). The digital technology's strong analytical capabilities could be an asset to policy makers in this regard and could help prioritize sustainability goals in the new scenario driven by AI technology (Pervaiz, 2020).

Manager and policy makers are currently facing a race of creativity, innovation and coming up with new solutions rather than just crunching the numbers (Baryannis et al., 2019). Thus, they need to make business operations more efficient and more effective with new AI technology. That's the vision of better decisions that offer suitable conditions to apply AI tools.

Above all, the first hypothesis can be formulated: "Hypothesis 1 - Managers and policy makers creates favorable conditions for applying AI technology to SCM".

2.5. The application of Blockchain technology

Blockchain technology includes distributed transaction database, in which the security and trustworthiness for collecting and sharing data is cryptographically secured through a consensus mechanism. Therefore, Blockchain can be considered a public ledger, which stores all committed transactions in a blockchain that continually grows as new blocks are added to it (Zheng et al., 2018; Di Vaio & Varriale, 2020). In addition, the main characteristics of the type of blockchain technology, are considered to be of paramount importance in corporate governance. Besides, it comes with the benefits of decentralization, resilience, infrequency, and auditing capabilities. Thus, in today's 4.0 technology, because of Blockchain technology, any transaction through blockchain can be done in a decentralized way. As a result, the cost of implementing in a decentralized way can be significantly reduced and efficiency improved (Zheng et al., 2018). Indeed, blockchain technology, considered to be a groundbreaking new kind of internet technology, is widely used to assist technology businesses in improving their production processes and reducing their costs and that. It is also one of the positives that AI technology brings advantages to businesses.

In terms of SCM, blockchain is a perfect factor in the field because it is the combination of data linked with odd blocks and stored on all of the user's smart devices. Thus, Zheng et al. (2018) believe that these data instruments can be in chunks of chain form thanks to their sequence in the form of a transaction. For example, to implement an issue that requires new regulation, the business must have consensus coming from both side and supply chain partners. Therefore, all data will be synchronized into users, creating a very high feature.

In other words, SCM is an approach to solving the work of planning and testing materials, operations, and information from supplier to customer end (Kshetri, 2018). Thus, it makes sense to use blockchain technology for distribution because all components of the application supply chain, from the component supplier to the retailer, have distribution and, ultimately, is achieved. Positive degree has no competitive advantage in communication logistics systems (Blome et al., 2014).

With the advantage of a young population, a high percentage of internet users, a large number of smart phone users, a rapidly growing e-commerce, etc. Vietnam is considered as a country with great potential for developing applications using blockchain technology, replacing traditional transactions and working ways.

While blockchain is a perfect ledger used to store data, AI is the engine that firms could tap into for analysis and improve decision-making process (Zheng et al., 2018). Blockchain create situations where AI can benefit from that and take the exploitation of data to new levels (Di Vaio & Varriale, 2020).

Therefore, we consider the second hypothesis: "Hypothesis 2 - Companies using Blockchain technology are more likely to apply AI technology to SCM".

2.6. The employee's technology skills

The application of AI in enterprises is considered as the optimal solution in the 4.0 revolution. However, in other respects it directly affects human's jobs. AI will replace millions of jobs, with unskilled workers being the most threatened (Li et al., 2017). In the future, no industry will stand outside the influence of AI and automation and to some extent AI is competing with humans in the labor market.

For the business community, it is seen as a resource to increase competitiveness. In enterprises, many jobs previously performed by humans have been replaced by AI. According to Min (2010), AI has brought positive effects, in some industries such as tourism, aviation, military, and defense, labor productivity can be doubled. Not only the leading enterprises but also small businesses tend to apply AI in SCM to increase productivity and increase the competitiveness of businesses (Baryannis et al., 2019).

However, the application of AI technology in SCM still has to be owned by humans, so AI cannot completely replace humans (Li et al., 2017; Di Vaio & Varriale, 2020). Therefore, the training of high-quality human resources to acquire, receive and operate AI applications is essential.

The 4.0 revolution will take away many jobs but will also create new jobs that require high skills. During this revolution, many professions will disappear, but new jobs are born. Of course, these jobs require human resources to be equipped with the appropriate knowledge and skills to meet the requirements in the new situation.

In today's new business environment, both people and machines matter. By integrating roles in areas such as supply chain planning, the synergy of people and machines creates new sources of value for businesses. Indeed, AI affects employment problems. However, that does not mean that traditional human resources will become obsolete. In fact, Baryannis et al. (2019) has pointed to the current misconception that AI systems will replace humans in almost every field.

In practical, technology can completely replace humans to perform some jobs, which of course leads to workers losing their jobs or cutting wages but not entirely occupations can replace humans with AI. It is clear that AI technology will be widely applied in many areas that increase inequality in society. In addition, AI technology will also become a competitor to countries that provide cheap labor.

The strong development of the 4.0 revolution also means that businesses will follow the trend of applying AI in production and business, especially in developing countries like Vietnam. This is expected to have rejection of workers, especially low-skilled workers. Therefore, in the future, there should be changes in human resource training and skills improvement needed to catch up with the trend. While AI can be used to perform a number of tasks including top management decision-making, the true power of technology is to enhance human capabilities and this is being made. That's exactly what happens in the supply chain arena. And the task of businesses now is to improve the employee's technology use in combination with AI technology in SCM.

Base on these facts, we come up with the third hypothesis: "Hypothesis 3 - The employee's technology skills positively support applying AI technology to SCM".

2.7. Supplier involvement

While managers around the world are aware of the need to develop supplier partnerships, integrate and organize commodity flows from supplier and supplier to end-customers. Besides sharing information among partners in the supply chain, the essential infrastructure for such seamless addition is still inaccessible due to certain difficulties (Min, 2010). Developing markets are under pressure to quickly deploy logistics and supply chain matching to compete globally, and Vietnam is no exception.

It can be seen that the well-organized management of the end-to-end design, planning and forecasting process, sourcing supplier networks is still complex, and the production and distribution of products. In fact, from raw materials to the final customer to the final customer, certain limitations still exist in the implementation of SCM, especially for suppliers involvement (Pervaiz, 2020).

Furthermore, controlled use of AI technology can evaluate the effectiveness of potential suppliers, broaden information exchange among stakeholders, and reduce decision-making time, and it becomes easier.

In the field of SCM, AI can help businesses fully capture the real-time business situation, assist in strategic decision-making, plan allocation and job execution assurance, and helps to diversify and fully diversify the participation of suppliers.

It can be seen that the well-organized management of the end-to-end design, planning and forecasting process, sourcing supplier networks is still complex, and the production and distribution of products. In fact, from raw materials to the final customer to the final customer, certain limitations still exist in the implementation of SCM, especially for suppliers involvement (Pervaiz, 2020).

As a result, the following hypothesis can be formulated: "Hypothesis 4 - Supplier involvement is necessary to apply AI technology to SCM".

2.8. Multidimensional data sources

AI technology provides access to real-time data and multi-source data that can be accurately used by business organizations to revolutionize supply chain management processes.

Big Data of AI technology are large and complex data sets. Indeed, it is extremely large that traditional data processing software is not able to collect, manage, and process data in a reasonable amount of time.

Multidimensional sources of information and analysis can be applied to a wide variety of business problems and use cases. Big Data is actually being applied to many areas of the economy (eg e-commerce, retail, digital marketing, healthcare, retail), making impressive changes, help increase efficiency and productivity of the business. Using this data source combines simultaneous analysis of timing data, transaction data, social media data, and forecasts that best pinpoint specific campaigns and products to stay relevant, ready to supply to customers.

Large datasets are also included in the studies of Pervaiz (2020) and Solanki and Brewster (2013) with the aim of increasing visibility in the global supply chain. The authors argue that administrative burdens may be reduced if supply chain participants share information

such as product traceability as linked multidimensional open data, with rights control mechanisms, appropriate privacy, security, and access. By minimizing the amount of invisible, missing, or inexplicable data, supply chain risk analysis can deliver improved results.

Each different big data source will have different methods of exploiting and managing big data according to AI technology. The advent of data-as-a-self-service solutions and services allows companies to analyze their data without having to build engineering department of learning data, just relying on AI technology.

Diverse data gives a multidimensional view of phenomena and things of interest in order to distinguish them and thus enable accurate detection of valuable samples (Solanki and Brewster, 2013). New data is created and moved at real-time speed and requires AI processes and technologies in data control to preserve data quality and accuracy because samples really matter only if they are extracted from the authenticated data source.

Accordingly, the following hypothesis can be suggested: "Hypothesis 5 - Multidimensional data sources positively supports applying AI technology to SCM".

3. METHODOLOGY

Research design: This study was conducted with surveys in companies operating in Vietnam. Data was collected in two months, July and August 2020. The 5-point scale is used for statements of the second part ranging from "1" - Strongly Disagree, "2" - Disagree, "3" - No comments, "4" - Agree, "5" - Strongly agree. The questionnaire was referenced from previous studies such as Di Vaio & Varriale, 2020; Pervaiz, 2020; Baryannis et al., 2019; Li et al., 2017; Min, 2010.

Sampling and data collection method: The minimum sample size of the research was 194, following the rules of Tabachnick and Fidell (2007) for studies using factor analysis ($n \geq 50 + 8p$, where n is the minimum sample size, p is the number of factors (independent variables) in the research model. Targeted firms are companies in the 3 largest cities in 3 regions of Vietnam, namely Hanoi, Da Nang and Ho Chi Minh City. It is due to the fact that firms in large cities will most likely be impacted by AI. Cities become the main battleground for AI innovation. Besides, these firms are easy to access online to collect data. We distributed 300 questionnaires to Vietnam supply chain companies via email and got the response rate of 72% (216 votes collected).

Data analysis method: The collected data was analyzed with the help of SPSS 20.0 and multivariate statistical analysis techniques.

4. RESULTS AND DISCUSSION

4.1. Scale results using Cronbach's alpha. and exploratory factor analysis

Table 1: Results of measuring reliability of scale

Factor	Cronbach's Alpha (Number of observed variables)	Corrected Item-Total Correlation (Observed variable)	KMO	TVE (%)	The smallest factor loading (Observed variable)
MP	0.918 (4)	0.784(MP2)	0.903	79.821	0.823 (MP3)
AB	0.826 (4)	0.697(AB4)	0.837	75.362	0.745 (AB4)
TS	0.795 (3)	0.624(TS3)	0.798	70.201	0.714 (TS3)
SI	0.746 (3)	0.562 (SI1)	0.682	65.067	0.692 (SI1)
DT	0.835 (4)	0.612(DT4)	0.735	78.145	0.742(DT2)
AI	0.831 (5)	0.656 (AI2)	0.791	73.072	0.763 (AI3)

Source: Author's own calculation

The reliability assessment of scales in the model showed that the factors have reached internal consistency, the Cronbach's Alpha coefficients are greater than 0.7 (the smallest is 0.746 with the supplier involvement factor) and each factor has a correlation coefficient of greater than 0.3 (Table 1). Factor discovery analysis shows that the set of observed variables in each factor is unidirectional and factor analysis is appropriate to the research data. The KMO coefficients are greater than 0.5 ($0.5 < KMO < 1$), the total variance explained (TVE) is greater than 50%, the factor loading is greater than 0.5 (Table 1).

4.2 Correlation analysis

The analysis results show that the average assessment of the application of AI technology in Vietnam supply chain and the factors in the model are all above 3 in the 5-point Likert scale and the standard deviation of the factors is also quite small (less than 1). Researched companies rated the highest in the application of Block chain (Mean = 3.880, SD = 0.865) and lowest in the supplier involvement (Mean = 3.316, SD = 0.806) (Table 2).

Table 2: Correlation matrix and evaluation score for each factor

Variable	Mean	SD	MP	AB	TS	SI	DT	AI
MP	3.675	.716	1	.728**	.642**	.215**	.326**	.682**
AB	3.880	.865	.728**	1	.283**	.514**	.196**	.410**
TS	3.452	.926	.642**	.283**	1	.475**	.168**	.596**
SI	3.316	.806	.215**	.514**	.475**	1	.401**	.642**
DT	3.521	.758	.326**	.196**	.168**	.401**	1	.453**
AI	3.548	.814	.682**	.410**	.596**	.642**	.453**	1

Source: Author's own calculation

Table 2 shows correlation coefficients between pairs of variables in the model. Gujarati argued that if the correlation coefficient among independent variables in the regression model exceeds 0.8, it is likely to lead to high multicollinearity in the model (Gujarati, 2004). Then, the sign of the regression coefficients in the model can be changed, leading to research results are incorrect. In general, the correlation coefficients between all pairs of independent variables in the regression model have

the absolute value to be less than 0.8. In addition, to quantify the multicollinearity between the independent variables in the variance inflation factor (VIF) regression model was also estimated. The results show VIF coefficients of all variables are less than 10. Therefore, multicollinearity is not a serious problem affecting the results of the model (Gujarati, 2004).

4.3. Regression analysis and verification of research hypotheses

Table 3: Results of regression analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics
	B	Std. Error	Beta			VIF
(Constant)	0.297	0.234		1.296	0.200	
MP	0.190	0.050	0.192	2.608	0.023	1.768
AB	0.335	0.042	0.337	5.143	0.000	1.398
TS	0.137	0.034	0.138	1.079	0.010	1.624
SI	0.106	0.035	0.112	1.285	0.005	1.277
DT	0.182	0.065	0.186	7.085	0.002	1.758
adjusted R square	0.618					
p-value (F test)	0.000					

Dependent variable: AI

Source: Author's own calculation

The results show that the p-value of the F test = 0.000 < 0.05, indicating that at least one study variable in the model influenced the dependent variable (AI). The coefficient of adjusted R square = 0.618 indicates that 61.8% the application of Artificial Intelligence to Supply Chain Management in Vietnam is explained by the independent variables in the model and 38.2% of the variance of dependent variable is influenced by other factors not included in the model. Besides, all 5 independent variables included in the analysis have regression coefficients with Sig. less than the significance level 5%. Therefore, all 5 variables have a positive correlation with the dependent variable. In which, the most correlated variables with the application of Artificial Intelligence to Supply Chain Management are: "The application of block chain" and "Managers and AI policy makers" and "Multidimensional data sources" with standardized regression coefficients respectively 0.337 and 0.192 and 0.186. The test results also show that the model does not violate the hypotheses of the regression model on the multicollinearity, the normal distribution of residuals and the variance of variance. Summary of hypothesis testing results of the research model is presented in Table 4.

Table 4: Hypothesis testing results

H1	Managers and policy makers creates favorable conditions for applying AI technology to SCM	Accept
H2	Companies using Blockchain technology are more likely to apply AI technology to SCM	Accept
H3	The employee's technology skills positively support applying AI technology to SCM	Accept
H4	Supplier involvement is necessary to apply AI technology to SCM	Accept
H5	Multidimensional data sources positively supports applying AI technology to SCM	Accept

5. CONCLUSION

To assess the application of Artificial Intelligence to Supply Chain Management in Vietnam, the enterprise sector empirical study is conducted at the local level with 300 companies nationwide. We find that *managers and policy makers, the application of Blockchain technology, the employee's technology skills, supplier involvement and multidimensional data sources* are factors that have positive effects on AI application. Several implications can be withdrawn from these findings.

First, it is the important role of *managers and policy makers* since they make decision, investment and application of AI technology possible and efficient. Supportive policies toward AI application in supply chain management not only increase the profitability opportunity for enterprises but also have a good impact on labor.

Second, the *Blockchain technology* should be applied widely to improve technological capacity, innovate technology for production and improve the competitiveness of enterprises. Companies need to coordinate with technology experts, research teams, domestic and foreign scientists to conduct research and implement research support policies of AI application.

Third, more *skilled workers* ensure the success of applying AI technology. This calls for the need of workers to get training to acquire better technology skills and earn higher lifetime income. Beside, the application of AI technology would make some skills be obsolescent and thus require workers to constantly update their skills and knowledge.

Fourth, a positive relation between the *supplier involvement* and AI application would suggest that the more number of enterprises using AI technology in

supply chain management, the more the more likely it is to apply Artificial Intelligence successfully. The rising emergence of enterprises using AI technology in supply chain is clearly a good sign. In addition, enterprises themselves need to invest in human resources and equipment to innovate technology and master key AI technologies.

Finally, *multidimensional data sources* have a positive effect on AI technology application. Innovation is crucial to the success of applying AI technology in any organization. And to innovate, companies need multidimensional data sources. Supportive government policies for the application of multidimensional data sources are thus preferred.

6. REFERENCES

- [1]. Baryannis, G., Validi, S., Dani, S., & Antoniou, G. (2019). Supply chain risk management and artificial intelligence: state of the art and future research directions. *International Journal of Production Research*, 57(7), 2179-2202.
- [2]. Blome, C., Schoenherr, T., & Eckstein, D. (2014). The impact of knowledge transfer and complexity on supply chain flexibility: A knowledge-based view. *International Journal of Production Economics*, 147(part B), 307-316.
- [3]. Bocken, N. M. P., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, 65, 42-56.
- [4]. Bouchard, E., Kidwell, G., & Rogan, J. E. (1988, September). The application of artificial intelligence technology to aeronautical system design. In *Aircraft Design, Systems and Operations Conference* (p. 4426).
- [5]. Di Vaio, A., & Varriale, L. (2020). Blockchain technology in supply chain management for sustainable performance: Evidence from the airport industry. *International Journal of Information Management*, 52, 102014.
- [6]. Gujarati, D. N., 2004. (2004). "Basic Econometrics". 4th edition. McGraw – Hill Irwin.
- [7]. Kamble, S. S., Gunasekaran, A., & Sharma, R. (2019). Modeling the blockchain enabled traceability in agriculture supply chain. *International Journal of Information Management*.
- [8]. Kshetri, N. (2018). Blockchain's roles in meeting key supply chain management objectives. *International Journal of Information Management*, 39, 80-89.
- [9]. Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, 18(1), 86-96.
- [10]. Min, H. (2010). Artificial intelligence in supply chain management: theory and applications. *International Journal of Logistics: Research and Applications*, 13(1), 13-39.
- [11]. Pervaiz, S. (2020). The Role of Artificial Intelligence in Supply Chain Management.
- [12]. Phan, A. C., Nguyen, H. A., Trieu, P. D., Nguyen, H. T., & Matsui, Y. (2019). Impact of supply chain quality management practices on operational performance: Empirical evidence from manufacturing companies in vietnam. *Supply Chain Management: An International Journal*, 24(6), 855-871.
- [13]. Saberi, S., Kouhizadeh, M., Sarkis, J., & Shen, L. (2019). Blockchain technology and its relationships to sustainable supply chain management. *International Journal of Production Research*, 57(7), 2117-2135.
- [14]. Solanki, M., and C. Brewster. 2013. "Consuming Linked Data in Supply Chains: Enabling Data Visibility via Linked Pedigrees." In *COLD 2013 - Proceedings of the Fourth International Conference on Consuming Linked Data*, Vol. 1034, 74-86.
- [15]. Tabachnick, B. G., and Fidell, L. S. (2007), *Using Multivariate Statistics (5th ed.)*, New York Allyn and Bacon.
- [16]. Truong, H. Q., Sameiro, M., Fernandes, A. C., Sampaio, P., Duong, B. A. T., Duong, H. H., & Vilhenac, E. (2017). Supply chain management practices and firms' operational performance. *The International Journal of Quality & Reliability Management*, 34(2), 176-193.
- [17]. Vuong, Q., Ho, M., Vuong, T., La, V., Ho, M., Nghiem, K. P., Ho, R. C. M. (2019). Artificial intelligence vs. natural stupidity: Evaluating AI readiness for the vietnamese medical information system. *Journal of Clinical Medicine*, 8(2), 168.
- [18]. Zheng, Z., Xie, S., Dai, H. N., Chen, X., & Wang, H. (2018). Blockchain challenges and opportunities: A survey. *International Journal of Web and Grid Services*, 14(4), 352-375.

DIGITALIZATION IN OPERATIONS AND SUPPLY CHAIN MANAGEMENT OF VIETNAMESE TEXTILE AND GARMENT ENTERPRISES

Nguyen Danh Nguyen and Tran Thi Huong*

School of Economics and Management, Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: huong.tranathi@hust.edu.vn

Abstract

Digitalization is the inevitable trend and fundamentally changed business and society. Digitalization is providing opportunities to enrich research and practice in the field of operations and supply chain management in almost business sectors, and the textile and garment industry is no exception. This paper investigates the current status of digitalization in operations and supply chain management of Vietnamese textile and garment enterprises. The research also explores challenges and proposes recommendations to foster the digitalization process in operations and supply chain management of Vietnamese textile and garment companies.

Keywords: Vietnamese textile and garment enterprises, digitalization, operations management, supply chain management.

1. INTRODUCTION

Digitalization is one of the prevalent trends altering society and business. It is referred to as the “more fundamental change than just digitizing existing processes or work products” and the use of digital technology in all aspects of human society (Parviainen et al., 2017). Digitalization of industry already began in the 1970s, and the current term “digitalization” refers to the second digital revolution when integration of operational technology (OT) and information technology (IT) (Isaksson et al., 2018). According to (Isaksson et al., 2018), the term “digitalization” stands for “new possibilities provided by the use of more and new types of data, communication infrastructure, and computing power”. But what are the motivations encouraging the industrial practitioners to apply these technologies to control their process and operations? According to Holmström et al., (2019), digitalization provides managers friendly- user interface production-control systems which allow managers to (i) connect and assess real-time information, (ii) visualize resource availability and changes during the production process, and (iii) detect bottlenecks and process variability faster and more accurately than ever.

The textile and garment industry has changed continuously in recent years. The enterprises innovated carrying out their business in a systematic way. Besides applying technologies of Industry 4.0 in the production system, textile and garment enterprises also studied and

deployed 4.0 technologies in their management system to facilitate connection and traceability with other members in the global value chain and transparency information to their customers. There are a number of digital technologies to digitalize operations and supply chain management (OSCM) activities of textile and garment enterprises, such as Enterprise Resource Planning (ERP), Product Life Cycle Management (PLM), Manufacturing Execution System (MES), Supply Chain Management (SCM), Transportation Management System (TMS), Warehouse Management System (WMS).

The textile and garment sector can be defined as a traditional and labor-intensive manufacturing sector (Ramachandran, 2020). The production process is relatively complex and contains a variety of products (with changing criteria such as size, color, models). In addition, the rhythm of production fluctuates with high frequency. Implementing ERP helps (i) improve the quality and efficiency of the manufacturing process, (ii) increase traceability of manufacturing progress, (iii) better planning, and (iv) decrease operating cost through integrating processes of the business across departments (Fibre2Fashion, 2020). Centric Manufacturing PLM also helped VT Garment, a leader in Thailand’s textile manufacturing industry, reduce lead time by 7%, cuts Time to Market by 20%, and increase productivity by 30% (Whichplm.com, 2020). Forever 21, Zara and H&M, and many other large apparel brands applied a PLM solution to save time, cut costs, and accelerate

speed to market in order to catch up with Fast Fashion (McGregor, 2015). After the coronavirus crisis, experts recommend that the first step to reset the industry, which is notoriously labor-intensive and defiantly low-tech, and much dependent on intermediaries-sourcing agents or buyers, is digitization, especially digitization in OSCM activities (Ramachandran, 2020).

Vietnam is the fourth-largest exporter for textiles, garments, and clothing worldwide after China, the European Union, and Bangladesh (Statista, 2020). The export turnover of the Vietnamese textile and garment industry (VTGI) in 2019 was 39 billion USD. The US is the largest market with an export turnover of 15.2 billion USD, up 8.9% compared to 2018 and accounting for 38.97% of total export turnover; the EU reached USD 4.4 billion, up 2.23%, accounting for 11.28%; China reached 4.25 billion USD, up 7.05%, accounting for 10.9%; Japan reached 4.2 billion USD, up 4.79%, accounting for 10.77%; South Korea reached 4 billion USD, up 4.42%, accounting for 10.26%; ASEAN reached 2.1 billion USD, increased by 7.75 billion USD, accounting for 5.38% (Chinhphu.vn, 2019). In the global value chains (GVCs), almost Vietnamese textile and garment enterprises (VTGEs) are in the production value chain CMT (Cut, Make, Trim) and OEM (Original Equipment Manufacturing); there are a few companies joining in GVCs at the position of ODM (Original Design Manufacturing) and OBM (Original Brand Manufacturing). Digital transformation is not only a trend but is becoming an indispensable requirement for Vietnamese garment companies in the context of the industrial revolution 4.0 booming on a global scale.

While the fourth industrial revolution is booming in most countries around the world, according to UNDP and MOIT (2019), VTGEs do not have good enough preparation and readiness for Industry 4.0 as well as digitalization. On the other hand, from the research perspective, there is a lack of research focusing on the digitalization of VTGEs, especially in OSCM activities.

Therefore, our research aims to become the first study in Vietnam to (i) investigate and analyze the current status of digitalization through the indicator of applications OSCM software integrated digital technologies in the Vietnamese textile and garment industry; (ii) identify the challenges/ reasons why the digitalization in VTGEs is still limited; and (iii) propose solutions to foster digitalization process of Vietnamese textile and garment enterprises.

2. RESEARCH METHODOLOGY

To achieve research goals, we conducted a literature review of Industry 4.0 in general and digitalization in particular, as well as the application of digital technologies in OSCM activities. After that, we built a

questionnaire to survey C-level managers of VTGEs about their awareness about and present situation of digitalization in OSCM activities. We collected 100 valid responses from 29 spinning companies, 15 weaving companies, 19 dyeing companies, and 37 garment/ apparel enterprises. The authors used descriptive analysis to get insights into research problems from collected data.

3. FINDINGS AND DISCUSSIONS

3.1 Digitalization in production management

Digitalization is disseminating in VTGEs. Evidence is the application of management software to replace traditional paper-based and labor-intensive, time-consuming accounting, human resource management (HRM), quality control, production control, and the whole supply chain management (SCM). Figure 1 shows that almost VTGEs applied at least three software (accounting, HRM, and quality control). However, the application of production control and SCMs software is still limited.

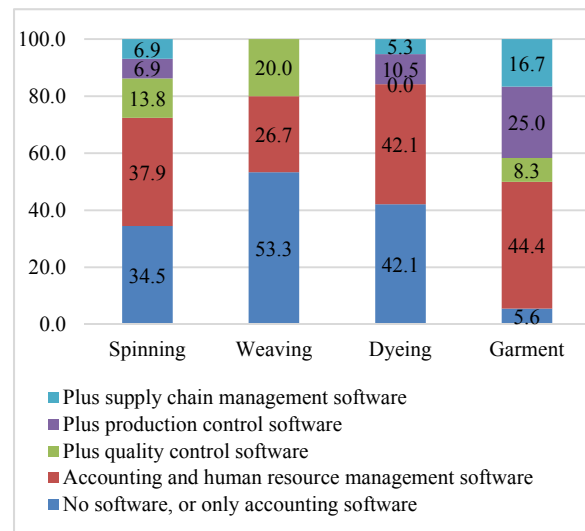


Fig. 1: Application software in OSCM activities of Vietnamese textile and garment enterprise

Table 1 presents the percentage of VTGEs implementing specific software in their OSCM activities. The last tier in the production chain of VTGEs before going to the international market, have the highest percentage of companies applying all types of OSCM software. 96.67% of garment enterprises applied CAD, a popular software supporting production management. 60% of garment enterprises applied ERP, the latest high-end solution, to have keeping track of data, ensure internal procedure flow smoothly, and increase their business efficiency. There are 66.67% of garment companies implementing a manufacturing execution system - MES. Spinning and dyeing are two groups having very few companies applying OSCM software.

Table 1: Percentage of enterprises applying specific OSCM softwares

Software	Spinning	Weaving	Dyeing	Garment
MES	17.24	6.67	21.05	66.67
ERP	20.69	0.00	26.32	60.00
PLM	6.90	13.33	5.26	10.71
PDM	24.14	20.00	10.53	56.67
PPS	10.34	20.00	21.05	54.84
CAD	20.69	33.33	21.05	96.97

Unit: %

Table 2 shows the level of digital technology usage of VTGEs in production. The evaluation used a 5-point measurement scale (1- Do not know; 2-Do not apply; 3- Will apply; 4- Applied partly; 5- Applied completely). The spinning companies have the highest average grades for applying sensor technology, mobile devices to send/ receive information from production machines and robots in operations. The reason is that there is quite a lot of FDI capital invested in this sector, for example, Yulun, Texhong, and Thien Nam Sunrise.

Table 2: Evaluation digital technology usage level of VTGEs in production

Technologies	Spinning	Weaving	Dyeing	Garment
Mobile devices to send/ receive information from production machine	3.79	2.87	2.89	3.45
Cloud computing and big data	2.97	2.40	2.37	2.77
Sensor technology	3.97	2.80	3.00	3.23
Audio-visual recognition	2.38	2.27	2.16	2.22
Robot	3.59	2.47	2.21	2.22

Unit: 5-point scale

In garment companies, the production process includes many stages. Therefore, managing semi-products on the production line is very important. However, most companies are still managing manually, only 11.76% of companies use barcode, and 8.82% of companies use RFID technology.

Table 3: Management semi-products on production line of garment companies

Level of digitalization	Proportion (%)
Manually	79.42
Using barcode	11.76
Using RFID	8.82

Like most other OSCM activities, quality control has broadly benefited from the use of digital technology, and it is still having a lot of opportunities ahead in collecting samples, storing records, statistical control, or early warning system... However, at present, the application of digital tools in VTGEs is very few, as depicted in figure 2. Only 7% of Vietnamese weaving companies controlling their product quality automatically and connecting information between all production stages. 67% of enterprises take sampling manually. 20% of enterprises have automatic quality control system, but only for each machine separately. 27% weaving companies still use manual statistical control without any software.

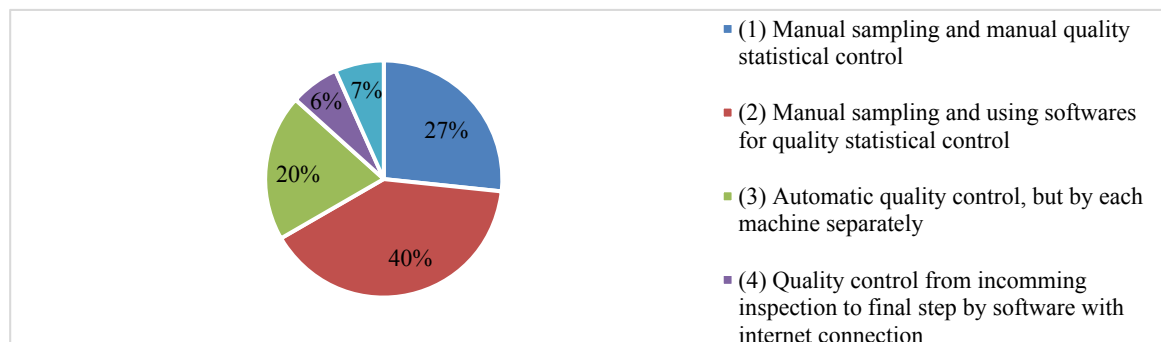


Fig. 2: Quality control in Vietnamese weaving enterprises

3.2. Digitalization in warehouse management

WMS is used quite popularly in the field of textile and garment industry. The successful implementation of the WMS solution will bring the following benefits: (i) Comprehensive tracking and management of different attributes of textile and garment products such as size, color, and style; (ii) Supports variable measurement units; (iii) Manage labeling and are suitable for the small parcel; (iv) Packaging management and quality control (QC) for apparel; (v) Management of forwarding pick; and (vi) Inlet material testing process. The big names in

the textile and garment industry like Macy, Inditex, Zara, and H&M are all successfully applying WMS integrating RFID technology, and acknowledging this integration ensures very high accuracy in warehouse management. Table 4 presents the proportion of VTGEs using different manner and technology in warehouse management. Almost dyeing companies manage their warehouse manually and do not use barcode or QR code, RFID, and WMS software. Only 5.41% of garment enterprises and 6.67% weaving companies have used QR code and professional WMS software.

Table 4: Warehouse management in VTGEs

Unit: %

	Spinning	Weaving	Dyeing	Garment
Managing manually and paper based	0	26.67	63.16	24.32
Using basic microsoft excel tools	75.86	53.33	36.84	54.05
Using barcode	24.14	13.33	0	16.22
Using QR code and professional warehouse management system (WMS)	0	6.67	0	5.41

3.3 Digitalization in customer and supplier relationship management

Nowadays, the individualization and dynamics of markets are ever-growing. That requires companies to become more agile and flexible. As the demand of customers, product development cycles must be shorter and shorter. Companies have to face high cost and innovation pressures. Consequently, purchasing processes must be more efficient and, therefore, leaner (Fröhlich & Steinbiß, 2020). As a result, it is important to have an appropriate customer and supplier relationship management system. Developing a traditional supplier/ customer relationship towards digital relationship management is considered and

deployed by practitioners and researchers (Fröhlich & Steinbiß, 2020). In this research, we surveyed VTGEs about their practices in supplier/customer relationship management (Table 5 and 6). Firstly, regarding the communication channel and method, most VTGEs are still using traditional personal communication with customers or via email/ phone or via a static website. About 10 to 30% of VTGEs use web 2.0 to two-way interaction with customers. There is no company that use 4.0 technologies like AI, robot,... to communicate with customers. Table 6 shows that very few VTGEs using professional software integrated with technologies of Industry 4.0 (AI, Blockchain, Big data,...) in managing customer/ supplier information system.

Table 5: Digitalization in communication with customers of VTGEs

Unit: %

	Spinning	Weaving	Dyeing	Garment
Personal communication or via email/phone	17.24	60	68.42	30.56
Static website	51.72	20	21.05	30.56
Web 2.0	24.14	20	10.53	27.78
Automatic ordering system	6.9	0	0	11.11
Using 4.0 technologies (AI, robot,...)	0	0	0	0

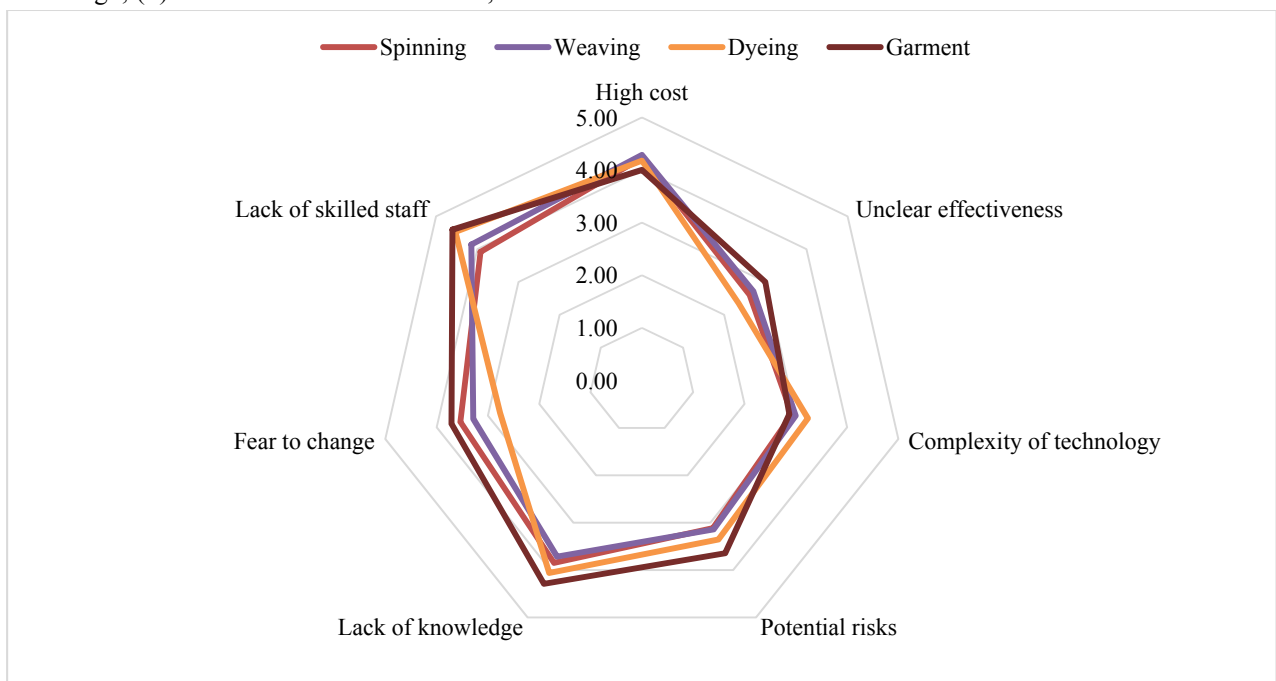
Table 6: Digitalization in the management information system for customers and suppliers of VTGEs

	Unit: %			
	Spinning	Weaving	Dyeing	Garment
Simple management by Excel	82.14	64.29	77.78	63.64
Using professional softwares	17.86	28.57	16.67	24.24
Using professional software integrated with technologies of Industry 4.0 (AI, Blockchain, Big data, ...)	7.14	0	5.56	12.12

3.4. Potential and challenges for digitalizing OSCM activities of VTGEs

The result from our survey shows that all managers agree that digitalization can bring a lot of benefits to their OSCM performance such as: (i) Improve productivity and quality; (ii) Reduce time and cost; (iii) Increase competitive advantage; (iv) Labor savings; (v) Advantages in commercial transactions; (vi) Support effective decision making; (vii) Increase transparency; (viii) Safety in machinery operation; and (ix) Minimize environmental pollution factors. However, there are a large number of challenges constraining the digitalization of VTGEs, i.e. (i) The implementation cost is too high; (ii) The effectiveness is not clear, at least in

the next few years; (iii) Technology is too complicated; (iv) Potential risks (safety, investment); (v) Lack of knowledge; (vi) Fear of change of staff; and (vii) Lack of skilled manpower/ technical experts. We measured the above challenges in a 5-point scale (increasing level of agreement) then visualized in the figure 3. Cost and human resource constraints are the most significant challenges because implementing technologies 4.0 requires a huge financial resource, especially R&D cost and IT-skilled staff. However, figure 4 shows that there are still a number of dyeing and garment do not have a budget for the R&D activities, most VTGEs only spend below 3% turnover before tax for this important activity in digitalization roadmap.

**Fig. 3:** Top managers of VTGEs evaluate challenges to digitalization

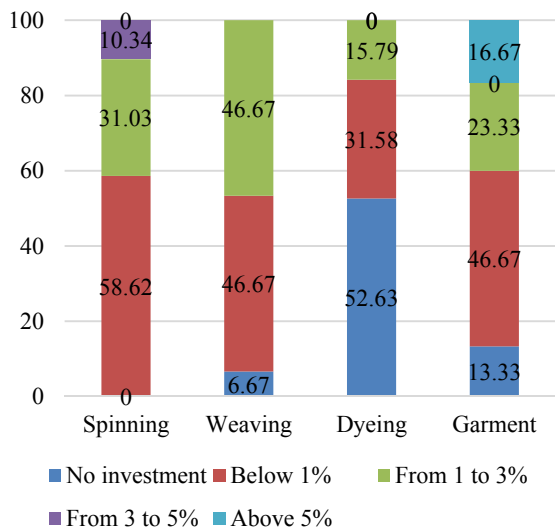


Fig. 4: Budget R&D in turnover before tax (%)

Table 6 shows that the percentage of VTGE technical staff having high competency in information technology is very low (spinning: 3.45%; weaving: 0%; dyeing:

10.53%; garment: 5.41%). Regarding automation and business analytics, no spinning, weaving, and dyeing confident that their technical staffs are excellent at these skills. Table 7 depicts the problems in training and development of VTGEs, which leads to challenges in researching and implementing digital technologies in doing business, production, and OSCM activities. The percentage of VTGEs does not perform or perform unfrequently different types of training are relatively high.

Table 6. Percentage of VTGE technical staff having good skills relating to digitalization

Unit: %

Skills	Spinning	Weaving	Dyeing	Garment
IT	3.45	0.00	10.53	5.41
Automation	0	0	0	5.41
Business Analytics	0	0	0	2.78

Table 7: Training and development activities of VTGEs

Unit: %

	Not performed	Performed but not frequently	Frequently performed	Total
Internal training	2.06	53.61	44.33	100.00
Hiring domestic or international expert for training at company	32.29	54.17	13.54	100.00
Training at Vietnamese training units	27.08	55.21	17.71	100.00
Training abroad	50.52	45.36	4.12	100.00

3.5. Solutions to foster digitalization in OSCM of VTGEs

From the above findings about the status quo and challenges of digitalization in OSCM of VTGEs, authors suggest the following solutions to promote digitalization in OSCM of VTGEs: (i) focusing on research digital technology to choose appropriate digital technology to adopt and lessons learned from other practitioners during their digital transformation; (ii) training and developing technical and R&D staff; (iii) collaborating with domestic IT companies and research organizations (institutes and universities) in step by step digitalizing (digital awareness, digital enquirement, digital collaboration, and digital transformation); (iv) take

advantage of big machinery manufacturers who also wish to foster digitalization of enterprises; and (v) call for supports from government in terms of consulting digital strategy, finance, administrative work, custom, training, and development.

4. CONCLUSION

Digitalization is rapidly spreading, and enterprises must find appropriate ways to adapt and innovate for business advantage. Even after the coronavirus crisis, experts recommend that the first step to reset the industry is digitization (Ramachandran, 2020). This paper conducted empirical research to investigate the current statement of the digitalization of VTGEs in general and in OSCM activities in particular. The maturity level of

digitalization of VTGEs is quite low in almost aspects such as applying software in production management, quality control, warehouse management, and supplier/customer relationship management. The authors also defined a number of challenges in terms of cost and human resource of digitalization in VTGEs. However, our research has not able to search, choose, and adopt a maturity model to quantitatively assess the level of digitalization in VTGEs. That limitation should be more carefully researched in the future. Another critical research questions for future research is how managers of VTGE approach the potential of a particular digital technology and justify its benefits, then adopt it effectively.

5. ACKNOWLEDGEMENT

The authors thank the support of the national research project ĐTDLXH.13/18 (Vietnam) “Investigating and evaluating impact of Industry 4.0 to the Vietnamese textile and garment industry, strategic solutions for the period 2019-2030”.

6. REFERENCES

- [1]. Chinhphu.vn. (2019). *Năm 2019, ngành dệt may Việt Nam dự kiến tăng trưởng 7,55%*.
- [2]. Fibre2Fashion. (2020). *Benefits of ERP in Textile and Garment Sector*.
- [3]. Fröhlich, E., & Steinbiß, K. (2020). Supplier relationship management goes digital: First empirical insights. *Universal Journal of Management*, 8(3), 63-73.
- [4]. Holmström, J., Holweg, M., Lawson, B., Pil, F. K., & Wagner, S. M. (2019). The digitalization of operations and supply chain management: Theoretical and methodological implications. *Journal of Operations Management*, 65(8), 728-734.
- [5]. Isaksson, A. J., Hatjunkski, I., & Sand, G. (2018). The impact of digitalization on the future of control and operations. *Computers & Chemical Engineering*, 114, 122-129.
- [6]. McGregor, L. (2015, June 5). Can PLM Systems Help Apparel Companies Catch Up With Fast Fashion? *Sourcing Journal*.
- [7]. Parviainen, P., Tihinen, M., Kääriäinen, J., & Teppola, S. (2017). Tackling the digitalization challenge: How to benefit from digitalization in practice. *International Journal of Information Systems and Project Management*, 5(1), 63-77.
- [8]. Ramachandran, V. (2020, August 12). Re-Drawing the Apparel Landscape: Why Digitization Is Fashion’s Way Forward. *Sourcing Journal*.
- [9]. Statista. (2020). *Apparel industry in Vietnam- Statistics & Facts*. Statista.
- [10]. UNDP and MOIT. (2019). *Impacts of Industry 4.0 on Vietnamese manufacturing sector*.
- [11]. Whichplm.com. (2020). VT Garment Cuts Time to Market by 20% with Centric Manufacturing PLM. *WhichPLM*.

CURRENT SITUATION OF PRODUCTION TECHNOLOGY AND QUALITY MANAGEMENT OF INDUSTRIAL ENTERPRISES SUPPORTING THE MECHANICAL ENGINEERING INDUSTRY OF HANOI

Vu Duc Nang, Pham Canh Huy*

School of Economics and Management, Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: huy.phamcanh@hust.edu.vn

Abstract

Mechanical engineering is an important sector contributing to the socio-economic development, industrialization and modernization. Although playing an important role, Vietnam's mechanical engineering industry still has many limitations. One of the reasons is that production technology and product quality management are still weak and out of date. This article will focus on analyzing the current situation and clarifying the shortcomings in production technology, R&D activities, product quality management activities of mechanical supporting industry enterprises. On that basis, some recommendations are made to promote production technology innovation, R&D, and the application of quality management standards to supporting industry enterprises of mechanical engineering.

Keywords: technology, quality management, mechanical supporting industry.

1. INTRODUCTION

Improving technological capacity, innovating technology and applying quality management tools to production are vital factors of an industrial enterprise in general and a mechanical supporting industry enterprise in particular. In the current context, Vietnam is becoming one of the countries with large economic openness. Vietnam has actively participated in almost all bilateral, multilateral, regional and global cooperation mechanisms, and has just signed trade agreements, CPTPP and EVFTA. With the current deep integration, many new opportunities appear, and, besides, there are strong competitive pressures. Therefore, supporting industry in general and mechanical supporting industry need to change and develop to take advantage of these opportunities. Despite certain achievements, Vietnam's mechanical engineering industry still has many limitations: domestic enterprises are often small scale with low competitiveness, product quality and accuracy have not yet satisfied the requirements, production costs are still high, the level of technology is still backward. Therefore, it is very important to research the current situation and have solutions to improve.

2. RESEARCH OVERVIEW

Supporting industry plays an important role in the economic development of a country. There have been

many studies related to the supporting industry of Vietnam, such as:

In 2005, Prof. Nguyen Tuan Anh published the report "Research on building and orienting Vietnam's mechanical engineering technology from 2005 to 2010", clearly stating the current state of Vietnam's mechanical science and technology at that time. Technology was outdated with lack of research programs on machine building technology development.

By 2015, the authors Nguyen Trong Hieu, Pham Ngoc Hieu and their team also researched on supporting technology for mechanical engineering. The authors pointed out the inadequacies in technology in the mechanical engineering, the inadequacies in innovation activities and in Government policies. Also in that year, authors Nguyen Trong Hoai and Huynh Thanh Dien did research on "Policy for developing mechanical supporting industry in Ho Chi Minh City". The article has pointed out shortcomings in the policies of mechanical supporting industry enterprises in Ho Chi Minh City, including difficulties in accessing new technologies and capital for technology development.

Tran Thi Minh Hang (2018) pointed out the challenges and competitive pressure faced by domestic mechanical enterprises in the industrial revolution 4.0.

Do Thy Nga (2018), in his doctoral thesis in economics,

used the exploratory factor analysis method to evaluate the factors affecting the development of supporting industries in Hanoi city. The author gave reviews on machinery, the research and development of products in enterprises to give recommendations for development.

Do Duc Nam (2019) researched on criteria and processes for searching, identifying technology and selecting production technology in the electronic supporting industry.

Although there have been quite a lot of relevant researches, to develop the supporting industry in general and the mechanical supporting industry of Hanoi in particular, this research is still very necessary, especially in the current period.

3. GENERAL THEORY OF SUPPORTING INDUSTRY

3.1. About supporting industry

Supporting industry is a concept that was first used by the Japanese.

In Japan, in 1985, for the first time, METI (Ministry of Economy, Trade and Industry) used this term in the “White Paper on International Cooperation 1985”. In this document, supporting industry is used to refer to “small and medium enterprises contributing to strengthening industrial infrastructure in Asian countries in the medium to long term or small and medium enterprises manufacturing spare parts and components”. (Kyoshiro Ichikawa, 2004).

In 1993, in the program of developing supporting industry in Asia, METI defined supporting industry as “an industry that produces necessary items such as raw materials, spare parts and capital goods... for the assembly industry (cars, electricity, electronics)...” (Kenichi Ohno, 2007). Currently, supporting industry in Japan is understood as “a group of industrial activities that supply intermediate inputs (not raw materials and finished products) to the downstream industries”.

Thailand defines the supporting industry as an industry consisting of enterprises producing spare parts and components used for the operation of final assembly enterprises.

From the above analysis, it can be seen that, up to now, there has not been a unified way of understanding about supporting industry, and there are many different opinions on differentiation of the scope of supporting industry.

In 2003, when Vietnam signed the “Vietnam - Japan Joint Initiative” phase I (2003 - 2005), the term “supporting industry” appeared for the first time. Decree No.11/2015/ND-CP of the Prime Minister on the development of supporting industry introduces the concept “Supporting industries are industries that produce raw materials, components and spare parts to supply for production of finished products”.

3.2. Mechanical supporting industry

Mechanical engineering plays a very important role in the industrialization process because their products are the components, spare parts, production machinery and equipment of many other industries. With that important role, industrialized countries often focus on developing mechanical engineering. Mechanical products can be understood as pure metal details; or an assembly of machines made up of metal and non-metallic parts; or a complete machine to meet a certain use demand. The final mechanical product is produced through a series of integrated multi-stage processes, in which the supporting industry enterprises are located in the machinery - tools - production parts - assembly subcontracting stages. Mechanical supporting industry enterprises are enterprises that supply their mechanical products to various industries such as motorcycle industry, automobile industry, shipbuilding industry, automation, electronics and PC/Electricity (Kenichi Ohno, 2007).

The operation structure of the mechanical engineering industry starts from the input stage with natural resources such as metal ores, fuels... through material manufacturing technology (metallurgy) to produce products of steel, cast iron, copper, aluminum and alloys. The materials are fabricated through billet manufacturing technology (casting, rolling, forging, welding), machining (turning, milling, planing, drilling, grinding...), treatment and protection (thermal treatment, chemical thermal treatment, coating...) to create equipment, machine parts. Through assembly technology, equipment and machine components produce part products and complete products, including electrical equipment, machines used in agriculture and industry, molds, engines - turbines, manual machines, mechanical processing machines and motor vehicles.

3.3. The role of technological innovation in the development of supporting industry enterprises

Technological innovation is the proactive replacement of an important part (basic, core) or the whole technology being used with another more advanced and effective

technology in order to improve productivity, quality and efficiency..., thereby innovating the process or creating new products and services to serve the market. Scientific and technological progress, technological innovation will allow to improve product quality, create new products, diversify products, increase output, increase labor productivity, and use raw materials rationally and economically... Thus, it will increase competitiveness, expand markets, promote rapid growth and improve production and business efficiency.

3.4. The role of quality management standards and tools for enterprises

In the trend of economic development and integration, the issue of product and service quality management is an issue that enterprises are always interested in. The application of quality management standards and tools will help enterprises save costs, reduce product costs, improve labor productivity, reduce waste products, promote good working habits and improve high-morale staff attitude, which is conducive to penetrating international and regional markets.

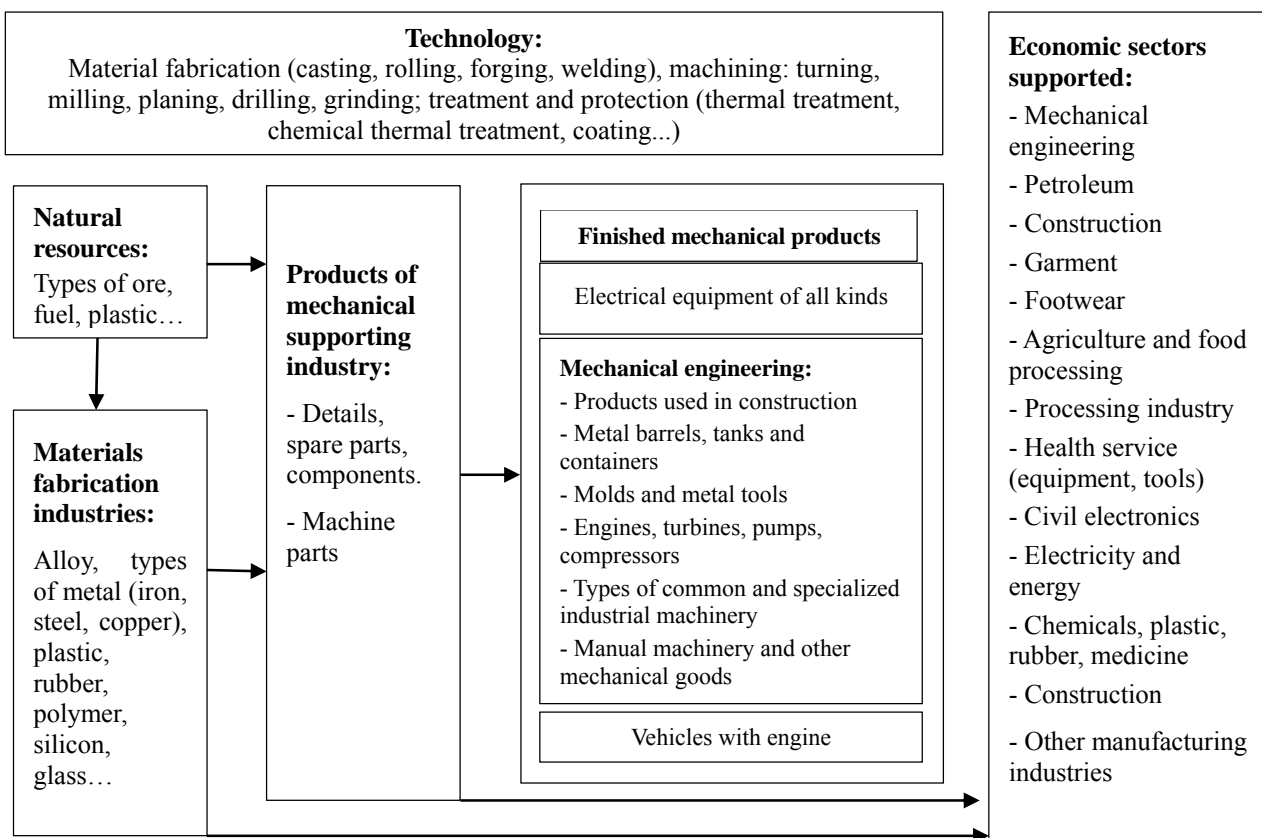


Fig. 1: Structure and role of mechanical engineering in the economy

Source: Nguyen Trong Hoai & Huynh Thanh Dien (2016)

4. RESEARCH FRAMEWORK

Research objectives: Evaluate the current state of technology and use of machinery and equipment of the mechanical supporting industry enterprises to propose solutions to technology innovation and development of the industrial engineering industry.

Object and scope of research: mechanical supporting industry enterprises in Hanoi city in recent years.

Sample: The study used a number of samples of 375 mechanical supporting industry enterprises. By type of

enterprise, 55.5% are limited liability companies, 36% are joint stock companies, 0.8% are state-owned enterprises, 1.6% are private enterprises, 5.6% are 100% foreign-owned companies, and 0.5 % are joint venture companies. By enterprise size structure, 30.4% are micro enterprises, 44% are small enterprises, 8% do not provide information, 9.6% are medium enterprises and only 8% are large enterprises.

The actual survey method: The process of investigating and surveying the supporting industry enterprises in Hanoi city is done by the following steps:

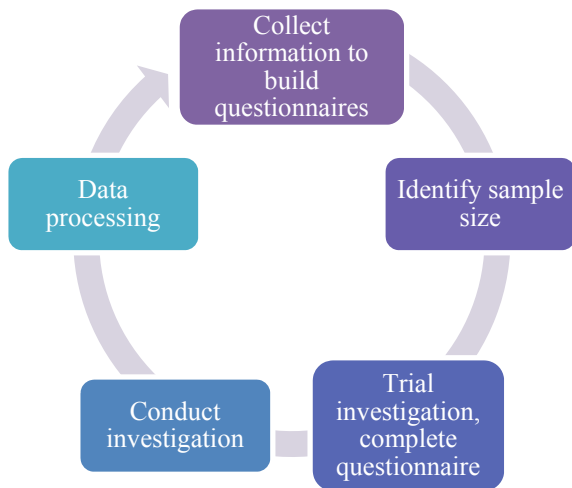


Fig. 2: Process of investigating and surveying enterprises

5. RESEARCH RESULTS

5.1. Current situation of production technology in mechanical supporting industry enterprises in Hanoi in present

According to the Vietnam Association of Mechanical Enterprises (VAMI), the current technological equipment of mechanical enterprises is two to three generations out of date compared to the world. Most modern and advanced technologies are located in FDI enterprises. The problem is how domestic enterprises can access these new technologies, thereby innovating technology, improving production capacity of the enterprises.

Machinery and equipment are one of the factors that directly participate in the production process, so modernization of machinery and equipment is very important for every enterprise. According to the survey results, the majority of enterprises use manual and semi-automatic machinery and equipment. 59.7% of enterprises surveyed have manual machinery and equipment, 15.2% are semi-automatic and only 2.2% of enterprises have primary equipment and devices which are automatic. There are still enterprises that have not been able to do statistics with or not provided survey information. Among the enterprises using automatic machinery and equipment, the majority are FDI enterprises. Domestic enterprises still use outdated manual machinery and equipment because they cannot afford to invest and access to advanced technologies.

Table 1: Type of machinery and equipment of the mechanical supporting industry enterprises in Hanoi city

Machinery and equipment	Percentage of respondents
No answer	22.9
Manual	59.7
Semi-automatic	15.2
Automatic	2.2
Total	100

Source: Survey results

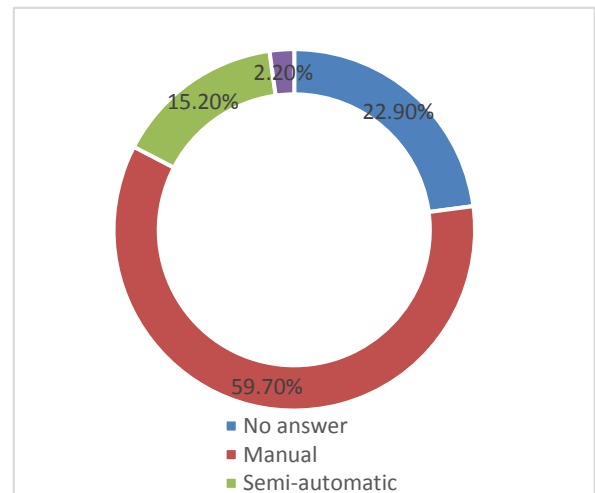


Fig. 3: Type of machinery and equipment of the mechanical supporting industry enterprises in Hanoi city

Most of the mechanical supporting industry enterprises of Vietnam in general and of Hanoi in particular are small and medium enterprises. Through the survey, when asked about the need to upgrade machinery and equipment, up to 60.6% of enterprises answered that they do not intend to upgrade. For most small-scale enterprises, manual machinery and equipment makes low output, low added value and low competitiveness of products (due to low product quality and usefulness, high cost and reduced labor productivity). For manufacturing with manual and semi-automatic machinery and equipment, the main employees in these enterprises are unskilled workers. The enterprises find it difficult to attract a workforce of highly skilled workers because income and working environment conditions are slowly improving. Therefore, the ability to invest and master modern technology and equipment is also an issue that needs to be solved in these mechanical enterprises.

The objective reasons of this problem are limited investment capital, lack of loan support mechanisms, loan guarantees as well as other technology innovation supports that are not really effective. In addition, the other subjective reason is that the current human resource is weak and in shortage. It is incapable of receiving new technologies. Because of limited information about the market and technology, it is not able to orient the technology, confidence in investment is lacking of, and which technology to be suitable has not been known. Enterprise often seek information about technology on the basis of which products customers order or due to their product development strategy, thereby analyzing the technical requirements of the product to find the appropriate technology. Enterprises, when buying machines, can grasp basic information, operate and manipulate them but do not understand the associated technology. Besides, advanced technology is mostly owned by FDI enterprises and limited by the transfer mechanism from these enterprises.

Table 2: Upgrade machinery and equipment for the mechanical supporting industry

Upgrade machinery and equipment	Percentage of respondents
No answer	23.0
Yes	16.4
No	60.6
Total	100

Source: Survey results

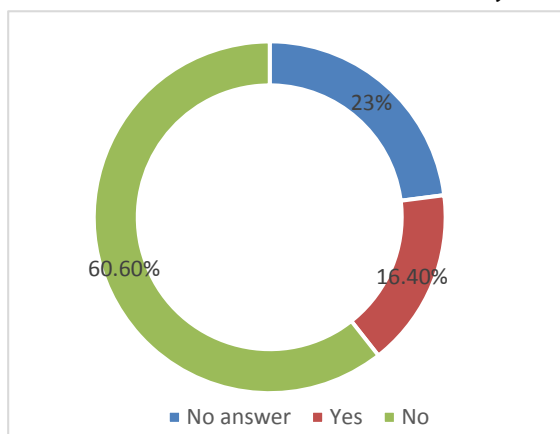


Fig. 4: Upgrade machinery and equipment for mechanical supporting industry

Regarding the origin of machinery and equipment, the main types used for the production of these enterprises are mainly quite old machinery and equipment imported from abroad such as China, Taiwan, Japan... Domestic machinery and equipment do not meet the

requirements of the enterprises so they have to import. Thus, it can be seen that technology and machinery and equipment for the mechanical sector still heavily depend on foreign countries. Domestic enterprises have many difficulties in technology innovation investment. Therefore, the outputs of these enterprises face many difficulties.

Regarding R&D activities, according to the survey data, only 6% of enterprises surveyed have R&D activities, the rest do not have these activities or do not provide information. Thus, it can be seen that R&D activities are not really interested by the mechanical enterprises although the status of the main machinery and equipment is still rudimentary and backward. The main form of R&D is self-research or combining self-research with outsourcing. This can be explained because small enterprises have limited financial capacity. They have not really boldly invested in technology innovation or developing new products. Technology support centers for mechanical enterprises such as embryo fabrication technology, manufacture technology, material handling technology, welding and assembly technology, measurement technology, and integrated production technology have not been formed clearly.

Table 3: R&D activities of mechanical supporting industry enterprises

R&D activities	Percentage of enterprises
No answer	58.6
Yes	6.0
No	35.4
Total	100

Source: Survey results

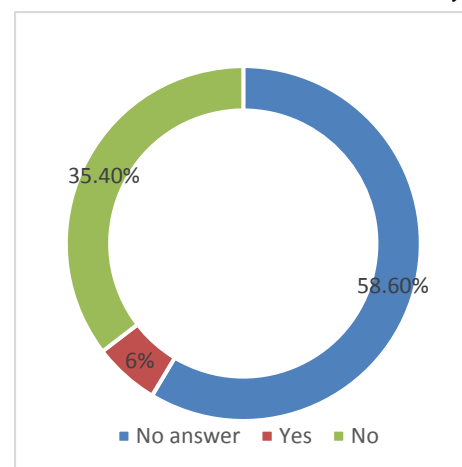


Fig. 5: R&D activities of mechanical supporting industry enterprises

Over the past years, the Government, ministries and branches have paid special attention to the development of supporting industries through a series of legal transactions. Although many policies have been set up, those are still ineffective, have not yet been approached by enterprises. According to the survey results, only 14.4% of enterprises surveyed know about incentives and support packages from state agencies. And only 13.1% of enterprises surveyed received incentives. This shows that enterprises are still facing many difficulties, limitations and lack of information about support packages and incentives.

Regarding the current situation of applying quality management tools in production, the survey results show that, nowadays, enterprises do not pay much attention to establishing quality management systems as well as applying other standards, especially standards related to energy, environment and occupational safety. Specifically:

Table 4: Quality systems applied by enterprises

Quality systems	Number of enterprises	Percentage of enterprises
ISO 9001 – 2008		
Yes	48	12.8
No or no answer	327	87.2
Total	375	100
ISO 14001		
Yes	12	3.2
No or no answer	363	96.8
Total	375	100
ISO 13485		
Yes	1	0.3
No or no answer	374	99.7
Total	375	100
ISO 5001		
Yes	1	0.3
No or no answer	374	99.7
Total	375	100
ISO/TS 16949		
Yes	2	0.6
No or no answer	373	99.4
Total	375	100

Source: Survey results

Thus, it can be seen that, with a small production scale, mainly raw processing or mold production are applied. The mechanical enterprises have not really paid attention to or implemented a quality management system. This will make enterprises slow in improving product quality, lacking of conditions to join the supply chains of large enterprises in the industry or to serve as a basis for doing business with partners or promoting exports. Therefore, the working conditions and environment for employees have not been paid much attention to, making the ability to attract high-quality workers to promote R&D activities, access new technologies and master equipment and machinery of these enterprises is becoming more and more difficult.

For the implementation and application of tools and techniques in quality management to improve labor productivity, reduce defective products and reduce waste in production, there are only a few mechanical enterprises that implement. Specifically, according to the survey data, the proportion of enterprises applying these tools in turn: 15.7% applying 5A, 1.3% applying 6 sigma, 0% applying TQM, 4.8% applying Kaizen, 1.9% applying LEAN, 1.6% applying TPM, 0.8% applying TQM and 1.1% applying Kanban.

Table 5: Quality management tools

Quality management tools	Number of enterprises	Percentage of enterprises
5S		
Yes	59	15.7
No or no answer	316	84.2
Total	375	100
Kaizen		
Yes	18	4.8
No or no answer	373	95.2
Total	375	100
6 Sigma		
Yes	5	1.3
No or no answer	370	98.7
Total	375	100
Lean		
Yes	7	1.9
No or no answer	368	98.1
Total	375	100
TQM		

Quality management tools	Number of enterprises	Percentage of enterprises
Yes	3	0.8
No or no answer	372	99.2
Total	375	100
TPM		
Yes	6	1.6
No or no answer	369	98.4
Total	375	100
Kanban		
Yes	4	1.1
No or no answer	371	98.9
Total	375	100

Source: Survey results

Although some enterprises have applied quality management tools in production, the enterprises only focus on a few tools. Thus, this implementation has not yet achieved efficiency. Working environment has not been improved and labor productivity is low while production costs increase, making production and business efficiency low. Increasing the application of quality management tools will help enterprises control costs well, reducing costs in the production process and increasing product quality, thereby increasing revenue, profitability, and improving production and business efficiency.

6. DISCUSSIONS AND RECOMMENDATIONS

The mechanical engineering industry in general and the mechanical supporting industry in particular plays an important role in promoting the industrialization and modernization of the country. Through the above analysis, we can see that the technological and technical levels of the mechanical supporting industry enterprises are still very limited such as:

- Machinery and equipment used in enterprises are mainly manual. A small number of enterprises use semi-automatic machinery or a combination of manual and semi-automatic. The number of enterprises applying completely automatic production lines is almost absent.
- Low demand for upgrading machinery and equipment due to limited resources and lack of access to market information, technology and government support.
- The machinery and equipment is mainly imported from abroad. Domestic machinery and equipment cannot meet the needs of enterprises. The import of

machinery and equipment causes high product costs, affecting the competitiveness of enterprises.

- R&D activities have not yet been applied by enterprises. Due to limited resources and finance, unable to grasp the technology, they do not dare to invest. Only a few large, FDI enterprises have invested in research. The lack of connections from research centers, universities and the ineffective policy for research are the causes of this situation.

- The production management system of enterprises has not been applied or has not met international standards; The use of quality management tools is not popular, mainly simple and easy to deploy.

With the analysis of the current situation, the article would like to propose some recommendations to promote activities in order to support enterprise in innovating, mastering technology, applying quality management tools into production for improving production capacity.

- Must strengthen policies to encourage investment and development of mechanical supporting industry. Complete synchronous policies on credit, tax, investment, land and preferential mechanisms on technology transfer, human resource training for mechanical supporting industry. In addition, each enterprise also needs to identify appropriate product and customer segments, in accordance with consumer trends and development directions of mechanical technology in the world.

- Must develop research institutions such as domestic research institutes and universities, promote the establishment of centers for mechanical technology innovation and development such as centers of embryo manufacturing technology, casting and manufacturing in mold, shaping; centers of manufacturing technology... There must be policies to promote technology transfer activities from abroad.

- Organize more programs and seminars to help enterprises access to information on market and new technologies. It is necessary to build database and information on supporting industry products to connect supply and demand data, and promote cooperation programs with countries that have developed mechanical industries.

- It is necessary to have more policies and support to help domestic enterprises to cooperate with FDI enterprises, thereby creating linkages between domestic enterprises and enterprises in the FDI sector.

- Support in the training of human resources for technology innovation. Hire foreign experts to train high-quality human resources for the industry.

– There must be support to help enterprises build quality management models in accordance with their characteristics and resources. There should be preferential tax policies for new enterprises to build quality management models. Organize seminars and propaganda about the role of quality management systems and quality management tools.

7. CONCLUSION

The development of supporting industry in general and mechanical supporting industry in particular is an important task to carry out the national industrialization and modernization. In order to develop mechanical supporting industry, technology is one of the factors that need to be developed first. From the above analysis, we can see that the technology in mechanical engineering is still backward and underdeveloped. Therefore, in order for the mechanical support industry to develop as expected, the Government, ministries, branches, cities and localities must have reasonable policies, appropriate ways and steps, strong action and support programs for the development of mechanical supporting industry.

8. REFERENCES

- [1]. Do Duc Nam, Vuong Van Thanh and Nguyen Hoang Hai. (2019), “Activities of searching, identifying and selecting production technology for electronic supporting industry and solutions proposal”, *Journal of Science and Technology Policy Management*.
- [2]. Do Duc Nam. (2019), “Criteria and process of searching, identifying and selecting production technology for electronic supporting industry”, *Journal of Science and Technology Policy Management*.
- [3]. Do Thuy Nga. (2018), *Doctoral thesis in economics Development of supporting industries in Hanoi city*.
- [4]. Kenichi Ohno, *Building supporting industry in Vietnam*, Hanoi: Vietnam Development Forum.
- [5]. Kyoshiro Ichikawa, *Report on building and strengthening supporting industries in Vietnam*.
- [6]. M.A. Pasha. (2018), *Technology Identification Course Contents: TM Activities - Identification: Introduction, Definition, Identification processes, Chapter 2 - Case study*.
- [7]. Nguyen Trong Hieu, Pham Ngoc Hieu, Nguyen Truong Phi and Nguyen Huu Xuyen, (2015). “Technological innovation in the mechanical engineering industry in Vietnam: Reality and solutions,” *Journal of Science and Technology Policy Management*.
- [8]. Nguyen Trong Hoai and Huynh Thanh Dien, (2015). “Development policy of the mechanical supporting industry in Ho Chi Minh City: Approaching the industry structure and identifying impact factors,” *Economic Development Journal*.
- [9]. Nham Tuan and Nguyen Mai, (2012). “A Firm Analysis Level of Supporting Industries in Hanoi City-Vietnam: Application of Resource-based View and Industrial Organization,” *International Journal Of Business And Management*.
- [10]. Nham Tuan, Nguyen Nhan, Pham Giang and Nguyen Ngoc, (2016). “The effects of innovation on firm performance of supporting industries in Hanoi, Vietnam,” *Journal Of Industrial Engineering And Management*.
- [11]. Pham Thi Ha and Nguyen Huu Xuyen, (2019). “Mastering technology through technology transfer in the field of mechanical engineering,” *Journal of Information and Communication*.
- [12]. Pham Trung Hai, (2019). “Some issues of technological innovation of Vietnamese enterprises,” *Journal of Finance*.
- [13]. Tran Thi Minh Hang, (2018). “Vietnamese mechanical engineering industry in the industrial revolution 4.0,” *Journal of Finance*.

A QUICK REVIEW OF OPERATIONS OPTIMIZATION SOFTWARE PACKAGES FOR SMEs

Dang Vu Tung

School of Economics and Management,
Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: tung.dangvu@hust.edu.vn

Abstract

Operations research has proved to be efficient in almost any area of the economy. Giant corporations have for long applied software to optimize their operations, from procurement to production planning, from budget allocation to staff schedule, just to name a few. But most SMEs, with their limited capacity and resources, have not taken up the tool to lean up their operations, improving efficiency and reducing waste and cost.

This paper presents a quick review of some operations involving the move of physical materials in a factory, including inventory management, material cutting, jobshop scheduling, load packing, and vehicle routing. Instances of more than 30 software with their most prominent features have been introduced. Most of them are software as a service (SaaS), while other are stand-alone software packages or a part of a more comprehensive solution like ERP.

Keywords: operations optimization, optimization software, SME.

1. INTRODUCTION

According to the Vietnamese General Statistics Office (GSO), small- and medium-sized enterprises (SMEs), which form a large entity of the domestic private sector, play a vital role in the Vietnamese economy. Of the total 518,000 enterprises registered in 2017, around 500,000 were SMEs. As mentioned by Mr. Nguyen Minh Cuong, principal country economist from the Asian Development Bank (ADB) SMEs contribute around 47 per cent of the country's GDP and 40 per cent the state budget, and about nine million jobs have been generated by SMEs. [1]

SMEs in Vietnam are popular in the fields of service trade, repair, providing simple ancillary services to large enterprises, small production with simple technology... However, according to the Vietnam Institute for Economic and Policy Research, despite improvement in their capacity in past decades, nearly 56% of SMEs do not have sufficient knowledge in business and corporate governance, financial management, and business law.

SMEs have always been in a vicious cycle of low competitiveness due to lack of capital, but difficult to access credit due to lack of collateral, resulting in slow investment in technology innovation. Outdated technology comes with poor management capacity, high cost, low competitiveness, less opportunity to access production orders with high added value.

Besides, a focus must also be placed on boosting innovation and technology application through fostering a sound business environment, helping SMEs to develop and use their internal strategic resources effectively.

With the development of information technology, Enterprise Resource Planning (ERP) has been a solution for large enterprises to improve their overall business management. However due to high cost and complexity, ERP is still unfamiliar to many SMEs.

Nevertheless, SMEs can turn to specialized software that help optimize individual aspects of daily business operations as the solution. Operations research, with mathematical optimization algorithms in the core, is the engine behind those specialized software packages. Optimization software provide the best (i.e. *optimal*) solution for the decision problem of resource allocation subject to various constraints of the system.

This paper provides a quick review of some instances of optimization software that are deemed suitable for SMEs since they do not require substantial financial as well as human resource investment to deploy.

In this paper, we focus on some operations in a business related to the physical flow of materials along the production process, namely:

- Inventory management,
- Material cutting,

- Jobshop scheduling,
- Load packing/stacking,
- Vehicle routing.

2. OPERATIONS OPTIMIZATION

2.1 ERP vs SaaS

Along with the industrial revolution, the world has seen a remarkable growth in the size and complexity of organizations. As the complexity and specialization in an organization increase, it becomes more and more difficult to allocate the available resources to the various activities in a way that is most effective for the organization as a whole.

Since the 1990s, Enterprise Resources Planning (ERP) was introduced and quickly become popular in the industries. ERP software is simply an all-in-one technology model, integrating many different applications into modules of a single software package, helping to automate business activities related to resources. The purpose of ERP software is to create an automated data system that unifies and runs across departments and operations.

Enterprises can rely on ERP to manage day-to-day business activities such as accounting, procurement, production planning and control, project management, risk management and compliance, and supply chain operations. A complete ERP suite also includes enterprise performance management, financial results and management reporting. Some modern ERP software also has solutions to link fixed modules with supporting devices such as mobile phones, barcode scanners, handheld computers,... ERP captures the entire operations of the business, where the database is used together to easily share information between departments.

Since its inception, ERP has always been considered the only solution if businesses are looking for a technology to overall business management. There are numerous large enterprises successfully deploying ERP.

However, number of SME adopting ERP systems is limited but there are risks associated since SMEs have limited resources and specific characteristics that make their situation different.

In the face of breakthrough technology, specialized software for each area of the enterprise quickly replaced ERP and dominated the market, specially to the SMEs.

With the development of technology in the B2B (Business to Business) segment, a series of SaaS (Software as a Service) solutions for emerging

businesses, provide another alternative for traditional ERP and is gradually becoming a new trend in corporate governance. They are cost-effective, compact, innovative and much more flexible than ERP when applied in the real world of business operations.

Due to the nature of the service, SaaS solution developers attach great importance to the flexibility to apply the product to the customer. Therefore, almost all SaaS solutions today have unlimited integration through the Application Programming Interface (API) allowing free exchange of data between applications.

Thanks to this superior integration, instead of using only one ERP software, an average enterprise using 20 SaaS applications that best satisfies their needs [2], and then use the integrated features of the software to link data between them.

The use of specialized software represents a positive trend in technology while simultaneously solving unified management problem of the enterprise and overcome the disadvantages that common ERP software encounters.

Online software applying cloud computing technology is getting attraction of manufacturers to apply SaaS to manage the production. Because it helps businesses not have to spend a large initial investment, as well as cut down the costs of maintaining IT infrastructure to run the software. SaaS reduces computer infrastructure maintenance costs and frees up capital to invest in store equipment and elsewhere.

Specialized software is not only cheaper, but can also be deployed independently and is risk-distributed. The time spent to put a specialized software into use is only 1-2 months, while the average deployment time for an ERP project is up to two years.

The following subsections look further to the features of those software.

2.1. Inventory Optimization

Inventories pervade the business world. A company inventory may include raw material, unfinished products (WIP) and finished goods. Maintain inventories is necessary for any company dealing with physical products, including manufacturers, wholesalers, and retailers. For example, manufacturers need inventories of the materials required to make their products. They also need inventories of the finished products awaiting shipment. Similarly, both wholesalers and retailers need to maintain inventories of goods to be available for purchase by customers.

To meet demand on time, companies often keep stock on hand for future sale. The purpose of inventory theory is to determine rules that management can use to minimize the costs associated with maintaining inventory and meeting customer demand (i.e. customer service level). Inventory models thus must answer questions like “When should an order be placed for a product”, or “How large should each order be”.

The costs associated with storing (“carrying”) inventory are very large, perhaps a quarter of the value of the inventory. Reducing storage costs by avoiding unnecessarily large inventories can enhance any firm’s competitiveness. The famous Japanese zero inventory system emphasizes planning and scheduling so that the needed materials arrive “just-in-time” for their use, resulting in huge savings by reducing inventory levels to a bare minimum. On the other hand, low inventory level increases the risk of stockout when customer demand cannot be timely met, which usually much more expensive than the carrying cost.

Forecasting and replenishment activity is optimized in terms of resource availability, manufacturing planning and distribution capacity. Inventory optimization tools will help target the service levels, reduce inventory, and make the best use of inventory investment, while preventing situation of short or excess inventory.

We will brief important features of some inventory optimizers including: Smart Inventory Optimization, EazyStock, Optimiza, and Logility Inventory Optimization.

Smart Inventory Optimization (SIO™) [3] delivers inventory policy decision support and the means to share, collaborate, and track the impact of inventory planning policy. Users can identify overstocks and understocks, adjust stocking policies when demand changes, share proposed policies with other stakeholders, collect feedback, and establish a consensus inventory plan. Smart Inventory Optimization prescribes the optimal service levels and users can optionally assign service level constraints to ensure the optimization engine respects business rules.

With Smart Inventory Optimization users can, among other, look at historical sales data and automatically choose the best statistical model to forecast the consumer demand in the future; calculate and display the inventory level for future periods, highlighting possible shortages and overstocks based on the current inventory, incoming supply, forecasted demand, and inventory targets; generate replenishment suggestions and create optimized orders potentially integrated with the purchasing system.

Smart Inventory Optimization provides the required inventory planning parameters for a variety of replenishment policies such as Reorder Point/Order Quantity, Min/Max, Safety Stock Planning, and Order Up to levels. It also suites to special needs such as very large SKU range, short-shelf life products, complex manufacturing/distribution process and short lead time orders.

EazyStock is an inventory management and optimization software solution that helps small to mid-size businesses control inventories, automate purchasing, and lower costs. [4]

The EazyStock platform automatically generates purchase orders when supplies or products are running low. The system calculates optimal inventory levels, ensuring businesses have the right products on-hand at the right time. The software also helps businesses order only what they need to prevent wasted space and resources on excess stock. EazyStock provides seamless integration with most ERP systems on the market including Acumatica, Epicor, Microsoft Dynamics AX, and SAP.

Optimiza is an inventory optimization and supply & demand planning software created by Llamasoft [5]. Optimiza is used to improve service levels with greater forecasting accuracy. Through supply/demand planning, better inventory management is achieved. The inventory optimization function seeks to balance supply and demand with business-specific inventory models to reduce the amount of inventory and keep an ongoing flow of products.

Optimiza builds a business-specific inventory model that takes into account the unique supply, demand and flow characteristics of each product to:

- Determine what inventory is needed to achieve service levels, given the existing flows and anticipated supply and demand fluctuations.
- Calculate and maintain the optimal safety stock and replenishment orders.
- Project future investment, procurement and warehousing requirements for the business.

Logility Inventory Optimization software is designed for multi-echelon inventory optimization [6]. This solution controls all stages and locations of supply chain network to reduce carrying costs. Users can even evaluate “what-if” scenarios to implement better cost and service alternatives. Features of Logility Inventory Optimization:

- Synchronize inventory goals.
- Automate inventory policy updates and changes.
- Optimize a multi-echelon supply chain.
- Categorize types of inventory (Finished, WIP, Component, Raw).
- Gain new insights on inventory form and function and analyze partner inventory.
- Determine ideal stocking locations.
- Calculate the size of inventory buffers.
- Create inventory policies on algorithmic optimization and machine learning results.

2.2. Material cutting optimization

The material cutting problems basically consist of placing a given set of small objects, called items, into a given set of larger ones, called stocks (cloth, glass, metal, leather, etc.), taking into considerations technological and organizational parameters of production.

Optimized cutting is vital for economic production, particularly for mass-production industries, because small improvements in the cutting patterns can result in major savings in material and a considerable reduction in production costs.

Optimization cutting software packages are used to produce the most efficient cutting patterns. The software help maximize the efficiency of materials by reducing material waste thus purchasing costs, and by saving the time required to create and analyze optimal cutting patterns.

Waste minimization is usually the main objective of this problem, but some packages do offer others, like minimizing the total cost, or the number of different cutting patterns.

The software technology is based on algorithms designed to achieve optimal or near optimal solutions for the cutting patterns. These algorithms are often heuristic approaches.

Most of the cutting optimization software focus on cutting material boards (2-dimensional or 2D) which is more difficult than cutting material bars (single dimensional or 1D), while volume cutting (or 3D) is much more complicated. The cutting problems can be classified into several categories, depending on the problem's specific constraints.

It can be regular, if the shapes of the items to be cut can be described by few parameters, or irregular, otherwise. Regular cuts can be rectangular or non-rectangular. Rectangular cutting is called oriented, if an item of width w and height h is considered to be different from another one of width h and height w , and non-oriented otherwise.

If a sheet (or any sheet fragment produced during operation) can only be cut from side to side, then we speak of guillotine-type cutting patterns; and problems allowing non-guillotine patterns are generally much harder to solve. A staged pattern is a guillotine pattern cut into pieces in a limited number of phases.

The direction of the first stage cuts may be either horizontal or vertical (parallel to one side of the stock sheet), and the cuts of the same stage are in the same direction. The cut directions of any two adjacent stages must be perpendicular to each other. If the maximum number of stages is not allowed to exceed n , the problem is called n -staged. When there is no such restriction, the problem is called non-staged.

Typical options of a cutting optimization software:

- Cutting Objective: Minimization of material waste, of total cost or of the number of different layouts.
- Cutting Type: Guillotine cutting (i.e. only edge-to-edge cuts allowed), free cutting, fixed or free rotation of items.
- Cutting Performance: Time limit, selection of optimization speed and cut quality.
- Cutting options: Kerf width consideration, Reuse of offcuts, Safety margins, Sheets priority, First cut orientation, Sheets of different sizes, Edge banding calculation.
- Manual layout rearrangement: Items position, Items rotation, Items removal, Items insertion, Items size altering.
- Outputs: Cuts quantity, coordinates, trajectories.
- Import/Export Data Format: MS Excel; MS Word; CSV; TXT; RTF; DXF; ASCII; XML; HTML; G code (for CNC machine).

Table 1 below provides comparisons of some cutting optimization software available on the market.

Table 1: Major features of cutting software

Software	Minimize waste	Minimize cost	Minimize # of diff. layouts	Guillotine cutting	Free cutting	Sheet priority	Reuse of offcuts	Items rotation	Inventory tracking
ACE Cutting Optimizer	Yes			Yes			Yes		Yes
Cutlist Plus	Yes	Yes		Yes			Yes		Yes
Optimik	Yes			Yes			Yes		Yes
PlanIQ	Yes		Yes	Yes	Yes	Yes	Yes		Yes
Real Cut 2D	Yes			Yes			Yes		Yes
Sheet Cutting Suite	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
SmartCUT	Yes			Yes			Yes		Yes
BestCut	Yes			Yes	Yes	Yes	Yes		Yes
Cut Master 2D	Yes		Yes	Yes			Yes		Yes
CutLogic 2D	Yes		Yes	Yes	Yes		Yes		
Opticut	Yes		Yes	Yes			Yes		Yes
Panel Optimizer	Yes			Yes					
Plus 2D for Woodworking	Yes	Yes		Yes			Yes		Yes
Sheet Layout 9	Yes			Yes					Yes

The software mentioned in Table 1 supports creating optimal image when cutting, but in some cases (like in wood plank cutting) it is also required to add textures to different horizontal and vertical sections. An exception is **Draw2D**, a Vietnamese application that provides solution for this special need. [8]

Draw2D allows:

- Optimal calculation of cutting area.
- Unlimited parts size.
- Wood grain declaration.
- Adjustment of the wood panel dimensions.
- Display in Vietnamese.

2.3. Jobshop schedule optimization

Scheduling is the allocation of shared resources over time to competing activities. Scheduling machines and manpower can be hard for keeping up with deadlines which often create logistical headaches as every job has unique requirements. It's not always easy to arrange jobs for smooth transition and flow from one batch to the next.

One common scheduling problem is the jobshop, in which multiple jobs are processed on several machines. Each job consists of a sequence of tasks, which must be performed in a given order, and each task must be processed on a specific machine. The problem is to

schedule the tasks on the machines so as to minimize the length of the schedule, i.e. the time it takes for all the jobs to be completed.

There are several constraints for the jobshop problem:

- No task for a job can be started until the previous task for that job is completed.
- A machine can only work on one task at a time.
- A task, once started, must run to completion.

Jobshop scheduling software can be a component of a larger total solution for enterprise (ERP) or be a stand-alone software which is mostly cheaper.

A typical sequencing optimization software may have the following features [9]:

- Visualizing the scheduling in a graphical way so that users can easily see and change the schedule plan via drag and drop.
- Sequencing constraints are always kept, including the predecessor/successor relations of tasks, priority of orders, restrictions such as dedicated machines, release and due dates, "start not earlier than" date, etc.
- Enabling the user to also build the plan based on one strategy (e.g. ASAP) and then make exceptions for selected orders (e.g. JIT).

- Keeping delivery times of every job under control and enable to manage the urgent order.
- Providing machine utilization information to make sure required machines are available for the assigned jobs.
- Cloud-based platform-independent software that do not require any installation and are ready-to-use on a browser.

ORITAMES APS Scheduler [10] is a finite capacity Advanced Planning and Scheduling optimization system based on Artificial Intelligence (AI). ORITAMES APS Scheduler features:

- Production Scheduling.
- Automated Scheduling.
- Capacity Planning.
- Change Management.
- MRP.
- Quality Management.
- Scheduling.
- What-if Analysis.

MaxScheduler is an easy to use web-based scheduler that allow to [11]:

- Improve operations scheduling, every staff can log in and check the schedule themselves.
- Import jobs from spreadsheets, MRP, ERP, accounting, MIS, etc.
- Assign jobs to people or machines easily, using a mouse.
- Create a graphical schedule.
- Show List View of jobs to be scheduled, with column sorting and data searching capability.
- Enable search and see all job details with an overall job status screen.
- Real-time access anywhere/anytime through a web browser.

Prodsmart [12] is a software solution for job shops, machine shops and made-to-order manufacturers. The system:

- Offer real-time tracking, OEE (Overall Equipment Effectiveness) and traceability.
- Reduce Waste and Scrap: locate bottlenecks.
- Reports are fed by real-time information collected from the shop-floor through mobile devices.
- Visual scheduler gives you full visibility into your resources, from workers to machines.
- Effectively plan and schedule your operations to balance the workload, align shifts and meet production targets.

2.4. Load stacking optimization

Enterprises may also need to ship their various products to customers, or distribute goods to other businesses, agents, end users. Naturally, it requires optimal loading and unloading goods into cartons, containers, trucks... to transport with maximum tonnage to minimize transportation costs. Due to the designed characteristics of the vehicles and the products, there are constraints to be observed when stacking, loading, unloading.

The most cost-effective way of reducing storage and shipping costs has been in getting more products onto a specified area or into a specified space. Precise placement of items effectively utilizes cargo space and saves transportation costs.

Companies use the software for loading onto storage or shipping facilities (e.g. containers) inside and outside the business. Within the enterprise, the software helps to arrange goods with optimized quantities to fill one or more containers, increasing the efficiency of using premises and workshops. For transport outside the enterprise, it helps to maximize the use of volume and vehicle space to save transportation costs.

Package design offers the greatest single opportunity for reduced logistics costs and improved profitability. Typical features of such software include:

- Create a picking plan using complex stacking rules including stacking order (LIFO, FIFO), partial load, weight balancing distribution,
- Load optimization under comprehensive stacking and box orientation rules,
- Store and retrieve full stowage cases,
- Have a sorting plan available when needed,
- Guide trucks to queue, with the axle weight limit fully considered or controlled,
- Allow to load goods around an area,
- Line up for trucks / trailers with off-grade capacity,
- Organize and stack goods on pallets, as well as cartons and other user-defined stacks,
- Distribute actual load instructions (electronic or printed) in 3D diagrams,
- Allow data import and export for communications with other software or staff.

CubeMaster developed by Logen Solutions USA Inc. is a cargo load planning, optimization, diagramming and distribution software for manufacturers, shippers, freight forwarders and logistics providers [13]. It has both desktop and cloud version.

CubeMaster is the powerful cargo load plan and optimization software for truck, container, pallet and carton. It reduces shipping and transport costs through

intelligent cargo loading and optimal space utilization algorithm. CubeMaster is the unique software able to calculate 23 load optimizations as in Table 2.

Table 2: CubeMaster optimization functions

Load Type	Truck& Trailer	Sea Container	Pallet	Air Container	Carton
Mix Load	OK	OK	OK	OK	OK
Single Load	OK	OK	OK	OK	OK
Set Load	OK	OK	OK	OK	OK
Multi-Set Load	OK	OK	OK	OK	OK
2-step Load	OK	OK	-	OK	-

CubeMaster Online is a cloud solution to build optimal load plan with teams working together in distributed areas. CubeMaster offers modules on Vehicle Load Optimization (VLO), Palette Optimization (PPO), Air Cargo Optimization (ACO), optimizes the loading of transport units such as trucks, trailers, railcars and sea container with maximized load efficiency, minimized number of vehicles to fulfill the orders, etc.

CubeDesigner [14], another application also by Logen Solutions is an online solution that provides package design and pallet configuration software to build optimized pallet patterns. It can also be used to calculate package size, package configuration, stacking strength, and truck configuration. With CubeDesigner, packaging engineers can oversee all steps of the package design from idea to final presentation, with a result of adding to the bottom line of the organization.

CubeDesigner can calculate and perform box design where user can define how many of primary packages to go inside the master shipcase or the maximum number of items to load around the Length, Width, or Height of the container. In addition to ship case design and optimization, its database feature can also make the best use of existing shipcases that work best for given cartons.

CubeDesigner maximizes number of boxes to fit onto Pallets and determines the best pallet pattern. CubeDesigner comes with a database of different pallet styles, but user can also create new pallets in certain style and size. CubeDesigner allows to calculate from simple to the most complex pallet patterns using a host of pre-defined shapes:

- Calculate multi-pallet types from the database.
- Pattern types - 1, 2, 3, 4 and 5 blocks, and multi-surface.
- Automatic layer generation.
- Add corner posts, slip sheets, top caps, shrink wraps or straps
- Rotate and choose alternate pallet patterns.

Cube-IQ [15] is a MagicLogic's software running on Windows operating system, with graphical user interface, with point-and-click and drag-and-drop to create new, optimized stacking plans, or editing existing arrangement plans. Its database comes with the ability to export and import data with CSV, Excel or XML files, fully compatible with SQL and ODBC.

Cube-IQ optimizes automatic cargo handling with flexibility in sorting and stacking rules. It will give the optimal layout to maximize weight/space usage (on pallets, carton boxes, containers, trucks, rail wagons), optimize the placement of goods in one or more different sized transports, stack goods of irregular shapes (rolls, L-shapes), choose the right means of transport for the shipment. The system simulates the process of arranging goods using hypothetical cubes.

EasyCargo [16] is a loading software running in web-browser. EasyCargo keeps the layout of cargo items input and the layout result on the same screen for convenient control. Load plan results are displayed using real-time 3D visualization, cargo items can be easily moved, rotated or zoomed to examine the loading plan result, before printed out or shared online.

The loading plan editor works on a “Drag&Drop” basis and the auto-snap function ensures an aligned fit with other boxes. It is also possible to sort items into groups based on final destination. The user can define as vehicles or containers weight limits, constraint settings for cargo item positioning (non-stackable, no-tilt, do not rotate, shift to mass center, etc.).

EasyCargo software allow data import from and export to MS Excel, integration with the SAP ERP, or integration via API-Interface.

PalletStacking [17] is a software for Pallet, Warehouse and transport optimization. With PalletStacking a company can set up its own product, calculate the box with the best arrangement, palletize and optimize the

truck loading to get the best pattern solutions with the lowest costs possible for warehousing and transportation.

With PalletStacking users have several alternatives to package products and then to load them on pallets, containers or trucks. The software can:

- Calculate the best box arrangement.
- Determine the best package units.
- Create your own pallets patterns.
- Mix loadings on pallets.
- Design Product Optimization.
- Generate pallet optimizing reports (in Excel, HTML, PDF formats).
- Calculate strength box resistance.
- Convert back and forth between metric and US units system.
- Communicate with Microsoft Access database.
- Be translated to your own language from the available English, Spanish, French.

StackAssist [18] supports with the efficient planning and execution of order picking, stacking and loading for warehouse management. It prevents unnecessary half full pallets, boxes and containers.

StackAssist takes customer requests into account and makes sure every customer will receive its products in the way he/she wishes. Use StackAssist when you are on the phone with your customers and give them proactive advice on the best mix of their order.

StackAssist takes special product properties as "this side up" and "do not stack" into account as required constraints. Via visual instructions employees get directions in a simple way.

StackAssist is a SAAS (software-as-a-service) solution, thus users do not have to install and maintain extra software nor high investment cost. The user will be charged per stacking advice or load plan.

PUZZLE® [19] has been optimizing the space on load carriers such as boxes and pallets since 1992. Numerous companies have already used licensed versions of the software, developed by the Fraunhofer Institute for Material Flow and Logistics, and benefited from the more efficient allocation of shipping space. PUZZLE® not only calculates the most optimal arrangement of geometric objects in a defined space but it also helps users select the right loading equipment for the job.

A complex algorithm based on item data (geometry, weight, surface structure, stability, and fragility), customer specifications, and order data (quantity, item group and so on) calculates an optimal loading arrangement for the items along with the loading sequence required for the specified order volume.

This portable software runs in a web browser independent of computer's operating system, so users in a company have access to its full functionality without having to install any software. WebGL is used to render the results of the optimization calculation as 3D graphics.

PUZZLE® consists of 4 Modules for various user needs:

- PUZZLE Box: Optimized filling of boxes with identical items.
- PUZZLE Pack: Palletization of identical packages
- PUZZLE Pack+: 2-step Optimization by combining the Modules Box and Pack.
- PUZZLE SHIP-IT: Palletization of mixed orders.

Functionality of all PUZZLE® modules include:

- Interactive visualization of the optimized loading units,
- Determination of the number of containers required for a specified transport volume,
- Planning of the required transportation capacity
- Calculation of the volume-optimized arrangement of items on a pallet,
- Provides support to the picking/loading areas with detailed picking lists or packing instructions
- Detailed packaging reports (PDF, DOCX, XLSX, PPTX or RTF),
- Multilingual (German, English, French).

2.5. Vehicle routing optimization

Route optimization means creating efficient transport plans (e.g. sending shipments, collecting packages...) using app or software to cut costs, save time, and utilize available resources.

For any logistics provider, arranging delivery services always carries a risk of cost escalation due to issues that affect your bottom line such as fuel wastage, surcharge fraud and low fill rate:

- High logistics costs due to non-optimal delivery routes.
- Transportation progress relies heavily on the drivers
- Customer service quality decreases due to late deliveries, missed shipments or inefficient fleet management.
- Inability to evaluate logistics performance and improve quality.

Route optimization plans the sequence of stops a delivery driver follows to improve the driver's efficiency and customer service. In the past, dispatchers had to create routes with pen, paper, maps, whiteboards, spreadsheets, and their accumulated business knowledge. To increase productivity and keep expenses low, it is

advisable that carriers consider using digital platform to streamline their logistics activities.

Instead of manual dispatching which usually is not so efficient in terms of time spent and quality of the routes, now much of the route planning work can be automated and performed with higher accuracy by algorithms. Route optimization software rapidly creates efficient routes, helps manage daily operations, and offers new strategies for running a fleet. The software utilizes the historical traffic data, weather conditions, and scenarios to identify the fastest and most economical route to an end destination even with multiple stop-points in between, finishing work orders on time.

The software makes these efficient routes for an entire fleet based on the business’s constraints and goals, assisting dispatchers by automating the work of manual planning. Compared to manual routing solutions, a fleet can expect to see significant business improvements after adopting new route optimization software, such as:

- Reductions in late delivery,
- Improvements in fleet utilization,
- Achieving higher levels of customer service,
- Savings in fuel and mileage costs.

Abivin vRoute [20] is an optimization software developed by a recent Vietnamese startup. The product has received international awards such as Champion of the “Startup World Cup 2019” contest organized in the US, the "Best Logistics and Supply Chain Startup" at Southeast Asia's Asean Rice Bowl Startup Award.

Abivin vRoute started out as a software to optimize automatic delivery distances and real-time delivery management, then integrated the outstanding features of Inventory Management software, Transportation Management software and Vehicle Routing Optimization software in the same system.

Abivin vRoute supports a range of transportation models such as last mile, long haul, pickup and delivery, container shipment, cold chain delivery, cross docking, etc. Its optimization algorithm, powered by artificial intelligence (AI), analyzes factors such as order, cost, vehicle type, weight, restricted road and more than 20 other delivery constraints to optimize the delivery route for the fleet, keeping costs at the minimum.

The sales route optimization algorithm is based on store data and constraints like visit frequency, time, sales goal, maximum number of visits. The algorithm will then automatically divide those stores into different groups and assign them to salespeople to meet all constraints with optimization goal: Minimum number of salespeople, Sales Maximum revenue, Minimum travel distance, or Minimum revenue difference between salespeople.

Abivin vRoute is currently present in Vietnam, Laos, Myanmar and is continuously expanding its deployment network for companies across Asia. Several domestic and foreign companies are utilizing Abivin vRoute, including big names like Procter and Gamble (P&G), FrieslandCampina (Dutch Lady), AOSmith, MESA, Habeco, Saigon New Port, Viet Thai International (Highlands Coffee).

Table below brief prominent features of some other routing software. [21].

Table 3: Routing optimization features

Software	Features
Opti-Time	<ul style="list-style-type: none"> • Automated territory balancing • Real-time tracking • Batch routing optimization • Asset tracking
Tour Solver	<ul style="list-style-type: none"> • Mileage tracking • Routing • Dispatching • Employee management
WorkWave Route Manager	<ul style="list-style-type: none"> • Drag-and-drop addresses • Find Restaurants • Manage schedules • Capture proof of delivery
MyRouteOnline	<ul style="list-style-type: none"> • Turn-by-turn driving directions • Export your routes to excel • Save and reload routes online • Print a large map
Team RoadWarrior	<ul style="list-style-type: none"> • Live-driver tracking • Dispatch management • Territory management • Performance metrics

3. CONCLUSIONS

The paper has discussed the needs of improving business operations through using optimization software in some areas like scheduling or routing.

It is clear that SMEs will be beneficial from applying specialized software, mostly in form of SaaS, rather than complicated software suite like ERP, due to their limitations in IT investment and staff capacity.

Five categories of hard-to-solve operational problems, namely inventory optimization, material cutting, jobshop scheduling, load packing, and vehicle routing have been briefly mentioned and explained.

Typical features of more than 30 software packages have been presented so that SMEs may have an initial points for future application of such optimization packages to improve their business efficiency and effectiveness.

It is worth to mention that this quick review is far from complete, in both terms of operations in a SME, or number of software packages available on the market. Further study may be needed to provide a clearer picture of actual situation of implementing optimization software at various SMEs.

4. ACKNOWLEDGMENTS

This study is a part of a research entitled “Assessment of the utilization of optimization software in Vietnam enterprises – case study of SMEs located in Bac Giang province” funded by the Hanoi University of Science and Technology (HUST) under contract number T2020-PC-037.

5. REFERENCES

- [1]. <https://www.vir.com.vn/expanding-the-global-role-for-vietnams-smes-71069.html>
- [2]. <https://financesonline.com/2018-saas-industry-market-report-key-global-trends-growth-forecasts/>
- [3]. <https://smartcorp.com/inventory-optimization/>
- [4]. <https://www.eazystock.com/>
- [5]. <https://llamasoft.com/>
- [6]. <https://www.logility.com/>
- [7]. Macedo R. et al (2008), 2D Cutting Stock Optimization Software Survey, OR/MS Today. <https://www.researchgate.net/publication/242422143>
- [8]. <https://phanmemquanlyerp.com/kien-thuc-erp/phan-mem-tinh-toan-cat-nguyen-vat-lieu-toi-uu-cho-nganh-go/>
- [9]. <https://www.just-plan-it.com/smb-production-scheduling-blog/8-job-shop-scheduling-software-must-haves>
- [10]. <http://www.oritames.com/>
- [11]. www.maxscheduler.com/
- [12]. <https://prodsmart.com/job-shop-software/>
- [13]. <https://www.cubemaster.net/>
- [14]. <http://CubeDesigner.net/>
- [15]. <https://magiclogic.com/cubeiq/>
- [16]. <https://www.easycargo3d.com/>
- [17]. <http://www.palletstacking.com/>
- [18]. <https://www.stackassist.com/>
- [19]. <https://www.scapos.com/>
- [20]. www.abivin.com
- [21]. <https://www.spaceotechnologies.com/best-route-optimization-software/>

INNOVATIVE SOLUTIONS FOR SUSTAINABLE CITY LOGISTICS: A LITERATURE REVIEW AND IMPLICATIONS FOR HANOI CITY

Tran Thi Huong

School of Economics and Management, Hanoi University of Science and Technology, Hanoi, Vietnam

Corresponding author: huong.tranhti@hust.edu.vn

Abstract

In recent years, along with the e-commerce and urbanization trend on a global scale, city logistics has been received considerable attention from both academia and practitioners. In this vein, there is considerable research and debate on innovative solutions to reach a sustainable city logistics system. This paper aims to synthesize the critical aspects of solutions for city logistics in the literature. To this end, we have collected and investigated peer-reviewed articles in high-quality journals and conference proceedings by using a systematic content analysis method. The content, impact, and success factors of the solutions referred to in reviewed papers are comprehensively analyzed and presented in classification frameworks in order to gain useful insights into this field. Furthermore, this paper provides implications for stakeholders of city logistics, including shippers, receivers, logistics service providers, and authorities in Hanoi.

Keywords: city logistics, innovative solutions, urban freight distribution system, urban logistics, sustainability.

1. INTRODUCTION

The world is witnessing the dramatic growth of e-commerce and urbanization. It is forecasted that the number of people living in cities will reach approximately 70% of the world's population in 2050 (Dolati Neghabadi et al., 2019; Lee, 2014). To meet the increasing demand in quantity and delivery time of consumers in the e-commerce era, logistics and transportation system have to suffer great pressure in fostering effectiveness and competitiveness of logistics service providers and simultaneously ensure the sustainable development of cities as well as livability and mobility within the city (Eiichi Taniguchi, 2014). City logistics is defined as "the process of optimizing both logistics and transport activities done by private companies in urban areas while considering the traffic environment, traffic congestion and energy consumption within the framework of a market economy" (E. Taniguchi et al., 1999). According to Dolati Neghabadi et al., (2019), city logistics is "a multi-disciplinary problem including managerial, social and engineering aspect" and it needs to carefully consider the complex interaction between different stakeholders who have different views and objectives. The major stakeholders of city logistics are shippers, receivers, logistics service providers (LSP), communities, and authorities. Because of its importance, recently, there are many researches conducted in this field to seek solutions either to optimize the whole city logistics problem or to divide city logistics into sub-problem, then analyze and develop initiatives to solve

the problem from different perspectives. In order to have an overview about recent research in this field, some authors have conducted literature review about different aspects, such as trends and gaps (Anand et al., 2012; Hu et al., 2019), modeling efforts (Anand et al., 2015), challenges in urban freight transport planning (Lindholm & Behrends, 2012) the impact of public policies on urban mobility (Maggi & Vallino, 2016) and methodologies to assess urban freight initiatives (Zenezini & De Marco, 2016). However, there is a lack of a comprehensive literature review of innovative solutions for a sustainable city logistics. Therefore, this paper aims to investigate the literature to synthesize innovative solutions for sustainable city logistics and then put them into a classification framework in order to brighten the realistic application value of these solutions and then suggest solutions for different stakeholders in Hanoi city logistics system. To this end, the following research questions are proposed and investigated:

- What are the innovative solutions towards a sustainable city logistics, referred to in recent literature?
- What are the impact and success factors of these innovative solutions?
- What are the practical implications for different stakeholders of Hanoi city logistics system towards sustainable development?

The remainder of this paper is structured as follows. Section 2 describes the methodology used to collect and analyze data. Section 3 is the classification framework

of different innovative solutions and discussion about the impact and success factors of those solutions, hence suggests appropriate solutions for Hanoi. Section 4 concludes this paper with the main findings, implications, and directions for future research.

2. RESEARCH METHODOLOGY

This paper makes use of content analysis, a powerful quantitative analysis method (Duriiau et al., 2007; Wilding et al., 2012), which was defined early by Berelson in 1952 and developed by Philipp Mayring in 2000 and 2008 (Berelson, 1952; Mayring, 2008, 2000). This method enables researchers to analyze on two levels: (i) manifest content of data in the form of text and documents, and (ii) uncover latent meaning and insights embodied in the text (Duriiau et al., 2007; Wilding et al., 2012). The ability to effectively search, screen, and analyze papers is the advantage of a systematic content analysis literature review in comparison with a traditional review (Ghadge et al., 2012; Strozzi & Colicchia, 2012). Therefore, this research takes advantage of the systematic content analysis method to analyze, synthesize, and classify innovative solutions and its other aspects of city logistics in the reviewed papers.

2.1. Data collection

To ensure the quality and reliability of the literature review part, we collected high-quality papers that were peer-reviewed and published between 1998 and the beginning of 2020 through structured keywords search and cross-referencing. The keywords applied to search for articles in the database of Google scholar, Emerald Insight, and Springer were “sustainable” AND “city” (OR “urban”) AND “logistics” (OR “freight distribution system”, “traffic management system”, “transportation system”, “last-mile delivery”) AND “Solutions” (OR “initiatives”, “measures”, “countermeasures”). After that, the screening of titles, abstracts, and conclusions is carried out to choose the appropriate paper to review.

In order to have appropriate implications for Hanoi, the author collects secondary data, reports about the current urban city logistics system as well as forecast, orientation, and plan of Hanoi to critical analysis.

2.2. Data analysis

In order to have an intensive content analysis, reviewed papers were coded according to a number of categories including “name of solution”, “impact towards sustainability” (environmental impact, or social impact, or economic impact) “beneficiary”, and “success factor(s)”. That categories were also revised during the coding process.

Results gained from the literature review are integrated with secondary research to compare, benchmark, and

develop appropriate solutions for Hanoi city logistics system towards sustainability.

3. RESEARCH FINDINGS

3.1. Classification framework of innovative solutions for sustainable city logistics

Table 1 summarises innovative solutions for sustainable city logistics in literature. The solutions are classified according to the four main groups by kind of solution (technology-based solutions, collaborative approach, transportation means/manner, and law/regulation) and two main groups of impact on sustainability (economics and social/environmental aspect).

3.2. Discussion about the impact and success factors of innovative solutions towards sustainable city logistics

3.2.1. Innovation solutions impact on different aspects

3.2.1.1. Increasing performance of LSPs

Almost above innovative solutions contribute to improve freight movement (by the reduction in the number of trips, the number of ton-km or change in modal split or in time choice) or increase economic efficiency (by the reduction in total logistics cost, transport time, improve reliability (blockchain), and enhance flexibility of logistics system.

Reducing logistics cost

According to Mangiaracina et al. (2019), transportation cost, the main components of logistics cost, consists of traveled distance, driver’s hourly fee, delivery time, problem-solving time, parcels delivered on a tour, % failed deliveries, failed delivery opportunity cost. These components can be reduced through almost technology-based and collaboration solutions, for example:

- crowdsourcing logistics, which can help LSPs share (semi) fixed transportation cost and reduce labor cost;
- dynamic pricing means associating different delivery prices to different time windows; hence this solution enable LSP to optimize delivery cost
- parcel locker, reception box, and pick-up point: Logistic operators-e.g, DHL, InPost – as well as e-commerce players-e.g, Amazon and ePrice-have implemented parcel lockers as an alternative to home delivery to reduce failed delivery.

Improving information security

According to Twenhöven and Petersen (2019), blockchain can help LSPs improve customer communication through stronger IT integration and save operational cost by smart contracts replacing broker and reducing payment risks.

Enhance customer experience and satisfaction

Reception box and Parcel locker help customer plan their receiving time better and solve the problem that several companies banned their staff receiving their private online-shopping goods during working time.

Intelligent transport systems, drones, underground delivery systems, and nighttime delivery as well as consolidate logistics centers also contribute to shortening delivery time; hence customers can get better service.

Table 1: Summary of innovative solutions for sustainable city logistics

Solutions	Referred in	Sustainability aspect	
		Economic aspect	Social and environmental aspect
Technology-based solutions			
<ul style="list-style-type: none"> ▪ Reception box ▪ Parcel locker ▪ I-logic box ▪ Pick-up point 	(Giuffrida et al., 2012; Deutsch & Golany, 2018; Zenezini et al., 2018; Zurel et al., 2018; Wiegmans & van Arem, 2019)	Reduction of time and cost, failed delivery	Reduction of air emission
<ul style="list-style-type: none"> ▪ Blockchain 	(Dobrovnik et al., 2018; Kühn et al., 2019; Tijan et al., 2019; Twenhöven & Petersen, 2019)	Secure operation Saving cost	
<ul style="list-style-type: none"> ▪ Drone/ Robots 	(Chung et al., 2016; Kunze, 2016; Yu et al., 2020)	Time Avoid traffic congestion	Reduction of air emission, noise pollution and traffic congestion
<ul style="list-style-type: none"> ▪ Smart route planning and fleet management ▪ Intelligent transport systems 	(Comi et al., 2018; Eitzen et al., 2017; Mangiaracina et al., 2017)	Track and traceability Optimized route plan Optimized human resources	Reduction of air emission, noise pollution, and traffic congestion
<ul style="list-style-type: none"> ▪ Mapping customer behavior 	(Pan et al., 2017)	Reduction of failed delivery by predict probability customer stay at home	
Collaborative approach			
<ul style="list-style-type: none"> ▪ Crowdsourcing logistics ▪ Crowd logistics ▪ Transportation platform 	(Buldeo Rai et al., 2017, 2018; Carbone et al., 2017; Ermagun & Stathopoulos, 2018; Kunze, 2016; Mladenow et al., 2016; Punel et al., 2018; Sampaio et al., 2019; Wanjiru, 2016)	Enhance service for customers and overall profitability	Contribute to social equity by creating flexibility job
<ul style="list-style-type: none"> ▪ Dynamic pricing 	(Klein et al., 2018; Mangiaracina et al., 2019)	Optimizing delivery cost	

Solutions	Referred in	Sustainability aspect	
		Economic aspect	Social and environmental aspect
<ul style="list-style-type: none"> ▪ Urban consolidation centers/hubs ▪ Public freight terminal 	(Morana et al., 2014; Morganti & Gonzalez-Feliu, 2015; Montoya-Torres et al., 2016)	Reduction of operational costs	Reduction of congestion and environmental impact
Transportation means/ manner			
<ul style="list-style-type: none"> ▪ Off-peak delivery ▪ Nighttime delivery 	(Holguín-Veras et al., 2005; Gatta et al., 2019; Dias et al., 2019; Yudha & Starita, 2019; Gatta et al., 2019)	Increase logistics efficiency through shorten delivery time and accuracy in the delivery schedule	Reduction of pressure on the traffic system
<ul style="list-style-type: none"> ▪ Innovative vehicles: bicycles and tricycles, cargo bikes, EUCAR ▪ Eco-vehicle 	(Slabinac, 2015), (Ehrler et al., 2020; Sonneberg et al., 2019) (Nathanail et al., 2016)		Reduction of air emission, noise pollution, and energy consumption
<ul style="list-style-type: none"> ▪ Light rail networks 	(Singh & Chakraborty, 2016; Kelly & Marinov, 2017; Visser et al., 2017; Barbero & Galeota, 2019; Marujo et al., 2020)	Saving cost	
<ul style="list-style-type: none"> ▪ Pipeline/ Underground delivery 	(Slabinac, 2015; Chen et al., 2017; Dong et al., 2019)		Reduction of the number of ground trucks and pressure on the traffic system
Law and regulation from authority approach			
<ul style="list-style-type: none"> ▪ Time window for truck entering urban area 	Manila Philippine (Castro & REYES, 2010)		Reduction of congestion and environmental impact
<ul style="list-style-type: none"> ▪ Low emission zones 	(Browne et al., 2010)		
<ul style="list-style-type: none"> ▪ Vehicle restriction (weight, width, based) 	(Muñuzuri et al., 2012; de Oliveira et al., 2019; Amaya et al., 2020)		

3.2.1.2. Reducing negative impact on society and environment

In addition to improving the efficiency of the distribution system, the above solutions also contribute to reducing noise pollution, air emission, traffic

congestion, accidents, energy consumption, and increase livability for cities. According to an analysis of Giuffrida, Mangiaracina, and Tumino (2012), the use of parcel lockers can save up to two-thirds of the air emissions in comparison to home delivery. Pipeline or underground delivery cut down a number of the ground

truck, avoid traffic congestion, reduce pressure on traffic system; hence it improves the quality of life of city communities (Dong et al., 2019). Also, innovative vehicles/ eco-vehicle such as bicycles and tricycles, cargo bikes eliminate CO₂ emission, and reduce energy consumption (Nathanail et al., 2016; Sonneberg et al., 2019; Ehrler et al., 2020).

3.2.2. Success factors for innovative solutions

Although the above innovation solutions have a great impact on the city logistics system, the feasibility belongs to quite a lot of factors. The success of technology-based solutions depends on the *infrastructure system, payment system, perception of customers, and support from authorities*.

The reality of the collaborative approach also based on *trust and sharing information* between LSPs as well as *customers playing a role as collaborators* (Cleophas et al., 2019). The information system and law/ regulation are critical factors to implement transportation platform/ crowdsourcing logistics. The underground/ pipeline delivery system requires enormous financial investment (Dong et al., 2019).

The perception of communities also is the signification condition to implement innovative solutions of LSPs or regulation of local authorities. For example, citizens need to understand and follow the regulation, such as time window entering cities, vehicle restriction, or entrance-city fees, which disturb their daily convenience. Toward a sustainable city, each person must become a sustainable consumer.

3.3. Implications for urban logistics system in Hanoi

3.3.1. Introduction to Hanoi urban logistics system

According to Lam et al., (2019), the population density of Hanoi is 2,300 people/km², which is high compared to the density of 300 people/km² throughout Vietnam. As a result, the LSPs often encounter high traffic volume when providing transportation services in the city, with nearly 80% in 2016 and 86% in 2019 of people in traffic using motorcycles (Petsko, 2016; VTV, 2019). The number of private cars is also forecasted to increase year by year because of the after-tax income has improved a lot. Currently, in Hanoi, there are 38 industrial parks and high technology clusters; 198 traditional trade villages; 135 supermarkets and 28 commercial centers and hundreds of wholesale and retail centers (Thuy Nga Nguyen & Pham, 2017). The production value of almost sectors such as manufacturing, construction and agriculture, forestry, and fishery has also increased rapidly over the years. Therefore, passenger and freight transportation activities lead to serious traffic congestion in the city. According to Lam et al., (2019), economic losses due to traffic congestion reached 600 billion US

dollars per year. Beside negative impact on the economy, this city logistics problem also lead to environmental problem due to its amount of CO₂ emission and noise pollution, which reduce the quality of life significantly and hinder sustainable development (Lam et al., 2019; Thuy Nga Nguyen & Pham, 2017).

Therefore, it is necessary to implement innovative solutions to foster economic and business development while increasing life quality and pursuing sustainable development objectives.

3.3.2. Suggestions for Hanoi city logistics system

Not all solutions presented in table 1 are appropriate to Hanoi city logistics system because (i) Hanoi has never had an underground traffic system, (ii) the weak railway system, (iii) payment system dominated by cash payment, (iv) cargo-bike seems not to be feasible... Base on a comprehensive analysis of cost-benefit and success factors, author suggests the following solutions which can be applied to Hanoi urban logistics system.

- Crowd logistics: According to Buldeo Rai et al. (2017), crowdsourcing logistics is an opportunity for more sustainable urban freight transport through enhancing service for customers and overall profitability, contribute to social equity by creating flexibility job replace inefficient urban freight transport flows and stimulate the efficient usage of the available transportation resources.
- Urban consolidation center: Hanoi also acts as a transshipment point for importers and exporters operating in Hai Phong port. Hanoi has a large amount of office space, so many freight forwarders and distributors place offices and warehouses in the city center. Cargo from Hai Phong port is transferred to the cargo warehouses in Hanoi before transporting to other provinces, making the city's traffic even more congested. However, by constructing warehouses or forwarding centers in the outskirts of the city, businesses can reduce the need to transport imported/exported goods to/from the city, thereby reducing congestion (Lam et al., 2019).
- Smart route planning and fleet management: Intelligent transport systems that allow updating real-time data of freights and transportation means/ drivers/ forwarders. At least, LSPs should use apps to control, track and trace their logistics activities.
- Reception box, parcel box: In Hanoi, Lazada has carried out pilot implementation, not on a mass scale of Ilogic smart box since 2019. This solution can reduce failed delivery significantly, but it needs the prerequisites of is online payment system, not COD, as currently.

Besides the above innovative solutions, it is necessary to develop transportation infrastructure, information

system, online payment system, strict regulations, and raise awareness of people and businesses about sustainable production and consumption.

4. CONCLUSION

Logistics that bring in goods and services to the cities increase the quality of life, but it brings much negative impact on the society and the environment. City logistics have four key stakeholders who have quite different missions and objectives to pursue: (i) shippers that attempt to minimize their total costs while maximizing the level of customer service through on-time delivery while (ii) freight carriers focus on minimizing transportation costs while maximizing the level of customer satisfaction through strict designated time, whereas (iii) residents and/or consumers want to maximize their gain through timely receiving of needed goods at a reasonable prices due to which are being exposed to traffic congestion and (iv) administrators aim to increase livability of city, enhance economic prosperity and to align conflicting interests of all by establishing a sustainable logistics system. This paper summarised and classified innovation solutions towards a sustainable city logistics system, which divided findings into technology-based, collaboration approach, transportation means/manner, and authority's perspectives. Besides, this research analyzed the impact of those solutions on different sustainable aspects and their success factors. The practical findings suggested appropriate solutions for the case of Hanoi city. This paper is qualitative-based and secondary research. Thus, there are some limitations need to be fixed in future research. Firstly, solutions can be judged by an empirical survey actual stakeholder of Hanoi logistics system to have accurate input to choose appropriate solutions towards sustainability, which balance the benefit of all stakeholders. Secondly, each solution should accompany by a detail action plan to implement. Finally, suggested solutions for Hanoi mainly focus on the business stakeholder rather than from administrator's perspective. Future research expected to reach a higher level of practical value if the above limitations can be solved.

5. ACKNOWLEDGMENT

This research is funded by Hanoi University of Science and Technology (Grant number T-2018-PC-111).

6. REFERENCES

- [1]. Amaya, J., Arellana, J., & Delgado-Lindeman, M. (2020). Stakeholders perceptions to sustainable urban freight policies in emerging markets. *Transportation Research Part A: Policy and Practice*, 132, 329-348.
<https://doi.org/10.1016/j.tra.2019.11.017>
- [2]. Anand, N., Quak, H., van Duin, R., & Tavasszy, L. (2012). City logistics modeling efforts: Trends and gaps-A review. *Procedia-Social and Behavioral Sciences*, 39, 101-115.
- [3]. Anand, N., Van Duin, R., Quak, H., & Tavasszy, L. (2015). Relevance of city logistics modelling efforts: A review. *Transport Reviews*, 35(6), 701-719.
- [4]. Barbero, J. A., & Galeota, C. (2019). Urban transportation. *The Wiley Blackwell Encyclopedia of Urban and Regional Studies*, 1-12.
- [5]. Berelson, B. (1952). *Content analysis in communication research*.
- [6]. Browne, M., Allen, J., Steele, S., Cherrett, T., & McLeod, F. (2010). Analysing the results of UK urban freight studies. *Procedia: Social and Behavioral Sciences*, 2(3), 5956-5966.
- [7]. Buldeo Rai, H., Verlinde, S., & Macharis, C. (2018). Shipping outside the box. Environmental impact and stakeholder analysis of a crowd logistics platform in Belgium. *Journal of Cleaner Production*, 202, 806-816.
<https://doi.org/10.1016/j.jclepro.2018.08.210>
- [8]. Buldeo Rai, H., Verlinde, S., Merckx, J., & Macharis, C. (2017). Crowd logistics: An opportunity for more sustainable urban freight transport? *European Transport Research Review*, 9(3), 39.
<https://doi.org/10.1007/s12544-017-0256-6>
- [9]. Carbone, V., Rouquet, A., & Roussat, C. (2017). The Rise of Crowd Logistics: A New Way to Co-Create Logistics Value. *Journal of Business Logistics*, 38(4), 238-252.
<https://doi.org/10.1111/jbl.12164>
- [10]. Castro, J. T., & REYES, M. R. D. (2010). Estimating traffic and emissions for various scenarios of freight vehicle restrictions in metro manila. *Asian Transport Studies*, 1(1), 4-17.
- [11]. Chen, Z., Dong, J., & Ren, R. (2017). Urban underground logistics system in China: Opportunities or challenges? *Underground Space*, 2(3), 195-208.
<https://doi.org/10.1016/j.undsp.2017.08.002>
- [12]. Chung, Y., Park, T., & Min, Y. (2016). Usefulness of Drones in the Urban Delivery System: Solving the Vehicle and Drone Routing Problem with Time Window. *Journal of the Korean Operations Research and Management Science Society*, 41(3), 75-96.
<https://doi.org/10.7737/JKORMS.2016.41.3.075>

- [13]. Cleophas, C., Cottrill, C., Ehmke, J. F., & Tierney, K. (2019). Collaborative urban transportation: Recent advances in theory and practice. *European Journal of Operational Research*, 273(3), 801-816. <https://doi.org/10.1016/j.ejor.2018.04.037>
- [14]. Comi, A., Schiraldi, M. M., & Buttarazzi, B. (2018). Smart urban freight transport: Tools for planning and optimising delivery operations. *Simulation Modelling Practice and Theory*, 88, 48-61.
- [15]. de Oliveira, L. K., Rocha Macedo, A. D., Lobo Sampaio, J. C., Mendes de Oliveira, T. de P., de Oliveira, R. L. M., & Vidal Vieira, J. G. (2019). Challenges to urban freight transport in historical cities: A case study for Sabará (Brazil). *Transportation Research Procedia*, 39, 370-380. <https://doi.org/10.1016/j.trpro.2019.06.039>
- [16]. Deutsch, Y., & Golany, B. (2018). A parcel locker network as a solution to the logistics last mile problem. *International Journal of Production Research*, 56(1-2), 251-261.
- [17]. Dias, P. A. P., Yoshizaki, H., Favero, P., & Vieira, J. G. V. (2019). Daytime or Overnight Deliveries? Perceptions of Drivers and Retailers in São Paulo City. *Sustainability*, 11(22), 6316. <https://doi.org/10.3390/su11226316>
- [18]. Dobrovnik, M., Herold, D., Fürst, E., & Kummer, S. (2018). Blockchain for and in Logistics: What to Adopt and Where to Start. *Logistics*, 2(3), 18. <https://doi.org/10.3390/logistics2030018>
- [19]. Dolati Neghabadi, P., Evrard Samuel, K., & Espinouse, M.-L. (2019). Systematic literature review on city logistics: Overview, classification and analysis. *International Journal of Production Research*, 57(3), 865-887. <https://doi.org/10.1080/00207543.2018.1489153>
- [20]. Dong, J., Xu, Y., Hwang, B., Ren, R., & Chen, Z. (2019). The Impact of Underground Logistics System on Urban Sustainable Development: A System Dynamics Approach. *Sustainability*, 11(5), 1223. <https://doi.org/10.3390/su11051223>
- [21]. Duriau, V. J., Reger, R. K., & Pfarrer, M. D. (2007). A content analysis of the content analysis literature in organization studies: Research themes, data sources, and methodological refinements. *Organizational Research Methods*, 10(1), 5-34.
- [22]. Ehrler, V. C., Lobig, A., & Rischke, D. (2020). Chapter 12-E-vehicles for urban logistics-Why is it not happening yet?-Requirements of an innovative and sustainable urban logistics concept. In R. Elbert, C. Friedrich, M. Boltze, & H.-C. Pfohl (Eds.), *Urban Freight Transportation Systems* (pp. 223-238). Elsevier. <https://doi.org/10.1016/B978-0-12-817362-6.00012-4>
- [23]. Eitzen, H., Lopez-Pires, F., Baran, B., Sandoya, F., & Chicaiza, J. L. (2017). A multi-objective two-echelon vehicle routing problem. An urban goods movement approach for smart city logistics. *2017 XLIII Latin American Computer Conference (CLEI)*, 1-10.
- [24]. Ermagun, A., & Stathopoulos, A. (2018). To bid or not to bid: An empirical study of the supply determinants of crowd-shipping. *Transportation Research Part A: Policy and Practice*, 116, 468-483. <https://doi.org/10.1016/j.tra.2018.06.019>
- [25]. Gatta, V., Marcucci, E., Delle Site, P., Le Pira, M., & Carrocci, C. S. (2019). Planning with stakeholders: Analysing alternative off-hour delivery solutions via an interactive multi-criteria approach. *Research in Transportation Economics*, 73, 53-62. <https://doi.org/10.1016/j.retrec.2018.12.004>
- [26]. Ghadge, A., Dani, S., & Kalawsky, R. (2012). Supply chain risk management: Present and future scope. *The International Journal of Logistics Management*.
- [27]. Giuffrida, M., Mangiaracina, R., & Tumino, A. (2012). Home Delivery vs Parcel Lockers: An economic and environmental assessment. *Proceedings of XXI Summer School "Francesco Turco"-Industrial Systems Engineering*, 225-230.
- [28]. Holguín-Veras, J., Polimeni, J., Cruz, B., Xu, N., List, G., Nordstrom, J., & Haddock, J. (2005). Off-Peak Freight Deliveries: Challenges and Stakeholders' Perceptions. *Transportation Research Record*, 1906(1), 42-48. <https://doi.org/10.1177/0361198105190600105>
- [29]. Hu, W., Dong, J., Hwang, B., Ren, R., & Chen, Z. (2019). A scientometrics review on city logistics literature: Research trends, advanced theory and practice. *Sustainability*, 11(10), 2724.
- [30]. Kelly, J., & Marinov, M. (2017). Innovative interior designs for urban freight distribution using light rail systems. *Urban Rail Transit*, 3(4), 238-254.
- [31]. Klein, R., Mackert, J., Neugebauer, M., & Steinhardt, C. (2018). A model-based approximation of opportunity cost for dynamic pricing in attended home delivery. *OR Spectrum*, 40(4), 969-996. <https://doi.org/10.1007/s00291-017-0501-3>

- [32]. Kühn, O., Jacob, A., & Schüller, M. (2019). Blockchain adoption at German logistics service providers. *Artificial Intelligence and Digital Transformation in Supply Chain Management: Innovative Approaches for Supply Chains. Proceedings of the Hamburg International Conference of Logistics (HICL), Vol. 27*, 387-411. <https://doi.org/10.15480/882.2477>
- [33]. Kunze, O. (2016). Replicators, Ground Drones and Crowd Logistics A Vision of Urban Logistics in the Year 2030. *Transportation Research Procedia*, 19, 286-299. <https://doi.org/10.1016/j.trpro.2016.12.088>
- [34]. Lam, Y. Y., Sriram, K., & Khera, N. (2019). *Tăng cường ngành Vận tải hàng hóa đường bộ Việt Nam: Hướng đến giảm Chi phí Logistics và Phát thải khí nhà kính*. World Bank Group.
- [35]. Lee, H. (2014). Urbanisation proceeding on unprecedented scale. *World Cities Summit, Marina Bay Sands, Singapore*.
- [36]. Lindholm, M., & Behrends, S. (2012). Challenges in urban freight transport planning-a review in the Baltic Sea Region. *Journal of Transport Geography*, 22, 129-136.
- [37]. Maggi, E., & Vallino, E. (2016). Understanding urban mobility and the impact of public policies: The role of the agent-based models. *Research in Transportation Economics*, 55, 50-59.
- [38]. Mangiaracina, R., Perego, A., Salvadori, G., & Tumino, A. (2017). A comprehensive view of intelligent transport systems for urban smart mobility. *International Journal of Logistics Research and Applications*, 20(1), 39-52.
- [39]. Mangiaracina, R., Perego, A., Seghezzi, A., & Tumino, A. (2019). Innovative solutions to increase last-mile delivery efficiency in B2C e-commerce: A literature review. *International Journal of Physical Distribution & Logistics Management, ahead-of-print*. <https://doi.org/10.1108/IJPDLM-02-2019-0048>
- [40]. Marujo, L. G., Blanco, E. E., Mota, D. O., & Leite, J. M. L. G. (2020). The Use of Public Railway Transportation Network for Urban Intermodal Logistics in Congested City Centres. In *Sustainable Rail Transport* (pp. 187-207). Springer.
- [41]. Mayring, P. (2008). Qualitative content analysis. Basics and techniques. *Beltz, Weinheim*.
- [42]. Mayring, P. (2000). Qualitative Content Analysis Forum Qualitative Sozialforschung. *Forum: Qualitative Social Research*, 1, 2-00.
- [43]. Mladenow, A., Bauer, C., & Strauss, C. (2016). "Crowd logistics": The contribution of social crowds in logistics activities. *International Journal of Web Information Systems*, 12(3), 379-396. <https://doi.org/10.1108/IJWIS-04-2016-0020>
- [44]. Montoya-Torres, J. R., Muñoz-Villamizar, A., & Vega-Mejía, C. A. (2016). On the impact of collaborative strategies for goods delivery in city logistics. *Production Planning & Control*, 27(6), 443-455.
- [45]. Morana, J., Gonzalez-Feliu, J., & Semet, F. (2014). Urban Consolidation and Logistics Pooling. In J. Gonzalez-Feliu, F. Semet, & J.-L. Routhier (Eds.), *Sustainable Urban Logistics: Concepts, Methods and Information Systems* (pp. 187-210). Springer. https://doi.org/10.1007/978-3-642-31788-0_10
- [46]. Morganti, E., & Gonzalez-Feliu, J. (2015). City logistics for perishable products. The case of the Parma's Food Hub. *Case Studies on Transport Policy*, 3(2), 120-128. <https://doi.org/10.1016/j.cstp.2014.08.003>
- [47]. Muñozuri, J., Cortés, P., Guadix, J., & Onieva, L. (2012). City logistics in Spain: Why it might never work. *Cities*, 29(2), 133-141. <https://doi.org/10.1016/j.cities.2011.03.004>
- [48]. Nathanail, E., Gogas, M., & Adamos, G. (2016). Smart interconnections of interurban and urban freight transport towards achieving sustainable city logistics. *Transportation Research Procedia*, 14, 983-992.
- [49]. Pan, S., Giannikas, V., Han, Y., Grover-Silva, E., & Qiao, B. (2017). Using customer-related data to enhance e-grocery home delivery. *Industrial Management & Data Systems*, 117(9), 1917-1933. <https://doi.org/10.1108/IMDS-10-2016-0432>
- [50]. Petsko, E. (2016, July 18). Transforming a motorcycle city: The long wait for Hanoi's metro. *The Guardian*. <https://www.theguardian.com/cities/2016/jul/18/long-wait-hanoi-metro-vietnam-motorbike>
- [51]. Punel, A., Ermagun, A., & Stathopoulos, A. (2018). Studying determinants of crowd-shipping use. *Travel Behaviour and Society*, 12, 30-40. <https://doi.org/10.1016/j.tbs.2018.03.005>
- [52]. Sampaio, A., Savelsbergh, M., Veelenturf, L., & van Woensel, T. (2019). Chapter 15-Crowd-Based City Logistics. In J. Faulin, S. E. Grasman, A. A. Juan, & P. Hirsch (Eds.), *Sustainable Transportation and Smart Logistics* (pp. 381-400). Elsevier. <https://doi.org/10.1016/B978-0-12-814242-4.00015-6>

- [53]. Singh, M., & Chakraborty, D. (2016). *Freight Distribution through Urban Rail System-Case Study-Delhi*. New Delhi: SPA Delhi.
- [54]. Slabinac, M. (2015). Innovative solutions for a “Last-Mile” delivery-a European experience. *Business Logistics in Modern Management*, 15, 111-129.
- [55]. Sonneberg, M.-O., Leyerer, M., Kleinschmidt, A., Knigge, F., & Breitner, M. H. (2019, January 8). *Autonomous Unmanned Ground Vehicles for Urban Logistics: Optimization of Last Mile Delivery Operations*.
<https://doi.org/10.24251/HICSS.2019.186>
- [56]. Strozzi, F., & Colicchia, C. (2012). *Literature review on complex network methods applied to measure robustness in supply chain design*.
- [57]. Taniguchi, E., Thompson, R. G., & Yamada, T. (1999). *MODELLING CITY LOGISTICS*. INTERNATIONAL CONFERENCE ON CITY LOGISTICS, 1ST, 1999, CAIRNS, QUEENSLAND, AUSTRALIA.
<https://trid.trb.org/view/658226>
- [58]. Taniguchi, Eiichi. (2014). Concepts of city logistics for sustainable and liveable cities. *Procedia-Social and Behavioral Sciences*, 151, 310-317.
- [59]. Thuy Nga Nguyen, & Pham T. T. H. (2017). Đề xuất các phương án phát triển cho vận tải hàng hóa tại thành phố Hà Nội. *Tạp chí Công Thương*, 2017(04-05).
<http://www.tapchicongthuong.vn/bai-viet/de-xuat-cac-phuong-an-phat-trien-cho-van-tai-hang-hoa-tai-thanh-pho-ha-noi-47878.htm>
- [60]. Tijan, E., Aksentijević, S., Ivanić, K., & Jardas, M. (2019). Blockchain Technology Implementation in Logistics. *Sustainability*, 11(4), 1185.
<https://doi.org/10.3390/su11041185>
- [61]. Twenhöven, T., & Petersen, M. (2019). Impact and beneficiaries of blockchain in logistics. *Artificial Intelligence and Digital Transformation in Supply Chain Management: Innovative Approaches for Supply Chains. Proceedings of the Hamburg International Conference of Logistics (HICL)*, Vol. 27, 443-468.
<https://doi.org/10.15480/882.2479>
- [62]. Visser, J., Allen, J., Browne, M., Holguin-Veras, J., & Ng, J. (2017). Light Commercial Vehicles (LCVs) in urban areas, revisited. *10th International Conference on City Logistics*.
- [63]. VTV B. D. T. (2019, April 4). *Xe máy đang chiếm 86% lượng phương tiện giao thông đang tham gia tại Hà Nội*. BAO DIEN TU VTV.
<https://vtv.vn/news-20190404142702196.htm>
- [64]. Wanjiru, L. (2016). *Critical Success Factors of Crowdsourcing Systems for Better Governance*. LinkedIn.
<https://www.linkedin.com/pulse/critical-success-factors-crowdsourcing-systems-better-lydia-hwanjiru/>
- [65]. Wiegmans, B. B., & van Arem, B. B. (2019). *FROM HOME DELIVERY TO PARCEL LOCKERS: A Case STUDY IN AMSTERDAM*. The 11th International Conference on City Logistics.
- [66]. Wilding, R., Wagner, B., Seuring, S., & Gold, S. (2012). Conducting content-analysis based literature reviews in supply chain management. *Supply Chain Management: An International Journal*.
- [67]. Yu, S., Puchinger, J., & Sun, S. (2020). *Urban deliveries using robots in a two-echelon system*.
<https://hal.archives-ouvertes.fr/hal-02434445>
- [68]. Yudha, A. K., & Starita, S. (2019). Nighttime Vehicle Routing for Sustainable Urban Logistics. *2019 17th International Conference on ICT and Knowledge Engineering (ICT KE)*, 1-6.
<https://doi.org/10.1109/ICTKE47035.2019.8966825>
- [69]. Zenezini, G., & De Marco, A. (2016). A review of methodologies to assess urban freight initiatives. *IFAC-PapersOnLine*, 49(12), 1359-1364.
- [70]. Zenezini, G., Lagorio, A., Pinto, R., De Marco, A., & Golini, R. (2018). The collection-and-delivery points implementation process from the courier, express and parcel operator’s perspective. *IFAC-PapersOnLine*, 51(11), 594-599.
- [71]. Zurel, Ö., Van Hoyweghen, L., Braes, S., & Seghers, A. (2018). Parcel Lockers, an Answer to the Pressure on the Last Mile Delivery? In *New Business and Regulatory Strategies in the Postal Sector* (pp. 299-312). Springer.

FACTORS AFFECTING BUSINESSES' PARTICIPATION IN GREEN SUPPLY CHAIN MANAGEMENT

Duong Van Bay^{1*}, Nguyen Thanh Hieu² and Nguyen Huu Sang³

¹ International School of Management and Economics, National Economics University, Hanoi, Vietnam

^{2,3} Faculty of Business Management, National Economics University, Hanoi, Vietnam

*Corresponding author: hieuntqtkd@neu.edu.vn

Abstract

The main purpose of this study is to explore the factors affecting on businesses' participation in green supply chain management. The official study was conducted with 479 fast-moving consumer goods companies (FMCG) through direct and online surveys. The official research results identified eight factors affecting on businesses' participation in green supply chain, including (i) Environmental regulations, (ii) Corporate social responsibility, (iii) Buyer pressure, (iv) Competitive pressure, (v) Managerial commitment, (vi) Environmental performance oriented strategic motive, (vii) Cost performance oriented strategic motive, (viii) Investment performance oriented strategic motive. In addition, the research results also identified that green supply chain management includes three main practices instead of five ones as in the original research model, including (i) Environmental management, (ii) Reverse logistics and (iii) Investment recovery.

Keywords: green supply chain management, environmental management, reverse logistics, investment recovery.

1. INTRODUCTION

In the context of increasing environmental degradation, businesses pay more attention to the "ecological footprint" by changing strategic views and applying green initiatives in production lines. Along with the increasing competition in the global market, businesses must implement modern strategies to build sustainable organizations and gain competitive advantage. Sustainable production and consumption are popularly applied in many countries. Developing a green economy that is based on new energy, renewable energy, energy efficiency, low greenhouse gas emissions, green production and creation of environmentally friendly products is a trend in the world.

Green Supply chain management (GSCM) is a new innovative management tool that can be used as a strategic tool to enhance competitiveness and promote environmental and financial performance of businesses. Green supply chain management is the process of integrating environmental ideas into supply chain management, including product design, selection and sourcing of raw materials, production processes, and product distribution. end-user, as well as lifelong product management after the product is no longer in use (Zhu and Sarkis, 2004). Green supply chain management is influenced by both external and internal

factors. External factors are mainly related to pressure from stakeholders, while internal factors are related to specific business strategies of businesses (Testa and Iraldo, 2009). The effects of supply chain management practices on economic and environmental performance can be distinguished based on the source of these pressures (Zhu et al., 2007). The firm's commitments to environmental issues can improve its ability to implement green supply chain management (Drumwright, 1994; Green et al., 1996).

Academically, the models of factors that influence green supply chain management vary widely. This can be explained by the businesses that participate in green supply chain management. The formation and maintenance of green supply chain management practices are influenced by extremely diverse factors. Different industries, different cultures, different economies are the big variables that strongly influence this concept. In developing economies, especially in transitional ones, the factors affecting the participation of businesses in green supply chain management have significant differences compared to those of developed economies. Through the review of previous studies, it can be seen that the studies on the factors affecting green supply chain management in transitional economies are rare.

Stemming from the above reasons, the authors have chosen the research topic "Factors affecting businesses' participation in green supply chain management". This study focuses on testing the model of factors affecting the participation of businesses in green supply chain management in fast moving consumer goods (FMCG) in Vietnam to clarify the concept of green supply chain management and affirming the factors affecting the participation of businesses in green supply chain management in the transitional economy and then propose some solutions to promote green supply chain management.

2. LITERATURE REVIEW AND THEORITICAL FRAMEWORK

2.1. Green supply chain management

Green supply chain management is an integration between environmental management and supply chain management (Vachon et al., 2006), or green supply chain management is the design of combining environmental factors with decision-making at each stage of material management, distribution, and post-consumption waste management process (Handfield, Sroufe and Walton, 2005). Green supply chain management is a form of sustainable strategic development for businesses in a competitive working environment, emerging as a new innovative method to simultaneously gain financial and environmental benefits through minimizing risks and environmental impacts (Van Hoek, 1999).

2.2. Drivers of green supply chain management

2.2.1. Environmental regulations

Environmental regulation plays an important role in the process of implementing environmental management in businesses and serves as one of the main drivers of ecological innovation based on the products of current legal requirements, current and future regulations. Environmental policy is an important factor affecting the creative activities of businesses (King and Lenox, 2001).

2.2.2. Social responsibility

Businesses applying green practices is to establish an image that is socially acceptable and ensures compliance with social obligations and values. A business can voluntarily fulfill its social obligations to meet social expectations and accept business conduct rules. Moreover, businesses are also obliged to fulfill their social responsibility goals through developing environmentally friendly products. Businesses applying green practices are to establish a socially accepted and guaranteed image consistent with social obligations and values (Hsu et al, 2013).

2.2.3. Buyer pressure

The environmental responsibility of the seller or supplier

may be due to pressure from the supply chain or from regulations. Key players in the supply chain are increasingly investing more time and resources for developing environmental capacity for their suppliers. Green supply chain management practices of buyers are aimed at improving the environmental performance of suppliers including green procurement, as well as other supporting activities such as developing supplier assessment criteria and environmental audit activities, training programs and education that suppliers can share information, and conduct research and development cooperation (Vachon and Klassen, 2006).

2.2.4. Competitive pressure

Successful large businesses in an industry are closely monitored by competitors and outside environmentalists (Zhu and Sarkis, 2007). Therefore, many organizations operating in an environment of competitive pressure are often required to apply green initiatives to compete and gain competitive advantage (Carter and Ellram, 1998). A business can gain a competitive advantage over competitors by acquiring products. Taking advantage of the agility of the market and the reputation of businesses, manufacturers can buy and resell products to increase sales (Zhu et al., 2008).

2.2.5. Managerial commitment

Businesses are run by managers who have different levels of commitment to environmental issues and ability to determine the extent to which they apply green supply chain management (Vachon & Klassen, 2006). The key to green supply chain management is the commitment and support of senior management teams and the culture that promotes environmentally friendly operations (Sarkis et al., 2005).

2.2.6. Environmental performance oriented strategic motive

Green supply chain management is an example of positive environmental performance that increases the performance of businesses, simultaneously improving environmental performance and minimizing risks and impacts on the environment. businesses apply green supply chain management to improve environmental outcomes such as reducing emissions, reducing wastewater, solid waste, reducing the consumption of toxic substances, reducing the frequency of environmental accidents and improving environmental status of businesses (Zhu et al., 2012). This green initiative is aimed at improving environmental performance through practices such as internal environmental management, green procurement, ecodesign and investment recovery.

2.2.7. Cost performance oriented strategic motive

Focusing on eliminating wastes affecting environmental sustainability, thereby reducing costs and improving economic performance, is the goal of green supply chain management. Rao and Holt (2005) have proven that relationship and argued that green supply chain management practices lead to competitiveness and economic efficiency. The application of green supply chain management practices brings positive economic benefits for businesses (Green et al., 2012) and increases employees' income, profits, taxes, welfare and economic results of enterprises (Zhu et al., 2012). In addition, green supply chain management reduces costs, increases market share and increases profits (Chan et al., 2001).

2.2.8. Investment performance oriented strategic motive

The strategic driver of investment performance has a positive impact on green supply chain management because this activity brings long-term benefits to businesses although it increases initial investment capital, increases operating costs and increase the cost of purchasing environmentally friendly materials. Green supply chain management help increase market share and increase profits (Chan et al., 2001). However, increasing the cost of purchasing environmentally friendly materials, increasing training costs and increasing operating costs can also be a measure to promote businesses to change technology, product quality, and change manufacturing and operating processes. Thereby bringing the image of environmentally friendly businesses with customers, gradually increasing market share for businesses in the long term.

2.3. Research model and hypotheses

Based on the literature review, the authors propose a research model on the factors affecting the participation of fast-moving consumer goods businesses in green supply chain management as shown in Figure 2.1. Accordingly, the study consists of eight factors affecting the participation of businesses in green supply chain management: (i) Environmental regulations, (ii) Social responsibility, (ii) Buyer pressure, (iv) Competitive pressure, (v) Managerial commitment, (vi) Environmental performance oriented strategic motive, (vii) Cost performance oriented strategic motive, (viii) Investment performance oriented strategic motive. Green supply chain management practices include three main practices: (i) Environmental management, (ii) Reverse logistics and (iii) Investment recovery.

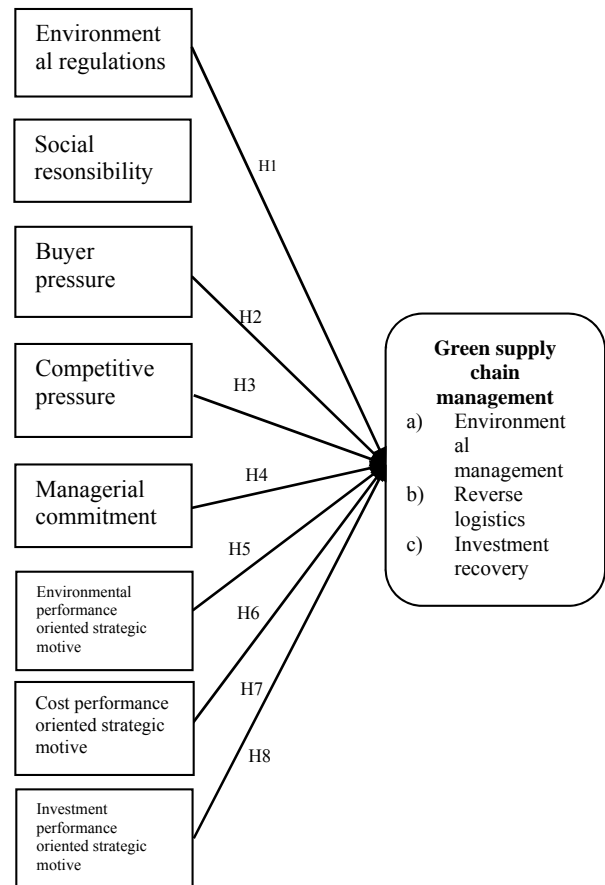


Fig. 1: Research model

Research hypotheses

Hypothesis H1: Environmental regulation positively affects the participation of businesses in (a) Environmental management, (b) Reverse logistics, and (c) Investment recovery.

Hypothesis H2: Businesses’ social responsibility positively affects the participation of businesses in (a) Environmental management, (b) Reverse logistics, and (c) Investment recovery.

Hypothesis H3: Buyer pressure positively affects the participation of businesses in (a) Environmental management, (b) Reverse logistics, and (c) Investment recovery.

Hypothesis H4: Competitive pressure positively affects the participation of businesses in (a) Environmental management, (b) Reverse logistics, and (c) Investment recovery.

Hypothesis H5: Managerial commitment positively affects the participation of businesses in (a) Environmental management, (b) Reverse logistics, and (c) Investment recovery.

Hypothesis H6: Environmental performance oriented strategic motive positively affects the participation of

businesses in (a) Environmental management, (b) Reverse logistics, and (c) Investment recovery.

Hypothesis H7: Cost performance oriented strategic motive positively affects the participation of businesses in (a) Environmental management, (b) Reverse logistics, and (c) Investment recovery.

Hypothesis H8: Investment performance oriented strategic motive positively affects the participation of businesses in (a) Environmental management, (b) Reverse logistics, and (c) Investment recovery.

3. METHODOLOGY

3.1. Sampling

To conduct the official research, the authors randomly selected samples of fast-moving consumer goods businesses by the stratification method, dividing the sample population into groups based on businesses' characteristics. In particular, the sample population of the research is all fast-moving consumer goods businesses, including state-owned enterprises, private enterprises and foreign-invested enterprises. In order to carry out the research objectives, under the condition of limited capacity and resources, the authors used a simple random sample selection. After conducting, the number of samples were collected with the size of $n = 479$. According to Hair et al. (2010), the general rule for the minimum sample size in exploratory factor analysis is five times the number of the observed variables and the suitable number of samples for the analysis is also five times the number of observed variables. This research model has 70 observed variables so the minimum sample size is $70 \times 5 = 350$, so $n = 479 > 350$ is acceptable.

3.2. Data collection

Data was collected by dividing the samples into groups in accordance with type of business including state-owned enterprises, private enterprises and foreign invested enterprises. Then, in each group, a simple random sampling method was used to select the samples and conduct the survey through direct survey and indirect survey.

Direct survey

The direct survey was conducted with FMCG businesses participating in trade fairs held in Hanoi and Ho Chi Minh City, including two international exhibition fairs on food and beverage, two international trade fairs and two Spring fairs were held with over 3,000 domestic and international businesses participating in product introduction. After the fair organizers provided the list of participating businesses, the authors and the survey

team summarized, selected and grouped fast-moving consumer goods businesses by type of business and conducted the survey by distributing questionnaires directly to businesses. This process took 60 minutes for each business at each stall. As a result, the authors and survey team distributed 600 questionnaires, got a return of 464 questionnaires. Of these, 14 were not valid due to failure to answer all questions.

Indirect survey

The online survey was conducted through Google Docs application. This application allows creating a form to get information from selected businesses as research samples. The authors sent the survey requests and links of the questionnaire to businesses via email after being grouped by type of business. The authors and survey team sent 100 questionnaires to 100 businesses, got a return of 29 questionnaires, reaching the rate of 29%.

Respondents

The respondents of the survey were considered as one of the important elements of the research. The respondents of the survey were managers of logistics, product development, sales departments and specialized staff. They were considered as people directly involved in the management and operation activities of businesses, including supply chain management activities. The study was conducted with the main objective of testing the model of factors affecting businesses' participation in green supply chain management.

4. RESULTS AND DISCUSSION

4.1. Research samples

The official research survey was conducted within six months. The total number of questionnaires distributed by direct and indirect survey methods was 700, and the number of questionnaires returned was 493, equivalent to 70.4%. Of which, 14 questionnaires were rejected because respondents did not answer all the information in the questionnaires. As a result, 479 valid questionnaires were included in the analysis. Of the 479 businesses participating in the survey, state-owned enterprises accounted for 8.4%, private enterprises accounted for 68.2%, foreign-invested enterprises accounted for 19.4% and other businesses accounted for 4.0%. In particular, enterprises with staff size of less than 100 people accounted for 46.1%, enterprises with of 100 to 300 employees accounted for 20.5%, enterprises with from 301 to 500 people accounted for 7.5%, enterprises with 500 employees or more accounted for 25.9%. Moreover, enterprises producing and supplying food items accounted for 33.4%; wine,

beer and soft drinks accounted for 12.7%; milk and dairy products accounted for 3.5%; personal and family care products accounted for 11.3% and other related products accounted for 39.1%.

4.2. Relevance of the scale model

4.2.1. Scale model of factors affecting businesses' participation in green supply chain management

The results of EFA analysis show that the scale model of factors affecting businesses' participation in green supply chain management consists of eight concepts, namely (i) Environmental regulations, (ii) Social responsibilities, (ii) Buyer pressure, (iv) Competitive pressure, (v) Managerial commitment, (vi) Environmental performance oriented strategic motive, (vii) Cost performance oriented strategic motive, (viii) Investment performance oriented strategic motive.

After performing the confirmatory factor analysis CFA, factors affecting businesses' participation in green supply chain management, the results show that the model has 617 degrees of freedom with Chi-square = 1774.306 and p-value = 0.000. Moreover, the results also show that the weights of the observed variables are greater than 0.5 and statistically significant with $p < 0.05$. The estimated coefficients associated with the standard errors SE have p-value = 0.000 (< 0.05). The composite reliability and average variance extracted from the scale model of factors affecting businesses' participation is tested satisfactory.

Thus, the CFA results show that the scale model of factors affecting businesses' participation in green supply chain management is compatible with market data, achieving unidirectional value, convergent value, discriminant value and ensure high reliability.

4.2.2. Scale model of green supply chain management

The scale model of green supply chain management consists of three components: (i) Environmental management, (ii) Reverse logistics, and (iii) Investment recovery. The CFA results show that the model has 111 degrees of freedom with Chi-square = 281.303 and p-value = 0.000. In addition, the standardized weights of observed variables ranging from 0.579 to 0.935 are greater than 0.5 and are all statistically significant with p-value < 0.05 . Verifying the general reliability and total variance of the green supply chain management scale model is satisfactory. The estimated coefficients associated with the standard errors SE have p-value = 0.000 (< 0.05). Therefore, the correlation coefficient of these concepts is different from 1 at the 95% confidence.

Thus, the CFA results show that the scale model of green supply chain management is compatible with market data, achieving unidirectional, convergent value, discriminant value and ensuring high reliability level.

4.3. Relevance of theoretical model and research hypotheses

4.3.1. Relevance of theoretical model

The linear structure model SEM is used to test the relationship between factors. The first SEM results show the value of Chi-square = 3,038 with df = 1341; $p = 0.000$ (< 0.05), GFI indicators = 0.777; TLI = 0.858, CFI = 0.887 and RMSEA = 0.065 (< 0.08). Although the model has $p = 0.000$ value < 0.05 and RMSEA index < 0.08 but Chi-square value is greater than 3, the indicators GFI, TLI, CFI are all less than 0.9. Therefore, the model is not relevant for market data.

To increase the relevance of the model to market data, non-meaningful relationships are removed from the model. After adjusting for the MI (Modification Indices), the indicators are improved with all greater than 0.9 (GFI = 0.938; TLI = 0.964 and CFI = 0.974) and RMSEA index is less than 0.08 (RMSEA = 0.057), so the model is compatible with the market data or in other words the model is consistent with the market data.

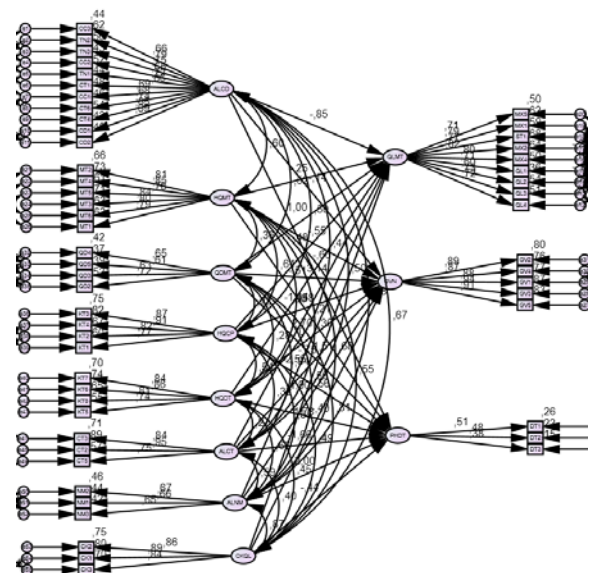


Fig. 2: The SEM results (standardized) of the model of factors affecting businesses' participation in green supply chain management

4.3.2. Relevance of research hypotheses

The aggregate test results (Table 4.1) show that there are 12 hypotheses on the factors affecting businesses' participation in green supply chain management are accepted. The trend of the factors' impact on green supply chain management is positive since the estimated parameters β of the independent variables have values > 0 . In addition, the results also show that there are three statistically significant relationships but having negative effect with reverse logistics.

In particular, the cost performance oriented strategic motive and investment performance oriented strategic motive are two factors that directly and positively impact green supply chain management through all three practices including environmental management, reverse logistics, and investment recovery. The cost performance oriented strategic motive has a direct and positive impact on environmental management, reverse logistics and investment recovery practices with corresponding weights $\beta = 0.163$; $\beta = 0.188$ and $\beta = 0.174$. This proves that the cost performance oriented strategic motive positively affects green supply chain management practices because businesses believe that these practices would help businesses reduce the cost of purchasing materials and reducing costs of energy consumption, reduction of waste and waste disposal fees. Meanwhile, investment performance oriented strategic motive has a direct and positive impact on environment management, reverse logistics and investment recovery with the corresponding weights $\beta = 0.184$; $\beta = 0.360$ and $\beta = 0.158$. That means that investment performance oriented strategic motive has a positive impact on green supply chain management because this activity might bring long-term benefits to businesses although it increases initial capital investment, increased operating costs and increased costs to buy environmentally friendly materials.

In addition, the test results of the research model show that environmental regulation has a direct and positive impact on reverse logistics ($\beta = 0.311$; $p = 0.000$). The managerial commitment has a direct and positive impact on environmental management ($\beta = 0.262$; $p = 0.000$) and reverse logistics ($\beta = 0.361$; $p = 0.002$). Strategic cost performance oriented strategic motive has a direct and positive impact on environmental management ($\beta = 0.163$; $p = 0.000$), reverse logistics ($\beta = 0.172$, $p = 0.026$) and investment recovery. ($\beta = 0.188$, $p = 0.049$). Meanwhile, investment performance oriented strategic motive has a direct and positive impact on environmental management ($\beta = 0.184$; $p = 0.000$), reverse logistics ($\beta = 0.360$; $p = 0.000$) and investment recovery ($\beta = 0.158$; $p = 0.033$). Buyer pressure has a direct and positive impact on environmental management ($\beta = 0.199$; $p = 0.000$) and investment recovery ($\beta = 0.237$, $p = 0.005$). Environmental performance oriented strategic motive has a direct and positive impact on environmental management ($\beta = 0.1115$; $p = 0.048$), but negative with reverse logistics ($\beta = 0.252$; $p = 0.032$).

In particular, the estimation results show that there are three relationships that are statistically significant but have negative effects. Especially, environmental performance oriented strategic motive has a direct but negative effect on reverse logistics ($\beta = -0.252$; $p = 0.000$), social responsibility of businesses has a direct but

negative impact on reverse logistics ($\beta = -0.356$; $p = 0.019$) and competitive pressure has a negative opposite effect on reverse logistics ($\beta = -0.2$; $p = 0.038$). In addition, the rest relationships are not statistically significant due to $p > 0.05$.

Table 1: Relationship between factors affecting businesses' participation in green supply chain management

Hypothesis	Relationship			Estimate	S.E.	C.R.	P
H1b	GVN	<---	QDMT	0,311	0,082	3,806	***
H2b	GVN	<---	ALCD	-0,356	0,151	-2,355	0,019
H3a	QLMT	<---	ALNM	0,199	0,053	3,799	***
H3c	PHDT	<---	ALNM	0,237	0,085	2,803	0,005
H4b	GVN	<---	ALCT	-0,200	0,096	-2,076	0,038
H5a	QLMT	<---	CKQL	0,264	0,057	4,622	***
H5b	GVN	<---	CKQL	0,361	0,114	3,170	0,002
H6a	QLMT	<---	HQMT	0,115	0,058	1,980	0,048
H6b	GVN	<---	HQMT	-0,252	0,118	-2,140	0,032
H7a	QLMT	<---	HQCP	0,163	0,048	3,425	***
H7b	GVN	<---	HQCP	0,188	0,096	1,965	0,049
H7c	PHDT	<---	HQCP	0,172	0,077	2,232	0,026
H8a	QLMT	<---	HQDT	0,184	0,046	3,969	***
H8b	GVN	<---	HQDT	0,360	0,093	3,862	***
H8c	PHDT	<---	HQDT	0,158	0,074	2,130	0,033

4.4. Discussion

The research results show that there are differences from previous studies on the impact model between the influencing factors and green supply chain management practices. Accordingly, the results have identified eight factors affecting the participation of businesses in green supply chain management. Cost performance oriented strategic motive and investment performance oriented strategic motive are the two internal factors of businesses that have the most positive and comprehensive impact on the participation of businesses in green supply chain management. In addition, there are three factors that have a negative impact on green supply chain management, namely, social responsibility, competition pressure and environmental oriented performance motive. In addition to testing the drivers of environmental performance for suppliers and institutional forces as previously studied (Tate et al., 2010), this study also includes buyer pressure as well as public pressure. Therefore, this study also contributes to

the theory of green supply chain management with empirical evidence to test all pressures such as environmental regulations, competition pressure, buyer pressure and corporate internal pressure in an emerging economy. Current studies show that environmental regulation, buyer pressure and internal pressure as well as managerial commitment to manage green supply chain management are consistent with the businesses from the developed economy (Lee, 2008). This research also confirms the theoretical basis with newer findings from Vietnamese businesses, a developing country. Moreover, this research also contributes to the development of green supply chain management theory and enriches the theoretical basis by providing empirical evidence from fast-moving consumer goods businesses. Therefore, this study contributes to a green supply chain management model with an empirical evidence from the test of pressures such as environmental regulations, buyer pressure and internal motives of businesses in a transitional economy. In the era of global business competition in FMCG, the supply chain trend has created an increasingly larger and more complex business environment to meet customer needs and is one of the main challenges of businesses facing the "green initiative" of the world in the supply chain system (Mollenkopf et al., 2010). The current business environment has shifted from traditional supply chains to green supply chains (Wang and Gupta, 2011). Consumers prefer green products with no negative environmental impact (Mahendra and Williamson, 2015). The concept of greening the supply chain is understood as the choice of suppliers with regard to the environment and conducting business only with appropriate partners and meeting the required standards (Stuart and Viviek, 2010). Green supply chain initiatives offer more benefits than that. It is found that green supply chain management provides efficiency and synergy across the entire supply chain network in all stages and also helps businesses enhance environmental efficiency, financial efficiency and minimize waste (Pochampally and Gupta, 2009). This synergy is also expected to increase competitive advantage, corporate image and customer focus. If green supply chain management is applied and fully implemented by businesses, there must be a clear link between economic efficiency and competitiveness (Kaynak and Montiel, 2009).

The research results show that in the transitional economy, the cost effectiveness oriented strategic motive and investment performance oriented strategic motive are two internal factors of businesses that play an important role in promoting businesses to participate in green supply chain management. These two factors are the main factors that directly and comprehensively impact on environmental management, investment

recovery and reverse logistics. This shows that participating in green supply chain management will reduce costs and increase efficiency, thus increase the competitive advantage, a cost advantage. Moreover, green supply chain management is a measure to promote businesses to change technology, change product quality, change production processes and operations, thereby bringing the image of environmentally friendly businesses with customers, gradually increasing market share for businesses in the long term. The empirical results from this study show that the cost effectiveness oriented strategic motive positively affects green supply chain management practices as they help businesses reduce energy consumption costs, reduce waste disposal and waste disposal fees. Meanwhile, the investment performance oriented strategic motive has a direct and positive impact on environment management, reverse logistics and investment recovery of businesses. It means that the investment performance oriented strategic motive has a positive impact on green supply chain management because this green activity brings long-term benefits to businesses even though it increases initial investment capital, operating costs and cost of purchasing environmentally friendly materials. This result is different from the research results of this field when it is assumed that environmental regulations and stakeholders are the main factors that motivate businesses to implement all green supply chain management practices (Zhu and et al., 2012; Zhu and Sarkis, 2006; Hall, 2000) but consistent with some previous studies arguing that green supply chain management is an activity focused on the removal of waste that affects environmental sustainability, thereby reducing costs and improving economic outcomes. Rao and Holt (2005) have proven that relationship and argued that green supply chain management practices lead to competitiveness and economic efficiency. The application of green supply chain management activities brings positive economic benefits to businesses (Green et al., 2012). Green supply chain management activities increase employee's income, profits, taxes, welfare and economic results (Zhu et al., 2012). In addition, green supply chain management reduces costs, increases market share and increases profits (Chan et al., 2001).

The research results show that there are three negative relationships with reverse logistics in green supply chain management, they are, social responsibility, competitive pressure and environmental performance oriented strategic motive. Accordingly, businesses have a high sense of social responsibility but lack of legal constraints, so businesses only focus on carrying out activities that bring immediate benefits to compete without taking into account long term impact on the environment. This indicates that businesses are affected by short-term rather than long-term impacts (Faulkner et al., 2005) and

the difference between positive attitudes and actual actions (Tilley, 1999). This is a testament to the need for government's participation in green activities to encourage businesses to apply green initiatives voluntarily. The biggest responsibility of the business is profit. Businesses must have low costs, high sales and thus maximize profits to survive and grow. However, social responsibility is an integral part of businesses' sustainable development strategy. This finding reinforces the significance of institutional theory of the role of government in managing and coordinating relationships in the supply chain to motivate enterprises to implement green supply chain management, and then changes the perception and behavior of businesses. Previous studies have shown that government is an important factor in promoting voluntary environmental management activities (Rivera, 2004). Government's coercive pressure is proven to motivate businesses to apply green initiatives voluntarily (Clemens and Douglas, 2006). Regulations in developed countries also increase the institutional pressure for businesses in developing countries to improve environmental management. The normative pressure in developed countries is found mainly from the moral values and ecological thinking of consumers (Ball and Craig, 2010). Meanwhile, the empirical results from this study show that enterprises have preferential financial policies of international organizations and government's support and tax reduction policies are the main motivation for businesses to apply green initiatives. The Government's regular inspection activities to ensure businesses comply with environmental laws and regulations are not considered as the main factors affecting the green supply chain management of businesses. This suggests that, in the long run, management tools provide a driver for innovation that drives businesses to engage in innovation beyond legal and regulatory requirements. A comparative study of the innovation-stimulating effect of separate environmental tools proves that economic tools such as taxes and rights are management tools as they encourage businesses to acquire measures to reduce environmental burden in an economical and wider way. Businesses recognize these issues, then determine their long-term ecological and economic potential and attempt to exploit them effectively. Global products face greater challenges due to compliance with environmental regulations around the world. In addition, compliance with product life cycle rules is adding complexity to product design, requiring a shift from disposal after use to recycle after use. The law therefore plays an important role in making this criterion a requirement, not an option.

Empirically, in the context of the world economy shifting to green economy, the development of green supply chain is considered as a new approach for many

businesses to improve competitiveness and position for each brand. Green supply chain management is considered as an effective mechanism to address environmental issues in the value chain. Green supply chain management solutions can bring benefits such as protecting human health, protecting environment, improving productivity, promoting creativity, stimulating growth, increasing revenue for businesses, and saving energy, reducing costs, improving competitiveness. With these benefits, businesses view green supply chain management as a strategic analysis tool and every actor in the supply chain tries to meet environmental standards to create a complete product that is consistent with consumer needs. Many studies indicate that the efforts of all members to pursue a green supply chain management strategy are their commitment to environmental protection and sustainable development.

5. CONCLUSION

The research results have identified eight influencing factors, including four external factors and four internal ones, including (i) Social Responsibility, (ii) Environment, (iii) Competitive pressure, (iv) Buyer pressure, (v) Environmental performance oriented strategic motive, (vi) Cost performance oriented strategic motive, (vii) Investment performance oriented strategic motive and (viii) Managerial commitment. In addition, the research results have also identified green supply chain management including three main components, (i) Environmental management, (ii) Reverse logistics and (iii) Investment Recovery.

5.1. Academic contribution

Firstly, the research results show that green supply chain management would bring long-term benefits to businesses even though it increases initial investment capital, increases operating costs and increases the cost of purchasing environmentally friendly materials but is a measure to promote businesses to change technology, change product quality, and change production and operation processes. From that, bringing the image of an environmentally friendly businesses to customers, gradually increasing market share for businesses in the long term. This result reinforces the significance of the theory of green supply chain management, assuming that cost and investment performance oriented strategic motives are the two main factors that directly affect businesses' participation in green supply chain management through all three components including environmental management, investment recovery and reverse logistics. The results of this study are different from previous research ones when they argue that environmental regulations and stakeholders are the main factors that motivate businesses to implement green

supply chain management (Zhu et al, 2012; Zhu and Sarkis, 2006; Hall, 2000).

- Secondly, the research results show that there are three negative relationships for reverse logistics in green supply chain management, that is, social responsibility, competitive pressure and environmental performance oriented strategic motive. Accordingly, businesses have a high sense of social responsibility but are incomplete and lack of legal constraints, so businesses only focus on performing activities that bring immediate benefits to competition without taking into account the long-term impact on environment. This is a testament to the need for government's participation in green activities in order to motivate businesses to apply green initiatives voluntarily. Social responsibility is an integral part of sustainable development strategy of businesses. This finding reinforces the significance of institutional theory of the role of Government in managing and coordinating relationships in the supply chain to motivate businesses to implement green supply chain management and change their perception and behavior.

5.2. Practical contribution

The nature of competitive advantage in green supply chain management is a competitive advantage in costs so businesses need to actively participate in green supply chain management because it might bring great benefits to businesses through cutting costs, enhancing competitive advantages in the current fierce competition context.

Government needs to internalize negative spillover environmental impacts through environmental regulations and applying waste discharge fees to environment so that businesses can take into account the functions of cost and benefit when making strategic decisions related to green supply chain management. Then businesses' benefits and social benefits will be harmonized and optimized. However, the monitoring costs of the regulations and environmental fees need to be carefully considered.

5. ACKNOWLEDGMENTS

The authors wish to extend our profound gratitude, acknowledgement and appreciation to the scientists at International School of Management and Economics and Faculty of Business Management, National Economics University and especially the respondents from the FMCG businesses, who have inspired us to conduct and finish this study.

6. REFERENCES

- [1]. Ball, A., Craig, R. (2010), "Using neo-institutionalism to advance social and environmental accounting", *Critical Perspectives on Accounting*, 21, (4), 283-293.
- [2]. Chan, R. Y. K., Lau, L. B. Y (2001), "Explaining green purchasing behavior: A cross-cultural study on American and Chinese consumers", *Journal of International Consumer Marketing*, 14, (2/3), 9-41.
- [3]. Chính Phủ (2012), *Quyết định số 432/QĐ-TTg của Thủ tướng Chính phủ về việc phê duyệt Chiến lược Phát triển bền vững Việt Nam giai đoạn 2011 – 2020*, ban hành ngày 12 tháng 4 năm 2012.
- [4]. Chính phủ (2016), *Quyết định 76/QĐ-TTg phê duyệt Chương trình hành động quốc gia về sản xuất và tiêu dùng bền vững đến năm 2020, tầm nhìn đến năm 2030 do Thủ tướng Chính phủ*, ban hành ngày 11/01/2016.
- [5]. Clemens, B., Douglas, T. (2006), "Does coercion drive firms to adopt 'voluntary' green initiatives? Relationships among coercion, superior firm resources, and voluntary green initiatives", *Journal of Business Research*, 59, (4), 483-491.
- [6]. Drumwright, M. E. (1994), "Socially responsible organisational buying: Environmental concern as a non-economic buying criterion", *Journal of Marketing*, 58, 1-19.
- [7]. Faulkner, D., Carlise, Y. M., Viney, H. P. (2005), "Changing corporate attitudes towards environmental policy", *Management of Environmental Quality: An International Journal*, 16, (5), 476-89.
- [8]. Green Jr, K. W., Zelbst, P. J., Meacham, J., Bhaduria, V.S. (2012), "Green supply chain management practices: impact on performance", *Supply Chain Management: An International Journal*, 17, (3), 290-305.
- [9]. Green, K., Morton, B., New, S. (1996), "Purchasing and environmental management: interaction, policies and opportunities", *Business Strategy & the Environment*, 5, 88-97.
- [10]. Hair J. F., Black W.C., Babin B. J., Anderson R.E. (2010), *Multivariate Data Analysis*, 7th ed, Prentice Hall.
- [11]. Hall, J. (2001), "Environmental supply-chain innovations", *Greener Management International*, 35, pp.105-119.

- [12]. Handfield, R., Sroufe, R., Walton, S. (2005), "Integrating environmental management and supply chain strategies", *Business Strategy and Environment*, 14, (1), 1-19.
- [13]. Hoàng Trọng và Chu Nguyễn Mộng Ngọc (2008), *Phân tích dữ liệu nghiên cứu với SPSS*, NXB Hồng Đức.
- [14]. Hsu C. C., et al (2013), "Supply chain drivers that foster the development of green initiatives in an emerging economy", *International Journal of Operations & Production Management*, 33, (6), 656-688.
- [15]. Hsu, C., Tan, K. C., Zailani, S. H. M., Jayaraman, V. (2013), "Supply chain drivers that foster the development of green initiatives in an emerging economy", *International Journal of Operations & Production Management*, 33, (6), 656-688.
- [16]. Huang, Y.C., Wu, Y.C.J. (2010), "The effects of organizational factors on green new product success: Evidence from high-tech industries in Taiwan", *Management Decision*, 48, (10), 1539-1567.
- [17]. Kaynak, H., Montiel, I., (2009), "The Relationship Between Sustainable Supply Chain Management and Sustainable Performance: An Integrated Framework", *Academy of Management Proceedings*, 1-6.
- [18]. Klassen, R. D., McLaughlin, C. P. (1996), "The impact of environmental management on firm performance", *Management science*, 1199-1214.
- [19]. Lê Minh Ánh (2016), "Chương trình hành động quốc gia về sản xuất và tiêu dùng bền vững", *Tạp chí Môi trường*, số 2/2016.
- [20]. Lee, S., Kim, S., Choi, D. (2012), "Green supply chain management and organizational performance", *Industrial Management and Data Systems*, 112, (8), 1148-1180.
- [21]. Lee, S.Y. (2008), "Drivers for the participation of small and medium-sized suppliers in green supply chain initiatives", *Supply Chain Management: An International Journal*, 13, (3), 185-198.
- [22]. Mahendra, I., Williamson, E. (2015), "Critically assess the development of green supply chain management in the fast moving consumer goods industry", *Proceeding of the 9th International Seminar on Industrial Engineering and Management, Supply Chain and Logistics Management, Glasgow Caledonian University, United Kingdom*.
- [23]. Mollenkopf, D., Stolze, H., Tate, W. L., Ueltschy, M., (2010), "Green, Lean, and Global Supply Chains", *International Journal of Physical Distribution and Logistics Management*, 40, (1), 14-41.
- [24]. Nguyễn Đình Thọ và Nguyễn Thị Mai Trang (2008), *Nghiên cứu khoa học marketing - ứng dụng mô hình cấu trúc tuyến tính SEM*, NXB ĐHQG TP HCM.
- [25]. Nguyễn Thế Đồng (2013), "Sản xuất và tiêu thụ bền vững ở Việt Nam - Thực trạng và giải pháp", *Tạp chí Môi trường*, số 10/2013.
- [26]. Nguyễn Thị Việt Anh và Lê Phan Hòa (2013), "Xanh hóa chuỗi cung ứng – hướng phát triển bền vững cho các doanh nghiệp trong thời kỳ hội nhập", *Tạp chí Kinh tế Phát triển*, 193, (II), 49-54.
- [27]. Phan Hằng (2016), "Thực hiện phát triển bền vững: Cam kết của lãnh đạo là một nửa thành công!", *Đặc san Báo cáo thường niên. Truy cập tại <http://tinnhanhchungkhoan.vn/doanh-nhan>*
- [28]. Pochampally, K. K., Nukala, S., Gupta, S. M. (2009), "Strategic Planning Model Reverse and Close-Loop Chains", Boca Raton, FL: *CRC Press*.
- [29]. Porter, M. E., Kramer, M.R. (2006), "Strategy and society", *Harvard Business Review*, 84, (12), 78-92.
- [30]. Rao, P., Holt, D. (2005), "Do green supply chains lead to competitiveness and economic performance?", *International Journal of Operations & Production Management*, 25, (9,10), 898-916.
- [31]. Rivera, J. (2004), "Institutional pressures and voluntary environmental behavior in developing countries: Evidence from the Costa Rican hotel industry", *Society and Natural Resources*, 17, 779-797.
- [32]. Sarkis, J. (2003), "A strategic decision framework for green supply chain management", *Journal of cleaner production*, 11, (4), 397- 409.
- [33]. Sarkis, J. (2009), "Convincing industry that there is value in environmentally supply chains", *Problems of Sustainable Development*, 4, (1), 61-64.
- [34]. Stuart, E., Barry, C. (2008), "Excellent in Procurement: How To Optimise Cost and Value", *Liverpool Academic Press*.

- [35]. Tate, W. L., Ellram, L. M., Kirchoff, J. F. (2010), "Corporate social responsibility reports: A thematic analysis related to supply chain management", *The Journal of Supply Chain Management*, 46, 19-44.
- [36]. Testa, F., Iraldo, F., Johnstone, N. (2009), "Determinants and effects of green supply chain management (GSCM)", *Working Papers*.
- [37]. Tilley, F. (1999), "The gap between the environmental attitudes and the environmental behaviour of small firms", *Business Strategy and the Environment*, 8, (3), 238-248.
- [38]. Vachon, S., Klassen, R. D. (2006a), "Extending green practices across the supply chain: The impact of upstream and downstream integration", *International Journal of Operations & Production Management*, 26(7), pp.795-821.
- [39]. Vachon, S., Klassen, R. D. (2006b), "Green project partnership in the supply chain: The case of the package printing industry", *Journal of Cleaner Production*, 14, (6-7), 661-671.
- [40]. Van Hoek, R.I. (1999), "From reversed logistics to green supply chains", *Supply Chain Management: An International Journal*, 4, (3), 129-135.
- [41]. Viviek, S., (2008), "Resource Highlights for Supply Chain Revolution", *Supply Chain Asia Magazine*, Vov/Dec.
- [42]. Wang, H. F., Gupta, S. M., (2011), "Green Supply Chain Management: Product Life Cycle Approach", *McGraw Hill*, United States.
- [43]. Zhu, Q., Dou, Y., Sarkis, J. (2010), "A portfolio-based analysis for green supplier management using the analytical network process", *Supply Chain Management: An International Journal*, 15, (4), 306-319.
- [44]. Zhu, Q., Sarkis, J. (2004), "Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises", *Journal of Operations Management*, 22, (3), 265-289.
- [45]. Zhu, Q., Sarkis, J. (2007), "The moderating effects of institutional pressures on emergent green supply chain practices and performance", *International Journal of Production Research*, 45, (18), 4333 - 4355.
- [46]. Zhu, Q., Sarkis, J., Lai, K. (2008), "Confirmation of a measurement model for green supply chainmanagement practices implementation", *International Journal of Production Economics*, 111 (2), pp. 261-273.
- [47]. Zhu, Q., Sarkis, J., Lai, K. (2012), "Green supply chain management innovation diffusion and its relationship to organizational improvement: an ecological modernization perspective", *Journal of Engineering and Technology Management*, 29, (1), 168-185.
- [48]. Zhu, Q., Sarkis, J., Lai, K. H. (2008), "Green supply chain management implications for closing the loop", *Transportation Research Part E: Logistics and Transportation Review*, 44, (1), 1-18.
- [49]. Zhu, Q., Sarkis, J., Lai, K. H. (2010), "Green supply chain management innovation diffusion and its relationship to organizational improvement: An ecological modernization perspective", *Journal of Engineering and Technology Management*, In Press.

RESHAPING SUPPLY CHAINS IN VIETNAM: THE NEED UNDER THE IMPACT OF A CHANGING WORLD AND THE COVID-19 PANDEMIC

Nguyen Danh Nguyen, Tran Thi Bich Ngoc, Duong Manh Cuong and Dao Thanh Binh

School of Economics and Management, Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: cuong.duongmanh@hust.edu.vn

Abstract

The article reviews the need to reshape the supply chains in the context of unpredictable fluctuations of a changing world with the trend of protecting domestic production and imposing international trade conditions that some countries currently pursue and under the impact of the COVID-19 pandemic, and provides an overview and analysis of the unprecedented impacts of the COVID-19 pandemic on the Vietnam's economy as well as Vietnam's enterprises, confirming the need to reshape and strengthen supply chains for Vietnamese industries. In this article, the aggregate method and analytical framework were used to clarify the sensitive dependence of the Vietnam's economy on external resources as vulnerabilities and hindrance to the efficient and stable business of enterprises and country's sustainable economic development in long term. Individual views raised by the authors while discussing may be useful for decision making.

Keywords: supply chain disruption, reshaping supply chain, COVID-19 pandemic, foreign direct investment, export-led growth, import dependence, import substitution.

1. INTRODUCTION

Supply chain (SC) is an integral part of business activities of all business sectors since trade began years ago. However, this term is increasingly used with the corresponding supply chain management (SCM) concept, presented by consultants in the 1980s (Arshinder et al, 2008; Injazz & Antony, 2004) when the issue related to the material line was first introduced. Various definitions about SC can be found in the literature and changed with the industry vertical and the context. A simple and rather generic definition was given by Sehgal (2009) who defined SC as the flow and management of resources through the enterprise for the purpose of maintaining the business operations profitably. Resources can be people, materials, information and other organizational assets such as assets and machinery. SC concept is not only encountered in industrial production, but also used in the service and other sector. Irina V. K. et al (2015), studying the SCM concept in marketing channels, concluded that in commerce, SC is a system of organizations, people, activities, information, and resources involved in supplying a product or service to a consumer. SC activities involved the transformation of natural resources, raw materials, and components into a finished product that is delivered to the end customer. It includes

not only the manufacturer and suppliers, but also the domains of marketing channels, logistics, purchasing, downstream relationships, connecting the firm to the end customer.

Companies joining the same SC have a close linkage and create great mutual collaboration throughout the whole SC (Erik, 2007). SC plays an important role as it links the value chain. Quinn (1997) defined that SC links all process incurred within an organization from acquiring raw material from the supplier to delivering final product to customers. Therefore, any change in supply and demand in the market as well as participants' changes or the structural deformation in SC result in production disruption, which causes unpredictable damages.

There were studies on SC realignment in recent years. ADVISEN (2013) has listed causes as natural disasters, terrorism, and climate change effects, demand fluctuation, misguided investments, cyber espionage and political changes, etc. certainly put SCs at risk. For companies, the causes of SC vulnerabilities that should be evaluated include outsourcing to volatile or vulnerable locations; limited redundancy; failure to identify exposures and understand the vulnerabilities of all of the suppliers in the chain. The consequences of this can include a tarnished brand, loss of customers and an overall fall in revenues and share price, all of which can

affect market share if not resolved quickly and efficiently. Studying SC structure elements, Cesar M. O. (2008) emphasized the importance of the alignment within and among SC structural elements in order to increase SC competitiveness.

Hence, it can be concluded that companies involved in the SC at a certain level have interdependence and influence governing each other, and the unexpected fluctuations of one company, especially in the manufacturing sector, can greatly affect other companies involved in the chain, causing production disruption and domino effect that could be able to occur in other economic sectors and spread to other countries. Therefore, the study of sudden fluctuations causing damage to SC and to optimize SC is always a matter of concern.

Current COVID-19 pandemic outbreak transmitted worldwide has the severe impact on public health and economic growth, causing unpredictable human and economic losses. Countries affected by Coronavirus pandemic have spent huge sums of money to rescue the economy, support businesses and citizens, prevent and control COVID -19 pandemic. In April 2020, the International Monetary Fund (IMF, April 2020) published its forecast of economic losses caused by the COVID-19 pandemic in form of GDP growth variation (Table 1).

The impact of this pandemic on society life and the global economy is unpredictable. By the end of June 2020 the IMF has made another projection that the coronavirus pandemic has caused more widespread damage than expected. Regarding economic losses, the global economy will shrink 4.9 percent this year, which is worse than the expected 3 percent decline in April 2020. The U.S. economy, the world's largest, is expected to shrink this year by 8 percent. Countries that use the single European currency are headed for a decline of more than 10 percent while Japanese output will fall by 5.8 percent. By the end of 2021, the pandemic will have cost the global economy US\$12.5 trillion in lost output (David, 2020).

Table 1: IMF economic growth projections for 2020-2021: Real GDP

	Real GDP		
	2019	Projection	
		2020	2021
North America	2.0	-6.0	4.5
United States	2.3	-5.9	4.7
Canada	1.6	-6.2	4.2
Mexico	-0.1	-6.6	3.0

Central America	2.4	-3.0	4.1
South America	-0.1	-5.0	3.4
Middle East and Central Asia	1.2	-2.8	4.0
Europe	1.6	-6.6	4.5
Euro Area	1.2	-7.5	4.7
Germany	0.6	-7.0	5.2
France	1.3	-7.2	4.5
Italy	0.3	-9.1	4.8
Spain	2.0	-8.0	4.3
Emerging and Developing Europe	2.1	-5.2	4.2
Asia	4.6	0.0	7.6
Japan	0.7	-5.2	3.0
Singapore	0.7	-3.5	3.0
Korea	2.0	-1.2	3.4
Australia	1.8	-6.7	6.1
China	6.1	1.2	9.2
India	4.2	1.9	7.4
ASEAN-5	4.8	-0.6	7.8
Indonesia	5.0	0.5	8.2
Thailand	2.4	-6.7	6.1
Malaysia	4.3	-1.7	9.0
Philippines	5.9	0.6	7.6
Vietnam	7.0	2.7	7.0

Source: IMF staff

An international law firm Baker McKenzie (2020) has also predicted that as a result of COVID-19 pandemic, global GDP growth is expected to average 0 percent for 2020 as a whole, a faster contraction than during the 2008 global financial crisis. Currently, the COVID-19 epidemic is still spreading faster, and we believe that the damages in the different aspects of life will probably greater, including the negative change in human psychology.

Financial market and SC disruptions, travel restrictions, and lockdowns have had extensive consequences. Many businesses reduced or temporarily closed operations, raising uncertainties and concerns on corporate and household debt defaults. In ASEAN, the uncertainties brought about by the pandemic also triggered a swift

outflow of capital, causing a dive in the markets and a rapid depreciation of the exchange rates across the region. Around a fourth of the stock market values in Indonesia, Philippines, Thailand, and Vietnam were vaporized. The highest drop was in Vietnam, where the VN index fell by 29.3 percent from 936.6 at the end of January to 662.5 by the end of March. In comparison, the downswing was relatively seen in Malaysia, where the decline was limited to 11.8 percent (from 1513.1 in end-January to 1350.9 in end-March) (ASEAN Secretariat, 2020).

The IMF's prediction also shows that Vietnam's GDP growth will fall from 7.0 percent in 2019 to 2.7 percent in 2020. And in fact, based on effective anti-epidemic measures and entire government and community efforts, Vietnam has quickly controlled the pandemic situation, and GDP in the first six months of 2020 was estimated to increase by 1.81 percent (GSO, 2020). And so, Vietnam GDP growth is expected to lose by about 3.6-4.4 percent.

The spread of the Covid-19 pandemic is being multiplied by free trade and widespread travel across continents. Today's economic globalization has amplified the cross-border impacts of the epidemic as it creates interdependence among economies in global supply chains (GSCs) for raw materials, components, equipment, consumer goods, and import-export. Social distancing practiced in countries and territories suffering from pandemic and stoppage of suppliers, transporters or manufacturers can disrupt activities of others that lead to reducing demand, consumer purchasing ability, increasing unemployment, service systems collapsing, etc. This domino effect quickly spreads inside the country and from one country to another. The purpose of this article is to examine the need to reshape the SCs in context of possible changes and under the impact of COVID-19 outbreak.

2. LITERATURE REVIEW

Traditionally, SCM has focused on efficiently integrating supplier and customer activities so that products are produced and distributed in the right quantities, at the demanded quality, at acceptable prices, to the right locations, and on time, in order to minimize system-wide costs while satisfying service-level requirements (Visser et al., 2007). Recent trends and changes in companies' production relocation and backshoring behavior against the background of the global economic crisis were noticed (Steffen K., 2012). The relevance of relocation activities to establish production presence in low-wage countries in Asia and Eastern Europe has grown and recently been studied since 1990s (Brainard & Riker, 1997; Jean-Louis, M. & Philippe, S., 1997). In the past, only multinational corporations (MNCs) were operating in this field, but today

production relocation as an alternative to foreign direct investment (FDI) is becoming an increasingly chosen option for companies of all sizes (Enrico & Leo, 2000).

Terry F. Y. (2020) in his research considers that re-alignment of GSCs was underway before the pandemic had even begun, and the pandemic has accelerated and deepened SC restructuring, but it did not initiate it. Before the COVID-19 pandemic there had been a series of non-pandemic-related factors that caused global business managers to re-evaluate how to optimize their supplier relationships. These include: (a) rising labor costs in China, Taiwan and other major Asian production centers which motivates the relocation of certain product-component manufacturing or sub-assembly into lower-cost nations such as Cambodia, Vietnam and other Asia-Pacific nations; (b) continuing quality control and related risk problems of food and pharmaceutical safety; (c) increasing SC complexity and loss of business control; (d) growing resistance of family members to live in highly polluted or politically unstable countries; and (e) re-examining the costs and efficiencies of multi-tiered SC structures.

Trends of production relocation are aimed at increasing SC stability, optimizing production profits and reducing SC risks. In Vietnam, there are several studies on SCM. But these studies often focus on perfecting the internal or external SCs of particular industries or business, such as "Sustainability and competitive advantages of the agricultural SC" aimed to propose a research direction to test the impacts of SC sustainability (Toan and Trinh, 2018); Phuong's Doctoral Thesis (2019) on SC quality management model as a basis to develop the capacity of domestic electrical, electronic, and telecommunication manufacturing enterprises to simultaneously solve the problems of quality, costs, delivery times and opportunity to participate in global value chain (GVC).

PwC, the multinational professional services network of firms (2020) has researched the impacts of COVID-19 pandemic on Vietnam's economy and its automotive industry, giving an example of PwC's standardized approach to enable companies to design a resilient SCs aimed to develop a solution for managing SC disruption that enables clients for accurate assessment and quantification of the value at risk during the course of disruptions occurring in the SC. Lam et al (2020) examining the ability of Vietnam's domestic enterprises to participate in local SCs and GSC, emphasized the need to realign SC in context of changing world. Comprehensive study of the need to reshape SCs and their sustainability in context of possible global changes, especially in the case of the COVID-19 pandemic, becomes an essential issue to adjust development strategies and policies to ensure safety and sustainable development of the country.

3. RESEARCH METHODOLOGY

The integrated approach and desk research methodology were used in the study to examine the effects of the COVID-19 pandemic on the overall SCs and the Vietnam's economy and businesses in particular, using data from published materials, IMF World Economic Outlook and VCCI Survey results. The methods of data collection and data analysis were also applied to determine the import dependence in the manufacturing and processing sectors, and evaluate the impacts of SC disruption caused by COVID-19 pandemic on Vietnam's enterprises. Secondary data used in the research was collected from international and Vietnamese sources officially published. In the article there is a gathering of information from well-known online media. Many published data have not been processed, so the authors consider that they are still worth for reference.

Vietnam's economy's dependence on external resources is assessed by evaluation method through respective facts and data related to foreign direct investment FDI in form of capital and technology, import of raw materials and intermediate goods. The impact of the SC disruption caused by the COVID-19 pandemic on Vietnam's businesses and the country's economic development in general is presented in a comparison of the GDP growth by sectors in the same time of years; the Government appropriate responses aimed at supporting enterprises and people affected by the pandemic were reviewed to propose further efforts to recover the economy and social life.

4. RESEARCH FINDINGS

Vulnerabilities of Vietnam's Economy

Vietnam is integrating deeply into the global economy; 13 free trade agreements (FTAs) between Vietnam and other countries and regions have been signed and come into effect. Therefore, any fluctuation in the world can affect Vietnam's economy. COVID-19 pandemic obviously causes tremendous damage to the economy and people's lives, revealing the weaknesses of economic development. As a developing country, Vietnam's economy is vulnerable to the reliance on its export-led growth strategy, external resources and GSCs.

Export-led growth represents a subsidiary branch in this new consensus that is applied to developing countries. Thomas I. Palley (2011) concluded that the specialty of this policy is a self-conscious focus on external markets helps capture the economic benefits of openness for developing countries by encouraging best practice adoption and promoting product development and exposing firms to competition. The evidence for the success of export-led growth was the appearance of four East Asian Tiger economies (Korea, Hong Kong, Singapore and Taiwan). The experience benefited from the development of East Asian and Southeast Asian countries was an advantage that helps Vietnam to shape its export-led growth economy successfully. In 2013-2019, the export proportion of foreign-invested enterprises was almost double that of domestic enterprises; in just 6 years, the total export volume has doubled, from US\$132 to US\$264 billion.

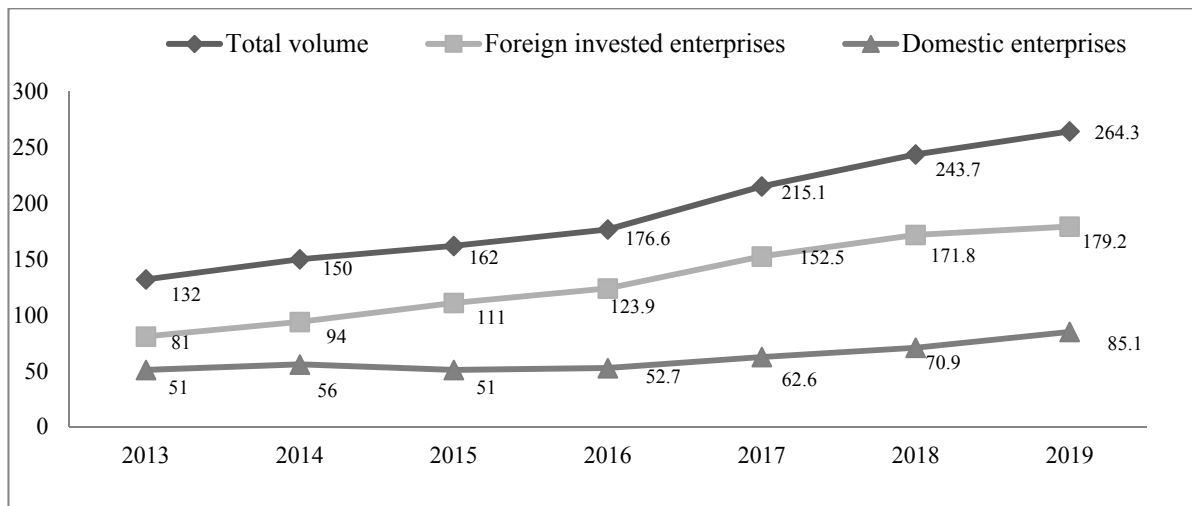


Fig 1: Export volume from 2013 to 2019 by type of enterprise (US\$ billion)

Source: *General Department of Vietnam Customs; updated in April, 2020*

Export-led growth generates a win-win outcome for both developing and industrialized economies. Thomas I. Palley (2011) has also presented the scheme of the cases of openness that include comparative advantage theory, political economy benefits and growth benefits of trade,

giving the thought that arguments on the benefits of trade and economic opening play an important role in promoting the new agenda of international economic integration because they dovetailed with the economic interests of large corporations who were looking to

establish a new global economic structure that has since become known as globalization. Wan-Wen Chu (1988), since 1988 studying the linkage between export-led growth and import dependence, found that the level of import content in exports increased during the course of Taiwan's export-led growth. On a sectorial level, the level of import dependence also increased for all sectors, and linkage effects of exports are not large enough to offset the price effect and the effect of the spreading of import-dependent technology to other sectors.

Hence, the deep integration into the global economy contributes to increasing the dependency of the Vietnam's economy, and we can acknowledge the exported-led growth strategy that drives Vietnam's economic growth could lead to import dependence that in its turn contributes to vulnerabilities such as: (a) dependence on capital, technology, goals and activities of MNCs as main foreign investors; (b) dependence on the international trade conditions, which are often not stable or changed by another country policy; and (c) abnormal fluctuations in the SCs caused by the factors listed in ADVISEN (2013) study.

FDI is one of the key determinants of external resources that contribute to the economy. Solow (1956) more than 50 years ago, based on Neoclassical Theory has described that foreign investment flows are important because it fills the gap between savings and investment.

FDI acts as an economic engine that drives growth by bringing in investments, knowledge, expertise, technology, jobs, and more other (Imtiaz et al, 2018).

Since the 1990s, Vietnam has attracted impressive FDI and made spectacular progress in economic development. According to the Ministry of Planning and Investment (MPI), as of December 20, 2019, the country has 30,827 valid projects with a total registered capital of US\$362.58 billion. The accumulated realized capital of FDI projects was estimated at US\$211.78 billion, equaling 58.4 percent of the total valid registered capital (MPI, 2020, January 6). Foreign-invested enterprises are always leading in exports with export turnover more than twice compared to that of domestic firms as presented in Figure 1. This success has been achieved through advantageous geographic location, open appropriate policies, improving business environment and relatively low labor costs. For Vietnam, while the merchandise trade surplus will continue to be supported by rising exports of the foreign-investment-driven manufacturing sector, imports of capital and intermediate goods will also continue to grow rapidly, as supporting industries remain underdeveloped (Sebastian et al, 2018). To maintain the production, Vietnam's enterprises have to import raw materials and intermediate goods mainly from China, Japan, Korea and ASEAN countries.

Table 2: Export and import turnover by continent, country and some major markets in 2019

Market	Export			Import		
	Turnover (billion USD)	Compared to 2018 (%)	Proportion (%)	Turnover (billion USD)	Compared to 2018 (%)	Proportion (%)
Asia	135,45	2,9	51,3	202,90	6,6	80,2
ASEAN	24,96	1,3	9,4	32,09	0,9	12,7
China	41,41	0,1	15,7	75,45	15,2	29,8
Japan	20,41	8,4	7,7	19,53	2,5	7,7
Korea	19,72	8,1	7,5	46,93	-1,4	18,5
Europe	47,27	2,0	17,9	18,63	4,9	7,4
EU(28)	41,48	-1,0	15,7	14,91	7,4	5,9
Oceania	4,46	-7,4	1,7	5,14	16,4	2,0
America	73,89	27,3	28,0	22,46	10,6	8,9
USA	61,35	29,1	23,2	14,37	12,7	5,7
Africa	3,12	8,1	1,2	3,95	-3,7	1,6
Total	264,19	8,4	100,0	253,07	6,8	100,0

Source: Vietnam Custom, statistical data. Situation of goods import and export in December and 2019

General Department of Vietnam Customs statistics showed that in 2019 the import value from China was US\$ 75.45 billion accounted for nearly 30 percent of total import value, in which only the import value of seven main commodity groups from China was calculated at US\$ 56.73 billion (Vietnam Customs, 2020). The serious trade deficit for Vietnam in the import-export balance of the two countries, Vietnam's growing dependence on bilateral trade with China have had a negative impact on the Vietnam's economy (Binh, 2017).

One company's dominance over another is a function of relative dependence – that is, the SC relationships are characterized by interdependence in structure and

distribution of resources, which creates dependence within chain participants (Crook and Combs, 2007). High dependence will lead to uncertainties and risks, resulting conflicts that negatively affect the overall collaboration (Corsten & Felde, 2005). When one party is heavily dependent upon the other party, it will be locked in the relationship (Narasimhan et al., 2009). Referring to Vietnamese case, we found that due to the high-level dependence on foreign suppliers Vietnam's enterprises of leading industries such as textile and garment, footwear, electronics and automobile affected by COVID-19 pandemic mostly have experienced negative growth.

Table 3: The most suffered manufacturing industries in the first six months of 2020

	Unit	Accrued 6 months of 2020	Compared to the same period last year (%)
Textile fabric from polyester or artificial yarn	MN m ²	472.2	87.0
Clothes	MN pieces	99.5	93.1
Leather footwear	MN pairs	95.7	95.4
Mobile phone	MN pieces	94.3	91.5
Automobile	Thous. pieces	77.3	73.4

Source: From the GSO Report on Socio-economic situation in the first 6 months of 2020

Evidence for this high-level dependence is Vietnam's Textile and Garment Industry (VTGI). Although it ranked 3rd in the world after China and India in 2018 in exporting goods with export turnover of over US\$ 36 billion, it relies exclusively on imports of raw materials. Fiber demand comprises over 1.4 million tons per year, but 90 percent of which is imported from China, South Korea and Taiwan. Moreover, up to 80 percent of fabric source for processing exports is mainly imported, of which 50 percent came from China. Because of being dependent on foreign suppliers for most raw materials and its weaknesses such as technology gap, lack of working capital, low labor skills etc., enterprises of the VTGI restrict at certain stages of production in form of outsourcing (CMT) for foreign brands that accounts for 65 percent; of the rest FOB is 25 percent, ODM and OBM comprise only 10 percent (Phong, 2019). It is the simple answer to the question that although the export value seems to be high, however, the benefits gained from exports are not commensurate.

Impacts of the Covid-19 Pandemic on Vietnam's Enterprises and Vietnam Economic Growth

The ripple effect from locking up large manufacturing centers and the demand shock in the hospitality and travel

sector could be considered as the main factors shaping manufacturing and service sector. These factors trigger a ripple effect along the GSCs, affecting sectorial activities worldwide (Baker McKenzie, 2020). The COVID-19 outbreak has interrupted imports from China and other supply hubs into Vietnam, and as a result, many Vietnam's enterprises are suffering because of the SC disruption. Results of a quick survey of nearly 130,000 enterprises conducted by the MPI in late April 2020 showed that about 86 percent of enterprises were negatively affected by COVID-19 epidemic; expected revenue in the first 4 months of 2020 plummeted to about 70 percent over the same period in 2019; over 45 percent of enterprises were short of capital for production and business; many enterprises were forced to cut wages and labor; in the first 4 months of 2020, the number of enterprises registered for temporary cessation of business increased by 33.6 percent compared to the same period of 2019 (Hoang, 2020).

Other figures of VCCI Assessment conducted in late April 2020 with 700 enterprises and Business Associations from 46 provinces/cities around the country have reflected severe impacts of the COVID-19 pandemic on enterprises of all ownership types (VCCI, 2020). The results are presented in Figure 2.

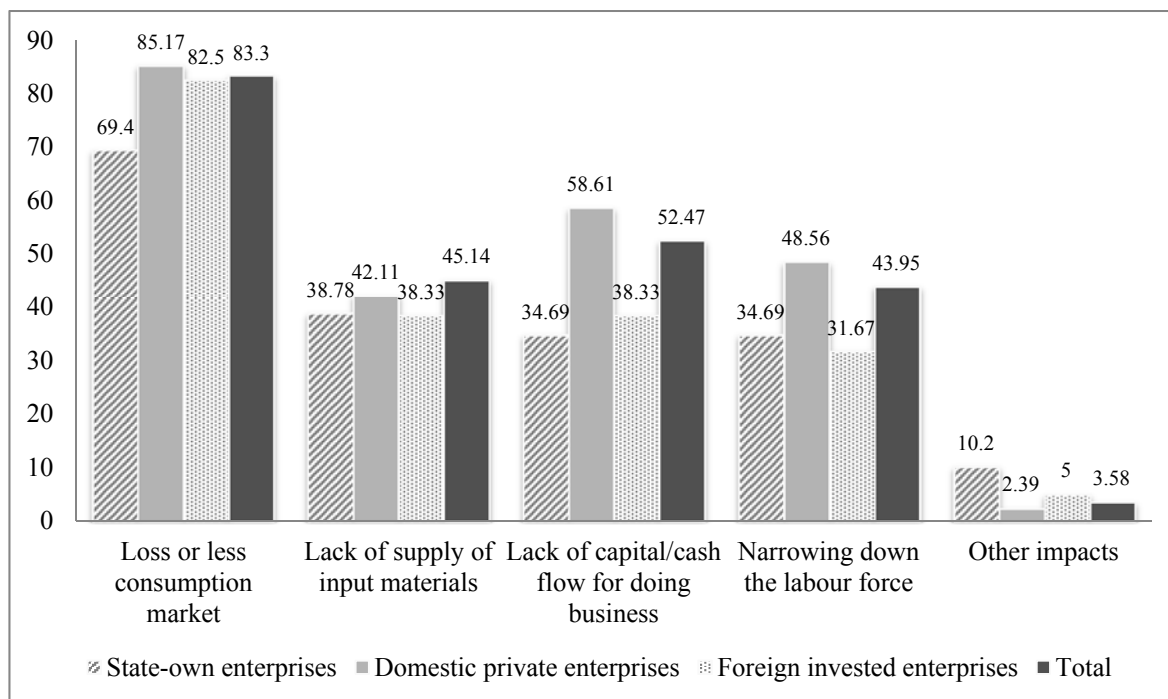


Fig. 2: Impacts on enterprises caused by COVID-19 pandemic by owners as of April, 2020, in percent

Source: Vietnam chamber of commerce and industry

The percentage analysis in Figure 2 affirms that the impacts of the COVID-19 pandemic on enterprises are related to SC disruptions, in which loss of consumption market contraction, shrinking labor force or lack of working capital are also consequences of input and output break. The interruption of external supplies, though it occurred only in the short term, has serious impacts on production and services in Vietnam, slowing its economic growth (Table 4), and the consequences will last for a long time if the problem of the SC

realignment has not been solved globally.

Isolation measure as social distancing practiced globally to contain the COVID-19 pandemic spread have had a strong impact on economic activities, while the sharp deterioration in business and consumer confidence, compounded by recent financial market turmoil, will continue to reduce discretionary spending that result in shrinking economy.

Table 4: GDP growth for the first six months of 2019 and 2020 in comparison by sector

	First six months of 2019		First six months of 2020	
	GDP Growth rate	Contribution to 100% growth rate	GDP Growth rate	Contribution to 100% growth rate
Total GDP growth rate	6,76	100	1.81	100
Agriculture, Forestry and Fishery	2,39	6	1.19	11.89
Industry and Construction	8,93	51,8	2.98	73.14
Service	6,69	42,2	0.57	14.97

Source: from the GSO Report on Socio-economic Situation in the first 6 months of 2019, 2020

Statistical data of the General Statistics Office (GSO) for the first six months of 2020 shown in Table 4 confirms that the most affected sectors are industry and services. According to GSO Report, in travel and hospitality sector

have suffered a severe decline. International visitors to Vietnam in the first six months of the year was estimated at 3,744.5 thousand arrivals, moving down by 55.8 percent compared to the same period last year. In particular, the number of foreign travelers to Vietnam in April only

reached 26.2 thousand; in May it was 22.7 thousand - the lowest level in many years, making a decline of 98.3 percent compared to that of the same period last year. As a result of this decline, a series of hotels, restaurants were temporarily closed and hundreds of thousands of workers were unemployed.

Regarding economic losses, a calculation shows that in case of the best scenario if it will happen as planned by the government, Vietnam's GDP growth in 2020 will fall to more than 4 percent (expected to be 6.8 percent before the coronavirus outbreak) equivalent to losing about US\$ 8.2 billion.

Government response

To assist companies struggling amid the coronavirus outbreak, the Government has approved a credit package worth VND 250 trillion (US\$ 10.86 billion) and a financial stimulus package of VND 30 trillion (US\$ 1.3 billion) (Mai, 2020). Different dynamic measures are also offered, directly and indirectly supporting businesses, in particular:

- Applying tax relief measures include extended due dates for taxpayers to pay value added tax (VAT), corporate income tax (CIT), individual (personal) income tax, and the amounts owed for land rental if the taxpayers are considered vulnerable as a result of the COVID-19 pandemic, including 30 percent CIT reduction, extend the timeline (up to 5 months) for VAT, land rental, personal income tax in line with the Decree No. 41/2020 / ND-CP and support policies as prescribed in Resolution No. 42 / NQ-CP; Central Bank has reduced policy rates by 0.25-1 percentage point, and several commercial banks have already lowered interest rates for businesses affected by pandemic;
- Simplifying customs procedures, especially for goods on the list of goods which are exempt from import tax in service of prevention and fighting of COVID-19 under Decision No.155/QĐ-BTC issued by the Ministry of Finance; suspending checking and assessing the compliance with the law of enterprises in 2020 including post-customs clearance audit and specialized inspection;
- Suspending of social insurance payments according to Directive 11/CT-TTg dated 4 March, 2020; the Prime Minister requested the Vietnam Social Insurance to assume the primary responsibility and coordinate with the concerned agencies in guiding the suspension of social insurance payment for those who are affected by the Covid-19 pandemic until the end of June or December 2020 without interest charge for late payment;
- Encouraging textile and garment enterprises disrupted production to produce medical protective clothing.

Social security package of up to VND 62 trillion (roughly US\$ 2.66 billion) to support people directly affected by the COVID-19 epidemic was approved by the Government (Nhu, 2020). Timely government solutions contribute to alleviating difficulties for businesses and people affected by the epidemic.

New challenges and opportunities

In Vietnam, COVID-19 pandemic obviously causes tremendous damages to the economy and people's lives, revealing the weaknesses and vulnerabilities of economic development, but it also creates different development opportunities for some socio-economic spheres.

The aggregated data analysis of COVID-19 pandemic impact on enterprises illustrated in Figure 2 shows that, in general, over 85 percent of Vietnam's enterprises are adversely affected by the pandemic, of which those domestic private enterprises operating in tourism, transport, trade manufacturing and processing (textiles and garment, furniture, forestry and fishery) sectors are most affected, encountering difficulties because they are labor-intensive and highly dependent on export markets and import of raw materials and intermediate products. SC disruption, demand reduction in both domestic and global markets put pressure on many businesses to stop operations and lay off workers (Samuel, 2020). Thus, the resilience of these industries in particular and the economy in general will have to last for many years, because it depends on the context of the global economy changes in the future.

The trend of moving production of developed countries such as Japan or the United States and EU countries from China to home or other countries, including Vietnam and ASEAN countries, is a reality. The epidemic has only accelerated this process. This trend provides an opportunity for Vietnam to increase cooperation with above-mentioned countries to create great chances in jointly restructuring SCs to increase own and country members' potential, reducing dependency on China and some traditional markets.

The UNCTAD (2020) forecasted that the Covid-19 outbreak will negatively affect global FDI flows. With scenarios of the spread of the epidemic ranging from short-term stabilization to continuation throughout the year, the downward pressure on FDI will be from 5 percent to 15 percent (compared to previous forecasts projecting marginal growth in the FDI trend for 2020-2021). In Vietnam as of June 20, 2020, the total foreign investment, including the newly registered, adjusted capital, contributed capital and shares purchased by foreign investors, reached nearly US\$ 15.7 billion, down 15.1 percent compared to the same period last year (GSO, 2020). But in further, Vietnam as one of the first

countries to reopen the economy during the COVID-19 pandemic, is facing great challenges, but having opportunity to attract new FDI inflows relating to reshaping GSCs before and after the pandemic.

In April 2020 Japan has earmarked ¥243.5 billion (US\$2.2 billion) of its record economic support package to help manufacturers shift production out of China as the coronavirus pandemic disrupts SCs between the major trading partners (Isabel and Emi, 2020). However, according to Mercy A. Kuo (2020), the fact that major Japanese companies move their operations out of China can be explained by geopolitical implications for Japan-China relations. In July 2020, Japan's Ministry of Economy, Trade and Industry unveiled the first group of 87 Japanese companies to subsidize for shifting manufacturing from China to Southeast Asia or Japan, of which 57 projects will head to Japan, 15 companies select Vietnam as destination and the rest will move to Thailand, Philippines, Malaysia, Indonesia, Myanmar and Laos (JETRO, 2020).

Some service industries also have opportunities to develop during the pandemic. Online education, e-banking and e-commerce are the sectors which have reached unexpected success during the COVID-19 pandemic. At the beginning of the pandemic, the Ministry of Education and Training (MOET) on March 26, 2020 issued Instruction for teaching via internet and on TV channels during the time students are absent from schools, and Regulations on ensuring the quality of teaching, checking and assessing learning results in 2019-2020 school year.

National Payment Services (NAPAS) reported that during the COVID-19 pandemic Mobile Banking, Internet Banking applications of 45 commercial banks are used through NAPAS with an average of nearly 2.8 million transactions per day (NAPA,2020); a Survey conducted by the Vietnam E-commerce Association (VECOM) in cooperation with a Global Measurement and Data Analytics Company (Nielsen) at the end of April 2020 showed that among businesses participated in the survey, revenue of 57 percent of surveyed businesses increased by less than 30 percent, and 24 percent of surveyed businesses had a revenue increase of over 51 percent compared to the same period of 2019 (VECOM,2020). VECOM predicted that the growth rate of over 30 percent would continue in 2020 and Vietnam's e-commerce value would exceed US\$ 15 billion compared to US\$ 11.5 billion in 2019.

5. DISCUSSION

Currently, there is no accurate prediction of both the time frame and the effects of COVID-19, but its consequences and implication will continue to be felt even after the spread of the pandemic. For some

countries and territories, the COVID-19 pandemic may last longer, lowering socio-economic development, affecting businesses and changing understanding of SCs and vulnerability in their sourcing strategies. It has also accelerated and deepened SC restructuring in further. Therefore, in case of Vietnam, at macro level, economic policy should focus on import substitution.

Along with the export-led growth model, domestic demand-led growth should be emphasized because of the fact that the conditions for supporting export growth have been being exhausted for developing countries due to the impact of the Great Recession and other fluctuations (Thomas, 2011). That does not mean the abandonment of exporting as countries will always need exports to pay for needed imported inputs and final goods they do not produce, but rather need to shift gradually from export-led growth to a domestic demand-led growth model. Domestic demand growth refers to building the domestic demand side of the economy and reducing dependence on external resources.

There exists a contradiction between desire and reality. One of the barriers for Vietnamese enterprises to reshape SCs, using domestic suppliers is their own weakness and undeveloped supporting industries (SIs). Participation in the GVC network is still low compared to similar economies in Southeast Asia. Research by the Asian Development Bank (ADB) found that only 36 percent of Vietnamese domestic enterprises joined the production network (including direct and indirect exports) while this proportion in Malaysia and Thailand was 60 percent; 21percent of small- and medium-sized enterprises (SMEs) participated in the GVS compared to 30 percent of Thailand, and 46 percent of Malaysia (Dieu, 2017). This issue can be explained by the fact that in Vietnam SIs have not yet developed. So, overall efforts should be focused on SI development measures to implement an import substitution strategy and achieve the goals mentioned in the National Supporting Industry Development Program for the period of 2016-2025 that would result in partly domestic sourcing as more domestic suppliers will appear, facilitating reshaping the SC.

The COVID-19 pandemic has changed business owners' understanding of SCs sustainability and intensified the need to diversify. The nature of diversification in this case is sourcing in different geographical locations, including inside the country to ensure continuousness and stability of input materials and output market. We try to evaluate the need for diversification in Vietnam Tourism and Hospitality as it is most severely affected by the COVID-19 pandemic in the service sector for argument. In 2019, international visitors to Vietnam reached over 18 million (GSO, 2019), while domestic tourists in 2019 comprised 85 million (VNAT, 2020), of

which 43.5 million visitors overnight stayed in hotel accommodation. That is, if not taking into account the amount of profit gained from international visitors, the number of domestic tourists and overnight stayed were more than 4.72 and 2.42 times respectively in comparison with international visitors. The tourism industry needs to focus on domestic tourism demand and upgrading tourism products for Vietnamese travellers in the long term because people's living standards are gradually improving. This diversification is necessary to resuscitate tourism while the COVID-19 pandemic and related travel restrictions around the world still remain.

Yosie's argument (2020) of regionalizing SCs, localizing suppliers, hedging strategies aimed at relocating SCs and diversifying raw material sourcing or SC components and building longer-term business relationships with fewer suppliers are the measures which manufacturers should examine to reduce the rising risks and costs from complex SCs in a post-pandemic world. This argument seems to be appropriate to large MNCs, but part of it is still useful for Vietnam's businesses. When the supply of raw and intermediate materials from China is stagnant, Vietnam's enterprises can look for other regional suppliers such as South Korea and Japan and other Asian countries to import and build their own SCs with domestic suppliers in the long term.

The Japan's and other developed countries' production relocation and reshaping GSC occurring recently creates opportunities for Vietnam to rapidly develop its own SIs, align and restructure SCs of manufacturing and processing industries. So, taking the advantages brought about by this process, Vietnam needs to continue improving the investment environment and its infrastructure network, the professional skill level of the workforce to attract and absorb new investments inflows.

To recover economic activities and ensure people's daily life, a variety of above-described measures have been announced by the Vietnamese government, including rescue packages for enterprises and financial social assistance for the epidemic-affected people, unemployment benefit allowance, and providing household relief. Currently, taking advantage of above-described government's preferential policies Vietnam's enterprises need to be agile and ready to address their constraints related to production, review and optimize the post-epidemic business model. This means raising the entrepreneur's awareness of reshaping their own SCs and promoting innovation activities, enhancing digital transformation for sustainability goals in addition to building resilient business. The enterprise SC reshaping, in principle should include: (1) restructuring and optimizing internal SCs and adjusting activities at all stages of purchasing, production, distribution and sales; (2) diversifying external SCs, building longer-term business relationships with fewer reliable suppliers.

It is important to focus on the external SC as it faces environmental factors that can directly or indirectly affect the SCs. They can be due to political, economic, technological or geographical reasons (Kleindorfer & Saad, 2005).

6. CONCLUSION

The model of Vietnam's economic growth during the past time has been based on export-led growth theory that has increased the dependence of the whole economy on external SCs, including capital flows, technology, MNC's strategies and FIEs and development policies of other countries. The extent dependence has exposed and deepened Vietnam economy's weaknesses and vulnerability, warning showing the need to reshape SCs aimed to reduce dependence on foreign suppliers to avoid damage caused by external changes.

Modern SC consists of complex and interwoven relationships. Any its interruption will have a profound impact on all aspects related to socioeconomic activities and people's life. Future SC will not only revolve around efficiency and costs, but will be based on its safety, sustainability and adaptability as the key of long-term competitive advantages for businesses. The requirement for reshaping and realigning SC were discussed and reviewed before covid-19 pandemic outbreak. Reshaping SC is the radical solutions that have been proven through the development of the world economy and the impact of the COVID-19 pandemic. The Government needs to make macro policies that accelerate businesses, and along with export-led growth gradually shift the economic growth model to the domestic - demand growth. It means encouraging supporting industries and domestic production to reduce import dependence and promote import substitution aimed at reducing cost, strengthening competitiveness and increasing business efficiency.

7. REFERENCES

- [1]. ADVISEN (2013). *The Vulnerability of Global Supply Chains: The Importance of Resiliency in the Face of Systemic Risk*. Advisen. https://www.advisen.com/pdf_files/global-supply-chain-vulnerability-aig-2013-09.pdf
- [2]. Arshinder, Arun, K. & Deshmukh, S.G (2008). Supply chain coordination: perspectives, empirical studies and research directions. *International Journal of Production Economics*, 115(2), 316-335. <https://doi.org/10.1016/j.ijpe.2008.05.011>
- [3]. ASEAN Secretariat (2020). *Economic Impact of COVID-19 Outbreak on ASEAN*. ASEAN Policy Brief. April 2020.

- [4]. Baker McKenzie (2020). *Beyond COVID-19: Supply Chain Resilience Holds Key to Recovery*. Bakermckenzie.
<https://www.bakermckenzie.com/-/media/files/insight/publications/2020/04/covid19-global-economy.pdf>
- [5]. Binh, N. X. (2017). Main Characteristics of Vietnam – China Trade Relations, 2000-15. *China Report*, vol. 53(3), 355-366.
<https://doi.org/10.1177/0009445517711510>
- [6]. Brainard, S.L. & Riker, D.A. (1997). Are US multinationals exporting US jobs? *NBER Working Paper*, No. 5958. Cambridge, MA. <http://www.nber.org/papers/w5958.pdf>
- [7]. Cesar Martinez-Olvera (2008). Methodology for realignment of supply-chain structural elements. *International Journal of Production Economics* 114(2), 714-722.
<https://doi.org/10.1016/j.ijpe.2008.03.008>
- [8]. David, J. L. (2020, June 25). *IMF says global economic collapse caused by coronavirus will be even worse than feared*. *washingtonpost*.
<https://www.washingtonpost.com/business/2020/06/24/imf-global-economy-coronavirus/>
- [9]. Corsten, D. and Felde, J. (2005). Exploring the performance effects of key-supplier collaboration: An empirical investigation into Swiss buyer-supplier relationships. *International Journal of Physical Distribution & Logistics Management*, Vol. 35 No.6, 45-461.
<https://doi.org/10.1108/09600030510611666>
- [10]. Crook, T. R. & Combs, J. G. (2007). Sources and consequences of bargaining power in supply chains. *Journal of Operations Management*, Vol. 25 No.2, 546-555.
<https://doi.org/10.1016/j.jom.2006.05.008>
- [11]. Dieu, P. T.L. (2017, December,12). *Enhancing the competitiveness of Vietnamese private enterprises in the process of joining the global value chain*. The Communist Magazine online. <http://english.tapchiconsan.org.vn/Home/PrintStory.aspx?distribution=1085&print=true>
- [12]. Enrico, P. & Leo S. (2000). International relocation: firm and industry determinants. *Economics Letters*, Vol. 67 No. 2, pp. 179-86.
[https://doi.org/10.1016/S0165-1765\(99\)00269-4](https://doi.org/10.1016/S0165-1765(99)00269-4)
- [13]. Erik, S. (2007). *The Role of Top Management in Supply Chain Management Practices*. Linköpings universitet, SE-581 83 Linköping, Sweden, 2007.
- [14]. GSO (2019). *Socio-economic Situation in 2019*. https://www.gso.gov.vn/default_en.aspx?tabid=622
- [15]. GSO [General statistics Office] (2020). *Socio-economic situation in the second quarter and the first 6 months of 2020*.
https://www.gso.gov.vn/default_en.aspx?tabid=622&ItemID=19663
- [16]. Hoang, Nguyen (2020, May 9). *The business community has been raising the spirit of overcoming difficulties and adapting to the new situation*. Online Government's Magazine. <http://baochinhphu.vn/Utilities/PrintView.aspx?distributionid=395208>
- [17]. Injazz, J. C. & Antony, P. (2004). Towards a theory of supply chain management: the constructs and measurements. *Journal of Operations Management*, 22(2), 119-150.
<https://doi.org/10.1016/j.jom.2003.12.007>
- [18]. Irina, V. K., Hult G. Tomas M., Lund, Donald J., Mena, J. A., Kekec, P. (2015). The Role of Marketing Channels in Supply Chain Management. *Journal of Retailing*, vol. 91 (4), 2015) 586-609.
<https://doi.org/10.1016/j.jretai.2015.03.003>
- [19]. IMF [International Monetary Fond] (April, 2020). *World Economic Outlook: The Great Lockdown, World Economic Outlook Reports*. April 2020. imf.
<https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020>
- [20]. Imtiaz, A., Lubna K., Syed Ali, R. (2018). External Resources and Economic Growth: An Empirical Analysis of South Asian Countries. *Zagreb International Review of Economics & Business*, Vol. 21, No. 2, 1-17, 2018.
<https://hrcak.srce.hr/209082>
- [21]. Isabel Reynolds and Emi Urabe (2020, April 9). *Japan to Fund Firms to Shift Production Out of China*. Bloomberg.
<https://www.bloomberg.com/news/articles/2020-04-08/japan-to-fund-firms-to-shift-production-out-of-china>
- [22]. JETRO [The Japan External Trade Organization] (2020, July 20). *15 Japanese firms to leave China for Vietnam*. VNExplorer.
<https://vnexplorer.net/15-japanese-firms-to-leave-china-for-vietnam-a202067918.html>

- [23]. Jean-Louis. M & Philippe, S.(1997). European industrial relocations in low-wage countries: policy and theory debates. Peter J. and Jean-Louis, M. (Eds), *Multinational Firms and International Relocation*, Edward Elgar, Cheltenham, 5-33.
- [24]. Kleindorfer, P.R. & Saad, G.H. (2005). Managing disruption risks in supply chains. *Production and Operations Management*, vol. 14 (1), 53-68. <http://dx.doi.org/10.1111/j.1937-5956.2005.tb00009.x>
- [25]. Lam, T. S., Ngoc, T.T.B, Galina, B. A., Binh, D. T., Trung, T. D. (2020). Domestic Enterprises in Supply Chains of Multinational Corporations: Vietnam Case Study. *International Journal of Supply Chain Management*, Vol. 9, No. 3, June 2020, 357-366.
- [26]. Laney, Richard (2007). *AFF 5200 Distribution Systems, Supply Chain Management*. Lecture Notes AFF 5200 Issues in Competitive Advantage 1, Department of Accounting and Finance, Monash University.
- [27]. Mai, N. (2020, March 6). *Vietnam Announces US\$12-billion Stimulus Package for Enterprises*. Hanoi times Magazine online. <http://hanoitimes.vn/vietnam-announces-us12-billion-stimulus-package-for-enterprises-311270.html>
- [28]. Mercy A. Kuo (2020, May 05). *Tokyo Prods Japanese Firms to Leave China*. The Diplomat. <https://thediplomat.com/2020/05/tokyo-prods-japanese-firms-to-leave-china/>
- [29]. MPI [Ministry of Planning and Investment] (2020). *Brief on foreign direct investment of 2019*. <http://www.mpi.gov.vn/en/Pages/tinbai.aspx?idTin=45020&idcm=122>
- [30]. NAPA (2020, May 22). *Digital banking and electronic payments - suggestions from the COVID-19 crisis*. NAPAS' e-portal. <https://napas.com.vn/tin-tuc/tin-thi-truong/nganh-hang-so-va-thanh-toan-dien-tu---goi-mo-tu-khung-hoang-covid--19-2-690.html>
- [31]. Nhu, Vien (2020, April 10). *Gov't releases package to support coronavirus-hit groups*. Online Newspaper of Vietnam Government. <http://news.chinhphu.vn/Home/Govt-releases-package-to-support-coronavirushit-groups/20204/39635.vgp>
- [32]. Phuong, Trieu Dinh (2019). *Supply Chains Quality Management in Electrical – Electronics and Telecommunication Manufacturing in Vietnam*. Doctoral Thesis. Vietnam Social Sciences Academy. https://gass.edu.vn/CMS/Lists/LuanVan_LuanAn/Attachments/17388/Luanan_TrieuDinhPhuong.pdf
- [33]. Phong, L. (2019, February 25). When Will Textile and Garment Industry Escape from Outsourcing. *Journal of Finance online*. <http://tapchitaichinh.vn/ngghien-cuu-trao-doi/bao-gio-nganh-det-may-thoat-canh-gia-cong-303393.html>
- [34]. PwC (2020). *Impact of COVID-19 and Navigating the Turbulence*. Pwc. <https://www.pwc.com/vn/en/publications/2020/pwc-vietnam-covid-19-automotive.pdf>
- [35]. Quinn, F. J. (1997). What's the buzz??. *Logistics Management*, Feb, 36(2), 43-46.
- [36]. Ram, N., Anand, N., David A. G., Jan, S. A., Elliot B. (2009). Lock-in situations in supply chains: A social exchange theoretic study of sourcing arrangements in buyer-supplier relationships. *Journal of Operations Management*, Vol. 27 No.5, 374-389. <https://doi.org/10.1016/j.jom.2008.10.004>
- [37]. Samuel Pritesh (2020, April 10). *COVID-19 and the Effects on Supply Chains in Vietnam*. Vietnam Briefing. <https://www.vietnam-briefing.com/news/covid-19-effects-supply-chains-vietnam.html/>
- [38]. Sebastian, E., Tuan D.V., De Kleine, F., Annette I., Minh, P.D., Oh, J. E. (2018). *An update on Vietnam's recent economic developments - special focus: reform priorities for reducing trade costs and enhancing competitiveness in Vietnam*. Vietnam Taking Stock, Washington, D.C.: World Bank Group.
- [39]. Sehgal V. (2009). *Enterprise Supply Chain Management: Integrating Best-in-Class Processes*. John Wiley & Sons Inc.
- [40]. Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70(1), 65-94. <https://www.jstor.org/stable/1884513>

- [41]. Steffen K. (2012). Trends in production relocation and backshoring activities: Changing patterns in the course of the global economic crisis. *International Journal of Operations & Production Management*, 32(6), May 2012. <http://dx.doi.org/10.1108/01443571211230934>
- [42]. Terry F. Y. (2020, May 28). *How sustainability reshapes post-pandemic supply chains*. Greenbiz. <https://www.greenbiz.com/article/how-sustainability-reshapes-post-pandemic-supply-chains>
- [43]. Toan, L. B. & Trinh, B. V. (2018). Sustainability and competitive advantages of the agricultural supply chain. *Science Journal of Can Tho University*, Vol 54, No. 9D (2018), 133-148.
- [44]. Thomas I. P. (2011). *The Rise and Fall of Export-led Growth*. Levy Economics Institute, Working Paper No. 675, July 2011.
- [45]. UNCTAD (2020). *Impact of Coronavirus on global (FDI. Investment Trends Monitor*. UNCTAD, March, 2020. https://unctad.org/en/PublicationsLibrary/diaefinf2020d2_en.pdf
- [46]. VCCI (2020, April). *Rapid Accessment Report: The impact of COVID-19 pandemic on labour and employment in enterprises in Vietnam*. Hanoi, April 2020. <https://api.fairwear.org/wp-content/uploads/2020/05/VCCI-Rapid-Assessment-report-16.4-Final-EN.pdf>
- [47]. VECOM (2020). *Vietnam: E-commerce will Speed Up after the COVID-19 Pandemic*. https://drive.google.com/file/d/1Z3HesM54w0t4ky9r7Tq1b3XU_sR2QDpu/view
- [48]. Vietnam Customs [General Department of Vietnam Customs] (2020). *Statistical data*. <https://www.customs.gov.vn/Lists/ThongKeHaiQuan/SoLieuDinhKy.aspx?Group=S%u1ed1+li%u1ec7u+th%u1ed1ng+k%u00ea>
- [49]. VNAT [Vietnam National Administration of Tourism] (2020, August 15). *International visitors to Vietnam in December 2019 increased by 24.4% over the same period in 2018*. VNAT's e-portal. <http://www.vietnamtourism.gov.vn/index.php/items/30849>
- [50]. Visser, W., Matten, D., Pohj, M. & Tolhurst, N. (2007). *The A to Z of Corporate Social Responsibility*. John Wiley & Sons Ltd.
- [51]. Wan-Wen Chu (1988). Export-led growth and import dependence: The case of Taiwan, 1969-1981. *Journal of Development Economics*, Vol. 28 (2), March 1988, 265-276. [https://doi.org/10.1016/0304-3878\(88\)90064-8](https://doi.org/10.1016/0304-3878(88)90064-8)

ESTABLISHING UNIVERSITY VENTURE CAPITAL FUND: THE CASE OF HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Nguyen Thuc Huong Giang^{1*}, Nigel Culkin², Tran Van Binh¹, Le Vu Toan³

¹School of Economics and Management, Hanoi University of Science and Technology

²University of Hertfordshire, United Kingdom

³ Vietnam Institute of Science, Technology and Innovation, Ministry of Science and Technology

*Corresponding author: giang.nguyenthuchuong@hust.edu.vn

Abstract

For entrepreneurs to be successful in any country, they need a favourable environment in which they can develop their ideas and grow their business. The concept of this environment, an ecosystem, is rooted in earlier developments around science parks and industrial district movements.

Within every entrepreneurial ecosystem much attention is focused on the role and health of its start-up component. Vietnam has experienced significant and rapid economic growth in the last twenty years; and, this shift has seen the country acknowledged as a leading nation for start-ups in Southeast Asia.

As a result, an increasing number of start-ups are being formed among university students, lecturers, and researchers, especially those in Science, Technology, Engineering & Maths (STEM) disciplines. However, one of the main obstacles most start-up projects is raising capital for deploying and commercializing scientific and technological R&D results. In many Western countries (e.g. USA, UK and the EU), University venture capital funds (UVCs) have been created in an attempt to overcome this barrier. In this paper we discuss how can one university in Vietnam - Hanoi University of Science and Technology (HUST) - establish an innovative start-up investment fund (the BK Fund). Theoretical and practical studies on setting up University venture capital funds will be necessary for HUST to overcome the legal barriers, financial resources difficulties and other constrains during the fund's establishment and implementation process.

Keywords: University venture capital fund, start-up, spinoff, HUST.

1. INTRODUCTION

We know that businesses – at any stage of their life - seldom operate in isolation and gain valuable knowledge from the local and regional economic area. When creativity and innovation have been placed at the center of entrepreneurship activity, the location where creating new technology ideas can be considered as the “nucleus” of the wider entrepreneurial ecosystem (Isenberg, 2010; Tung, 2018). Such an ecosystem can be defined as a community consisting of many self-governing actors (universities, governments, firms, investors, mentors, service providers) that can play a key role in the development of entrepreneurial activities for a given geographical area (Hechavarría & Ingram, 2018).

So, if we take the case of the European Union, at the heart of their enterprise policy is a desire to provide an environment that is conducive to business creation and

development, acknowledging the role of new firms in terms of job creation. As, van der Zwaan (2017) stated in his EU Report *Higher Education in 2040*: “tomorrow all universities will derive their right to exist primarily from being active *in* society and by producing knowledge *for* society;” in the light of this statement, a university therefore needs not only to manage its internal environment, but also to develop and manage relationships with various stakeholders coming from public and private sector (Etzkowitz, 2017). In 2020, Research England (RE) who are responsible for funding research and knowledge exchange at Higher Education Institutes invested in excess of £2,235M in support of enterprise-related activities to help the sector become a key partner in this process through a variety of initiatives (Culkin and Mallick, 2010). Such policies are underpinned by a (political) belief that increasing entrepreneurial activity is central to the UK’s drive for

international competitiveness and that the UK's world-class HE sector has a vital role to play in the development of entrepreneurial talent and opportunities.

In general, there are 2 models of entrepreneurship in a university setting formed from research results: start-up and spin-off. According to Salamzadeh and Kesim (2015), "start-up companies" are newly born companies, which struggle for existence. These entities are built mostly based on brilliant ideas and grow to succeed; formed to seek a repeatable and scalable business model. A start-up will find the solution for innovating, raising capital from angel investors, venture capital funds and having ambitions to eventually, go global. When a start-up finds a scalable business model, it ceases being referred to as a start-up (Blank, 2013). Start-ups are designed to go rapidly, make major changes or radical innovations, from which make impact to change the economy and the society, such as the cases of Microsoft, Apple, Google (Groenewegen & Langen, 2012). The notion of a start-up is associated with *uncertainty*, *breakthrough* and always contains *creativity*, especially in a university setting. The "creative" factor, on one hand promotes the viability of start-ups, but on the other hand, makes start-ups facing with financial risks.

A "spinoff" is the result of the creation of an independent company through the sale or distribution of new shares of an existing business or division of a parent company, it is sometimes referred to as a spinout¹. In universities, University spinoffs or Academic spinoffs mean "a special start-up company that is founded by an academic inventor with the aim to exploit technological knowledge that originated within a University setting in order to develop products or services" (Bigliardi, *et al.*, 2013). The difference between a "start-up" and a "spinoff" is that a spinoff is created by the University or a Research institution, with technology owned by the University, financed by the University and managed by the researchers or academics of the University. Whereas, when a start-up has to buy the technology license (technology transfer) from the University, as well as not has been funded and managed by the University.

In this paper, we use the term "start-up" for both university start-ups and spinoffs, as spinoff is just a "special start-up" upon the definition mentioned above. University start-ups can have one of the 6 conditions: patent base relationship, knowledge-based relationship, faculty engagement relationship, student relationship,

education-based relationship or incubation faculty relationship" (Hasegawa and Sugawara, 2017). The number of University start-ups is quite impressive if we look around in other countries; in the main, they have benefitted from regional or national government support. For example, in The University of Tokyo, at the end of 2015, it was 237 start-ups created with the market value of 10-13 billion US dollars and account for 0.2% total market capitalization of listed companies in Japan (Hasegawa, Sugawara, 2017). Likewise, Gregorio and Shane (2003) found that, more eminent universities have greater start-up activities than other universities. For example, Fred Emmons Terman at Stanford and Vannevar Bush at MIT, his PhD supervisor, created nuclei of technology commercialization in electrical engineering at these universities. During his time as, Dean of Engineering Terman provided some of the funds to help two of his former students, Hewlett and Packard, to form their firm in the late 1930s. According to Terman²:

"...through an unusual chain of circumstances, my laboratory received a \$1,000 gift ...[from]... the Sperry Gyroscope Company.....Packard would be ideal for this assignment in view of his experience at General Electric with vacuum tubes, so I asked Hewlett: 'Do you think Dave would be interested in taking a leave of absence from GE to work on this project for nine months or so? We could pay him about \$55 a month for nine months, and still have \$500 for expenses. He could take a leave of absence from GE ...and decide for himself whether you are right in feeling you have an adequate basis for starting a company.'"

In Vietnam, the first business incubators come in the university sector; it is not absolutely a prerequisite for starting successful company, but there are a number of factors that gave it, first mover status. Whether it originated from the university under the form of a spinoff or a start-up, it is impossible not to acknowledge the important role of the universities in promoting the establishment of start-up businesses. In many cities and provinces, start-up activities took place vigorously, promoting the entrepreneurial spirit of students in universities. Vietnamese universities organized workshops to connect students, lecturers with businesses, organized start-up competitions, introduce the entrepreneurship subject into the curriculum. A survey on start-up intention of students in Binh Duong

¹ When a company creates a new independent company by selling or distributing new shares of its existing business, this is called a spinoff. A spinoff is a type of divestiture. A company creates a spinoff expecting that it will be worth more as an independent entity. A spinoff

is also known as a spin out.
(<https://www.investopedia.com/terms/s/spinoff.asp>)

² https://smecc.org/hewlett-packard,_the_early_years.htm

province suggested that 91% students have a desire to start a business within which, 28% students had started a business, but got failure (Bien, Phu, 2018). Not only in Binh Duong, the reality highlight that failure of student start-up often come from one or more of a) a lack of knowledge and experience in starting a business; b) a lack of support from university and businesses; and, c) financial difficulties. With the survey on financial support for student start-up projects in Binh Duong, 37% of the students think that it is important to have interest support when they borrow money to start a business, 41% mention on the essential of providing diversify financial services and 38% state that it is necessary to have the support from the venture capital funds (Bien, Phu, 2018).

Funding for start-ups in Vietnamese universities comes from formal established funds or under the form of budgets dedicated to start-ups. Prior to 2016, funds to support start-ups in public universities were mainly through university-established incubators, where operating budgets came from the state budget and, capital raised from external investors for start-up projects. After 2016, on a national scale, the 2 Government projects: "Supporting the national innovative start-up ecosystem to 2025" (Decision No.844/QD-TTg on 18 May 2016) and "Support start-up students to 2025" (Decision No.1665/QD-TTg on 30 October 2017) were initiated with the twin aims of creating a, *synchronous* and *effective* start-up ecosystem, in which universities were recognized as an anchor institution (Culkin, 2016). These projects sought to establish a legal mechanism of fund building to support start-up activities in universities.

Although being considered the cradle for start-up activities, universities in Vietnam seem to have not fully played their roles; mainly focusing their attention on developing an entrepreneurial idea and the pre-seed phase. Some universities provide funding support for start-ups such as Vietnam National University, Foreign Trade University but they do not create their own fund. Recently, some universities have projected to set up a fund support for start-up activities, and some have established a fund support for start-ups such as Open University in Ho Chi Minh City. However, such amounts are quite low and only being an intermediary step for start-ups to become for attracting "next-step" external funds.

However, despite being one of the larger patent holders and utility solutions universities, HUST's technology transfer activities are still modest compared to the potential. In the past 10 years, although the number of patents and utility solutions of HUST has steadily increased over the years (in 2019, there were 18 patents been issued, double in compared to 2018), but the

income from scientific and technology services and technology transfers have reduced 1/3 compared to 2018 (An, 2020). Given the opportunity, HUST needs to a) develop a a more effective and efficient framework for technology transfer and, b) establish a start-up enabling system to make the most of the University venture capital fund (UVC). To support the launch of this highly innovative UVC in the last quarter of 2020, HUST has attracted the interest of media, researchers, investors, and businesses. Theoretical and practical studies on setting up University venture capital funds will be necessary for HUST to overcome the legal barriers, financial resources difficulties and other constrains during the fund's establishment and implementation process.

2. UNIVERSITY VENTURE CAPITAL FUNDS: AN OPPORTUNITY FOR STUDENTS' START-UPS

University licensing practices originated in the early 1920s when a group of scientists at the University of Wisconsin established the Wisconsin Alumni Research Foundation (WARF). Several of the first inventions patented and licensed by WARF achieved widespread public use and returned significant revenues to the foundation, enabling it to expand its activities (Atkinson, 1994). In 1974, Harvard Medical School entered into a twelve-year, \$40 million collaborative research agreement with the Monsanto Company for the purpose of developing new approaches to diagnosing and treating cancer. At the same period, Havard's technology-transfer group considered it-self to find alternative sources of development funds and routes to commercialization, including creating a venture capital fund, but all the discussions came to a halt in late of 1980, when the President of Havard at that moment chose another way of participated directly in a company (Genetics Institute). After that, since the passage of the Bayh-Dole Act in 1980, U.S. universities have increased their efforts in formal technology transfer and licensing, and in some cases, investments in new firms. Besides, many venture capitalists and investors still approached Havard Medical School and other researches universities for the possibilities of establishing a fund (Atkinson, 1994).

University venture capital funds then are recognized to begin in the 1980s the first time at Chicago University and at that period, only some universities have followed Chicago's experiment, most of US institutions still largely opt to work with traditional venture capitalists rather than create their own funds (Brown, 2017). The 3 cases of the medical schools at Havard, John Hopkins and the University of Texas has shown the development of university – affiliated venture funds which have

financed to the commercialization of university originated technologies in medical fields in the 90s decade (Atkinson, 1994). In 1990s, “academic capitalism” transformed academic institutions into entrepreneurial universities, embarked the universities with the new functions from TTO, science parks, incubator facilities to investing heavily in entrepreneurship education programs, entrepreneurship clubs, business angel syndicates and venture capital funds (Brown, 2016). The University venture funds then “began to flourish when it reached the British shores around the turn of the millennium” (Brown, 2017). The first University venture capital fund in UK was Imperial Innovations (later renamed as Touchstone Innovations) of Imperial College London. After that was UMIP Premier Fund of Manchester University in 2008, Cambridge Innovation Capital of Cambridge University in 2013, and then following with other universities. According to data extracted from Thomson One Database, until 2010, there were a very limited number of only 26 UVCs active (7 from UK universities, 2 from Swedish universities, 2 from Spanish universities, 4 from universities of Denmark, Belgium, Germany, Ireland, and the rest, 11 were from US universities). From 2010 until now, there are numbers of UVCs have been created, however, we can say that the US and the UK are the two countries that have the strongest University venture capital fund network. Thomson One uses the definition of “University-affiliated venture capital funds” to mention those University venture capital funds (Croce, Grilli, Murtinu, 2014). However, according to Quora.com, UVCs can be understood broadly as University-related venture capital funds, which are classified including University-backed venture capital funds (in US, for example the cases of NYU Innovation Venture Fund of New York city, BRV-BR Venture Fund of Cornell University, OSU Venture Fund of Oregon State University, Simon School Venture Capital Fund of University of Rochester...), University-affiliated venture capital funds (Berkeley Ventures of University of California, Experiment Fund of Harvard University, MentorTech Ventures of University of Pennsylvania...) and Student-run or Student-focused venture capital funds (University Venture Fund of University of Utah, Demming Center Venture Fund of Colorado University, or Social Venture Fund of University of Michigan...). In the vast world of technological transfer practices implemented by universities, the establishment and management of UVCs is nevertheless largely unknown and under-researched (Croce, Grilli, Murtinu, 2014). Unlike traditional venture capital funds, very few research papers refer to these UVCs. The two typical researches related to this topic are from Widding, Mathison, Madsen (2009) and from Croce, Grilli, Murtinu (2014) as just be mentioned.

Widding, Mathison, Madsen (2009) analyzed how UVCs finances to University Spin-Off companies based on lessons learnt from the UK, Belgium and the US. They concluded that UVCs can bridge the financing gap, especially as business angels with technological experience and background have been shown to be an important contributor of both capital and competence, but can only cover part of the capital required. UVC is not a likely source of funding for most of university spin-offs at early stage (cases of European universities, excluding biotechnology field). Venture capital becomes a vital source of funding when university spin-offs reach a stage that their growth potential matches the strict requirements of venture capital funds. Besides, Croce, Grilli, Murtinu (2014) based on the data of 26 UVCs in Europe and US extracted from Thomson One Database (VentureXpert) to make a quantitative research on UVCs’ performance. They found that, UVCs from EU seem to be more focused in financing the Start-up/ Early-stage than the US counterparts opposing the views of Widding, *et al.* (2009). UVCs from the EU focused on biotechnology and medical/health industry, while US UVCs are more focused on ICT and related industries. One of their key conclusions is that, the success of UVCs cannot be disjoined by the quality of the universities. Better universities are more likely to have successful UVCs, or at least attract funds. EU UVCs tend to invest in small enterprises (less than 50 employees), while US UVCs focused on larger concerns (more than 50 employees).

Although the concept of UVC is already very familiar in the world from almost 40 years, at the time of writing, no UVCs exist and no academic research paper mentioned about this type of funds in Vietnam. Some universities established Science and Technology Development Fund support for R&D projects, but it is not a venture capital fund financed for start-ups and spinoffs. However, in June 2020, one University in Vietnam, Hanoi University of Science and Technology (HUST), announced the intention to launch a University venture capital fund named BK Fund in late 2020. BK Fund has the expected capital of from 20 to 50 billions VND, operating under the model of a venture capital fund, managed by BK Holdings (Bach khoa Hanoi Technology Investment and Development One member company limited), the company which provides services of technology consultant and transfer, mobilizes and manages capital for incubators and commercialization of technology products from HUST. The University does not contribute capital in cash to the Fund but contributes by reputation and the right to use the University’s trademark, which equivalent to 15% of the Fund’s shares. This share limit will not change over the time and does not depend on the scale of the Fund. Each start-up in which the invention has commercialization potential

may receive an investment of 1 billion dongs as the primer capital (Nam, 2020). This idea of establishing a venture capital fund in one university is novel in Vietnam for university start-ups. However, difficulties remain in the establishment process before the fund is operating effectively, to bring the real benefits to university start-ups.

3. VENTURE CAPITAL PROCESS ISSUES FOR UNIVERSITY START-UPS: SOME SUGGESTIONS TO HUST

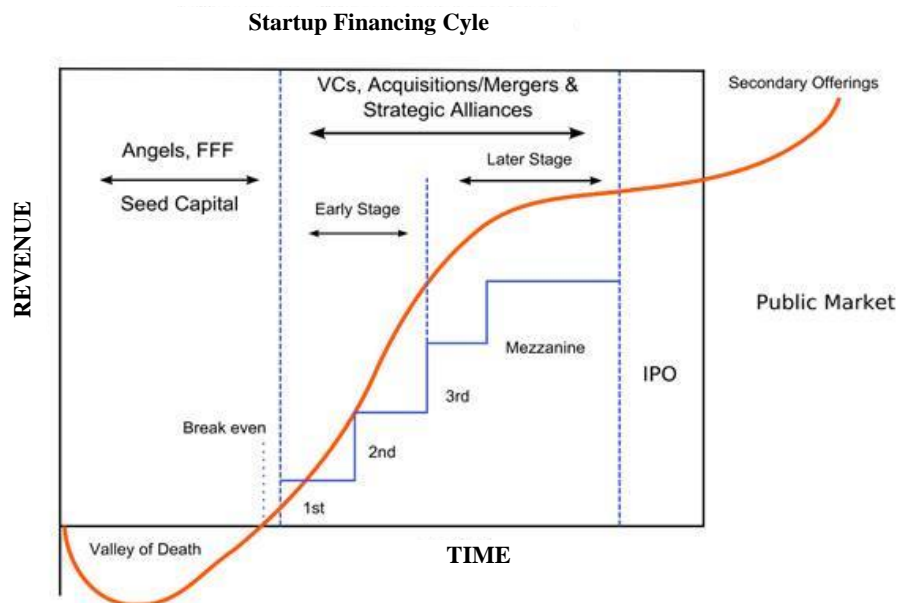
3.1. Legal, financial, and organizational issues

The Vietnamese venture capital sector has achieved a certain success; however, the current legal framework is still in its infancy (Giang, Toan, 2020). In the Law on Investment, Law on Enterprises, Law on Credit Institutions as well as Law on Securities do not acknowledge this kind of fund. Law on Supporting to SMEs No.04/2017/QH14 and its guidance Decree No.38/2018/ND-CP provide regulations relating to Innovative Start-up Investment Funds, but nothing about Venture capital funds. It means BK Fund has to operate under the title of an Innovative start-up investment fund;

and, follow Decree No.38/2018/ND-CP as no clear legal basis on venture capital fund exists in general and a UVC, in particular: the Decree on scientific and technology in universities is still in draft version, which may have some article(s) relating to Innovative start-up investment funds in Universities. Besides it, applying Decree No.38/2018/ND-CP, BK Fund can only have maximum 30 investors contributing to the fund's capital: the main obstacle to the operation and the capital raising ability of the fund.

In the process of product development and business model improvement, founders are always concerned with the question of project finance; hence, why the success in raising capital is also considered crucial for start-ups (Berger, Cowan, Frame, 2011)... Many entrepreneurs choose their own financial resources (often referred to as "boot-strapping") before seeking external resources, however the total mobilizations from the internal resources are quite limited. External resources from bank lending, 3F (family, friends, and fans), angel investors, venture capital funds, other start-up investment organizations (accelerators, incubators...) or crowd funding before IPO... are both good choices for entrepreneurs.

Graph 1: Start-up Financing Cycle



Source: <https://spiderum.com/>

In reality, STEM start-ups are almost built on intellectual property rather than physical assets, which characterized by high levels of creativity and high level of risk associated to their operations. Start-ups often spend a lot of capital raised in the first years of their life, while the mortgage assets are very low (Moro, 2020). This creates difficulties for both founders and investors

in evaluating the present value, as well as future expectations. As a result, start-ups are often unattractive to the traditional commercial banks; their capital financing often replaced by resources such as venture capital or capital from private investment funds. The reasons that venture capital funds prefers to invest in start-ups is not simply to enrich the investors, but also

because such investments are easy to monitor and founders cannot extract value for themselves. Many countries try to formalize the definition of “start-ups businesses”, allowing them to be prioritized for special grants and support from the government rather than traditional SMEs (Cavaliere, 2015), nevertheless as they have higher risks than traditional SMEs, while the government and other grant providers expect the safety, support from venture capital fund is really necessary.

Concerning capital raising ability, a traditional venture capital fund often receives capital contributed from its Parent Group (in the case of a Group/Corporation) or raising capital from commercial banks, investment funds, other financial institutions and from the market. Therefore, the venture capital funds belong to a big corporation have great financial potential and capacity to invest to start-ups. Those are the case of Vina Capital Ventures, FPT Ventures, CMC Innovation Funds, Vingroup Ventures... in Vietnam. Not only providing capital for the funds, these parent Group will also provide positive supports in terms of personnel with experienced professionals, and technical infrastructure. The Group also has a system of domestic and international institutional customers who can support to the project in connecting to find out customers' needs as well as bring products, services solution to the customers in a fastest way. Not only that, their partners can also be invited to join the investment or consult to the start-up. In the case of BK Fund, HUST of course can support to the fund through talent professors, academic staffs, institutional experts, and infrastructure. However, as informed to the media, HUST will not contribute capital in cash to the Fund, but contributes its brand name and the right to use the University's trademark, which equivalent to 15% of the Fund's shares. This is the typical characteristic of the investment of public university in Vietnam. According to Dung (2020), Vietnamese universities converge their mainly limited financial resources for their main task of training activities, thus, the investments in spinoff and start-ups are very little, almost nothing but value converted from its reputation or some facilities such as secondhand machines and equipments. These machines and equipments were mainly used for teaching and basic scientific research, which can be considered as processing workshops with low technology content, may not suitable for product development and completion, performing testing production and increasing commercialization capacity. This situation is quite different to UVCs in developed countries. Thus, with HUST, with an intention of raising capital from 20 to 50 billion dongs for the Fund and the Fund can finance about 1 billion for each project, besides HUST staffs and external investors, HUST alumni is the potential and key investors. Until now, HUST have an alumni network of

200,000 alumni and among them, many people are in the important positions in big companies and they are willing to contribute, support for the development of the University.

However, as their contribution will come in the form of investments to University start-ups, and as venture capital investment contains many risks, they definitely want to gain confidence from the fund management company. BK Holdings is pointed by HUST to temporary manage the fund. With other case of UVCs in the world, TTO (Technology Transfer Office) is often be the agency managing UVCs (Croce, Grilli, Murtinu, 2014). HUST does not have a TTO but it announced to create a TTO in the coming time (An, 2020). However, the roles, responsibilities and tasks of BK TTO and BK Holdings need to be more clarified to avoid the overlap and ineffectiveness. BK Holdings was established in 2008. This is an enterprise with 100% capital of the University. BK Holdings now includes BK Holdings Education, BK Holdings Technology and BK Holdings Incubator. The Board of Members is appointed by the University. The operating apparatus is decided by the Board of Members or Board of Directors. They may be the staff working at the University or capable people from outside. BK Holdings establishment has made a new model of business within University which is different from other universities: (1) separating technology transfer activities and production and business activities from the public University administration; (2) to make the university's assets transparent in production and business process, create a mechanism for scientists in the university to contribute to the establishment of companies. Its aims are supporting research, incubation and commercialization. BK Holdings has created a close network with 25 training schools and research institutes within the university, including 150 research groups with 400 projects and 8 patents per year, forming a system of incubator and technology Hubs. However, this model gradually reveals its disadvantages over time, as the scientist who used to solving technical problems is not the right person having capability to run a business. BK Holdings then mainly focuses on training or providing consultings services to businesses, then the businesses have to process the technology transfer by themselves (An, 2020). Besides, although having 12 years experiences, having 9 member-companies and schools but in the market, not like other fund management companies, BK Holdings is still new in this area of venture capital management. In the private sector, reputation and management experience of the venture capital fund management company is among of the most important factors to attract capital investing to the fund. To be trusted by alumni – the potential investors, HUST must promote communication about BK Holdings, its

relationship with HUST, its experience in incubating and technology transferring, sharing its recent positive financial and operational results to alumni and other investors. Raising capital from investors of course is the most difficult issue in operating an UVC at the beginning.

3.2. Investment stage and University-based innovation and entrepreneurship ecosystem

The venture capital process consists of 3 steps: (1) fundraising; (2) evaluating, selecting and investing; (3) end of investment or divestment, selling shares or selling the enterprise to other investors (Trinh et al., 2014).

Start-ups often go through funding rounds: (1) Pre-seed (market testing or new field exploration); (2) Seed/start-up (business idea development, market suitability testing and development); (3) Early stage (optimization and model development); (4) Later stage (development and scaling); (4) IPO (Initial Public Offering). Individual investors, 3F, angel investors, crowdfunder often participate in the early stages (Pre-seed, Seed, Early stage) due to the small amount of capital required. Venture capital funds however often join the Seed/Start-up (Incubation/Seed/Inception), Early stage or Series A (Initial), Later Stage (Series B,C...). Join in the Seed/Start-up round, the amount invested by the Venture capital fund is not much, the risk is high and many investments are unsuccessful. But in some cases, it still benefits the Funds. The Early stage requires capital invested to develop the business model. The Growth round takes place when start-up have certain success in the market, so the capital requirements of venture capital funds are much higher, up to ten million US dollars to support for the size expand, market share increase, and create a new development level for the company. After this stage, the company usually reach a high value and can be re-purchased. That is the period of raising capital from commercial banks or stock market (IPO stage) as the fundraising ability become quite sure, rather than from the venture capital funds, which is a kind of risk investment. In their draft of Establishment Charter, BK Fund choose Seed and Early Stage are the stages for investing (traditional venture capital funds often invest from Early stage – graph 1, also the cases studied in literature review). However, many students of HUST come from the provinces and have very limited relationships, which make them difficult to raise capital from their relatives and friends, individual angel investors... for the Pre-seed stage, thus to make business ideas, scientific and technology products which are completed at a laboratory scale, results of accepted scientific research projects become seed groups, success in building business models and can attract more capital from venture capital funds to form businesses, supports from an incubator center is necessary. The role of HUST

in the start-up ecosystem did not really develop. BK Holdings Incubator has been established within BK Holdings. However, after 10 years, only 9 companies originated from HUST have been incubated. Compared to the capacity and potential of HUST, this is a very limited amount. Each year, HUST has about 400 research projects of HUST lecturers, researchers and students, but only few have been commercialized. Some spinoff companies did not choose BK Holdings Incubator as they do not get the information on the Incubator, means the communication of the Incubator is still weak, and the capacity of the Incubator is still limit. Besides the establishment of BK Fund, HUST has to think about creating Angel Investor Club. Business angels can be defined as high net worth individuals who invest their own money, either alone or with other, directly in unquoted businesses in which there is no family connection (Mason, Botelho and Harrison, 2016). In reality, with a business, several forms of support and investment in entrepreneurship can be carried out in gradually developing phases. For example, in the case of Hochiminh city, the city created the Angel Investor Club in the first phase, connected potential start-up projects with angel investors; and then formed a mechanism of consulting and managing start-up projects by establishing professional group to manage the connections and investment under the business consulting company model in the 2nd phase; and in the 3rd phase established a professional fund management company and created the venture capital fund. This project had been supported by the Ministry of Scientific and Technology, Embassies of Israel and Chile, and the angel investors at the beginning gathering leaders of many big companies (Thien Long, Dien Quang, Suntory Pepsico Vietnam, Viettel, E&Y, Casumina, An Phuoc, PNJ, GIBC). Such steps will bring more certainty to success because everything has been carefully prepared for the investors and businesses. Angel investor is different to Venture capital fund, as each investor is in smaller size with smaller investment amount, and often invest from pre-seed/seed stage (between the period of technology completion to the beginning of market entry (Binh, Toan, Khuyen, 2019). Venture capital fund will join after for promoting growth stage. Angel investors can decide on their investment themselves, while venture capital funds have to establish an Investment committee, to avoid the subjective opinion of one member, however, the fund management is implemented by a fund management company. Each angel investor may interest in one or few certain areas. They can commit to invest money to the good project they choose. With the case of an UVC, it is better to establish an Angel Investor Club to connect the alumni of the University and start funding to University start-ups before creating an UVC. According to Mason, Botelho and Harrison (2016), business angels can be

under the form of angel networks (formed as a network of friends or business associates which had been developed in 1980s and 1990s) or angel groups (a transformed model that really developed in recent decades when individual investors prefer to organise themselves into groups to invest collectively). These authors in their research also showed that, due to the differences between angel groups and venture capital funds on investment instruments, investment stages and investment objectives, angel groups can have opportunities (even quite few) to be the sequential investment complimentary investors for a start-up, beside venture capital funds (Mason, Botelho and Harrison, 2016). In case of BK Fund, as HUST has announced to the creation of BK Fund in late 2020, Angel Investor Club should be established in parallel to support for the earlier stage. Besides, the Incubation unit within BK Holdings also have to strengthen its capacity, improve services and communication. However if only relying on resources of the University, it is quite difficult for the Incubator unit for maintain and improve their activities. With the investment from Angel Investor Club and other resources (from University, Ministries or City), Incubation Center could incubate a scientific and technology product or project from the laboratory scope become expanding to industrial scale in reality. Angel investors through their club will contribute every year for financing to incubation activities and they also spend time for advising the start-up project they choose to invest. University can support via the office, incubation center's staff, provide some free services for projects, support in applying for funding from ministries and organisations. This will also help to create an university-based innovation and entrepreneurship ecosystem.

Regarding the allocation of capital for each stage of investment, each fund has their own strategy and principles. For example, with IDG Ventures, the fund will invest to the start-up following the 3 stages: (1) Seed/start-up: the fund grants 40% of the total committed investment capital for the project to enable the company to develop its products and promote marketing activities; (2) Early stage: 40% of the total committed investment capital to produce and launch products into the market; (3) Growth period: spend 20% remaining for investing in production expanding, market scope extension, upgrade products and optimize the production structure. This capital allocation rate is quite reasonable, that can be a good example for BK Fund to consider. The representative of the Venture capital fund will then represent the investors to participate in the Board of Director of the start-up company for monitoring the management and implementation of the capital invested.

In reality, if the investments by venture capital fund are well managed, it can bring a high rate of profit to the

investors. For example, IDG Ventures Vietnam has an increase of 30-40% per year. The average time of the start-up investors around the world (from the time the start-up company gets access to the capital until when the investor divests the fund to invest in another start-up) is about 3-5 years, and HUST also expect an investment period of 4 to 5 years for each project funded by BK Fund, but in reality in Vietnam, it took from 7 to 10 years. That means, both the University and the alumni who invest in the start-up projects have to determine that it is a long-term investment, with high risk but high profit if well-managed, and they have to spend money and effort to make the investment become effective.

At the end of the venture capital investment process, the fund should have strategy to divest capital and distribute profits. This period often occurs when the start-up business has reach a mature stage, after the completion of product development, marketing implementation, and before the stage of production scale expansion, revenue and profitability in a good and stable level, with a much higher share price compared to the initial time, and the company is going to go IPO in the market), the venture capital fund will divest the capital, collect profits and continue investing to other start-up. The method implemented can be shares transfered to other investors and withdraw from the company, or the company will buy back the shares from the investors, or transfer the rights and obligations to the third party and receive the corresponding payment.

However, it is necessary to specify the divestment time expected from the beginning of the investment between investors and start-ups, so that the companies will not be surprised, unpredictable and can not actively in doing business. Sudden divestments can lead to risks for start-ups, for example financial risks can happen when the capital has not been fully disbursed, or when start-up can not afford to buy back the shares, or in case of information risks when the start-up has shared too much information and plans with the investors. Besides it, in the future, to increase the rate of divestment through the stock exchange, open more opportunities for UVC and other investors, the information relating to the start-up which has been funded by UVC need to be public more. Actually this ratio is currently very modest (Trinh et al., 2014) because start-up companies are SMEs private enterprises, not be listed and unbound by information disclosure.

3.3. Investment selection issues

Related to investment choice, to select project or start-up that receive the investment, among numerous start-ups currently, the venture capital funds often prioritize the selection of small and medium size start-ups, with creative ideas, good plans, having potential for development and opportunities in the market. The

Fund's investment committee works together to make a decision, in avoiding subjective opinion from one member regarding the investment project (Binh, Toan, Khuyen, 2019). Characteristic of founders and managers of the start-up can be one of the choosing criteria. As in the case of DFJ Vina Capital, they intend to give their choice to the Vietnamese founders (wherever they stay), products serve to the Vietnamese consumers, and project using Vietnamese human resources. While Vina Capital Ventures defines one of their criterias is the project which can make a positive impact to the economy of Vietnam and to the technology development. Start-ups in university are less in quantity, however, BK Fund still has to set up a criteria framework for choosing projects to invest. With a university as HUST, founders of the start-up can be students or academic staffs or anyone outside of the university. Students and academic staffs must be both in priority in the selection process, but it should be more prioritize for tech-students, who are the young talents, with high qualification, quick adaptability, having great love with technology and high ambitions, as the purpose of the venture capital is not to develop high technology, but to nurture and develop potential young businesses (Trinh et al., 2014).

Good people and good ideas are just part of the reason for selection. In reality, venture capital funds often invest in good industries. The trend of investment choice of Venture capital funds in recent years focused on the following areas: (1) technology companies (fintech, hi-tech in agriculture, medical technology, educational technology); (2) model of chain development, as Vietnam is weak in this area (Phuong, 2019). The establishment of BK Fund aims to target the 1st groups. Until now, HUST students and academic staffs have had many high quality research projects in Information and technology, electronic and telecommunication, electricity, mechatronics, dynamic mechanics, bio-medical, chemistry, physics. It is clear that due to the development trend of the digital economy and the 4th Industrial Revolution worldwide, the new and hightech segments is still the first choice of venture capital funds (CMC Innovation Fund, Convergence Ventures, IDG Ventures, Cyber Agent Ventures, DFJ Vina Capital, FPT Ventures...), and it is no exception with UVCs like BK Fund. Thus, BK Fund should focus on the projects that applying technology platforms such as AI, big data, IoT, blockchain..., but can not ignore projects in other strength areas of the University such as material science, automation engineering, biomedical electronics... We know that, beside the financial support, the fund can also provide mentors for the project, and alumni of HUST are those who have many experience years in the production and business, having knowledge in both technology and the market to support as mentors, of course in their field of interest or operation. For example, Chairman of

Austdoor group pointed out that some inventions of HUST relating to water-proof and dust-free glass which have potential to develop into commercial products can be invested by his group. In financing to the fields they need and choose, they can also be the mentor for advising to the start-up. Or the chairman of the Board of Directors of Rang Dong company intended to contribute 5-7% profit after tax to contribute to BK Fund if there is a digital transformation project and he is ready to apply to his company (HUST Conference on UVC establishment, 2020). However, in the start-up investment process, there is always the problem of asymmetric information (Nosfinger, Wang, 2011). That's why in the market, there are many innovative start-ups nowadays, but not all businesses are funded by venture capital. On the side of venture capitalists, they are at high risk due to asymmetric information, they do not have or have very few information related to the performance of the company and obliged to self-analyse the company's performance in order to make an investment decision (Larh, Mina, 2016). As such, it is important that start-ups should have strategy and knowledge, and share information about their business ideas, plan implementation and potential market to attract investors. If the start-up only has ideas, lack of knowledge, experience and planning, it will be very difficult to raise capital. And then the cooperation and sharing of information during the implementation of the start-up project so that the investors can get the most suitable and optimal support for the start-up.

On the other hand, after signing the investment agreement, the venture capital fund has to provide strategic advice, support and join the management, administration, professional support, deployment and network expansion. In reality, the venture capital funds often have a lot of experience and capacity in many areas related to business/company operations, from legal, financial, to human resources, technology, communications, marketing... For the case of BK Fund, eventhough it is managed by BK Holdings-a company of HUST which having 12 years of experiences, this model of a venture capital fund within an university is still very new, beside the support from investors, the consultation from external experts and other venture capital funds are certainly necessary.

4. CONCLUSIONS AND SUGGESTIONS

The development of a start-up ecosystem including the State, investors, enterprises and universities with the participation of students, lecturers and researchers will be a method of comprehensive development, and the university should play the pioneering role. In the past two decades, the field of academic entrepreneurship has found greater visibility, and universities are now recognised as a source of creativity among high-tech

firms. Universities are moving from their traditional roles of research, teaching, and knowledge dissemination to a more advanced role in society, creating spin-offs and promoting academic entrepreneurship. In Vietnamese context, entrepreneurs of start-ups need the infrastructure, finance, coaches and mentors, and universities can be used as catalyst in this national innovation ecosystem model (Rowan, 2019). However, the current situation of Vietnamese entrepreneurship is unsustainable with 90% of start-ups stop working in the first 3 years primarily this is due to self-destruction rather than competition (Dung, 2020). In respect of university start-ups, such limitations relate to poor legal frameworks, organization models, a lack of entrepreneurship knowledge among students, lecturers and the university, a lack of information and (the correct) mechanisms for coordination between businesses and universities and capital raising for start-up projects are the main issues. The establishment of funds supporting to start-up activities including the new model of UVC will be inevitable and necessary. However, with UVCs like BK Fund, fundraising will be more difficult than the private equity funds, as they primarily raising capital from successful alumni and contribution in-kind from the university.

In order to mobilize more financial resources for the fund, HUST must design a clear strategy and roadmap for establishing and developing a start-up support system within the university. This will start with the creation of the Angel Investor Club, in parallel with launch of the BK Fund, in order to increase the capacity of raising capital from potential investors and better support start-up projects from the early stage. The BK Holdings Incubator has to take the role a professional incubator centre to promote a high level of service quality, such as promotion of training activities, organizing workshops, connections with the market, the development of consultancy services, increased investment on innovation labs for product commercialization of university start-ups. On the other side, if BK-Holdings is confirmed to be chosen as the management company of BK Fund, it is important to enhance the capacity of this company in managing venture capital fund, which is totally a new task for this company, as well as promote the communication to attract both internal and external investors. Improvements in the personnel quantity and quality, as BK-Holdings currently has staffs who are very good in technology, but they need more experts who have good experience in finance, investment, and business operation. The criteria for investment choosing, the rate of University's capital ownership in the start-up company, the rate of profit sharing with investors have

to be clearly defined to attract more investors, as they are those who mainly contribute financial resources and mentoring services which can lead to the success of the start-up projects. The clarification of tasks and responsibilities of BK-Holdings and BK TTO is also necessary. Non-financial activities for supporting university start-up such as organize start-up competitions, strengthen the cooperation between university and businesses, and enhance the intention and knowledge on entrepreneurship in the university, learning experiences of success start-ups are also important. Actually, not all the universities in Vietnam have to invest and set up a full start-up supporting system, but it is important to take advantages of the unique superiority of each university and enhance the collaboration between universities. As such, universities can fulfil their mission of being the center for entrepreneurship and innovation.

5. REFERENCES

- [1] An T., BK TTO: Solution for technology transfer issue of Hanoi University of Science and Technology, *Journal of Science and Development*, 2020.
- [2] Atkinson S. H., *University-Affiliated Venture Capital Funds*, in *Healthaffairs.org*, 1994.
- [3] Berger A. N., Cowan A. M., Frame W. S., "The Surprising Use of Credit Scoring in Small Business Lending by Community Banks and the Attendant Effects on Credit Availability, Risk, and Profitability," *J. Financ. Serv. Res.*, 2011.
- [4] Bigliardi B., Galati F., Verbano C., "Evaluating Performance of University Spin-Off Companies: Lessons from Italy", *Journal of Technology Management & Innovation*, Volume 8, Issue 2, 178-188, 2013.
- [5] Bien T. V., Phu N. T. C., Situation of student's start-up environment in universities in Binh Duong, *Journal of Economics and Technology*, 2018.
- [6] Binh T. V., Toan L. V., Khuyen N. T. V., Angel investors and their roles in start-up projects, *Journal of Science and Technology*, 2019.
- [7] Brown R., Mission impossible? Entrepreneurial universities and peripheral regional innovation systems, *Journal of Industry and Innovation*, 2016.
- [8] Brown G. B., University venture funds must reach beyond the Golden Triangle, *Oxford University Innovation*, in *Medium.com.*, 2017.

- [9] Cavalieri S., "The role of 3Ts factors in the birth, development and success of a start-up. Tesi di Laurea in Entrepreneurship, innovation and technology," LUISS Guido Carli, 2015.
- [10] Culkin, N. and Mallick, S., "Producing Work-Ready Graduates: The Role of the Entrepreneurial University", *International Journal of Market Research*, 53(3), pp. 347-368. doi: [10.2501/IJMR-53-3-347-368](https://doi.org/10.2501/IJMR-53-3-347-368), 2011.
- [11] Culkin, N., "Entrepreneurial universities in the region: the force awakens?", *International Journal of Entrepreneurial Behavior & Research*, Vol. 22 No. 1, pp. 4-16. <https://doi.org/10.1108/IJEER-12-2015-0310>, 2016.
- [12] Croce A., Grilli L., Murtinu S., Venture Capital enters Academia: an analysis of university – managed funds, *The Journal of Technology Transfer*, 2014.
- [13] Dung N.T., Innovation in universities is not substantial, *Journal of Education and Era*, 2020.
- [14] Etzkowitz, H., Innovation Lodestar: The entrepreneurial university in a stellar knowledge firmament. *Technological Forecasting and Social Change*, 123, pp.122-129, 2017.
- [15] Groenewegen G., Langen F., "Critical Success Factors of the Survival of Start-Ups with a Radical Innovation," *J. Appl. Econ. Bus. Res.*, 2012.
- [16] Gregorio D.D, Shane S., Why do some universities generate more start-ups than others?, *Research Policy*, vol.32, 2003.
- [17] Hasegawa K., Sugawara T., Characteristics of University Start-ups in Japan: Analysis of start-up companies at The University of Tokyo, *IEEE Technology & Engineering Management Conference (TEMSCON)*, 2017.
- [18] Hechavarría, D. M., & Ingram, A. E., Entrepreneurial ecosystem conditions and gendered national-level entrepreneurial activity: A 14-yearpanel study of GEM. *Small Business Economics*,53 (2), 1-28, 2018.
- [19] Hiep P. T., B K-Holdings Incubator: just has reached a part of potential, *Review on Science and Development*, 2019.
- [20] Isenberg, D., How to start an entrepreneurial revolution, *Harvard business review*, 88(6), 41-49, 2010.
- [21] Larh H., Mina A., Venture capital investments and the technological performance of portfolio firms, *Research Policy*, Vol.45, 2016.
- [22] Mason C., Botelho T., Harrison R., The transformation of the business angel market: empirical evidence of research implications, *Venture Capital Journal – An international Journal of Entrepreneurial Finance*, 2016.
- [23] Nam H., BK Fund invests 1 billion dongs for each invention which have commercialization potentials, *Journal of Science and Development*, 2020.
- [24] Nosfinger J.R., Wang W., Determinant of start-up firm external financing worldwide, *Journal of Banking and Finance*, Vol.35, 2011.
- [25] Phuong T., Technology start-ups are the first choice of investment funds, *Investment Newspaper*, 2019.
- [26] Rowan A.P., Start-up Vietnam, innovation and entrepreneurship in the socialist republic, *Mascot Books*, 2019.
- [27] Sterve B., "Why the lean start-up changes everything," *Harvard Business Review*, vol. 91, no. 5. 2013.
- [28] Tung, T.H. Innovative enterprises in universities: start from changing awareness, *Tia Sang Journal (Journal of Science and Development)*, 2018.
- [29] Trinh T.D et al., Venture capital – from theory perspective, *Journal of Science and Technological Policy Management*, 201.

ENTREPRENEURSHIP AND HAPPINESS: THEORETICAL INSIGHTS INTO ENTREPRENEURIAL WELL-BEING

Pham Lam Hanh Trang

Faculty of Business Management, National Economics University, Hanoi, Vietnam

*Corresponding author: Pham Lam Hanh Trang, trangph@neu.edu.vn

Abstract

Research in entrepreneurs' mental health and wellbeing has been gaining interests recently. Therefore, relevant knowledge in entrepreneurial wellbeing is limited. This research contributes to the current literature by unpacking the mechanisms that underpin the entrepreneurship – entrepreneurial wellbeing link. The paper is focused on three key research questions: (1) How are the income and non-income factors of entrepreneurship associated with entrepreneurial wellbeing? (2) Do necessity and opportunity entrepreneurs differ in their wellbeing? The findings lay the groundwork for future empirical research that can validate and substantiate our understanding of these phenomenon. Finally, this study advocates greater consideration of institutional quality in not only entrepreneurship research but policy-making process.

Keywords: Entrepreneurship, Subjective well-being, Entrepreneurial well-being, institutional quality.

1. INTRODUCTION

The well-being of entrepreneurs has recently come to the forefront of entrepreneurship research and gained significant interests in both scholarly and public policy conversations. While entrepreneurship and management scholars have frequently devoted their research to studying the economic outcomes of entrepreneurial activities such as growth and performance, little attention was paid to the happiness or subjective well-being of entrepreneurs.

Research psychologists generally manifest and measure well-being through the term “Subjective well-being” (SWB) that is construed as the overall internal state of mental wellness, which may involve not only mental fulfilment and suffering avoidance (hedonic approach) but also highlight vitality, values, self-acceptance and self-realization (eudemonic approach) of mental wellness (Keyes, 2006; Ryff, 1989; Deci et al., 2001). Subjective well-being is a self-reported measure of mental health (Diener, 1984). As one measurement of mental health, SWB is the absence of all negative emotions and include only positive factors. Second, SWB measurement is the global assessment of all aspects of life including happiness and satisfaction to life (Diener, 1984). Third, SWB is subjective as self-assessed by the experience of all activities in life of the individuals (Campbell, 1976). Since Henry Thoreau said that happiness comes from the participation in activities, the notion “entrepreneurial well-being” indicates that entrepreneurial activities is a source of happiness and

well-being (Stephan, 2018; Shir, 2015). Starting up a new venture enables entrepreneurs to experience the feeling of happiness when they fulfil their life goals and desires (Chekola, 1975).

On one hand, defining and measuring entrepreneurial well-being is challenging, drawn on a variety of perspectives from different disciplines and schools of thoughts (Linton et al., 2016). Subjective mental health and well-being is more than just the absence of mental disorder. Mental health as defined by World Health Organization (WHO) refers to “state of well-being in which an individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community” (WHO, 2014). On the other hand, although subjective well-being research has always been the dominant playing field of sociologists, psychologists and economists, it is surprising that well-being in entrepreneurship is still at infant stage (Wilklund, 2019). In a meta-analysis, Stephan (2018) concludes at the time of research that there is only a total of 25 studies on the entrepreneurial well-being that use market and country context as antecedents, whereas the amount of research studying entrepreneurial well-being as an entrepreneurial outcome is far less limited. Only until the recent 2018 Academy of Management Annual Meeting with the highlighted theme “improving health and wealth-being in society: how can organizations help?” and the latest Journal of Business Venturing’s 2019-special issue on

“entrepreneurship and well-being: past, present, and future”, was this nascent but important research field be able to set the momentum to prosper.

First, people engage in entrepreneurial activities in pursuit of happiness, or a higher level of entrepreneurial well-being such as sense of achievement, autonomy, independence or social motivations (Stephan et al., 2015). Although most of new ventures fail to conserve their sustained competitive advantage (Gopinath and Mitra, 2017) which often results in entrepreneurs' disappointment and lack of motivation for continuation (Arasti et al., 2014), the positive emotions from being independent, surviving real hardship and fulfilling goal achievements enable them to sustain business and aim at higher entrepreneurial performance (Przepiorka, 2016). For established firms, experienced entrepreneurs also need to cope with various challenges from the lack of financial and emotional support to bureaucratic environment and unstable economic and political policies. The entrepreneurial process on overall still brings satisfaction and the sense of fulfilment despite lower income and longer working hours.

Second, entrepreneurial well-being is a key entrepreneurial outcome (Wiklund et al., 2019) and has a strong spillover effect, "happiness spillover". Once entrepreneurs accomplish a certain level of happiness, they are motivated to transform their optimism into financial gain and bright business outlook, and spread their contagious happiness to other stakeholders such as employees, family members and the surrounding community. Happy entrepreneurs demonstrate leadership in taking good care of their employees' individual well-being and creating a favorable workplace so that their employees can thrive (Packard and Bylund, 2018). Entrepreneurs may even not regard business closure as a sign of failure once the pleasure of start-up ambitions has been fulfilled (Shepherd et al., 2009). They are ready to bear the cost of delaying business closure if so doing makes them feel better and recover faster (Shepherd et al., 2009). Therefore, it is of utmost importance for not only individual entrepreneurs but also the local communities and the national economy of the countries important to shed further insights into the interrelationship between entrepreneurial activities and mental well-being.

There has been an emerging number of studies that associate entrepreneurship with entrepreneurial well-being but the results remain mixed and inconclusive (Zhao et al., 2019; Stephan, 2018). The first strand of literature supports a positive effect of entrepreneurship on the level of entrepreneurial well-being (Zhao et al., 2019; Shir, 2015; Schneck, 2014; Benz and Frey, 2010). On one hand, entrepreneurs are happier. By choosing an

entrepreneurial occupation, entrepreneurs relish the sense of freedom, fulfil their innate ambitions and enhance personal development (Shir et al., 2018; Wood et al., 2016), which is inaccessible by other professions. On the other hand, happier people tend to be entrepreneurs. Happiness would energize the mental and psychological well-being of people through “optimism”, “resilience”, “self-efficacy” and “self-esteem” (Foo et al., 2009). These entrepreneurial traits are more likely to be found in entrepreneurs who possess higher work satisfaction (Hmieleski and Baron, 2008). Happy entrepreneurs can also lead their firms to higher growth and better performance (Wincent et al., 2008). However, the endogenous and two-way relationship between entrepreneurship and wellbeing has not received deserved attention in entrepreneurship and management literature.

The second strand of research observes no significant and beneficial influence of entrepreneurship on entrepreneurial well-being (Hanglberger and Merz, 2011). Indeed, entrepreneurship exerts an adverse effect on household happiness especially in low-income countries with unstable entrepreneurship ecosystem such as Indonesia or Iran (Kwon and Sohn, 2017; Arasti et al., 2014). Inappropriate policies, unstable rules and regulations and bureaucratic taxation rules all give rise to unsupportive business environment for entrepreneurs, undermining the survival rate of newly established businesses despite efforts being made by the entrepreneurs (Arasti et al., 2014). In addition, substandard entrepreneurial work welfare in developing countries leads to disappointment and low level of satisfaction (Zhao et al., 2019). Lack of motives and inspiration would consecutively lead to business failures (Arasti et al., 2014).

An important reason for the mixed finding on the entrepreneurship-mental well-being nexus is the absence of an integrative theoretical framework (Shir et al., 2019) seeking to understand the antecedents and consequences of entrepreneurial well-being, and the extent to which they are supported by empirical evidences (Stephan, 2018). Moreover, while there are many factors, such as entrepreneurial traits, macroeconomic environment or institutional quality, involved in moderating and mediating the relationship between entrepreneurship and psychological well-being, most extant research have failed to take into account these moderation and mediation effects effectively (Alvarez and SindeCantorna, 2014; Alesina et al., 2004; Blanchflower and Oswald, 1998; Binder and Coad, 2013). To the best of our knowledge, Shir et al (2019) is among the first attempts to develop a Self-determination theory (SDT) model in which autonomy mediates the relationship between entrepreneurial engagement and well-being.

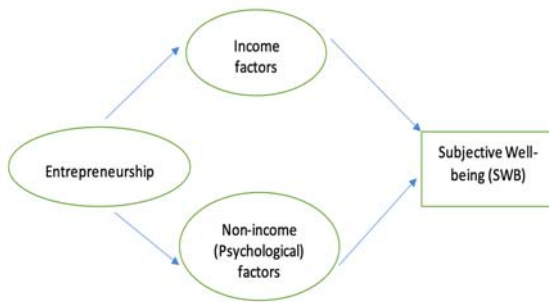


Fig. 1: A Framework for Understanding Entrepreneurial Subjective Well-beings

2. LITERATURE REVIEW

2.1. Defining entrepreneurial well-being

Wiklund et al (2019) calls for the bonding of eudemonic approach and hedonic approach in measuring the subjective well-being of entrepreneurs. The hedonic approach reflects the positive state of mental wellness that involves all aspects of life (Ryff, 1989). Well-being in hedonic approach incorporates both cognitive judgement of either general life experience or specific life domains (life satisfaction) and pleasant and unpleasant affect in response to events that cross one's life (moods and emotions). The eudemonic approach emphasizes the self-determination (Ryan and Deci, 2000), self-actualization (Maslow, 1968), personal development (Erikson, 1959) and personal pleasure (Waterman et al., 2010). Wiklund et al (2019) notes that both approaches have their differences and similarities. In this paper, I adopt an integrated framework that consolidate the core elements of each approach. I argue that the differences between the approaches form the rationale behind the analysis of my papers in terms of necessity entrepreneurs and opportunity-seeking entrepreneurs. Entrepreneurs pursue entrepreneurial activities for deeply personal reasons (Wiklund et al., 2019). However, only opportunity entrepreneurs who are truly proactive in their self-organized career pursuits can be able to harvest the benefits derived from autonomy or self-actualization (Binder & Coad, 2013). Therefore, the eudemonic well-being is pertinent to the analysis of opportunity entrepreneurs but necessity entrepreneurs. Kautonen and Palmroos (2010) finds that necessity entrepreneurs who are "pushed" into self-employment because they have other choices unsurprisingly report negative contentment with their own necessity-based entrepreneurship. Kautonen and Palmroos (2010) also find that when necessity entrepreneurs earn satisfactory income, the negative impact disappears.

Previous research focuses either on global evaluation of well-being (positive affect) or satisfaction derived from a specific context or activity of the business. Wiklund et

al (2019) argues that devoting emphasis only on perspective cannot capture the full picture of entrepreneurial experience. For instance, entrepreneurs who express satisfaction with their career may report lower fulfilment and happiness with their personal life. Comprehensive measurement of entrepreneurial well-being should be able to theorize and measure both entrepreneurs' subjective experience and entrepreneurial experience that affect their wellbeing. Therefore, I adopt the definition of Wiklund et al (2019) in defining entrepreneurial well-being as "the experience of satisfaction, positive affect, infrequent negative affect, and psychological functioning in relation to developing, starting, growing, and running an entrepreneurial venture."

2.2. Impact of entrepreneurial activities on wellbeing of entrepreneurs through income effect

Current literature finds that active engagement in entrepreneurial activities is strongly associated with the level of wellbeing (Shir et al., 2019; Zhao et al., 2019). Recent studies relate sources of entrepreneurial wellbeing to the fulfilment of psychological needs including individual self-organization or wellbeing (Shir et al., 2019), self-acceptance and personal growth (Wiklund et al., 2019). Income and related financial rewards from the start-up business are also significant positive source of entrepreneurial wellbeing (Dawson and Veliziotis, 2014; Millan et al., 2013). However, the income effect of entrepreneurial activities on wellbeing is not as straightforward due to the happiness-income paradox (Tian and Yang, 2006). The basic idea of happiness-income puzzle is that the average happiness level only rises until it reaches a critical income level (Tian and Yang, 2006). Once the peak level is reached and exceeded, increasing income could actually reduce the overall happiness level. Entrepreneurial activities certainly provide entrepreneurs with some disposable income that could be transformed into a certain level of happiness for entrepreneurs. However, Stutzer (2004) showed that SWB depends only on the gap between income aspirations and actual income. Once the gap has been closed increasing income does not significantly change the level of subjective well-being, a phenomenon that has been witnessed in developed countries.

Kaneman and Deaton (2010) reports that emotional well-being, which is one subcategories of subjective well-being increases with log income but there is no further progress beyond an annual income of around \$75,000. High income could buy life satisfaction but not happiness and low income is associated with low emotional well-being (Kaneman and Deaton, 2010). For instance, as Chinese president Xi has repeatedly confirmed China's status as a developing country, Zhao et al (2019) witnesses that China is still in a development

status that entrepreneurial activities can enhance subjective wellbeing by increasing household income. On the other hand, Muresan et al (2019) find that the increased ability to purchase of European individuals whose income is over the threshold of \$35,000 does not increase happiness. I propose the following proposition:

Proposition 1: *The relationship between income derived from entrepreneurial activities and the level of happiness of entrepreneurs has an inverted U-shaped relationship.*

2.3. Impact of entrepreneurial activities on wellbeing of entrepreneurs through non-income effect

People decide to engage in entrepreneurial activities for other idiosyncratic reasons such as the fulfilment of need for achievements (McClelland, 1961), the satisfaction of desire for autonomy (Deci and Ryan, 2000) or other intrinsic motivations such as risk-taking propensity (Das & Teng, 1997). Non-entrepreneurial activities or regular employment cannot provide such psychological nutrients to entrepreneurs (Shir et al., 2018; Ryan, 1995). The difference in fulfilling basic psychological nutrients is the basis for entrepreneurs' higher level of subjective well-being.

Entrepreneurial engagement as a self-organized and goal-direct pursuit (Shir, 2015; Bird, 1998; McMullen and Shepherd, 2006) provide a telling and distinctive work environment for entrepreneurs and offer them opportunities to pro-actively satisfy innate tendencies for growth. Entrepreneurial activities are also different from regular employment in the sense that entrepreneurial tasks stimulate creation of more meaningful relationships (Power, 2019) or self-organizing approach to goal pursuits and learning and development (Gagne and Deci, 2005). Ryan and Deci (2017) finds that the fulfilment of these basic psychological desire is positively associated with level of individuals' well-being.

It cannot be denied that relative to traditional jobs entrepreneurs live a more stressful life (Monsen and Wayne Boss, 2009) due to remorse from failed projects (Jenkins et al., 2014), fear (Mitchell et al., 2008) and pecuniary loss (Parasuraman et al., 1996). Shir et al (2018) argues that traditional employment may offer more stable career but limit the self-directed activities and the existence of self-motivated behaviors at work because firms would prefer efficiency by maintaining operating procedures and routine competencies. Therefore, self-employed entrepreneurs in general achieve higher level of well-being derived from psychological factors.

Proposition 2: *The fulfilment of basic psychological needs by engaging in entrepreneurial activities exerts positive influence on entrepreneurial subjective wellbeing.*

3. CONCLUSION

Entrepreneurship affects well-being through income and psychological factors. Income effect plays an important role in entrepreneurial well-being in a society that most people strive to satisfy their most basic needs. As societies continue to evolve into civilization that values democratization, human values and self-actualization, psychological factors will consistently change the well-being of entrepreneurs. Consequently, struggling necessity entrepreneurs who are "push" to self-employment experience gratification only when the judicial/economic institutional system guarantees acceptable income and basic protection. On the other hand, opportunity entrepreneurs who have desire for greater autonomy, independence and new challenges improve subjective well-being once the political and societal institutional system ensure their psychological needs. Finally, entrepreneurial well-being also wield influence on the possibility of becoming an entrepreneur through the channels of behavioral activation mechanisms. Combining BIS/BAS with cognitive motivational theories already prevailing in the entrepreneurship literature can enrich our understanding of the role of emotional entrepreneurial motives.

Overall, this research helps build up a novel perspective for the literature on entrepreneurial wellbeing. Second, the study has implications for both practical management and relevant authorities in the sense that both government and societies are key enablers as well as moderators of entrepreneurial activity. Third, a major limitation of my paper is the lack of empirical results to support my theoretical arguments. The data on government activism, post-materialism and socially supportive culture is all available in World Value Survey while the individual data on entrepreneurship and self-employed individuals can be easily obtained from GEM, World Value Survey and European Social Survey. Future empirical research on entrepreneurial well-being is needed.

4. REFERENCES

- [1] Alesina, A., Di, T. R., and MacCulloch, R. (2004). Inequality and happiness: are Europeans and Americans different? *Journal of Public Economics*, 88(9-10), 2009-2042.
- [2] Alvarez, G., and Sinde-Cantorna, A. I. (2014). Self-employment and job satisfaction: an empirical analysis. *International Journal of Manpower*, 35(5), 688-702.

- [3] Arasti, Z., Zandi, F., and Bahmani, N. (2014). Business failure factors in Iranian SMEs: Do successful and unsuccessful entrepreneurs have different view points? *Journal of Global Entrepreneurship Research*, 4 (1), 1-14.
- [4] Benz, M., and Frey, B.S. (2008). Being independent is a great thing: subjective evaluations of selfemployment and hierarchy. *Economica*, 75 (298), 362-383.
- [5] Binder, M., & Coad, A. (2013). Life satisfaction and self-employment: A matching approach. *Small Business Economics*, 40(4), 1009-1033.
- [6] Blanchflower, D. G., Oswald, A. J. (1998). What makes an entrepreneur? *Journal of Labor Economics*, 16, 26-60.
- [7] Chekola, M. G. (1975). The concept of happiness. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 35(7A), 4609.
- [8] Dawson C., and Veliziotis M. (2013). Temporary employment, job satisfaction and subjective well-being. University of the West of England, Working Papers 1309.
- [9] Campbell, A. (1976). Subjective measures of well-being. *American Psychologist*, 31(2), 117-124.
- [10] Diener, E. (2000). Subjective well-being: the science of happiness and a proposal for a national index. *American Psychology*. 55 (1), 34-43.
- [11] Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95, 542-575.
- [12] Deci, E. L., Koestner, R., and Ryan, R.M. (2001). Extrinsic rewards and intrinsic motivation in education: reconsidered once again. *Review of Educational Research*, 71 (1), 1-27.
- [13] Erikson, E. (1959). Identity and the Life Cycle, *Psychological Issues*, 1 (1),1-171.
- [14] Gopinath, N., and Mitra, J. (2017). Entrepreneurship and Well-Being: Towards Developing a Novel Conceptual Framework for Entrepreneurial Sustainability in Organisations. *Journal of Entrepreneurship and Innovation in Emerging Economies*, 3 (1), 62-70.
- [15] Gagne, M., and Deci, E, L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*. 26, 331-362.
- [16] Foo, M. D. (2011). Emotions and entrepreneurial opportunity evaluation. *Entrepreneurship Theory and Practice*, 35 (2), 375-393,
- [17] Foo, M. D., Uy, M. A., and Baron, R. A. (2009). How Do Feelings Influence Effort? An Empirical Study of Entrepreneurs' Affect and Venture Effort. *Journal of Applied Psychology*, 94, 1086-1094.
- [18] Hanglberger, D., and Merz, J. (2011). Are self-employed really happier than employees? An approach modelling adaptation and anticipation effects to self-employment and general job changes. Bonn IZA, IZA Discussion Paper.
- [19] Hmieleski, K. M., and Baron, R. R. (2008). When does entrepreneurial self-efficacy enhance versus reduce firm performance? *Strategic Entrepreneurship Journal*. 2(1): 57-72.
- [20] Linton, M.-J., Dieppe, P., and Medina-Lara, A. (2016). Review of 99 self-report measures for assessing well-being in adults: exploring dimensions of well-being and developments over time. *BMJ Open*, 6 (7), e010641.
- [21] Shir, N., Nikolaev, B., Wincent, J. (2018). Entrepreneurship and Well-being: The Role of Psychological Autonomy, Competence, and Relatedness. *Journal of Business Venturing*, 34(5), 105875.
- [22] Schneck, S. (2014). Why the Self-Employed Are Happier: Evidence from 25 European Countries. *Journal of Business Research*, 67 (6), 1043-1048.
- [23] Stephan, U. (2018). Entrepreneurs' Mental Health and Well-Being: A Review and Research Agenda. *Academy of Management Perspectives*, 32(3), 290-322.
- [24] Stephan, U., Hart, M., Mickiewicz, T., & Drews, C. C. (2015). Understanding motivations for entrepreneurship, BIS Research paper No. 212, http://eprints.aston.ac.uk/25296/1/Understanding_motivations_for_entrepreneurship.pdf.
- [25] Stephan, U., and Uhlaner, L. M. (2010). Performance-based vs. socially supportive culture: A cross-national study of descriptive norms and entrepreneurship. *Journal of International Business Studies*, 41(8), 1347-1364.

- [26] Shepherd, D. A., Wiklund, J., and Haynie, J. M. (2009). Moving forward: Balancing the financial and emotional costs of business failure. *Journal of Business Venturing*, 24(2), 134-148.
- [27] Keyes, C. (2006). Mental health in adolescence: is America's youth flourishing? *American Journal of Orthopsychiatry*, 76 (3), 395-402.
- [28] Kautonen, T., and Palmroos, J. (2010). The impact of a necessity-based start-up on subsequent entrepreneurial satisfaction, *International Entrepreneurship and Management Journal*, 6(3), 285-300.
- [29] Kwon, I., and Sohn, K. (2017). Job dissatisfaction of the self-employed in Indonesia. *Small Business Economics*, 49(1), 233-249.
- [30] Kautonen, T., and Palmroos, J. (2009). The impact of a necessity-based start-up on subsequent entrepreneurial satisfaction. *International Entrepreneurship and Management Journal*, 6, 285-300.
- [31] Mitchell, R.K., Mitchell, J.R., and Smith, J.B. (2008). Inside opportunity formation: Enterprise failure, cognition, and the creation of opportunities. *Strategic Entrepreneurship Journal*, 2, 225-242.
- [32] McMullen, J. S., Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneurs. *Academy of Management Review*, 31, 132-152.
- [33] McClelland, D. C. (1961). *The achieving society*. Princeton, NJ: Van Nostrand.
- [34] Merchán-Clavellino, A., Alameda-Bailén, J. R., García, A. Z., and Guil, R. (2019). Mediating effect of trait emotional intelligence between the behavioral activation system (BAS)/behavioral inhibition system (BIS) and positive and negative affect. *Frontiers in Psychology*, <https://doi.org/10.3389/fpsyg.2019.00424>.
- [35] Monsen, E. and Boss, R.W. (2009). The impact of strategic entrepreneurship inside the organization: Examining job stress and employee retention. *Entrepreneurship Theory and Practice*, 33, 71-104.
- [36] Muresan, G. M., Ciomas, C., and Achim, M. V. (2019). Can Money Buy Happiness? Evidence for European Countries. *Applied Research in Quality of Life*, doi:10.1007/s11482-019-09714-3.
- [37] Maslow, A. H. (1968), *Toward a Psychology of Being*, 2nd ed., Princeton, N.J.: Van Nostrand.
- [38] Parasuraman, S., Purohit, Y. S., Godshalk, V. M., and Beutell, N. J. (1996). Work and family variables, entrepreneurial career success, and psychological well-being. *Journal of Vocational Behavior*, 48, 275-300.
- [39] Packard, M. D., and Bylund, P. L. (2018). On the relationship between inequality and entrepreneurship. *Strategic Entrepreneurship Journal*, 12(1), 3-22.
- [40] Ryan, R. M., and Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, 52(1), 141-166.
- [41] Ryan R. M., and Deci, E. L. (2017). *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness*. New York: Guilford.
- [42] Ryan, R. M., and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.
- [43] Ryff, C.D., 1989. Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*. 57 (6), 1069-1081.
- [44] Ryff, C. D. (2017). Eudaimonic well-being, inequality, and health: Recent findings and future directions. *International Review of Economics*, 64(2), 159-178.
- [45] Shir, N., Nikolaev, B, N., and Wincent, J. (2019). Entrepreneurship and well-being: The role of psychological autonomy, competence, and relatedness. *Journal of Business Venturing*, 34(5), 105875.
- [46] Stutzer, A. (2004), The Role of Income Aspirations in Individual Happiness. *Journal of Economic Behavior and Organization*, 54(1), 89-109.

- [47] Shir, N. (2015). Entrepreneurial Well-being: The Payoff Structure of Business Creation. Entrepreneurial well-being: The payoff structure of business creation, PhD thesis.
- [48] Tian G., Yang L., 2006. A Solution to the Happiness to Income Puzzle: Theory and Evidence. *Economic Research Journal*, (11), 4-15.
- [49] Wiklund, J., Nikolaev, B., Shir, N., Foo, M., and Bradley, S. (2019). Entrepreneurship and wellbeing: Past, present, and future. *Journal of Business Venturing*, 34(4), 579-688.
- [50] Wood, M. S., Bylund, P., and Bradley, S., (2016). The influence of tax and regulatory policies on entrepreneurs' opportunity evaluation decisions. *Management Decision*, 54 (5), 1160-1182.
- [51] Wincent, J., Örtqvist, D., and Drnovsek, M. (2008). The entrepreneur's role stressors and proclivity for a venture withdrawal. *Scandinavian Journal of Management*, 24, 232-246.
- [52] Waterman, A. S., Schwartz, S. J., Zamboanga, B. L., Ravert, R.D., Williams, M. K., Bede Agocha, V., Brent Donnellan, M. (2010). The Questionnaire for Eudaimonic Well-being: psychometric properties, demographic comparisons, and evidence of validity. *Journal of Positive Psychology*, 5 (1), 41-61.
- [53] Zhao D., Jiang J., and Yin Z. 2019. Can entrepreneurship bring happiness? Evidence from China. *Economic modelling*, <https://doi.org/10.1080/13547860.2019.1643694>.
- [54] R. C. and Charlie, B. (2001), "Non-linear unstable systems", *International Journal of Control*, **23**, (4), 123-145.

TRIGGERING INTERNAL TECHNOVATION TRIANGLE BY INTANGIBLE ASSETS AND STRATEGIC PLANNING: EVIDENCE FROM VIETNAM'S SUCCESSFUL AGRO-FOOD MANUFACTURERS

Nguyen Thi Minh Chi^{1*}, Tournois Nadine² and Le Xuan Quynh³

¹ Côte d'Azur University, IAE, Nice, France and Lecturer at The University of Danang, Campus in Kon Tum, Vietnam

² Côte d'Azur University, IAE, Nice, France

³ Faculty of Economic and Accounting, Quy Nhon University, Binh Dinh, Vietnam

*Corresponding author: minhchi0601@gmail.com

Abstract

This study focuses on the question of technological adoption, in general, and innovation management, in particular, with specific reference to Vietnamese agro-food manufacturers. A qualitative case study approach was adopted capturing the perspectives of managers and employees in three successful agro-food manufacturers. The findings showed that, it is necessary to deepen our systematic understanding of integral technovation process in managerial practices. These include first, within internal technovation process, there is occurring a technovation transformation of three flows: organizational knowledge, and organizational behavior and organizational culture in all successful agro-food companies. Our analysis also reveals that this technovation process also based simultaneously on two dimensions: strategic planning (push factor) and intangible assets (pull factor). Strategic planning established by manufacturers' internal factors gives them strong and intense reasons to change from traditional business model from identifying their current capacities and limitations. Intangible asset is also a strong desire, but based on external expected resource including knowledge-based capital or invisible assets which are always influenced by opportunities and barriers. Theoretical and practical implications are discussed and presented.

Keywords: Internal innovation; technology; intangible assets; strategic planning; agro-food manufacturers, Vietnam.

1. INTRODUCTION

Viet Nam has participated in global value chains in a number of areas, such as textiles and garments, food, furniture, and more recently mobile phones; structural change towards more sophisticated, but high-technology products has been rather slow (OECD & The World Bank, 2014). Lock-in in low value-added activities limits the scope for technological learning and improving innovation capabilities. Move into global value chains deeply will provide opportunities to create a virtuous circle of innovation, learning and productivity growth and new value-added activities. As Vietnam innovation capabilities increase, enterprises in industry and services will be able to upgrade technologically by assimilating new knowledge, engage in more advanced innovation activities, strengthen backward and forward linkages and enter sophisticated new production activities.

At present it has a number of technological innovation weaknesses in agro-business sector, which are described

by international organizations (OECD & The World Bank, 2014; UNIDO, 2019; VMIT, 2020), which origin from some underlying causes. Firstly, low level of sophistication exists in production and exports. Exports still are largely concentrated in low-technology and low value-added industries. Secondly, supporting industries are still underdeveloped, unable to produce products of sufficient quality and scale to be able to participate in the supply chain of products and components for export enterprises. Thirdly, the level of market diversification of some products in the group of agro products is not high, in particular, depends heavily on Asia (accounting for over 50%). Fourthly, there is even less R&D capacity in the agro-business sector. Finally, R&D and innovation statistics and other relevant information are not systematic, lack international comparability and are out of date.

Moreover, an extent of the shift in the consumption patterns and trends are appraised under a broader lifestyle concept including socio-economic, physical activity, psychosocial and behavioral determinants. In

doing so, the overall focus of the local production system is on sustainable consumption. Most of activities are aiming to develop innovative products based on consumer-centered re-design of traditional value and origin, in order to satisfy consumer demand in terms of healthiness, convenience, and cultural identity. Nurturing and achieving Viet Nam's potential for technological innovation as a source of economic growth and development will require a sustained, forward-looking effort and, in addition to an open and competitive environment, progressive diversification and upgrading into manufacturing and service activities that increase domestic value added and generate technological spillovers. This study focuses on the question of technological adoption, in general, and innovation management, in particular, with specific reference to Vietnamese agro-food manufacturers

2. LITERATURE REVIEW

Agro-manufacturers have various motivations for becoming technovation. According to Heider (1958), he claimed that one could explain/attribute behavior as being determined by either push (internal) or pull (external) factors. Internal attribution or dispositional attribution refers to an inside factor, agent or force, such as needs, wants and wishes (Petri & Govern, 2012). Conversely, external attribution or situational attribution refers to an outside factor, agent or force, such as environment (Petri & Govern, 2012), such as seeing an opportunity (Hakim, 1989). The primary theory development around innovation motivations has been to classify motivations into categories of push and pull factors (Brem & Voigt, 2009; Choi, 2018; Di Stefano et al., 2012; Horbach et al., 2012; Lu et al., 2009; Zmud, 1984). In all these cases, demand/need-push and technology-pull are at the basis of this fundamental synthesis, as demonstrated by most of the articles linked to internal innovation.

Although, strategic planning is not mentioned directly demand/need-push factors, at indirect perspective, it absolutely represent significantly for firms' technovation motivation. Pointing major pull factor like strategic planning is extremely important to specific managerial practices, while demand/need-push factor of past scholars is incredibly vague in organizational technovation. The strategic planning as an ability to enhance innovation is a desired capability of effective planning systems (Ramanujam & Venkatraman, 1987). The role of strategic planning is considered as a comprehensive mechanism to foster innovation in organizations (Batra et al., 2018). Taylor (1976) identified that planning can be viewed as a framework for innovation which is institutionalized in an organization as a series of planned breakthroughs. In doing such strategic planning, firms will act as a

stimulus for progressive adaptation and self-renewal through new products and ideas which fulfills the customers' need through innovative activities towards a level of satisfaction and increase of the organizational performance.

2.1. Push and pull factors

Technological assets can themselves be an internal motivation source of innovation. This means that in some cases the competences serve the need of simply importing external sources within the firm (Von Hippel, 1994). Di Stefano et al., 2012 and Mowery & Rosenberg (1979) have criticized the actual role of demand and narrowed innovation motivation to the role of a selection force of technology (Zmud, 1984). Applicability of push-pull theory was not felt when innovation were partitioned into technological concerns. Many technological innovations have their origin in science and technology but still need a market and the related complementary assets (Teece, 1986) to be successfully commercialized (C. M. Christensen & Bower, 1996; Gatignon & Xuereb, 1997). Similarly, innovations that stem from an external pull perspective (Von Hippel, 1976, 1994) still require technological competences to be developed effectively. This result brings in the issue of the firm's internal technovation as a crucial ability of the innovator to absorb such signals.

Traditionally, technological sources stand for material assets which can be seen or touched. The work developed here deals with the study of plant, machinery and equipment of the main sources that firms encounter to achieve technological innovations of the so-called insufficient kinds. Incremental factor effecting to the overall management process of the firm are the case of intangible assets or pull factor (external attribution) to which modern innovation. The value of intangible assets stems from its knowledge content and its capacity to add value to physical nature of other assets. Take co-creation for example, in the extent of technology-rich environment, it completely is a new invisible source of value in technological way. In addition, Corrado et al., (2009) and Grant (1991) listed invisible assets as knowledge-based capital (KBC) including a wide range of resources: technological capital (software and databases, scientific and non-scientific R&D, copyrights, designs, brand equity and marketing research), human capital (firm-specific training), reputational capital (firm brand) and organizational capital (organizational know-how). Business investment in KBC now significantly exceeds investment in physical capital. Demographic and other constraints mean that growth in advanced economies will increasingly depend on knowledge-based increases in productivity (OECD, 2017).

Knowledge-based asset is the heart of innovation, productivity and business success (Itami & Roehl, 1987).

In context of technology revolution 4.0, innovation reflects changes in the use and efficiency of both fixed capital investment and knowledge-based capital (intangible assets). Producing new and better products entails investing not only in research and development (R&D), but also in complementary assets such as software, design, human capital and firms' organizational capabilities - in short, KBC. The knowledge assets that many firms view as current and future sources of long-term sustainable growth provides metrics of knowledge-based capital (on-the-job training, organizational assets, market and non-market sector). Skills required for the new working environment shaped by technological development, as well as returns to technical skills, are analyzed through a new set of indicators. For KBCs, they are the sources that are most likely to fulfill the requirements to generate sustainable competitive advantages (López Rodríguez & García Rodríguez, 2005).

Strategic planning as push factor shows firms' internal motivation which, in turn, has a positive effect on innovation performance. McGinnis & Ackelsberg (1983) state the result of the paralysis of analysis is that innovation is stifled, with the consequence that strategic plans merely reflect conventional management wisdom. Opportunities are missed and the firm becomes vulnerable to competitors that are willing to pursue innovative strategies (Bouhali et al., 2015). Since it is crucial for firms to rapidly respond to persistent external fluctuations (Zhou & Li, 2010), specifically undertaking strategic planning allows the company to prevent competitors from entering the market. Through effective strategic human resource practices in terms of staffing, training, participation, performance appraisal, and compensation, firms would enhance their capability in introducing new products, services, and management system, and then achieve better innovation outcomes (Chen & Huang, 2009).

The dedication of more inputs to the innovation process does not guarantee innovation outcomes, since the process of developing innovation is complex and characterized by high risks (Wolff, 2007). Thus, identification and prioritization of strategic planning innovation is what firms need to be able to manage technology for strategic competitive advantage. The firm's innovation behavior of commitments to identify strengths, weaknesses, opportunities and threats, formulate plans in accordance with corporate vision and missions, and acclimatize the plans to implementation achievement of strategic objectives (Richards & Yang, 2010; Zandhessami et al., 2012). Strategic capabilities that comprise creation, design and engineering, and construction capabilities, which are perhaps the most dynamic organizational knowledge capabilities given the pace of change in all organizations' business environments (Panda & Ramanathan, 1996).

Our analysis is what is referred to as the technology-pull characteristic of innovation and stands in contrast with the "strategy-push" concept. The "technology-pull" form of innovation primarily relies on push from technology and improvements in production techniques to increase enterprise performance, our research have maintained that technology's role within agro-manufacturing innovation is really significant. All in all, this literature review on innovation management, with frameworks and models, illustrates how most authors such Guan & Ma (2003), Hurley & Hult (1998), Martínez-Román et al. (2011) and Zandhessami et al. (2012) tend to examine the relationship between the dimensional factors of organization and firm performances. As previous studies did not explain the push and pull factors on internal technovation, this study is adopting Heider's theory to explain them. Based on the key dimensions recommended by López Rodríguez & García Rodríguez, 2005 and Pawliczek et al. (2015), the case-comparison allows identifying push and pull factors of internal technovation in agro-food manufactures, has been modified based on the current study objectives.

2.2. Internal technological innovation

Internal technological innovation (ITI) ranks among the top determinants of firms' performance and many empirical studies have found this relationship to be significant (Calantone et al., 2002). The firm innovation system can be defined as an interactive process that involves the generation, adoption, implementation, and incorporation of new ideas and technological practices within the firm (Carlsson et al., 2002; Van de Ven & Angle, 1989). The main feature of this system is the ability of the actors to generate, diffuse, and utilize innovations that have economic value, collectively known as the firm's internal technovation. Innovation activity within a firm is an interactive process characterized by technological interrelatedness between various sub-systems or sub-processes (Teece, 1996). These sub-processes include those of concept generation, product development, production, technology acquisition, leadership, resource provision, and system and tool provision.

ITI can be enhanced by developing the firm's ability in each sub-process. Various studies have sought to identify the ITI components that are important to firms (Adler & Shenbar, 1990; J. F. Christensen, 1995; Phaal et al., 2001; Yam et al., 2004). It is recognized that a firm with greater ITI is able to achieve higher levels of organizational performance and effectiveness. Hence, the technovation of a firm are crucial in sustaining its global competitiveness. A deepen understanding of empirical researches, it can be seen as firm-level scope such as

knowledge management, organizational behavior, standards and technological learning have been given some attention but are still somewhat less important (Petti, 2013).

In an interactive view of innovative processes, the capability to innovate is an internal ability that conditions the entire organization. This complex and multidimensional nature is a major challenge to conceptualize ITI in an achievable way for empirical investigation at the global level. In this sense, Baden-Fuller & Pitt (1996) and Nueno & Quelch (1998) considered an interesting springboard for proposing solutions to this situation. Specifically, the authors suggest the existence of the three dimensions of the innovative capability. The first dimension is that of knowledge management, basic for generating technological learning, assimilating available technologies and imitating the competition (Carneiro, 2000; Darroch, 2005; Donate & de Pablo, 2015; Hull & Covin, 2010; Kumar & Rose, 2012; Zhou & Li, 2012). The second one relating to the organizational behavior adapted for the development of the innovations (Cohen & Levinthal, 1990; Martínez-Román et al., 2011; Tang et al., 2013; Teece et al., 1997). Thirdly, the human resource is an essential axis that includes the set of variables related to human capital (Kroll & Schiller, 2010; Subramaniam & Youndt, 2005). These include leadership style, the level of staff training and the organizational culture, interiorized by the members of the organization. Although this three-dimensional approach has not been directly used, it is partially supported by different researches (Akman & Yilmaz, 2008; Guan & Ma, 2003; Nassimbeni, 2001; Saunila et al., 2014).

Organizational knowledge is defined as the ability to develop ideas and concepts in order to take advantage of market opportunities (Assink, 2006; Damanpour, 1991; Elmquist & Masson, 2009; Wei & Xie, 2008). Garvin (1993) described an organizational knowledge as an organization skilled at creating, acquiring, and transferring knowledge, and modifying its behaviour to reflect new knowledge and insights. The manifestation of knowledge in patents is a key aspect of innovative capability which has been the focus of much research in

the field (Puranam et al., 2009; Romijn & Albaladejo, 2002). Technological innovation in companies is a learning process through which a flow of new knowledge competencies and capabilities is generated (Nieto, 2004).

Various investigations have indicated a connection between ITI and certain variables related to generate organizational knowledge and its application in obtaining market value (Carneiro, 2000; Darroch, 2005; Donate & de Pablo, 2015; Hull & Covin, 2010; Kumar & Rose, 2012; Zhou & Li, 2012). Factors internal to the firm include first of all, the knowledge and skills brought into the firm by the entrepreneurs and workforce, which they obtained through earlier experience (Romijn & Albaladejo, 2002). Du Plessis (2007) have concluded that managing the knowledge in an organization does not only focus on innovation but also helps in building an environment which is favourable for developing innovations. ITI depends on the knowledge that allows us to improve or create new technologies (Romijn & Albaladejo, 2002; Wonglimpiyarat, 2010) and influences technological position or development of patents (Chen et al., 2009). Likewise, the new and relevant knowledge and skills enhance capabilities for adapting to changes in the business environment, or proactive decision making that keep up with and stay ahead of its competitors (Calantone et al., 2002; Rajala & Westerlund, 2010; Sinkula et al., 1997).

These studies focus on the role of innovative firms and the need to improve scientific knowledge in this type of organizations (Dosi & Nelson, 1994; Furman et al., 2002; Nelson & Winter, 1982). The evolutionist trend, which integrates various theories, adopts a new vision of technology and technological change based on organizational knowledge. Organizational knowledge innovation, as a capability that continuously acquires, digests, and utilizes external knowledge Zhou & Li (2012) has become an important process necessary for a firm to identify market opportunities and use new knowledge to realize innovation (Xie et al., 2018). The axis of organizational knowledge may be broken down into four stages: knowledge acquisition, knowledge assimilation, knowledge transformation, and knowledge exploitation (Fig. 1).



Fig. 1: Four-stage process of organizational knowledge innovation

Innovation can also occur in the managerial methods and organizational structure of a firm. Technological innovation is fundamentally determined by a firm's external factors and companies are characterized by their passive behaviour. Organizational behaviour are a main explanatory factor of firms' ITI (Cohen & Levinthal, 1990; Martínez-Román et al., 2011; Tang et al., 2013; Teece et al., 1997). Nayir et al. (2014) documented how innovative behaviour stimulates product and process innovativeness. Kuczmarski (1996) reported that innovative behaviour and the mind-sets of individuals enhance the innovation of firms. The firm must adapt itself to the needs of the innovative process in order to generate the aforementioned capability (Gumusluoglu & Ilsev, 2009; Hult et al., 2004; Nonaka & Takeuchi, 1995). The impact of and behavioural characteristics of technical professionals on creativity and innovation (Goncalo & Staw, 2006) or how entrepreneurial behaviours shapes ITI development and exploitation (Dyer et al., 2008) may prove to be valuable research in understanding the underpinnings of technological innovation.

Likewise, the ability to innovate depends on the organizational structure, which includes aspects such as behaviour activities in the value chain (Sher & Yang, 2005), production processes, and methods of operation (Nassimbeni, 2001). The firm's behaviours originated in combination with multiple features of both a formal and informal nature that the theory describes. Dedahanov et al. (2017) investigates what forms of structural factors (centralization, formalization, integration) should be managed to enhance the levels of employee innovative behaviours, which in turn fosters ITI. Innovative behaviour is defined in terms of methods of technology generation, sources of information, accumulative nature of the process, general objectives, mechanisms Galende & de la Fuente (2003) which are influenced by organizational structure (Ahmady et al., 2016) Brockman and Morgan, 2003. In a more generic sense, other recent research confirms the importance of flexibility (Li & Kozhikode, 2009) or type of organizational structure (organic vs. mechanistic) in ITI (Hull & Covin, 2010; Menguc & Auh, 2010).

The firm's behaviors originated in combination with multiple features of both a formal and informal nature that the theory describes. Several factors have been examined as the determinants of innovative behaviour, such as job characteristics (Oldham & Cummings, 1996), organizational climate and culture (Scott & Bruce, 1994), relationships with superiors (Janssen & Van Yperen, 2004), individual differences (Bunce & West, 1995), and social/group contexts (Munton & West, 1995). In addition such kind of in-depth research, our study will provide insightful managerial implications where organizational behaviour characterized by to the organizational characteristics and structural style of businesses in combination with centralization,

decentralization, formalization, integration and market focus (Fig. 2).

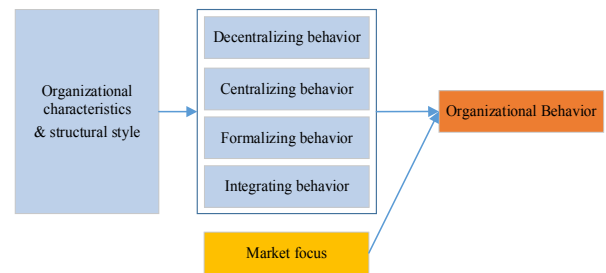


Fig. 2: Framework of organizational behavior innovation

Generally, organizational culture includes values, belief, assumptions, and norms that are prevalent and difficult to copy by another firm. Organizational culture has generated a significant amount of research interest since the early 1980s (Deal & Kennedy, 1982). One definition of organizational culture is the collective programming of the mind which distinguishes the members of one organization from another (Hofstede et al., 2010). Hence, differences in culture between organizations are largely a function of managerial practice as perceived by organization members (Hofstede, 1998).

The literature also offers numerous testimonies which support the existence of a clear association between ITI with human factor or organizational culture. ITI also relies on aspect of organizational culture (human resources or human capital) (Subramaniam & Youndt, 2005). Workers' participation in development and improvement activities, along with the generation of new ideas, are relevant variables when evaluating ITI. Aspects related to human factor, such as work-force specialization, group incentive and training programs are among the variables which help us to understand organizations' ability to innovate (Nassimbeni, 2001). Training and qualifications of workers are also important to ITI (Kroll & Schiller, 2010). Organizational culture established in order to encourage innovation is important factors which should be taken into account when we study ITI. In the axis of the organizational culture, this dimension is connected to such aspects as staff training and attitude, promotion/reward system, workload pressures and risk taking are found in Fig. 3.

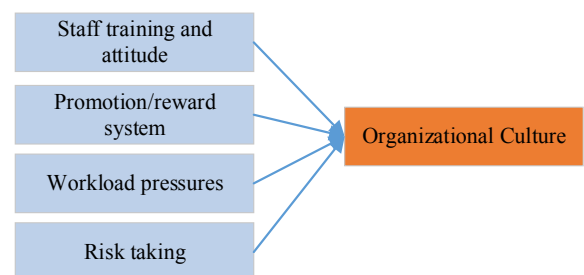


Fig. 3: Framework of organizational culture innovation

3. METHODOLOGY

3.1. Identification and selection of case-studies

Accordingly, starting from the case selection procedure proposed by Eisenhardt (1989), the case studies were selected for several theoretical reasons. Specifically, we carried out a multiple case study of technology innovation process implemented by agro-food manufacturer 1 (AM1), agro-food manufacturer 2 (AM2), agro-food manufacturer 3 (AM3). Table 3 shows some general information related to the above-mentioned firms. The decision to focus on the three firms mentioned above was based on the fact that all of them are leaders in their respective fields (Stake, 1995). Qualitative sampling strategies aim to identify reasonable instances of the (larger) phenomenon under research (Flick, 2018). Such a non-probabilistic strategy is guided by considerations of a more or less theoretical nature; it seeks to select a purposeful sample, while at the same time reducing the likelihood that the way a sample is chosen influences the outcome of the research (Easterby-Smith et al., 2015). The researched object's typicality and distribution should be represented in the sample which you study (i.e., collect and analyze) in a way that allows you to draw the inference of the relations in the object (Flick, 2018).

More specifically, significant changes of these firms will be observed in various dimensions employed include: (1) They are representative of sub-sector in agro-industry with success business; (2) Their attitudes toward innovation in all areas of from farming, process to commercial; and (3) Their attitudes to apply and manage technology by adapting and quickly responding to consumer needs, or even creating new specific needs. As shown, they are quite very different in terms of size, year of establishment, and products, but they exemplify the world of manufacturing and trading business. In

addition, in order to have reasonable control over the research, the choice of these cases was discussed with a panel of experts from both academia and the agro management field.

3.2. Data collection

Case studies typically combine data collection methods such as archives, interviews, questionnaires, and observations. The evidence may be qualitative (e.g., words), quantitative (e.g., numbers), or both. Based on 983 agro-processing firms' profile on stock finance market recorded on January, 2020, the procedure of data collection was adapted from three-step logic of Dominguez & Mayrhofer (2017), as shown by Table 2. First, we identified, through three data-bases (Vietstock, Ministry of Industry and Trade, General Department of Vietnam Customs), independent agro-manufacturing exporters located in the Vietnam with high-light business activities. This first step led us to identify 85 agro-processors corresponding to the profile. Second, we conducted an exploratory study to test our interview guide and to select firms for in-depth case-studies. A focus group is administrated under an open interview with 2 managers of agro-processing, 2 industrial consultants, and 2 public-sector agencies of promoting who accompany these firms. We selected these three agro-manufacturers for their critical nature, as they represent information-rich cases to illuminate the questions under study (Larsson, 1993; Patton, 2002; Perry, 1998; Voss et al., 2002). Purposeful sampling gives us a chance to focus on a various set of 3 agro-food cases. Third, we implement procedures of 'data trajectory' collection on three case-studies. In the data collection phase, we used various sources of evidence to identify the technology resources and technology innovation of the company and to measure performance of the company's technology innovation. This phase was organized into different stages in order of data collection.

Table 2: Data collection procedure of three-step logic

Steps	Period of time	Actions	Results
Identification	January – February, 2020	Construction of a data-base sampling independent agro-manufacturer located in the Vietnam with export activities	Identification of 85 agro-processing exporters
Exploratory study	March – May, 2020	Focus group Administering a focus group with 2 managers of agro-processing, 2 industrial consultants, 2 public-sector agencies of promoting	Selection of 3 case-studies following their critical nature, as they represent information-rich cases.

Steps	Period of time	Actions	Results
Multiple case study	June – July, 2020.	Semi-structured interviews geared Administering 5 questionnaires among senior managers of each case; Conducting 15 interviews, including middle-level managers, department heads, team leaders, group captains, as well as the engineers and the workers of each case. Typically each interview will last for 1 hour.	Identifying experiences and perceptions with audio recording; video tape, content analysis, diary, self-reporting and memoing
		Observation of interaction Taking 2 month in observations (body language, use of personal space) at 3 workshops, 9 steering committee meetings, 6 planning meeting and 6 group dynamics monitoring workshop	Identifying behaviour and perceptions with audio recording; video tape, content analysis, diary, self-reporting and memoing
		Document analysis Collecting written and electronically stored material/documents/records Collecting meeting minutes over 3 years (2018 – 2020), newspaper articles over 5 years (2016 – 2020), communication with Ministry of Agriculture and Food Industry (MARD) and external partners	A collection of scientific articles, technical articles, conference proceedings, press releases, policy documents, technical reports, statistics. A collection of company annual reports, policy papers, marketing research data, internal staff memos, plans, an in-depth study of their websites and social networks, process models and personal documents.

The primary field data involved virtual interviews, using semi-structured questions. Notes were taken, and some interviews were recorded with the participants' permission. Sixty interviews were conducted across the three cases; the participants included senior managers, line managers, union representatives, engineer, and employees. All respondents were full-time employees from 3 cases with over 2-year experience. The sample size (over 25) satisfied the criteria of "sufficiency" and "saturation". Interviewing stopped at 60 interviewees when there was no new information emerging (Creswell & Creswell, 2017; Guest et al., 2006).

The study also explored secondary data including company annual reports, policy papers, marketing research data, internal staff memos, plans, an in-depth study of their websites and social networks, process models and personal documents. Moreover, a source of

scientific articles, technical articles, conference proceedings, press releases, policy documents, technical reports, and statistics was explored. This process of triangulation involved cross-referenced information from a range of sources (Creswell & Creswell, 2017).

Reliability was established through the development of a case study protocol and a case study database. All the interviews were transcribed. Construct validity was established by using multiple sources of evidence, establishing a chain of evidence and by having the key informants' review drafts of the case study. Pattern-matching and explanation building were used to establish internal validity and the external validity was established by using the replication approach (Yin, 2018). The accounts of 3 cases were used to investigate the framework of success dimensions.

3.3. Presentation of sample

The main characteristics of the sample are presented in Table 3. Following previous studies, we use three key processes to identify the different measurements of firms' technological innovation performance: (1) product diversification which measured by the number of new/modified products as well as accumulated total in past three years (Camisón & Forés, 2011; Lau & Lo, 2019; Xie et al., 2018); (2) process improvement as well as purchasing new equipment (Chen & Huang, 2009) and (3) strategic planning innovation used (Panda & Ramanathan, 1996; Zandhessami et al., 2012).

All above dimensions indicate the current commitment and the evolution of agro-manufacturing operations. Although the number of patents and percentage of export sales of new/improved products are an important indicator of technological innovation performance (Ahuja & Katila, 2001; Brouwer & Kleinknecht, 1999; Schoenmakers & Duysters, 2006), it is typically suitable for the measurement of technology-intensive firms' technological innovation performance (Salman & Saives, 2005). Because most agro firms are non-technology-intensive, the number of patents and percentage of sales of new/improved products was not used to measure successful technological innovation.

Table 3: Major characteristics of the three mature agro-manufacturers

Manufactures	AM1	AM2	AM3
Year of foundation	1997	1998	1995
Type of company	Family owned	Family owned	Family owned
Total sales (2019)*	\$339,750,292	\$333,166,536	\$44,432,430
Export ration on total sales (2019)	82.52%	58.35%	86.99%
Number of employees (2019)	Over 6,000	About 8,960	About 300
Manufacturing capacity (2019)	90,000 ton fish raw material	80,000 tons of agricultural seed; 118,000 tons of rice; 20,000 tons of confectionary; 20,000 tons of seafood	13,300 tons of fresh and processed fruits
Export markets	About 30 countries	More than 30 countries	About 70 countries
First export time	In 2000, issued export code to the European market	In 2013, after owning 54.6% of charter capital of one of the oldest seafood processing & exporting companies in Vietnam	In 2000, researching the project of construction factory specializes in processing and exporting fruit juice products.
Main products/field	Aquaculture and food (fillets, ready-to-cook, ready-to-eat), galetin, collagen	Farm and food (seeds, rice, flowers, frozen seafood, vegetable, fish sauces, confectionery, nuts products, coffee, fish sauce)	Fruits, vegetables, beverage (concentrate juice, puree juice, frozen fruits and vegetables, fresh fruits, dried fruits)
Factory Location	Dong Thap	Long An, Dong Thap, Soc Trang, Ha noi, Hung Yen, Dong Nai	Nghe An, Son La, Long An, Gia Lai

Notes: * Exchange rate 1 USD = 23,450VND (recorded in June, 2020 at vietcombank.com.vn)

3.4. Data structure and management

Ideally, after creating qualitative database on a various level and approaches, we include structures to manage the information associated with a source data structure, a primary object data structure, a secondary object data structure, and a coder data structure (MacQueen & Milstein, 1999). We structure data because a single case may require more than one data table or data set to effectively manage all of the relevant information contained within it. By considering the relationships among and the content within each case, we can systematically organize our data to make analysis and the reporting of results more efficient and reliable. We extend the meaning of data to encompass all symbolic representations of information and meaning. We generate metadata in the form of codes, comments, memos, and annotations, as well as graphical summaries of the interpreted objects (e.g., schedules, diagrams, networks, clusters, and maps) capable of showing the multidimensional structure of coding patterns.

Qualitative data is characterized by its subjectivity, richness, and comprehensive text-based information from many sources of non-numerical data such as field notes, video, audio, recordings, word documents, excel file. Traditionally, researchers utilized colored pens to sort and then cut and categorized these data (Hilal & Alabri, 2013). Alternatively, the researcher could use the highlighting function in the word processor to highlight the text he or she is interested in, once more a different color for each interviewee and then bring them together in an electronic file (Marshall & Rossman, 1990; Miles et al., 2013). Analyzing qualitative data is often a muddled, vague and time-consuming process.

The raw data (including interview, fieldwork notes, documentation, memos and comments) was transcribed and processed by using the software Nvivo 11. This qualitative data analysis software developed to manage the 'coding' procedures is considered the best in this regards. Nvivo software helped us to classify, sort, reduce and arrange a range of data into organized storage file system. Furthermore, by pursuing of the relationship between categories and themes of data, it allowed us seeking to increase the understanding of the technological innovation phenomenon between firms, thus facilitating our cross-case. NVivo ease important task qualitative data analysis by utilizing the data collected and the result found to formulate transcript reports about the study conducted (Jackson & Bazeley, 2019).

4. FINDINGS AND DISCUSSIONS

4.1. Strategic planning and intangible assets

In this section, we will present the technovation process

developed by each company and identify the different strategies and characteristics that have marked their success in agro-food field. As indicated by Table 4, the internal technovation process of 3 agro-food manufacturers is formed from three different platforms which triggered by two push and pull factors of strategic planning and intangible assets. This same target led to same internal practices in three agro-food manufacturers.

AM1 is also a family-owned company that manufactures and offer by-products such as fish meal, fish oil, and fresh by-products to the food and beverage and retail industry globally; wellness products such as gelatin and collagen as functional ingredients to the pharmaceutical and wellness industry. From its humble beginning as small seafood processor in 1997, has grown rapidly to be the global pangasius leader, supplying high quality and affordable products to customers in 30 countries around the world. It is the largest company of our sample, with total sales of USD 340 million and over 6,000 employees in 2019. The company was created in 1997 and focused on its international market for more than 20 years. AM1 has rapidly exported in international markets which represent 82.52% of its total sales in 2019.

AM1's strategic goal is to open new markets for our products by meeting emerging lifestyle needs and trends. AM1 aims to make a difference in constant innovation for quality food and wellness products. Sustainable practices lead to an abundant supply of healthy food and safe wellness solutions without environmental or economic trade-offs, contributing to the greater consumer confidence to our brand name. AM1 strive to be a supplier of high-quality seafood and sustainable aquaculture with strict farming standards, animal welfare and transparent traceability under the international standards. AM1 recognized that their success is dependent upon the engagement of our people, so all staff is all aligned to one direction. AM1 are all towards to set plans and target segmentations, by that AM1 satisfy our customers at the high level of standards. Commitment to transparency from farm to table is a tool to build trust. This regime is core to AM1's business activities.

By embracing innovation and technology, AM1 is ideally positioned to meet challenges of the future. AM1 has strongly focused its investment into human capital, hatchery, and farming, and technology. Projects are underway to improve supply chain and management system using information technology. At Aquaculture Division, AM1 maintain own R&D laboratory to make aquaculture practices more market-focused, efficient and sustainable. AM1's high-tech hatchery project is developed to strengthen breeding and aquaculture R&D in late 2020. Year 2020, AM1 has continued research and development on farming, nutrition and machinery

solutions to improve Feed Conversion Ratio (FCR). At pangasius processing, AM1 has made incremental improvement by automation and by re-engineering manual processes. A new by-product facility at Food Division commenced operation in late 2019 to maximize recovery value by converting fresh by-product into fish meal and fish oil. One of most notable achievements was Wellness Division, AM1 investment into agro-tech R&D to manufacture gelatin and collagen from the pangasius skin. Wellness Division has transformed pangasius skin into high value products. Led by a team of dedicated and passionate engineers, they made incremental development in the production techniques over many years to improve gelatin and collagen manufacturing. Complemented by stable skin supply and an unparalleled sales network, Wellness Division gradually increased capacity to meet the needs of pharmaceutical and functional ingredient customers worldwide.

In the spirit of innovation and differentiation, all employees are encouraged to contribute their suggestions and ideas in daily activities in an open and innovative organizational culture. AM1 are not afraid to step out of comfort zone. It is always cognizant of the rapidly changing industry landscape to continuously evolve and differentiate in every step of the production process. AM1 together with its subsidiaries engages in farming, processing, and sales of pangasius fish products. Moreover, AM1 works closely with more than 300 fish farmers to ensure that their aquaculture practices are compatible with international standards for product quality and safety. AM1 educate and train on-site to impart knowledge, technical skills and company values with farmers in four core areas: stock, feed, pond management, and systems. As well as manufacturing organization of traditional and value-added products such as fish meal, fish oil, and fresh by-products to the food and beverage, two kinds of wellness products such as gelatin and collagen are developed as functional ingredients for health & wellness, nutraceuticals, and cosmeceuticals applications. Net revenue from wellness products increased 95% to USD 22 million (2018: USD 11.2 million) due to organic growth in both volumes and prices. Year 2020, AM1 budgeted a 60 % growth of collagen and gelatin sales, reaching \$US 35 million thanks to their expanded gelatin line which will be in operation by August.

AM2 is a family-owned company that develops products from farming to and food. The company was created in the year 1998 and enjoyed a period of strong growth. In 2019, its total sales reach USD 333 million and about 8,960 employees in 2019. In 2013, after owning 54.6% of charter capital of one of the oldest seafood processing & exporting companies in VN, AM2

had started its export activities. AM2 is strongly oriented towards international markets: foreign sales account for 58.35%% of total sales and products are sold in 30 countries.

With the mission of striving to develop and leverage Vietnam's Agriculture and Food, AM2 offer trusted, traceable products and innovative solutions within an integrated full value chain from farm to family. First, AM2 considers sustainable development an important part of our long-term development strategy. AM2 commits developing business in harmony with social development and environmental protection; complying with applicable laws and governance standards committed by the company. Second, AM2 develops its business in agriculture and food industry with M&A strategy. Through M&A deals, AM2 has owned well-branded companies, good human resources, and a large market. This foundation has helped AM2 to build a value chain, produce products that meet international standards in a short time, and at the same time establish a solid foundation in farming, food, and distributing products to consumers. Third, AM2 always explores market and catch trends quickly to respond, especially quality, originality, creativity and health for consumers. With the goal for community health, AM2's products are manufactured from a closed process with selected materials and modern technology, crystallized from the most pure nature and talent of workers.

With the orientation of developing agriculture, food, and application of high-technology in producing valuable product, AM2 highly appreciates importance of research and development activities. AM2 considers R&D activities as our core strength bringing AM2's success. R&D also emphasizes product development. Producing high-quality products with healthy nutritional values according to local and international needs is a top priority. R&D also aims to develop products and improve production processes to meet international standards. R&D emphasis is on plant breeding and the development of varieties of various stable food crops. AM2 owns 15 R&D centers, laboratories, and experimental stations nationwide; 3 laboratories with international standard; 3 research centers; models of indoor and outdoor plants are featured in each facility with more than 70 employees, including top experts in agro-food industry.

In 2019, AM2 continued to affirm its outstanding R&D capability in agriculture. The company got impressive results in new rice varieties development, of which VNR 20 is outstanding. It is a short-duration, strong growth and high density and yield (20-28% higher than other rice) even in hot, dry weather. Currently, VNR 20 has continued to be tested in many localities across the country and has great potential to grow in 2020. In

addition, Dai Thom 8 rice variety has been officially registered since May 2019. The profit margin of the agriculture segment is guaranteed to be at a high level, with good business results from new high quality rice varieties with outstanding advantages such higher yields, better resistance to extreme weather conditions (drought, saline intrusion, and diseases). In term of confectionery, thanks to promoting the R&D, in 2019, AM2 continued to successfully send two new product lines to the market, Lurich and Ropyy. Moreover, 2019 was a successful year of shrimp farming thank to breeding at a high density and at simultaneously applying R&D results to help shrimp grow well, contract less diseases and gain high yield.

There is an innovation to establish value chain from farming to family under AM2's development history. All activities lead to quality products, diversity, added value, meeting domestic demand as well as export orientation to increase sales. AM2 has attempted in reshaping Vietnam's agriculture sector with safe and high quality products throughout the entire value chain. In the period of 2016-2020, AM2 continued to focus on improving its organizational structure and corporate governance system such as the establishment of the Law Division, the R&D Division, and issuing internal regulations as well as a manual series of operating procedures. In 2019, AM2 continued to build its corporate culture through team activities, the group-scale cultural events, sustainability & CSR activities, core value compliance. AM2's core values build trust between the company, its employees, and between the employees themselves. They have shaped the AM2 culture and are the foundation of the company's continuous improvement and sustainable future development.

AM3 is a family-owned company that offers a various kind of fruits, vegetables (concentrate juice, puree juice, frozen fruits and vegetable, fresh fruits, dried fruits) for beverage and pharmacy industry. The company was created in 1995 and enjoyed strong growth. In 2000, AM3 invested to establish a factory specializing in processing and exporting fruit juice products. It is the smallest company of our sample with its total sales of USD 44 million and 300 employees in 2019. The breakthrough business of AM3 can be explained by transformation to passion fruit development in Vietnam and master of a passion fruit seeding. The company total revenue increased very rapidly and its export sales account for 87% of total sales in 2019. The products are sold in 70 countries.

AM3 pursues the ambition of turning passion fruit and

baby jackfruit into Vietnam's pride as kiwi fruit of New Zealand. Always being consistent with vision and mission of providing the world with natural, safe and environmentally friendly products, bringing a good life to everyone, AM3 has gradually invested in core business activities, applied science and technology to the closed, green agricultural value chain. The comprehensive message of a strategic development over 2018-2022 is "industry/digitization-foundation, passion fruit-core/future, and ecosystem/value chain - sustainability". The company also established a strategic planning department with functions, tasks, organizational chart and recruited personnel to enhance the management capacity.

Recognizing the importance of R&D, AM3 established the agricultural R&D institute as the nucleus to lead and coordinate R&D activities with departments and divisions in its subsidiaries and factory. By maintaining and developing well the innovation movement in production, promoting scientific research and technology transfer, AM3 created new products, improved productivity, diversified products and increased enhancing product competitiveness. Currently, R&D activities have been effectively deployed in the entire value chain of the enterprise, from research and selection of new plant varieties, disease-free propagation process, and material development to preservation and processing. The agricultural R&D Institute of AM3 has mastered the technology of breeding passion fruit varieties and created 3 new passion fruit varieties under Vietnamese copyright, which are currently being tested and developed in farming.

AM3 has identified the development strategy towards a green and closed agricultural value chain, thereby restructure and set up subsidiaries to operate in a specialized manner, each company undertakes a task/'chain' in the value chain. Taking the BSC balanced scorecard method to manage the business, AM3 focuses on the root aspect of "Learning and development", which promote training and retraining activities, especially internal training. For direct employees, AM3 offers on-the-job training courses to improve workers' skills and understanding of the industry. The company conducts training and retraining to improve the labor efficiency of employees. Employees are also always encouraged and facilitated to participate in training courses to improve their professional qualifications to meet new requirements in their work. For employees of professional departments, they participate in domestic and foreign courses that are suitable for work requirements.

Table 4: Strategic planning and intangible assets of three agro-food manufacturers

	Strategic planning	Intangible assets
AM1	<p>Promote the value chain by starting gradually in agriculture sector primary;</p> <p>Making difference in constant innovation for quality;</p> <p>Transparency is the key to a successful cooperation.</p>	<p>Fostering the research on technological application in the entire value chain to trigger breakthroughs to boost labour productivity, and to renew the image of an industry in the global market from R&D fund of \$0.43 million;</p> <p>Strongly developing and heavily investing in new products' R&D capacity, install new equipment for value-added products facilities;</p> <p>Giving priority policy to feed plants that can replace marine fishmeal with by-products from farmed fish by working closely with the feed suppliers in research and development, cooperates and promotes sustainable development;</p> <p>Investing into agro-tech R&D to manufacture gelatin and collagen from the Pangasius skin;</p> <p>Undergoing hatchery project to strengthen breeding and aquaculture R&D in late 2020;</p> <p>Maintaining book value of intangible assets (land-use right, copyrights, computer software...) for over 21% of total fixed asset.</p>
AM2	<p>Establishing integrated value chain from farm to family by developing its business in agriculture and food industry with M&A strategy;</p> <p>Going slowly and ensure surely minimizing risks; satisfies with the low revenue growth which compensate for high-quality products;</p> <p>Developing business in harmony with social problem solutions and environmental protection.</p>	<p>Owing 15 R&D centres, laboratories, and experimental stations nationwide (three of them meet VILAS standards) with more than 70 employees, including top experts in agro-food industry;</p> <p>R&D budget for the period from 2015 to 2020 is considerably higher than the budget for the previous period;</p> <p>Producing more than 100 kinds of copyrighted flowers and vegetables, which meet the strict quality standards of the export markets;</p> <p>Conducting the testing, evaluation and recognition of trial production of farming, plant protection, disease control, high-quality seed and breed which meet the market requirements;</p> <p>Developing and successfully applied new rice and corn seeds of high economic value, and are increasingly recognized as the best in quality;</p> <p>Applying equipment and technology imported from Europe, Japan and the US for automatic lines and factories;</p> <p>Maintaining book value of intangible assets (land-use right, copyrights of maize and rice varieties, computer software, trademarks and customer relationship...) for over 60% of total fixed asset.</p>

Strategic planning	Intangible assets
<p>Establishing closed, green agricultural value chain by investing gradually in core business activities;</p> <p>Development of traceable products and innovative solutions;</p> <p>Building digital management foundation.</p>	<p>Mastering the technology of breeding passion fruit varieties and created 3 new passion fruit varieties under Vietnamese copyright;</p> <p>Integrating information technology (IoT - Internet of Things) into the garden management and control system, building a centralized database, developing the application of agent and customer management; modernizing gradually agricultural activities;</p> <p>Creating a sampling garden with over 1,000 hybrid lines and 45 prospective lines for testing in ecological zones;</p> <p>Succeeding in researching and testing technology for ripening mangoes and bananas;</p> <p>Installing manufacturing lines and machines comply with European standards including Germany, Italian and Sweden technology;</p> <p>Creating a number of innovates to extend the storage time from 1 week to over 40 days for passion fruit, over 60 days for lemons and over 30 days for dragon fruits, helping to ensure export standards of fresh fruits;</p> <p>Maintaining book value of intangible assets (land-use right, copyrights, computer software...) for over 16% of total fixed asset.</p>
AM3	

It seems interesting to note that all companies of our sample started their business by developing export activities in early year of establishment. This shows their ambitions to get bigger total revenue from abundant agricultural yield. However, in early year of business, three of agro-food, strategic planning is merely business development orientation of enterprises for the short term. Agricultural enterprises relied only on the advantage of yield, had not participated in deep processing. Thus, in early year, the terms such ‘innovation’ and ‘value chain’ or ‘sustainable development’ was barely mentioned in these orientations. According to IPSARD (2018), although exports have seen a strong growth, 50% of agricultural, forestry and fishery products are exported in the raw, fresh or preliminarily processed manner, the deeply processed export accounts for a very low rate.

Three agro-food enterprises have chosen stepping firmly to minimize risks and satisfying with the low revenue growth early which compensate for high-quality products. They promoted the value chain by starting gradually in agriculture primary sector and made difference in constant innovation for quality. Integrated value chains are established from farm to family by developing its business in agriculture and food industry.

Moreover, to improve the position of Vietnam's agricultural industry by producing and supplying safe, high-quality, traceable products in the closed value chain, cooperation, networking and investment become important factors of innovation strategic planning.

“We both would like to go fast and go away, so I think there is no other way we all have to run together. We have to run because we desire to touch the big dream, taking Vietnamese agriculture & food to the next level”
Interview informant from AM2 expressed.

Identification and prioritization of strategic planning innovation what firms need to be able to manage a new business model. In comparison with others, competitive manufacturers with high strategic innovation planning show its desire to change to make breakthroughs. Under the context of the market trends, when the competition becomes fiercer, trade barriers are growing, companies have to think of innovation, particularly in technology and R&D. Innovation also brings many risks so that the company must change its business model, and ensure this new model must be sponsored by huge investment resources. To limit the risks, companies are forced to develop appropriate business strategies, step out comfort zone. Thus, in the second half of the development phase,

a business strategy, along with its goals, assessing its current position and product strategy was shaped and born. The firm's innovation behavior of commitments to identify strengths, weaknesses, opportunities and threats, formulate plans in accordance with corporate vision and missions, and acclimatize the plans to implementation achievement of strategic objectives (Richards & Yang, 2010; Zandhessami et al., 2012).

In Vietnam, the accounting for purchased intangible assets is very simple, the purchase price and related reasonable costs will be capitalized into the intangible asset. However, intangible assets developed by the enterprise, it is impossible to determine the future economic benefits obtained at the research stage. Therefore, all costs incurred during the research period are recorded as costs incurred during the period and not capitalized into intangible assets. Therefore, the book value of intangible assets does not fully reflect the nature of the business strategy. In comparison with financial view, the management view shows that activities of innovation agro-food manufacturers in the research phase from searching, evaluating, selecting to design, construction and experimental production are all considered as KBC or intangible assets.

In the past, technological sources stand for material assets which can be seen or touched. Incremental sources within the overall technology strategy of the firm are the case of intangible assets as knowledge-based capital (KBC) to which modern innovation³. Corrado et al., (2009) and Grant, 1991) list KBC assets including a wide range of resources: technological capital (software and databases, scientific and non-scientific R&D,

copyrights, designs, brand equity and marketing research), human capital (firm-specific training), reputational capital (firm brand) and organizational capital (organizational know-how). Many agro-food enterprises in the world invest in R&D to develop products, to encounter to achieve technological innovations. Intangible assets can be purchased from outside, or developed by the business. They are kind of copyrighted varieties of rice, maize, vegetables flower, fish which meet the strict quality standards of the export markets. Intangible assets even are processing of the testing, evaluation and recognition of trial production of farming, plant protection, disease control, high-quality seed and breed which meet the market requirements. The change in understanding on form of technology assets and its importance in total assets will totally influence structural behavior and then ITI.

4.2. Internal technological innovation

The analysis of the three case-studies shows that the internal technovation continues to follow the organizational platform of knowledge, behavior and culture, which can be characterized by two push and pull factors of strategic planning and intangible assets. We will first describe the identified management process of internal innovation before presenting the theoretical and managerial implications of our research. The comparison of the three cases presented in this article allows identifying the management process of companies from agro-food manufacturing industries. The process is composed of three platforms whose combination flexibilities according to the companies in unknowledgeable ways.

Table 5: Cross-case internal technovation

Flows	Organizational knowledge	Organizational behaviour	Organizational culture
Push factor: "strategic planning" (Internal/Dispositional Attribution)	Gaining a deep understanding of potential of Vietnam in agriculture sector	Defined quality not only from brand, processing, marketing, trading but also from seeding, planting, tending and harvesting from its own farms	Being steadfast in developing a sustainable green value chain from seedling, planting, manufacturing, processing and selling; bring a happy, balanced life to investors, employees, and farmers (Sustainability)
	Being aware, recognize analysis, explore market and catch trends quickly to	Cooperated with local	Improving farmers' income,

³ The data from (OECD, 2017), R&D intensity varies between industries and countries, but equipment (i.e. manufacture of computer, electronic, and optical equipment) is the most R&D-intensive industry (24.7%), after pharmaceuticals (25.1%). The average R&D intensity

across all industries is 5%. R&D in areas such as vehicle efficiency and automation has made the automotive industry, one of the top 10 most R&D intensive in the OECD area, with R&D intensity reaching 17% in Germany and 19% in Sweden.

Flows	Organizational knowledge	Organizational behaviour	Organizational culture
	<p>respond</p> <p>Identify the following risks (brand, market, weather, human resource...) and their potential impact levels; analysis and apply risk management methods</p> <p>Building a fair, professional and inspiring working environment, offering opportunities that benefit company and employees</p>	<p>authorities, famers to actively restructure planting areas and promote high-quality farming under long-term support and commitment</p>	<p>help farmers sell their crop, keep them on the land, and prevent further reductions in the area under cultivation (Empathy)</p>
	<p>Built, recruited and trained personnel with knowledge and skills in specific fields, closely following the process of management in the specialized field</p>	<p>Committing to best efforts until success, committed to always stick to the vision, mission and cultural values, with the team and customers by staff in charge to enhance the innovation capacity (Commitment)</p>	
	<p>Developed policies, procedures, processes, reporting systems and control systems for each specific management activity</p>	<p>Adhering disciplines by employees to processes, perfectly comply with the smallest to the largest, ensuring consistency and efficiency to bring satisfaction to themselves, investors and customers... (Professionalism)</p>	
	<p>Built appropriate labour policies, regulations and principles of performance in the workplace; provided a working environment promoting everyone's strength and capabilities</p>	<p>Working with 100% of individual capacity to bring the best results; use time and tools in a best way to achieve the set goals (Efficiency)</p>	
	<p>Completed an advanced, transparent management system which synchronized to the international standards to protect the human rights, provide relevant information to parties fully, transparently and promptly</p>	<p>Being loyal, faithful, responsible and emotional in attachment, integrity and cooperation (Loyalty)</p>	
	<p>Updating modern technology platform in the context of the technology revolution 4.0</p>	<p>Invested in automation tools and software to upgrade activities</p>	<p>Developing premium products that are highly resistant to climate change, thereby solving a major problem of Vietnamese agriculture (Learning)</p>
<p>Pull factor: "intangible assets"</p>		<p>Opened an R&D centres connect independent R&D</p>	

Flows	Organizational knowledge	Organizational behaviour	Organizational culture
(External/Situational Attribution)	Understanding of important role of R&D in success and sustainable development plan	activities at subsidiaries to optimize R&D within company as a whole	Researching and improving products; developing new added-value products with the best quality standards to customers (Quality)
	Catching trend to respond and orient	R&D budget was considerably higher than the budget for the previous period	
	needs of consumers on originality, traceability, nutritious value, and health impact of products...	Restructured and shifted its focus to high-quality value-added products that can command consistently high prices to reduce risks from changing market conditions	
	Evaluating of company on socio-environmental responsibility	All processing factories currently meet international standards such as HACCP, BRC, FSSC22000	
		All agro-food products complied with safe production standards under various certifications such as Viet GAP, Global G.A.P, and ASC, BAP 4-Star	

Our three case-study manufacturers gained a deep understanding of potential of Vietnam in agriculture sector, modern technology platform in the context of the technology revolution 4.0. Then, they were able to be aware, recognize analysis, explore market and catch trends quickly to respond. In other hand, AM1, AM2 and AM3 identified the following risks (brand, market, weather, human resource...) and their potential impact levels; analysis and apply risk management methods. Zahra & George (2002) indicated that knowledge acquisition and assimilation related to the internal creation of knowledge exploitation, such as processes of learning and capacitation; also exert a clear influence on internal innovation. Three case-studies also provide insightful managerial implications where organizational behavior characterized by to the organizational characteristics and structural style of businesses in combination of policies, procedures, processes,

reporting system, restructure, and shift under international standards and certifications. A fair, professional and inspiring working environment was formed offering opportunities that benefit company and employees. In the axis of the organizational culture, this dimension is connected to such aspects sustainability, empathy commitment, professionalism, efficiency, quality, loyalty, and learning to form corporation culture.

Findings and discussion related to each dimension has allowed listing a series of associated factors which characterize each dimension. Fig. 4 shows push factors are explained as internal needs of agro-food manufacturers and pull factors are explained as external factors that motivated agro-manufacturers to technovative their business. The findings of our empirical study have important theoretical and managerial implications.

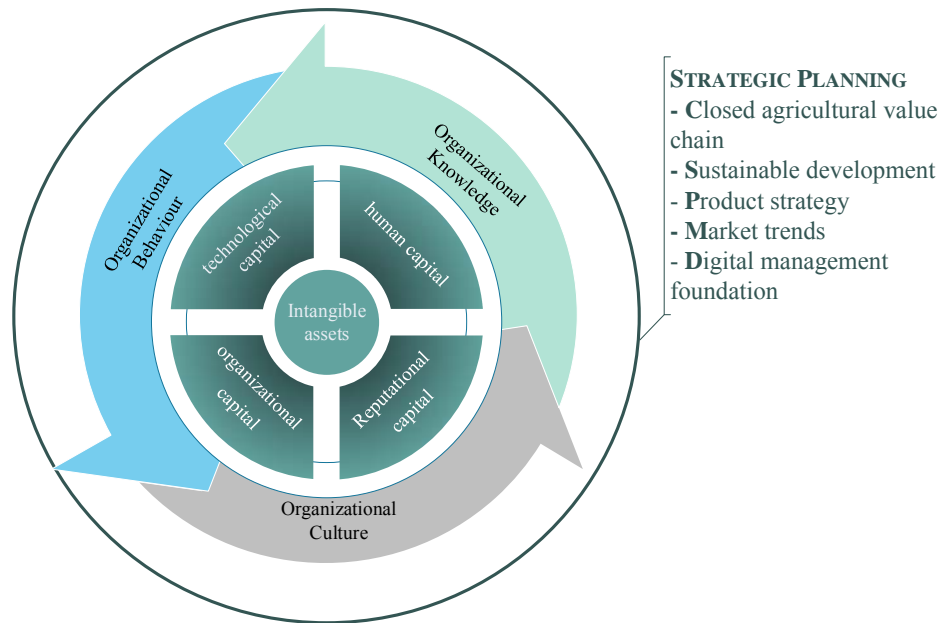


Fig. 4: Internal technovation triangle model

Our analysis shows that both strategic planning and intangible assets are parallel first priorities for manufacturers who always seek change, innovation and make own significant difference on intense business market.

First, our observations show that three companies follow internal technovation process which is triggered by strategic planning as push factors. This push factor gives agro-food companies strong and intense reasons to change from traditional activities. Push factors can be many different things. Basically anything that can force a manufacturer or an industry to consider change its strategic planning can be considered a push factor. The reason why some companies 'do' strategic planning while others do not is generally not well understood (Hart, 1992; O'Regan & Ghobadian, 2002; Steiner, 2010). Strategic planning in agro-food industry forced manufactures identifying the "barriers", their position. In other words, understanding of threat and opportunities will allow "more careful and accurate encouragement" to overcome (Wang et al., 2007), thereby increasing the overall levels of internal technovation. Fig. 4 shows that strategic planning is aiming to break various barriers to planning which result in and explain high levels of strategic planning (Bowonder et al., 2010; Johnston & Bate, 2013; Song et al., 2011) observed in three-case manufacturers. Regarding to AM1, over period of 2016-2020, it pursued strategy "high-tech products confirm its position". Wellness division has transformed pangasius skin into high-value products which are playing an increasing important role in profit expansion.

Second, this research contributes to a better internal technovation affected by second triggers is intangible assets as pull factor. Pull factors absolutely are the incomplete opposite of push factors, they are expected. Pull motivation is also a strong desire, but based on external expected resource, including technological capital, human capital, reputational capital and organizational capital (Corrado et al., (2009) and Grant (1991) which are always influenced by threat and opportunities. Three manufactures show that pull factors encourage them to technovative in context of technological revolution 4.0, creating a position of confidence and pioneers. Agro-food manufacturers that engage in intangible asset are also more likely to be those enterprises that are more innovative (Amit & Schoemaker, 1993; Itami & Roehl, 1987; Nahapiet & Ghoshal, 1998), that have more newly patented products, that employ new process and management technologies (Becker & Gerhart, 1996; Nahapiet & Ghoshal, 1998) and that achieve international standards (Allen & Sriram, 2000; Blind, 2016; Calza et al., 2019). Perhaps most importantly, companies that engage in intangible assets are less likely to be those that fail. Take human capital for example, in technology-rich environments, the share working of the young with good skills such problem-solving, thinking and communication is three and four times, respectively, that of the previous generation (OECD, 2017). To maximize these pull factors, AM3 has also boldly integrated information technology (IoT - Internet of Things) into the garden management and control system, built a centralized database, developed the application of agent and customer management; modernize gradually agricultural activities, asymptotic to smart digital agriculture.

Third, our analysis highlights that internal technovation process is occurring simultaneously a transformation of three flows of organizational knowledge, organizational behavior and organizational culture. All of them are being aligned themselves. Enterprises must augment the application of external and internal knowledge to achieve better innovation performance (Majchrzak et al., 2004). Internal technovation measure the internal effort to create technological knowledge, with a special emphasis on increases in knowledge and accumulated experience as exploitation innovation (Hull & Covin, 2010; J. Li & Kozhikode, 2009; Puranam et al., 2009; Quintana-García & Benavides-Velasco, 2008). Moreover, internal technovation continuously occur in the managerial methods and organizational structure of agro-food manufacturers as organizational behavior. Technovation of AM1, AM2, AM3 depends on the organizational structure, which includes aspects such as behavior activities in the value chain (Sher & Yang, 2005), production processes, and methods of operation (Nassimbeni, 2001). In regard to organizational culture, it has been proven that the continual training of staff, learning and experimentation and team spirit encourage technovation (Akman & Yilmaz, 2008; Elmquist & Masson, 2009; Hull & Covin, 2010; Wonglimpiyarat, 2010). For example, the key to AM2's success is its human resource, more important than capital flow. An abundant financial resource is not everything. In fact, after a successful M&A deals, AM2 unchanged the personnel structure of the companies it owned. AM2 relied on human resource availability, bringing more people to the board to support the administration, planning business strategies and raising capital from investment funds to improve their financial capacity, competitiveness and exploit the existing potential of its member companies. AM2 also maximizes internal resources of member companies and promotes the motivation of all employees contributing for the sustainable development of the business, including the benefits of both company and themselves.

4. CONCLUSION

Our work contributes to a better understanding of the integral technovation process adopted by agro-food manufacturers. It allows identifying the main flows of the transformation of technovation as well as the internal and external factors leading traditional agricultural companies to evolve to higher position in sub-processing industry. Internal technovation appears to be a complex phenomenon concerning its origins and the forms it can take. Our results also reveal that internal technovation often depends on organizational knowledge which is

defined as the ability to create, acquire, and transfer knowledge, and modifying its behavior to reflect new knowledge and insights. In the axis of the organizational culture, these dimensions of staff training and attitude, promotion/reward system, workload pressures and risks taking are connected with organizational knowledge and behavior. Our analysis of this technovation process can not only be based on the level of transformation to knowledge, behavior and culture, but also needs to consider push and pull established by agro-food manufacturer's motivation and technology-rich environment. All in all, these contribute to push-pull theory by offering internal technovation triangle model to advance theory with several significant strategic actions to owners of agro-manufacturers to help them achieve such a sustainable competitive advantage. In order to foster innovation, it is imperative for managers to build a coherent business model and strategies that collectively give rise to a culture amenable to creativity and innovation.

Our research presents several limitations and research perspectives. It thus seems necessary to follow the internal technovation process for a longer period in order to deepen our identified flows. Future studies should also attempt to evaluate degree of external technovation associated with external factors. In line with Guan & Ma (2003) and Liu et al. (2009), we believe that more studies need to be conducted to better understand the negative impact of experiences on technovation and the way stackable capabilities favor technovation. Furthermore, it would be interesting to extend the study to other geographic contexts in order to analyze how the home-country affects technovation paths of agro-food manufacturers. In fact, the economic, institutional and cultural characteristics of the home-country are likely to have an impact on the way agro-manufacturers technovate their activities. Regarding the sample, our empirical study focuses on mature companies from traditional agricultural industries with some minor differences in firm size, export ratio, number of employees, manufacturing capacity, export market, and first time of exporting. However, it acknowledges that sample characteristic should tend to homogeneity to eliminate impact from these differences on ITI.

5. ACKNOWLEDGMENTS

The authors gratefully acknowledge the support provided by Professor Ulrike Mayrhofer for initial input into the research, GRM lab-mates for their thoughtful and thought provoking comments.

6. REFERENCES

- [1] Adler, P. S., & Shenbar, A. (1990). Adapting your technological base: The organizational challenge. *Sloan Management Review*, 32(1), 25-37.
- [2] Ahmady, G. A., Mehrpour, M., & Nikooravesh, A. (2016). Organizational Structure. *Procedia - Social and Behavioral Sciences*, 230, 455-462.
- [3] Ahuja, G., & Katila, R. (2001). Technological acquisitions and the innovation performance of acquiring firms: A longitudinal study. *Strategic Management Journal*, 197-220.
- [4] Akman, G., & Yilmaz, C. (2008). Innovative capability, innovation strategy and market orientation: An empirical analysis in turkish software industry. *International Journal of Innovation Management*, 12(01), 69-111. <https://doi.org/10.1142/S1363919608001923>
- [5] Allen, R. H., & Sriram, R. D. (2000). The role of standards in innovation. *Technological Forecasting and Social Change*, 64(2-3), 171-181.
- [6] Amit, R., & Schoemaker, P. J. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, 14(1), 33-46.
- [7] Assink, M. (2006). Inhibitors of disruptive innovation capability: A conceptual model. *European Journal of Innovation Management*, 9(2), 215-233.
- [8] Baden-Fuller, C., & Pitt, M. (1996). *Strategic innovation: An international casebook on strategic management*. Routledge.
- [9] Batra, S., Sharma, S., Dixit, M. R., & Vohra, N. (2018). Does strategic planning determine innovation in organizations? A study of Indian SME sector. *Australian Journal of Management*, 43(3), 493-513.
- [10] Becker, B., & Gerhart, B. (1996). The impact of human resource management on organizational performance: Progress and prospects. *Academy of Management Journal*, 39(4), 779-801.
- [11] Blind, K. (2016). The impact of standardisation and standards on innovation. In *Handbook of Innovation Policy Impact*. Edward Elgar Publishing.
- [12] Bouhali, R., Mekdad, Y., Lebsir, H., & Ferkha, L. (2015). Leader roles for innovation: Strategic thinking and planning. *Procedia-Social and Behavioral Sciences*, 181(11), 72-78.
- [13] Bowonder, B., Dambal, A., Kumar, S., & Shirodkar, A. (2010). Innovation strategies for creating competitive advantage. *Research-Technology Management*, 53(3), 19-32.
- [14] Brem, A., & Voigt, K.-I. (2009). Integration of market pull and technology push in the corporate front end and innovation management - Insights from the German software industry. *Technovation*, 29(5), 351-367.
- [15] Brouwer, E., & Kleinknecht, A. (1999). Innovative output, and a firm's propensity to patent.: An exploration of CIS micro data. *Research Policy*, 28(6), 615-624.
- [16] Bunce, D., & West, M. A. (1995). Self Perceptions and Perceptions of Group Climate as Predictors of Individual Innovation at Work. *Applied Psychology*, 44(3), 199-215.
- [17] Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management*, 31(6), 515-524.
- [18] Calza, E., Goedhuys, M., & Trifković, N. (2019). Drivers of productivity in Vietnamese SMEs: The role of management standards and innovation. *Economics of Innovation and New Technology*, 28(1), 23-44.
- [19] Camisón, C., & Forés, B. (2011). Knowledge creation and absorptive capacity: The effect of intra-district shared competences. *Scandinavian Journal of Management*, 27(1), 66-86.
- [20] Carlsson, B., Jacobsson, S., Holmén, M., & Rickne, A. (2002). Innovation systems: Analytical and methodological issues. *Research Policy*, 31(2), 233-245.
- [21] Carneiro, A. (2000). How does knowledge management influence innovation and competitiveness? *Journal of Knowledge Management*, 4(2), 87-98.
- [22] Chen, C.-J., & Huang, J.-W. (2009). Strategic human resource practices and innovation performance-The mediating role of knowledge management capacity. *Journal of Business Research*, 62(1), 104-114.
- [23] Chen, Y., Yang, Z., Shu, F., Hu, Z., Meyer, M., & Bhattacharya, S. (2009). A patent based evaluation of technological innovation capability in eight economic regions in PR China. *World Patent Information*, 31(2), 104-110.

- [24] Choi, H. (2018). Technology-push and demand-pull factors in emerging sectors: Evidence from the electric vehicle market. *Industry and Innovation*, 25(7), 655-674.
- [25] Christensen, C. M., & Bower, J. L. (1996). Customer power, strategic investment, and the failure of leading firms. *Strategic Management Journal*, 17(3), 197-218.
- [26] Christensen, J. F. (1995). Asset profiles for technological innovation. *Research Policy*, 24(5), 727-745.
- [27] Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 128-152.
- [28] Corrado, C., Hulten, C., & Sichel, D. (2009). Intangible capital and US economic growth. *Review of Income and Wealth*, 55(3), 661-685.
- [29] Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- [30] Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34(3), 555-590.
- [31] Darroch, J. (2005). Knowledge management, innovation and firm performance. *Journal of Knowledge Management*.
- [32] Deal, T. E., & Kennedy, A. A. (1982). Corporate cultures: The rites and rituals of organizational life. *Reading/T. Deal, A. Kennedy.-Mass: Addison-Wesley*, 2, 98-103.
- [33] Dedahanov, A. T., Rhee, C., & Yoon, J. (2017). Organizational structure and innovation performance. *Career Development International*.
- [34] Di Stefano, G., Gambardella, A., & Verona, G. (2012). Technology push and demand pull perspectives in innovation studies: Current findings and future research directions. *Research Policy*, 41(8), 1283-1295.
- [35] Dominguez, N., & Mayrhofer, U. (2017). Internationalization stages of traditional SMEs: Increasing, decreasing and re-increasing commitment to foreign markets. *International Business Review*, 26(6), 1051-1063.
- [36] Donate, M. J., & de Pablo, J. D. S. (2015). The role of knowledge-oriented leadership in knowledge management practices and innovation. *Journal of Business Research*, 68(2), 360-370.
- [37] Dosi, G., & Nelson, R. R. (1994). An introduction to evolutionary theories in economics. *Journal of Evolutionary Economics*, 4(3), 153-172.
- [38] du Plessis, M. (2007). The role of knowledge management in innovation. *Journal of Knowledge Management*, 11(4), 20-29.
- [39] Dyer, J. H., Gregersen, H. B., & Christensen, C. (2008). Entrepreneur behaviors, opportunity recognition, and the origins of innovative ventures. *Strategic Entrepreneurship Journal*, 2(4), 317-338.
- [40] Easterby-Smith, M., Thorpe, R., & Jackson, P. (2015). *Management and Business Research* (5th ed.).
- [41] Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532-550.
- [42] Elmquist, M., & Masson, P. L. (2009). The value of a 'failed' R&D project: An emerging evaluation framework for building innovative capabilities. *R&D Management*, 39(2), 136-152.
- [43] Flick, U. (2018). *An introduction to qualitative research*. Sage Publications Limited.
- [44] Furman, J. L., Porter, M. E., & Stern, S. (2002). The determinants of national innovative capacity. *Research Policy*, 31(6), 899-933.
- [45] Galende, J., & de la Fuente, J. M. (2003). Internal factors determining a firm's innovative behaviour. *Research Policy*, 32(5), 715-736.
- [46] Garvin, D. A. (1993). Manufacturing Strategic Planning. *California Management Review*, 35(4), 85-106.
- [47] Gatignon, H., & Xuereb, J.-M. (1997). Strategic Orientation of the Firm and New Product Performance. *Journal of Marketing Research*, 34(1), 77-90.
- [48] Goncalo, J. A., & Staw, B. M. (2006). Individualism-collectivism and group creativity. *Organizational Behavior and Human Decision Processes*, 100(1), 96-109.
- [49] Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review*, 33(3), 114-135.

- [50] Guan, J., & Ma, N. (2003). Innovative capability and export performance of Chinese firms. *Technovation*, 23(9), 737-747.
- [51] Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), 59-82.
- [52] Gumusluoglu, L., & Ilsev, A. (2009). Transformational leadership, creativity, and organizational innovation. *Journal of Business Research*, 62(4), 461-473.
- [53] Hakim, C. (1989). Identifying fast growth small firms. *Employment Gazette*, 97, 29-41.
- [54] Hart, S. L. (1992). An Integrative Framework for Strategy-Making Processes. *Academy of Management Review*, 17(2), 327-351. <https://doi.org/10.5465/amr.1992.4279547>
- [55] Heider, F. (1958). The psychology of interpersonal relations Wiley. *New York*.
- [56] Hilal, A. H., & Alabri, S. S. (2013). Using NVivo for data analysis in qualitative research. *International Interdisciplinary Journal of Education*, 2(2), 181-186.
- [57] Hofstede, G. (1998). Attitudes, Values and Organizational Culture: Disentangling the Concepts. *Organization Studies*, 19(3), 477-493. <https://doi.org/10.1177/017084069801900305>
- [58] Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind: intercultural cooperation and its importance for survival*. McGraw-Hill.
- [59] Horbach, J., Rammer, C., & Rennings, K. (2012). Determinants of eco-innovations by type of environmental impact – The role of regulatory push/pull, technology push and market pull. *Ecological Economics*, 78, 112-122.
- [60] Hull, C. E., & Covin, J. G. (2010). Learning Capability, Technological Parity, and Innovation Mode Use*. *Journal of Product Innovation Management*, 27(1), 97-114.
- [61] Hult, G. T. M., Hurley, R. F., & Knight, G. A. (2004). Innovativeness: Its antecedents and impact on business performance. *Industrial Marketing Management*, 33(5), 429-438.
- [62] Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: An integration and empirical examination. *Journal of Marketing*, 62(3), 42-54.
- [63] Itami, H., & Roehl, T. W. (1987). *Mobilizing Invisible Assets*, Harvard University Press. *Cambridge, MA*.
- [64] Jackson, K., & Bazeley, P. (2019). *Qualitative data analysis with Nvivo*. SAGE Publications Limited.
- [65] Janssen, O., & Van Yperen, N. W. (2004). Employees' Goal Orientations, the Quality of Leader-Member Exchange, and the Outcomes of Job Performance and Job Satisfaction. *Academy of Management Journal*, 47(3), 368-384.
- [66] Johnston, R. E., & Bate, J. D. (2013). *The Power of Strategy Innovation: A New Way of Linking Creativity and Strategic Planning to Discover Great Business Opportunities*. AMACOM.
- [67] Kroll, H., & Schiller, D. (2010). Establishing an interface between public sector applied research and the Chinese enterprise sector: Preparing for 2020. *Technovation*, 30(2), 117-129.
- [68] Kuczmarski, T. D. (1996). What is innovation? The art of welcoming risk. *Journal of Consumer Marketing*, 13(5), 7-11.
- [69] Kumar, N., & Rose, R. C. (2012). The impact of knowledge sharing and Islamic work ethic on innovation capability. *Cross Cultural Management: An International Journal*.
- [70] Larsson, R. (1993). Case survey methodology: Quantitative analysis of patterns across case studies. *Academy of Management Journal*, 36(6), 1515-1546.
- [71] Lau, A. K. W., & Lo, W. (2019). Absorptive capacity, technological innovation capability and innovation performance: An empirical study in Hong Kong. *International Journal of Technology Management*, 80(1-2), 107-148.
- [72] Li, J., & Kozhikode, R. K. (2009). Developing new innovation models: Shifts in the innovation landscapes in emerging economies and implications for global R&D management. *Journal of International Management*, 15(3), 328-339.
- [73] Liu, J., Baskaran, A., & Li, S. (2009). Building technological-innovation-based strategic capabilities at firm level in China: A dynamic resource-based-view case study. *Industry and Innovation*, 16(4-5), 411-434.
- [74] López Rodríguez, J., & García Rodríguez, R. M. (2005). Technology and export behaviour: A resource-based view approach. *International Business Review*, 14(5), 539-557.

- [75] Lu, I.-Y., Yang, C.-Y., & Tseng, C.-J. (2009). Push-Pull interactive model of service innovation cycle-under the service encounter framework. *African Journal of Business Management*, 3(9), 433-442.
- [76] MacQueen, K. M., & Milstein, B. (1999). A systems approach to qualitative data management and analysis. *Field Methods*, 11(1), 27-39.
- [77] Majchrzak, A., Cooper, L. P., & Neece, O. E. (2004). Knowledge Reuse for Innovation. *Management Science*, 50(2), 174-188.
- [78] Marshall, C., & Rossman, G. (1990). *Designing qualitative research. (p111) Newbury Park*. Sage Publications.
- [79] Martínez-Román, J. A., Gamero, J., & Tamayo, J. A. (2011). Analysis of innovation in SMEs using an innovative capability-based non-linear model: A study in the province of Seville (Spain). *Technovation*, 31(9), 459-475.
- [80] McGinnis, M. A., & Ackelsberg, M. R. (1983). Effective innovation management: Missing link in strategic planning? *Journal of Business Strategy*, 4(1), 59-66.
<https://doi.org/10.1108/eb039007>
- [81] Menguc, B., & Auh, S. (2010). Development and return on execution of product innovation capabilities: The role of organizational structure. *Industrial Marketing Management*, 39(5), 820-831.
- [82] Miles, M. B., Huberman, A. M., & Saldana, J. (2013). *Qualitative data analysis: A methods sourcebook. (3. Baskı) Los Angeles*. Sage Publications.
- [83] Mowery, D., & Rosenberg, N. (1979). The influence of market demand upon innovation: A critical review of some recent empirical studies. *Research Policy*, 8(2), 102-153.
- [84] Munton, A. G., & West, M. A. (1995). Innovations and personal change: Patterns of adjustment to relocation. *Journal of Organizational Behavior*, 16(4), 363-375.
<https://doi.org/10.1002/job.4030160407>
- [85] Nahapiet, J., & Ghoshal, S. (1998). Social Capital, Intellectual Capital, and the Organizational Advantage. *Academy of Management Review*, 23(2), 242-266.
<https://doi.org/10.5465/amr.1998.533225>.
- [86] Nassimbeni, G. (2001). Technology, innovation capacity, and the export attitude of small manufacturing firms: A logit/tobit model. *Research Policy*, 30(2), 245-262.
- [87] Nayir, D. Z., Tamm, U., & Durmusoglu, S. S. (2014). How Formalization Hinders Different Firm Innovativeness Types: Opening the Black Box with Evidence from a Service Industry. *International Journal of Innovation and Technology Management*, 11(05), 1450029.
- [88] Nelson, R. R., & Winter, S. G. (1982). *An evolutionary theory of economic change*.
- [89] Nieto, M. (2004). Basic propositions for the study of the technological innovation process in the firm. *European Journal of Innovation Management*, 7, 314-324.
- [90] Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford university press.
- [91] Nueno, J. L., & Quelch, J. A. (1998). The Mass Marketing of Luxury. *Business Horizons*, 41(6), 61-61.
- [92] OECD. (2017). *OECD Science, Technology and Industry Scoreboard 2017: The digital transformation*. OECD.
- [93] OECD, & The World Bank. (2014). *Science, Technology and Innovation in Viet Nam*. OECD.
<https://doi.org/10.1787/9789264213500-en>
- [94] Oldham, G. R., & Cummings, A. (1996). Employee Creativity: Personal and Contextual Factors at Work. *Academy of Management Journal*, 39(3), 607-634.
- [95] O'Regan, N., & Ghobadian, A. (2002). Effective strategic planning in small and medium sized firms. *Management Decision*.
- [96] Panda, H., & Ramanathan, K. (1996). Technological capability assessment of a firm in the electricity sector. *Technovation*, 16(10), 561-588.
- [97] Patton, M. Q. (2002). Two Decades of Developments in Qualitative Inquiry: A Personal, Experiential Perspective. *Qualitative Social Work*, 1(3), 261-283.
- [98] Pawliczek, A., Kozel, R., Vilamová, Š., & Janovská, K. (2015). *On the strategic planning, innovation activities and economic performance of industrial companies*.

- [99] Perry, C. (1998). Processes of a case study methodology for postgraduate research in marketing. *European Journal of Marketing*, 32(9/10), 785-802.
- [100] Petri, H. L., & Govern, J. M. (2012). *Motivation: Theory, research, and application*. Cengage Learning.
- [101] Petti, C. (2013). State-of-the-Art Research on Technology Innovation Management in China. *Frontiers of Business Research in China*, 7(3), 402-432.
- [102] Phaal, R., Farrukh, C. J. P., & Probert, D. R. (2001). Technology management process assessment: A case study. *International Journal of Operations & Production Management*.
- [103] Puranam, P., Singh, H., & Chaudhuri, S. (2009). Integrating Acquired Capabilities: When Structural Integration Is (Un)necessary. *Organization Science*, 20(2), 313-328.
- [104] Quintana-García, C., & Benavides-Velasco, C. A. (2008). Innovative competence, exploration and exploitation: The influence of technological diversification. *Research Policy*, 37(3), 492-507.
- [105] Rajala, R., & Westerlund, M. (2010). Antecedents to Consumers' Acceptance of Mobile Advertisements – A Hierarchical Construct PLS Structural Equation Model. *2010 43rd Hawaii International Conference on System Sciences*, 1-10.
- [106] Ramanujam, V., & Venkatraman, N. (1987). Planning system characteristics and planning effectiveness. *Strategic Management Journal*, 8(5), 453-468.
- [107] Richards, M., & Yang, Y. (2010). Modes of international external technology innovation: Evidence from a global sample. *International Journal of Strategic Business Alliances*, 1(4), 337-363.
- [108] Romijn, H., & Albaladejo, M. (2002). Determinants of innovation capability in small electronics and software firms in southeast England. *Research Policy*, 31(7), 1053-1067.
- [109] Salman, N., & Saives, A.-L. (2005). Indirect networks: An intangible resource for biotechnology innovation. *R and D Management*, 35(2), 203-215.
- [110] Saunila, M., Pekkola, S., & Ukko, J. (2014). The relationship between innovation capability and performance: The moderating effect of measurement. *International Journal of Productivity and Performance Management*, 63(2), 234-249.
- [111] Schoenmakers, W., & Duysters, G. (2006). Learning in strategic technology alliances. *Technology Analysis & Strategic Management*, 18(2), 245-264.
- [112] Scott, S. G., & Bruce, R. A. (1994). Creating innovative behavior among R D professionals: The moderating effect of leadership on the relationship between problem-solving style and innovation. *Proceedings of 1994 IEEE International Engineering Management Conference - IEMC '94*, 48-55.
- [113] Sher, P. J., & Yang, P. Y. (2005). The effects of innovative capabilities and R&D clustering on firm performance: The evidence of Taiwan's semiconductor industry. *Technovation*, 25(1), 33-43.
- [114] Sinkula, J. M., Baker, W. E., & Noordewier, T. (1997). A framework for market-based organizational learning: Linking values, knowledge, and behavior. *Journal of the Academy of Marketing Science*, 25(4), 305.
- [115] Song, M., Im, S., Bij, H. van der, & Song, L. Z. (2011). Does Strategic Planning Enhance or Impede Innovation and Firm Performance?*. *Journal of Product Innovation Management*, 28(4), 503-520.
- [116] Stake, R. E. (1995). *The art of case study research*. sage.
- [117] Steiner, G. A. (2010). *Strategic Planning*. Simon and Schuster.
- [118] Subramaniam, M., & Youndt, M. A. (2005). The Influence of Intellectual Capital on the Types of Innovative Capabilities. *Academy of Management Journal*, 48(3), 450-463.
- [119] Tang, J., Pee, L. G., & Iijima, J. (2013). Investigating the effects of business process orientation on organizational innovation performance. *Information & Management*, 50(8), 650-660.
- [120] Taylor, B. (1976). New dimensions in corporate planning. *Long Range Planning*, 9(6), 80-106.

- [121] Teece, D. J. (1986). Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *The Transfer and Licensing of Know-How and Intellectual Property: Understanding the Multinational Enterprise in the Modern World*, 15, 67-88.
- [122] Teece, D. J. (1996). Firm organization, industrial structure, and technological innovation. *Journal of Economic Behavior & Organization*, 31(2), 193-224.
- [123] Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-533.
- [124] UNIDO. (2019). *VIETNAM INDUSTRY WHITE PAPER 2019: Manufacturing and Subsector Competitiveness* (2019th ed.).
- [125] Van de Ven, A. H., & Angle, H. L. (1989). *Suggestions for managing the innovation journey*. Strategic Management Research Center, University of Minnesota.
- [126] VMIT. (2020). *Vietnam Import-Export Trade 2019* (2019th ed.). Industry and Trade Publisher.
- [127] Von Hippel, E. (1976). The dominant role of users in the scientific instrument innovation process. *Research Policy*, 5(3), 212-239.
- [128] Von Hippel, E. (1994). "Sticky information" and the locus of problem solving: Implications for innovation. *Management Science*, 40(4), 429-439.
- [129] Voss, C., Tsikriktsis, N., & Frohlich, M. (2002). Case research in operations management. *International Journal of Operations & Production Management*, 22(2), 195-219.
- [130] Wang, C., Walker, E., & Redmond, J. (2007). Explaining the Lack of Strategic Planning in SMEs: The Importance of Owner Motivation. *International Journal of Organisational Behaviour*, 12(1).
- [131] Wei, X., & Xie, F. (2008). Knowledge management processes and innovation: An empirical analysis of firms in software cluster. *International Journal of Human Resources Development and Management*, 8(1-2), 25-42.
- [132] Wolff, M. F. (2007). Forget R&D Spending-Think Innovation. *Research-Technology Management*, 50(2), 7.
- [133] Wonglimpiyarat, J. (2010). Technological change of the energy innovation system: From oil-based to bio-based energy. *Applied Energy*, 87(3), 749-755.
- [134] Xie, X., Zou, H., & Qi, G. (2018). Knowledge absorptive capacity and innovation performance in high-tech companies: A multi-mediating analysis. *Journal of Business Research*, 88, 289-297.
- [135] Yam, R. C. M., Guan, J. C., Pun, K. F., & Tang, E. P. Y. (2004). An audit of technological innovation capabilities in chinese firms: Some empirical findings in Beijing, China. *Research Policy*, 33(8), 1123-1140.
- [136] Yin, R. K. (2018). *Case study research and applications: Design and methods*.
- [137] Zahra, S. A., & George, G. (2002). The Net-Enabled Business Innovation Cycle and the Evolution of Dynamic Capabilities. *Information Systems Research*, 13(2), 147-150.
- [138] Zandhessami, H., Parvinchi, S., & Molaei, Z. (2012). Identification and prioritization of technology innovation capability on technology innovation performance. *International Journal of Economics and Management Sciences*, 1(6), 8.
- [139] Zhou, K. Z., & Li, C. B. (2010). How strategic orientations influence the building of dynamic capability in emerging economies. *Journal of Business Research*, 63(3), 224-231.
- [140] Zhou, K. Z., & Li, C. B. (2012). How knowledge affects radical innovation: Knowledge base, market knowledge acquisition, and internal knowledge sharing. *Strategic Management Journal*, 33(9), 1090-1102.
- [141] Zmud, R. W. (1984). An examination of "push-pull" theory applied to process innovation in knowledge work. *Management Science*, 30(6), 727-738.

FIRM INNOVATION IN RESPONSE TO PANDEMIC CRISIS: THE ROLE OF INNOVATIVE INBOUND COLLABORATION, STATUS CERTAINTY, AND TECHNOLOGICAL SPEED

Bui My Trinh^{1*}, Phi Hong Minh² and Tran Thi Thanh Huyen³

¹ VNU International School - Vietnam National University, Hanoi, Vietnam

² Vietnam Academy of Social Sciences, Hanoi, Vietnam

³ Banking Academy

*Corresponding author: trinhbm@isvnu.vn

Abstract

The study proposes framework to build up the innovation in response to pandemic crisis in the field of hospitality and tourism. First, the study begins by figuring out some crucial aspects of innovative inbound collaboration including its influence of individual creativity, traditionality, innovativeness, and mimetic pressure. Innovative inbound collaboration is expected to be the most dominant dimension lead to significant organizational innovation. Second, a propose of status certainty is expected to accelerate higher levels of organizational innovation in COVID-19 outbreak. Digital environmental speed (technology speed) is proposed as pulling forces generate higher innovative performance at incumbent firms. The model aims to investigate multi-dimensional antecedents to generate innovative inbound corporation mode. Smart PLS version 2.0 was employed to analyse the data of 301 respondents in hospitality and tourism to understand the human, environment and technology-related factors which predict organizational innovation.

Keywords: collaboration, innovation, technology, status certainty.

1. INTRODUCTION

Tourism industry was experiencing a prosperous time of rapid revenue growth until Covid-19 outbreak. Covid-19 crisis have impacted enormously on economic and tourism. International tourist arrival has declined 78% which caused the damage of US\$ 1.2 trillion in tourism export revenues, marked the largest decrease in the tourism history [1]. A new wave of discussion and studies of tourism during Covid-19 is blooming which suggest a unanimous call to see and use the pandemic crisis as transformational opportunity [2]. Tourism innovation may resolve its crisis problem, get to resilience, reform the normalization and economic activities [3]. The replication of existing knowledge is obsolete [4] when a need to use new knowledge of evaluating and forecasting tourism impacts with the aim to foster innovation, alter changes, reshape the new context of normalization [5]. However, the blend of innovative collaboration, status certainty, and technology speed is radical for tourism managers as well as in many other industries. Even under pressure of innovation, manager's reluctance to adopt new information system, form the innovative collaboration, and respond to environmental uncertainties.

The innovation performance is rarely measured by the combination of innovative collaboration, status certainty, and technology speed in the research literature. Scant research uses innovative collaboration as a knowledge blending process to be considered as a critical antecedent for innovation performance [6-8]. Specifically, collaboration factor is influenced by multidimensional categories, including individual creativity, traditionality, innovativeness, mimetic pressure.

Our study argued that the innovation decisions may be generated from the institutional complexity (innovative collaboration mode), environmental complexity (status certainty and technology speed) during the Covid-19 pandemic. Our goal is to provide theoretical implication and practical principles for tourism and hospitality managers for the innovation strategy.

2. LITERATURE REVIEW

2.1. Innovative Collaboration: Institutional Logics to Manage Institutional Complexity

Innovation and its processes to form the organization competitive advantages have taken a particularly important role in knowledge-based view research [9-12].

Innovation is know-how applicable to generate new know-how [13]. Innovation is assumed to arise from the knowledge asset available for innovative activity [14, 15] and the ability of persons as well as organizations to apply that available knowledge asset into practical performance [16, 17, 15]. Recognizing these aspects of innovation associated with the differing use of knowledge incorporation mode [18]. Vague causality and contextual dependency are knowledge-based reasons to develop firm innovation [19, 20]. To resolve know-how complexity for innovation processes [21], it challenges to connect innovation with conventional operation, because mature and tenured individuals may cultivate conventional practices and hinder innovation. However, collaboration between members involved with innovative task and members experienced in conventional task can integrate and advance different competing logics to ideally manage institutional complexity [22]. Collaboration to aim for innovation vision is the long-term integration strategy because of their sharing behavior of applicable belief power, business value, expertise, and their competence to all the new know-how creation.

2.2. Covid-19 Status Certainty and Technology Speed

Managers perceive that environmental uncertainties as ambiguous context which is critical to increase behavior of information seeking in purpose to reduce uncertainties [23, 24]. The more information they gather, the more they understand the aspects and influences of external environment. A few research review different specific aspects and types of environmental uncertainty [23]. When managers put their effort on decode the environmental ambiguity, they are close to innovative response [24]. The process model of browsing, understanding, learning and reacting to environmental changes. Especially, the covid-19 pandemic and its different degree of unpredictability directly influence on the nature of tourism, its traveling requirement, its growth, evolution [5]. All government administrators and business operators are scrambling to adapt to the emergency and to minimize damages [25].

In addition, to combat the pandemic crisis, technology speed is critical for recovering tourism and economy. Many advanced technologies are speedily developed to ensure health and safety with the aim to control the pandemic. Research and development (R&D) of technologies are speeded up including mechanical ventilation, infector tracing apps, big data analysis, robotized artificial intelligence machine, disinfecting public spaces, detecting body temperature. Many high technological products may be digital trojan horses which could be questioned regarding its “purposes, designs and affordances, interpretations and application ethics” [5]. The advance in information and technology

provides managers an important means to decode context ambiguity and innovation catalyst. The trendy development and adoption of digital tourism services, smart destinations, artificial intelligence, and big data are prominent globally. Technology not only enhance the recovery and reinforcement of tourism but also transforming new paradigm of e-tourism [5].

3. HYPOTHESIS DEVELOPMENT

Our study organizes the innovation determinants into multi-level factors and verify the direction and effect-strength of each determinant. The study will center on knowledge-based corporation mode and its influence on organizational innovation. Then, the influence of a technological speed and instability of environment on organizational innovation are proposed.

Many different research dispositions towards controllability of context complexity, the study proposes collaboration may be a mechanism to navigate knowledge ambiguity and accommodate incompatible logics and philosophies which is critical for managing conflicts and differences [26, 22]. Firm could integrate all the competing, central logics by maintain the traditional environment while promote innovative logics and thinking [27]. Collaborative efforts are important to enhance the long-term integrative vision, reach common goal, and find problem solution for routinely activities.

Individual logics on knowledge creativity may depend on different character individuals, ranging from personality-based factor such as working style and value; and job-related factor including prior experience and existing practice; and strategic decision maker [28]. The traits differ among individual and their perception of knowledge collaboration mode. The dimensional knowledge using modes identify how individual adapt knowledge to contribute innovation for firms or organizations. Practically, the individual ability to integrate a combination of existing knowledge from different contexts and apply it to the new context is considered as a source of innovative integration and corporation [29]. Thus, we hypothesis:

Hypothesis 1: Higher levels of individual creativity is positively related to higher level of innovative inbound collaboration.

Firms may benefit from using distant knowledge in the past including increasing reliability, legitimacy and reducing risk when creating new products [27]. The application of prior knowledge is considered as refuge to reduce chaotic and unstable crisis times of Covid-19. If traditional practices are at all effective across time, the knowledge receiver can see the value of traditional knowledge [30] and therefore be inspired to create solutions. From different settings, individuals' mutual interaction may joint-create new knowledge which is

favorable to new context [31-33]. The overlapping or copying of the same knowledge is one of the important pre-conditions for knowledge creation and innovation collaboration. Hence, the greater level an individual invests in traditional culture, mimetic pressure activities, the higher level the innovation he/she may attain.

When the knowhow aligns with new context, the replication of tradition and competitors is effective. To date, vast literature on knowledge show its dependence on context. The dissimilarity between knowledge and new circumstances make it difficult to replicate the knowledge [34]. In many cases of replication, firms need to change and adapt to new practices [35]. The following hypothesis are proposed:

Hypothesis 2: Higher level of traditionality is positively related to higher level of practice of innovative inbound collaboration.

In addition to traditional culture, innovative culture is the capability of predicting innovative corporation. Innovative environment enables individual adjust and modify practices to fit to changes and therefore reduces unexpected problems in the collaboration. The capability of identifying the essential traditional and innovative elements in the working and value system should enhance the effective innovative collaboration mode applied into the new context. Firms may use the technical knowhow from industrial peer to be interpreted into productive knowledge using. Mutual adjustment between organizational individual and technology is suggested to be triggering extension for innovation [36]. In international business theory, multinationals need to adapt its organization and local context [37, 38]. Knowledge using mode as adaptation cuts down the cost of knowhow transfer and alignment with the new context [30] which effectively creates innovative knowledge. Adaptable firms can work on knowhow and assimilate it into new context. We posit the hypothesis 3:

Hypothesis 3: Higher level of innovativeness is positively related to higher level of innovative inbound collaboration.

Among externalities context which take into consideration the customer, partner, supplier, government, institutional innovation is strongly suggested to be applied [39, 40]. Beside the motivation that organizational strategy and climate [41], knowhow using mode are directed by ambition to perform efficiently and effectively, the need for constitutionality and legitimacy is dominantly formulated [42]. Institutional mimetic pressure is the institutional isomorphism which enact as pushing external forces (successful competitors) to firms using corporation mode [43]. Mimetic pressures are the replication action when knowledge fails to understand, mission is vague,

environment is turbulent, organization use knowledge replication and flexible mode to successful one to maintain sustainability [44]. Positional and situational familiarization may enable individuals to defeat the conventional and administrative variations and construct new distinctive practice, new legitimization and knowhow base [42]. The following hypothesis is proposed:

Hypothesis 4: Higher level of mimetic pressure is positively related to higher level of practice of innovative inbound collaboration

The Innovative collaboration may increase with application because knowledge reused and modified in the vague and ambiguous context may reduce hindrance [45]. Practiced by diversified contexts, collaboration allow innovators could work on the alignment of existing practices with new contextual sources [46, 17]. The application of prior knowledge and practices into the replication process, firm can explore out new innovative solution. During pandemic crisis to innovative resilience for a long-term sustainable business, firm may involve with corporation of both traditional knowledge replication to create and define the firm business model, and creative knowledge to make innovation efficient within the firm. We hypothesize that:

Hypothesis 5: The higher a level of innovative inbound collaboration practiced by an individual is, the higher a level of organizational innovation.

Environmental factors come from unexpectedly change, uncertainties and turbulence as the business externalities [47, 19]. Since it is difficult to predict all possible future contingencies, ex ante, ex post adjustments, adaptations usually become necessary in unstable and volatile environments [48, 49]. Knowledge transfer leading to firm transformation occur in condition of technological and environmental change, which suggests firm new approach to prevent the internal obstacles and external threaten of acquisition, take advantage of new growth opportunities [50]. Government even deregulate and empower the new technical enablers and innovators to which encourage different modes of knowledge transfer and using. Extant literature is not clear about how environment factors impact on knowledge using mode. The practical influence from beneficial externalities (competitors, partners, government) should directly affect new knowledge application mode. Reducing risk in response to external pandemic is task of technology speed [51]. The technology pulling forces will influence knowledge innovative application. Thus, environmental pressures including status certainty and technological speed are proposed can influence on knowledge using mode:

Hypothesis 6: Higher levels of status certainty lead to stronger organizational innovation

Hypothesis 7: The higher a level of technological speed perceived by an individual is, the higher a level of organizational innovation.

4. RESULTS AND DISCUSSION

4.1. Data collection and measurement

Structured survey is used to create questionnaire. The formal questionnaire is distributed to tourism and hospitality firms in via Amazon-based outsourced marketplace. All participants who registered their profile in the food and beverage, tourism, hospitality are considered valid to be our respondents.

To guarantee the survey validity and reliability, a pilot test will be conducted in first month. After the validity and reliability test, unfavorable survey items are modified to fit to the research context. Subsequently, a google-based survey was carried out during four months from May to early August, 2020. The survey resulted a total amount of 683 respondents. After dropping unsatisfactory respondents, a data of 301 respondents is chosen to analyze. The demographic data is illustrated by table 1.

Table 1: Demographics (n = 301)

Measure	Item	Frequency	Percentage
Gender	Female	96	31.9
	Male	205	68.1
Marital status	Single or divorced	75	24.9
	Married	226	75.1
Age	<=25.9	57	18.9
	26-35.9	156	51.8
	36-45.9	47	15.6
	46-55.9	40	13.3
	>=60	1	0.3
Occupation	Official Worker	99	32.9
	Front-line employee	35	11.6
	Supervisor	48	15.9
	Outlet manager	16	5.3
	Department manager	42	14.0

General manager	General manager	40	13.3
	Specialist/Expert	13	4.3
	Others/do not reveal	8	2.7
Professional tenure	<3 years	50	16.6
	3-6 years	81	26.9
	6-9 years	66	21.9
	9-12 years	55	18.3
	12-15 years	28	9.3
	15-18 years	12	4.0
	18-21 years	4	1.3
	>21 years	5	1.7
Employee (person)	< 50 persons	130	43.2
	50-249	120	39.9
	> 249 persons	51	16.9
Country	USA	114	37.9
	India	127	42.2
	others	60	19.9
Industry	Agency	39	13.0
	Bar/drink stall/tea store/tea shop	6	2.0
	Cruise tourism	4	1.3
	Event	22	7.3
	Food Preparation/catering	25	8.3
	Gaming and Casino Management	10	3.3
	Hotel, motel, resort	33	11.0
	Restaurant	56	18.6
	Tourism	57	18.9
	Others	49	16.3

The study adopts measurement items from information system and knowledge management study, modifies to

adjust to the innovation and covid-19 context. The Likert scale is seven-point measurement from Strongly Disagree to Strongly Agree. Indicators are following.

The study adopted innovativeness from traditionality from prior study [52]. The measurement items of mimetic pressure are adopted from [42]. The dimension of technological speed is adopted from [48]. Status Certainty is adopted from [24] while Organizational Innovation [53]. Creativity is modified from [54]. Inbound collaboration is modified and adopted from [27]. The experiment survey indicators are latent variables. which are indirectly measured.

4.2. Data analysis

The SPSS PLS 2.0 is used to analyze the structural model. The bootstrap resampling is to test the estimates stability and robust confidence intervals. The factor loadings of standardized indicators are expected to be above 0.6, which is acceptably reliable. The composite reliabilities are greater than 0.7 to ensure construct validity (Hair et al. 1998). Cronbach’s alphas are reasonably high for constructs reliability. The average variance extracted (AVE) and the inter-construct correlation are compared to indicate discriminant validity. AVEs for the latent variables, which are measured by reflective indicators, are suggested to be greater than 0.5. Each construct has a larger square root of AVE than its correlations with other constructs to show discriminant validity. The average variance extracted (AVE) values and Cronbach alpha are above the suggested criteria (table 2).

Harman’s single-factor test is used to test common method variance (CMV). A principal component factor analysis loads all variables and the unrotated factor solution is examined. The results reveal that the first construct only accounts for 20.95% of the variance, indicating that common method bias is unlikely to be of serious concern [55].

In addition, Pearson correlation is employed to assess the reliability and construct validity. The results reveal adequate qualification for further testing (Table 3). Creativity, mimetic pressure, innovativeness, traditionality explains 72% of the variance of innovative.

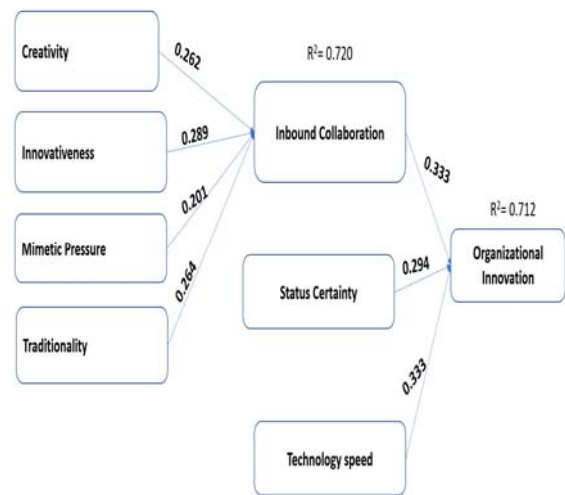


Fig. 2: Smart PLS Path Diagram

Table 2: Description, Correlation, Reliability, and Discriminant Validity

	MP	CT	IN	SC	TE	TR	IC	OI
MP	(0.788)							
CT	0.592	(0.774)						
IN	0.591	0.677	(0.802)					
SC	0.465	0.656	0.569	(0.813)				
TE	0.614	0.648	0.680	0.649	(0.733)			
TR	0.549	0.520	0.622	0.513	0.583	(0.761)		
IC	0.671	0.713	0.748	0.622	0.708	0.689	(0.758)	
OI	0.627	0.702	0.716	0.716	0.759	0.622	0.750	(0.749)
Mean	5.262	5.414	5.423	5.410	5.299	5.293	5.392	5.381
SD	0.923	0.934	0.952	0.878	0.842	0.934	0.859	0.841

Note: * $p < 0.05$, ** $p < 0.01$, MP = Mimetic Pressures, CT = Creativity, IN = innovativeness, SC = status certainty, TE = technology Speed, TR = traditionality, IC = Inbound Corporation, OI= org anizational innovation, SD = Standard deviation, CR = Composite reliability. The square root of the AVE is in parentheses. The numbers in parentheses are all higher than the corresponding off-diagonal elements.

inbound collaboration. Innovative collaboration, state uncertainty, technology speed explains 71.2% of the variance of organizational inbound innovation. Creativity, mimetic pressure, innovativeness, traditionality enhance the innovative collaboration. Thus, H1, H2, H3, and H4 are supported. The relationships between innovative collaboration and organizational innovation, state uncertainty on organizational innovation, technology speed on organizational innovation are positive and significant. Thus, H5, H6, and H7 are supported.

5. CONCLUSION

The COVID-19 is emerged as rare event with unpredicted consequences for people and organizations to innovate their business models (Bacq, Geoghegan, Josefy, Stevenson, & Williams, 2020). The pandemic threats urge for greater technological speed, better collaboration scenario, and more uncertainty mitigation going forward, this paper is intended to propose up an innovative model for entrepreneurship, management, and business experts and practitioners to collectively consider innovative responses to a variety of unexpected grand challenges (George et al., 2016). Our study utilized a stock of deep-rooted perspectives and concepts to investigate the question of organizations' innovation one of the grand challenges of pandemic time, to extend previous theoretical and empirical studies on organizational innovation. By basing our conceptual model on the crisis perspective, we explored the roles of perceived state certainty, technology speed, inbound collaboration. Our hypotheses are mostly supported with some insightful exceptions. Below we address several of our key findings.

The first key finding relates to an inbound corporative behavior about the Covid-19 phenomenon. At a general level, creativity behavior, Innovativeness, Traditionality, Mimetic pressures have positive influence on corporative behavior. Our analysis indicates that when organizations are tends to collaborate to work in innovative projects when their people are creative, innovative, and respect for the traditionality, and take care of competitors.

Table 3: Measurement Results

Items	Factor Loadings
Creativity (AVE = 0.600, CR = 0.857, Cronbach Alpha = 0.777)	
CT1	0.757
CT2	0.771
CT3	0.761
CT4	0.807

Innovativeness (AVE = 0.643, CR = 0.878, Cronbach Alpha = 0.815)	
IN1	0.820
IN2	0.775
IN3	0.805
IN4	0.808
Traditionality (AVE = 0.579, CR = 0.846, Cronbach Alpha = 0.758)	
TR1	0.777
TR2	0.779
TR3	0.703
TR4	0.781
Mimetic Pressure (AVE = 0.620, CR = 0.830, Cronbach Alpha = 0.694)	
MP1	0.815
MP2	0.747
MP3	0.800
Technological speed (AVE = 0.537, CR = 0.853, Cronbach Alpha = 0.784)	
TE1	0.750
TE2	0.740
TE3	0.728
TE4	0.676
TE5	0.766
Status Certainty (AVE = 0.661, CR = 0.853, Cronbach Alpha = 0.742)	
SC1	0.828
SC2	0.754
SC3	0.853
Inbound cooperation (AVE = 0.574, CR = 0.843, Cronbach Alpha = 0.752)	
IC1	0.802
IC2	0.715
IC3	0.798
IC4	0.711
Organizational Innovation (AVE = 0.562, CR = 0.836, Cronbach Alpha = 0.739)	
OI1	0.799
OI2	0.737
OI3	0.745
OI4	0.714

In addition to collaboration, technology speed, environmental uncertainty can contribute to a more fine-grained understanding of the way that high uncertainty (or low state certainty) can paralyze firms from addressing and incorporating environmental issues and technological advance in their innovative strategic planning and execution process. Awareness of the new solution during the COVID-19 can be mainly explained by the environmental crisis, technology speed, and collaborative efforts of insiders.

One intriguing possibility is the moderating role of digital adaptation on the relationship between collaboration innovation. A recent study in adaptive psychology (Brown, 2013) indicates that people are tend to use more digital technology which caused by human mobility. It raises the importance of investigating the digital adaptation of positive and negative evaluations because of the global nature of Covid-19 resilience issues.

6. ACKNOWLEDGMENTS

This research is funded by Vietnam National Foundation for Science and Technology Development (NAFOSTED) under grant number 502.02-2019.310.

7. REFERENCES

- [1] UNWTO, "UNWTO World Tourism Barometer". 2020. 18(2): p. May 2020.
- [2] Mair, S., "What will the world be like after coronavirus? Four possible futures.". *The Conversation*, 2020. 2020, March 30: p. Retrieved from <https://theconversation.com/what-will-the-world-be-like-after-coronavirus-four-possible-futures-134085>.
- [3] Mckinsey, "Beyond coronavirus: The path to the next normal". 2020: p. Retrieved from <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/beyond-coronavirus-the-path-to-the-next-normal>.
- [4] Gössling, S., D. Scott, and C.M. Hall, "Pandemics, tourism and global change: a rapid assessment of COVID-19". *Journal of Sustainable Tourism*, 2020: p. 1-20.
- [5] Sigala, M., "Tourism and COVID-19: Impacts and implications for advancing and resetting industry and research". *Journal of Business Research*, 2020. 117: p. 312-321.
- [6] Anderson, N., K. Potočník, and J. Zhou, "Innovation and Creativity in Organizations: A State-of-the-Science Review, Prospective Commentary, and Guiding Framework". *Journal of Management*, 2014. 40(5): p. 1297-1333.
- [7] Lin, Y., et al., "In the Eye of the Beholder: Top Managers' Long-Term Orientation, Industry Context, and Decision-Making Processes". *Journal of Management*, 2018. 45(8): p. 3114-3145.
- [8] Wallace, J.C., et al., "A Multilevel Model of Employee Innovation: Understanding the Effects of Regulatory Focus, Thriving, and Employee Involvement Climate". *Journal of Management*, 2013. 42(4): p. 982-1004.
- [9] Birkinshaw, J., G. Hamel, and M. J. Mol, "Management Innovation". *Academy of Management Review*, 2008. 33(4): p. 825-845.
- [10] Bowie, D., "Innovation and 19th century hotel industry evolution". *Tourism Management*, 2018. 64: p. 314-323.
- [11] Brockman, B.K. and R.M. Morgan, "The Role of Existing Knowledge in New Product Innovativeness and Performance". *Decision Sciences*, 2003. 34(2): p. 385-419.
- [12] Majchrzak, A., L.P. Cooper, and O.E. Neece, "Knowledge Reuse for Innovation". *Management Science*, 2004. 50(2): p. 174-188.
- [13] Drucker, P.F., "Post-capitalist Society". *New York: Butterworth Heineman.*, 1993.
- [14] Ahuja, G., "Collaboration networks, structural holes, and innovation: A longitudinal study". *Administrative Science Quarterly*, 2000. 45: p. 425-455.
- [15] Taylor, A. and H.R. Greve, "Superman or the fantastic four? Knowledge combination and experience in innovative teams". *Academy of Management Journal*, 2006. 49: p. 723-740.
- [16] Brown, J.S. and P. Duguid, "Organizational learning and communities of practice: Toward a unified view of working, learning and innovation". *Organization Science*, 1991. 2(40-57).
- [17] Parente, R., et al., "Adapting and sustaining operations in weak institutional environments: A business ecosystem assessment of a Chinese MNE in Central Africa". *Journal of International Business Studies*, 2019. 50(2): p. 275-291.

- [18] Thomas, R. and E. Wood, "Innovation in tourism: Re-conceptualising and measuring the absorptive capacity of the hotel sector". *Tourism Management*, 2014. 45: p. 39-48.
- [19] Fraj, E., J. Matute, and I. Melero, "Environmental strategies and organizational competitiveness in the hotel industry: The role of learning and innovation as determinants of environmental success". *Tourism Management*, 2015. 46: p. 30-42.
- [20] Souto, J.E., "Business model innovation and business concept innovation as the context of incremental innovation and radical innovation". *Tourism Management*, 2015. 51: p. 142-155.
- [21] Larsen, M.M., S. Manning, and T. Pedersen, "The ambivalent effect of complexity on firm performance: A study of the global service provider industry". *Long Range Planning*, 2019. 52(2): p. 221-235.
- [22] Ramus, T., A. Vaccaro, and S. Brusoni, "Institutional Complexity in Turbulent Times: Formalization, Collaboration, and the Emergence of Blended Logics". *Academy of Management Journal*, 2016. 60(4): p. 1253-1284.
- [23] Ashill, N.J. and D. Jobber, "Measuring State, Effect, and Response Uncertainty: Theoretical Construct Development and Empirical Validation". *Journal of Management*, 2009. 36(5): p. 1278-1308.
- [24] Matsuno, K. and F. Kohlbacher, "Firms' (non) responses: The role of ambivalence in the case of population aging in Japan". *Long Range Planning*, 2019. 52(2): p. 236-254.
- [25] Pantano, E., et al., "Competing during a pandemic? Retailers' ups and downs during the COVID-19 outbreak". *Journal of Business Research*, 2020. 116: p. 209-213.
- [26] Ashforth, B.E. and P.H. Reingen, "Functions of Dysfunction: Managing the Dynamics of an Organizational Duality in a Natural Food Cooperative". *Administrative Science Quarterly*, 2014. 59(3): p. 474-516.
- [27] De Massis, A., et al., "Innovation Through Tradition: Lessons From Innovative Family Businesses and Directions for Future Research". *Academy of Management Perspectives*, 2016. 30(1): p. 93-116.
- [28] Li, Y., et al., "From Employee-Experienced High-Involvement Work System to Innovation: An Emergence-Based Human Resource Management Framework". *Academy of Management Journal*, 2017. 61: p. amj.2015.1101.
- [29] Kogut, B. and U. Zander, "Knowledge of the firm, combinative capabilities, and the replication of technology". *Organization Science*, 1992. 3(3): p. 383-397.
- [30] Williams, C., "Transfer in context: Replication and Adaptation in knowledge transfer relationships". *Strategic Management Journal*, 2007. 28: p. 867-889.
- [31] Grant, R.M., "Toward a Knowledge-Based Theory of the Firm". *Strategic Management Journal*, 1996. 17(Winter Special Issue): p. 109-122.
- [32] Nonaka, I. and H. Takeuchi, "The Knowledge-Creating Company: How Japanese Create the Dynamics of Innovation". *Oxford University Press, Oxford, UK.*, 1995.
- [33] Un, C.A. and A. Cuervo-Cazurra, "Strategies for knowledge creation in firms". *British Journal of Management*, 2004. 15: p. 27-41.
- [34] Argote, L. and P. Ingram, "Knowledge transfer: a basis for competitive advantage in firms". *Organizational Behavior and Human Decision Processes*, 2000. 82(1): p. 150-169.
- [35] Winter, S.G., & Szulanski, G., "Replication as Strategy". *Organization Science*, 2001. 12(6): p. 730-743.
- [36] Leonard Barton, D., "Implementation as mutual adaptation of technology and organization". *Research Policy*, 1988. 17: p. 251-267.
- [37] Jensen, R. and G. Szulanski, "Stickiness and the Adaptation of Organizational Practices in Cross-Border Knowledge Transfers". *Journal of International Business Studies*, 2004. 35(6): p. 508-523.
- [38] Kostova, T. and U. Zander, "Adoption of an organizational practice by subsidiaries of multinational corporations: institutional and relational effects". *Academy of Management Journal*, 1992. 45(1): p. 215-233.
- [39] Scott, S.G. and R.A. Bruce, "Determinants of innovative behavior: A path model of individual innovation in the workplace". *Academy of Management Journal*, 1994. 37(3): p. 580-607.

- [40] Vargo, S. L., H. Wieland, and M. A. Akaka, "Innovation through institutionalization: A service ecosystems perspective". *Industrial Marketing Management*, 2015. 44: p. 63-72.
- [41] Marinova, S. V., X. Cao, and H. Park, "Constructive Organizational Values Climate and Organizational Citizenship Behaviors: A Configurational View". *Journal of Management*, 2018. 45(5): p. 2045-2071.
- [42] Liang, H., et al., "Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating role of Top Management". *MIS Quarterly*, 2007. 31(1): p. 59-87.
- [43] Martínez-Pérez, Á., et al., "Cultural Tourism Clusters: Social Capital, Relations with Institutions, and Radical Innovation". *Journal of Travel Research*, 2018. 58(5): p. 793-807.
- [44] DiMaggio, P.J. and W.W. Powell, "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields". *American Sociological Review*, 1983. 48(2): p. 147-160.
- [45] Gezhi, C., L. Jingyan, and H. Xiang, "Collaborative Innovation or Opportunistic Behavior? Evidence from the Relational Governance of Tourism Enterprises". *Journal of Travel Research*, 2019: p. 0047287519861170.
- [46] Hargadon, A. and R.I. Sutton, "Technology brokering and innovation in a product development firm". *Administrative Science Quarterly*, 1997. 42: p. 716-749.
- [47] Brews, P. and D. Purohit, "Strategic Planning in Unstable Environments". *Long Range Planning*, 2007. 40: p. 64-83.
- [48] Carson, S.J., A. Madhok, and T. Wu, "Uncertainty, opportunism, and governance: The effects of volatility and ambiguity on formal and relational contracting". *Academy of Management Journal*, 2006. 49(5): p. 1058-1077.
- [49] Williams, A. M., I. Rodríguez Sánchez, and V. Škokić, "Innovation, Risk, and Uncertainty: A Study of Tourism Entrepreneurs". *Journal of Travel Research*, 2020: p. 0047287519896012.
- [50] Folta, T.B., "Governance and uncertainty: The trade-off between administrative control and commitment". *Strategic Management Journal*, 1998. 19(11): p. 1007.
- [51] Luo, Y., "Are joint venture partners more opportunistic in a more volatile environment?". *Strategic Management Journal*, 2007. 28: p. 39-60.
- [52] Hon, A.H.Y. and A.S.M. Leung, "Employee Creativity and Motivation in the Chinese Context: The Moderating Role of Organizational Culture". *Cornell Hospitality Quarterly*, 2011. 52(2): p. 125-134.
- [53] Fernandez, M.C., A.M. Bedia, and R.G. Lopez, "Factors Encouraging Innovation in Spanish Hospitality Firms". *Cornell Hospitality Quarterly* 2011. 52(2): p. 144-152.
- [54] Liu, D., et al., "Human Resource Systems, Employee Creativity, and Firm Innovation: The Moderating Role of Firm Ownership". *Academy of Management Journal*, 2017. 60(3): p. 1164-1188.
- [55] Podsakoff, P.M., et al., "Common method biases in organizational research: A critical review of the literature and recommended remedies". *Journal of Applied Psychology*, 2003. 88(1): p. 879-903.
- [56] Bacq, S., et al., "The COVID-19 Virtual Idea Blitz: Marshaling social entrepreneurship to rapidly respond to urgent grand challenges". *Business Horizons*, 2020.

IMPACT OF ENTREPRENEURSHIP EDUCATION ON ENTREPRENEURIAL INTENTION: A MODERATOR EFFECT

Nguyen Thu Thuy*

¹ Department of General Management, National Economics University, Hanoi, Vietnam

*Corresponding author: thuyntqtkd@neu.edu.vn

Abstract

This empirical study propose a comprehensive model testing the impact of entrepreneurship extracurricular activities and entrepreneurship inspiration on students' entrepreneurial intention. With the sample consisting of 640 students from 11 universities in Vietnam, the study use structural equation modelling analysis approach. The results revealed that entrepreneurship extracurricular activities and entrepreneurship inspiration are significantly related to students' entrepreneurial intention. The impact of entrepreneurship education on entrepreneurial intention differ across field of study. Technical students generally get more benefits from entrepreneurship educational activities than business and economics students do. The research findings recommend some implications for fostering graduates' entrepreneurship in emerging countries.

Keywords: entrepreneurial intention, students, entrepreneurship extracurricular activities, entrepreneurship inspiration, field of study, entrepreneurship self-efficacy.

1. INTRODUCTION

The last decade has seen a strong renewed interest in university's entrepreneurship education study (Liñán and Fayolle 2015). However, current entrepreneurship education researches remain several unexpected gaps. Findings on the impact of entrepreneurship education activities on college students' entrepreneurial intentions have been reported inconsistent and ambiguous (Lüthje and Franke 2004; Wilson, Kickul, and Marlino 2007). The mixed results on the effectiveness of entrepreneurship education resulted from the diversity of pedagogical assessment approaches and prior assessment had been made without specifying teaching methods or educational activities and supports should be offered to students to get desired outcomes (Roberts et al. 2014). In addition, university entrepreneurship education aim to provide knowledge and supports to promote students' entrepreneurship, in which university supports can be classified into cognitive - emotional supports, oriented towards entrepreneurship culture awareness; and informative - instrumental supports, aimed at providing information, resources and physical help for the materialization of entrepreneurial intention (Arranz et al. 2017). A knowledge gap exists regarding the potential causal link between extra-curricular activities - an instrumental support and entrepreneurship inspiration - a cognitive-emotional support with their impact on student learning, entrepreneurial competences

and entrepreneurial intention (Pittaway et al. 2011). A positive relationship between extracurricular activities and students' entrepreneurial intentions are found in Couetil, Shartrand, and Reed (2016); Pittaway and Cope (2007) while Oosterbeek, van Praag, and Ijsselstein (2010) found negative relation and Graevenitz, Harhoff, and Weber (2010) found the relation between entrepreneurial education and students' entrepreneurial intentions is not significant. The conflicting findings on the relationship between entrepreneurship extracurricular and entrepreneurship inspiration with students' entrepreneurial intentions reinforce the need to deeper examine, with a moderator or a mediator (Doan and Sung 2018; Martin, McNally and Kay 2013; Pittaway et al. 2011).

In this research, we choose to put our main focus on the relationship between entrepreneurship extracurricular, inspiration and entrepreneurial intention. The failure of researchers to identify a consistent relationship between entrepreneurship education and intention suggests us to use a moderator. A number of studies have examined the role of academic major in building entrepreneurial intention (Wu and Wu 2008; Herman and Stefanescu 2017). Interestingly, a related issue under debate is whether the impact of entrepreneurial education factors on entrepreneurial intentions is differentiated by field of study (Hamidi, Wennberg, and Berglund 2008). Arranz et al. (2017); Chen et al. (2013) suggested to identify the

field of study as moderator of the relation between entrepreneurial intentions and its antecedences. Therefore, we choose academics majors as a moderator in this study.

With this paper we contribute to the emergent stream of literature on this important topic in two aspects. First, grounded in social-cognitive theory, the research provide empirical evidence of the influence of entrepreneurship extra-curricular activities and inspiration on the intention to become an entrepreneur in developing country, where entrepreneurship education is in beginning stage. The second contribution of this study is our specific focus on a moderator - academics major in the relationship between those two entrepreneurial education factors and entrepreneurial intention.

2. LITERATURE REVIEW

Ajzen (1991) believes entrepreneurial intention to be a reliable precedence to entrepreneurial behaviours. Therefore, entrepreneurial intentions of university students have been widely interested from the argument that understanding entrepreneurial intention provide us a chance to understand and predict entrepreneurial activity (Linan and Chen 2009; Nowiński et al. 2017; Wilson, Kickul, and Marlino 2007).

Extracurricular Activity and Entrepreneurial Intention

A substantial body of literature centred entrepreneurship education in modelling entrepreneurial intention among students (Liñán and Fayolle, 2015). There are wide range of education activities and supports that university provide to students in order to foster entrepreneurship, in which extra-curricular activities play very important role (Doan and Sung, 2018). Entrepreneurship extra-curricular activities involve actions, experiences and newness, which may be organized inside or outside universities and fall outside the realm of the higher education's official curriculum. Entrepreneurship extra-curricular activities supplement to required coursework of formal curricular in university education. Those activities are provided to promote entrepreneurship initiative, aimed at offering proper support to entrepreneurship interests and intentions to start a new venture of students (Arranz et al. 2017). There are various forms of entrepreneurship extracurricular activity including: entrepreneurship games, business plan competitions, exchanges, business mentoring, clubs and societies, pre-incubators, workshop programmes, entrepreneurship support programmes, developing new product and innovation competition, idea development, business incubators, etc. (Pittaway et al. 2011).

There are controversial discussions on the relation between entrepreneurship extracurricular activities and entrepreneurial intention in literature. Feldman and Matjasko (2005) argues that entrepreneurship extracurricular as well as entrepreneurship education on one hand would enrich an individual's business ability, experiences, which in turn increases the probability of entrepreneurship; but on the other hand, higher levels of capabilities might create better wage employment options (higher salary opportunities, better work position) and thus decrease the preference of choosing a career as an entrepreneur. Nabi et al. (2018) found complex findings, training and practical activities which are provided in entrepreneurship education can foster but also decrease entrepreneurial intentions. However, recently, there is growing acceptance that extracurricular is beneficial (Arranz et al., 2017). As most educators consider involvement in extracurricular activities to be a form of experiential learning (Pittaway, et al., 2015). The Kolb's theory of experiential learning indicate that experience is a valuable source for learning, changing mind-set and development; people do learn from their experiences (Couetil et al., 2016). Experiential learning construct new knowledge and perception through collective experiences. Extracurricular create a supportive environment within which students experience business and entrepreneurial activities, and raise awareness, attitude of entrepreneurship (Pittaway, et al., 2015). Therefore, entrepreneurial intentions, can be enhanced through knowledge of the activity and social capital which student gain from extracurricular practice (Peterman and Kennedy, 2003). Pittaway et al. (2015); Vesa (2010) have shown that participation in business plan development, competition, or participate in an entrepreneurship-related student organization like clubs have a positive impact on individual's self-perceptions of entrepreneurship.

Hypothesis 1: Entrepreneurship extra-curricular activities participation is positively related to entrepreneurial intention

Entrepreneurship inspiration and entrepreneurial intention

Souitaris et al. (2007) defined "entrepreneurship inspiration as a change of hearts (emotion) and minds (motivation) evoked by trigger events or inputs of university education and directed towards considering becoming an entrepreneur". Inspiration implies elicited emotions such as aware and admiration, a feeling often associated with "falling in love", inspiration has an emotional element and involves a "change of hearts". Triggers can come from people (role models, university lecturers, mentors and guest speakers, entrepreneurs)

and events (educational activities including presentation of ideas, business simulation exercises, business plan development etc.) (Nabi et al. 2018).

Souitaris et al. (2007) argued that the emotional supports in the form of “triggers” coming from verbal persuasion or positive encouragement on entrepreneurial career has a positive effect on entrepreneurial perception. The change in hearts and/or minds can be very strong, leading to the change in entrepreneurial intentions. From Social Cognitive Career Theory perspective in the context of entrepreneurship, entrepreneurship inspiration can be seen as contextual supports having a direct effect on the career decision-making process. The social, culture, and institutional context create or constraint opportunities for performing an entrepreneurial activity (Vesa, 2010). Entrepreneurship inspiration is as a kind of emotion, when motivated, through entrepreneurial cognitions will culminate attitude of entrepreneurship, directly changes overall personal perception of entrepreneurship. If triggers are coming from people that students trust or admire, or from successful role model in society, verbal persuasion may make a powerful influence on the development of entrepreneurial interest (Farashah, 2015). Another qualitative work of Nabi et al. (2018) showed that a simple negative experience, for example, a teacher’s funny story of business failure, can serve as a deterrent to personal perception of entrepreneurial intention. The empirical study of Souitaris et al. (2007) on engineering students reported that entrepreneurship inspiration, rather than resources or knowledge transferring and other education benefits, positively relates to the entrepreneurial intention. The presence of triggers directly influences entrepreneurial career intentions and options.

Hypothesis 2: Entrepreneurship inspiration is positively related to entrepreneurial intention

Academic major as moderator

Hamidi et al. (2008) mentioned that academic major is a decisive factor to career choice intentions in general and to entrepreneurial intentions in particular. Souitaris et al. (2007); Wu and Wu (2008) indicated that important differences exist in how students in various academic majors perceive entrepreneurial opportunities in their future profession. Herman and Stefanescu (2017) highlights the role of the fields of study in the relationship between entrepreneurship education and entrepreneurial intention. Arranz et al. (2017) showed that the impact of extracurricular activities on entrepreneurial intention and its antecedence in group of business students and group of non-business students are different. Thus, we propose that academic major can be

moderator for the impact of entrepreneurship inspiration and extracurricular activities on intention.

While Arranz et al. (2017); Chen et al. (2013) showed neither entrepreneurship curricular nor extracurricular activities have any impact on entrepreneurial intention of students with a business background, Couetil et al., (2016); Souitaris et al. (2007) found that the entrepreneurship program can raise the science and engineering students’ entrepreneurial intention. Roberts et al. 2014 mentioned in his research that aspiring entrepreneurs should concentrate in departments outside the school of business. Engineers who are equipped with an entrepreneurial mind-set, have potential to contribute to business success. Students in technical and science disciplines usually expertise at the technical and creative skills, and often have very solid ideas of new products or services, which are the primary capital of individuals to start new business (Herman and Stefanescu, 2017). Souitaris, Zerbinati, and Al-Laham (2007) proposed that innovative and viable business ideas arise from scientific, technical and creative studies, the technical training of science and engineering give students in these field of study the potential to start high growth technology ventures. Arranz et al. (2017) emphasized engineering degree whose creative competences and product knowledge are greater than in other degrees, have greater entrepreneurial potential. However, majority of entrepreneurship courses is provided in business and economic studies, little entrepreneurial training is provided in engineering and science degrees, makes the development of entrepreneurship among non-business students very natural. We propose that the impact of entrepreneurial education on entrepreneurial intentions is significantly stronger among engineering students than among business students.

Hypothesis 3: The positive relationship between entrepreneurship extracurricular activities and entrepreneurial intentions will be stronger in science and engineering students than in business and economics students.

Hypothesis 4: The positive relationship between entrepreneurship inspiration and entrepreneurial intentions will be stronger in science and engineering students than in business and economics students.

3. METHDOLOGY

Materials

Before quantitative surveys is carried out, it is essential to take a qualitative study to check for the research theoretical model and the accuracy of questionnaires.

The survey instruments was borrowed from previous researches with adaptation for Vietnamese context. The

questionnaire included 23 items and each administration took between 5 to 6 minutes. The respondents indicate their agreement and disagreement on a 5-point Likert scale with strongly agree (5) to strongly disagree (1). We used the entrepreneurial intention questionnaire (Linan and Chen 2009) to measure entrepreneurial intentions of students. Meanwhile, we applied the Souitaris et al. (2007) questionnaire and technique to measure entrepreneurship inspiration. Following Arranz et al. (2017), we adapted the measurement of extracurricular activities.

This study involved final year students as respondents. Both online and offline questionnaires were sent to students at 11 universities in Hanoi, Vietnam. A total of 1500 students were targeted for this study, including 2 main majors: technical- engineering and business-economics (sent 1500, received 651, response rate of 43.4%). After collecting the questionnaires, I checked the data to ensure that the sample consists of the research designed subjects, eliminate questionnaires with missing important information or bias answers (11 questionnaires). Thus, an acceptable final dataset consist of 640 students.

Methods

Statistical analysis was carried out using SPSS 22.0 and AMOS 22.0 software. First, Cronbach’s alpha, explorative factor analysis (EFA), confirmatory factor analysis (CFA) are implemented to assess the validity and reliability of variables. Second, the structural equation modelling (SEM) was applied to estimate path coefficients for proposed relationships (Hair et al. 2009). In order to investigate the moderating effects of academic major, we use multiple group analysis to estimate different effects of moderating variable (Frazier et al., 2004) multiple group analysis is a method to test the difference of path coefficients between two groups. We divided all samples into two groups’ technical – engineering students and business – economics students. Based on these, we employ an unconstrained (or free) model and equality constrained model which assume that the sizes of relations between variables are equal to each other. We then analyse the moderating effects of three variables by conducting χ^2 difference test between the two models.

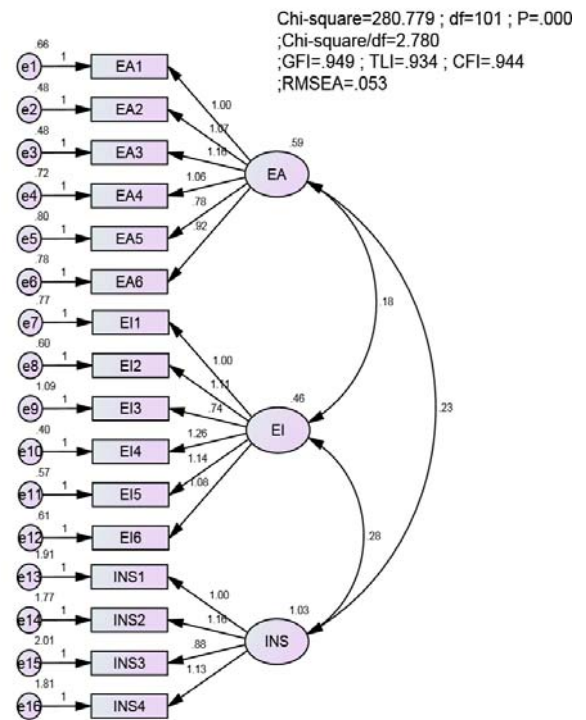
4. RESULTS AND DISCUSSION

The final sample consist of 640 questionnaires. In which, 63% are men, 17.3% of respondents have entrepreneurial experiences; 82.7% have not involved in business activities. 35.9% of respondents’ parents is working in business related careers; 64.1% of the students’ parents are doing other occupations. 55% of

sample respondents study business-economics major, 45% are learning technical-science – engineering majors.

Test for instruments

Figure 1: CFA analysis



EA: extracurricular activities; EI: entrepreneurial intention; INS: Entrepreneurship inspiration

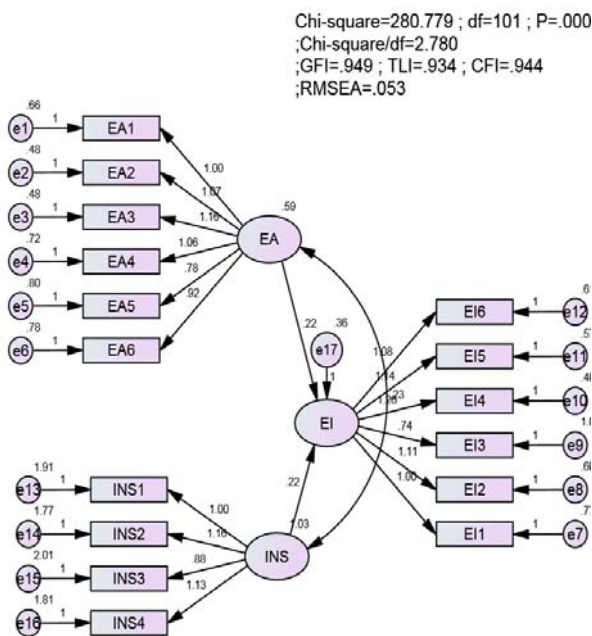
EFA and Cronbach's alpha tests were conducted to test the reliability and validity of the instruments measuring entrepreneurial self-efficacy, entrepreneurial inspiration, extra-curricular activities and entrepreneurial intention before proceeding to structural path analysis. EFA was conducted for the initial evaluation of the survey instrument validity. Principal component analysis with promax rotation method were used for factor identification, the results supported the factor structure developed from the literature review. All items loaded in original factors: two independent factors composed of 10 variables (4 for entrepreneurial inspiration, 6 for extra curricula programs), and a dependent factor with 6 variables. Initial Eigenvalues = 54.713 > 50%; KMO = 0.86; Sig. (Bartlett’s Test) = 0.000. The analysis provided support the validity of the measurement instruments (Hair et al. 2009). The instruments also was reliable with Cronbach's alpha of all variables ranging from 0.703 to 0.86 (EI = .816, EA = .841, INS = .703). Then, CFA analysis with all 23 variables were conducted to final confirm the measurement model. CFA result confirmed that all scales validity are proven, all scales

are internally consistent and reliable for using in next steps.

Hypothesis testing

The hypothesized model of the structural equation modelling (SEM) analysis (full mediation model) has satisfactory fitness indices ($\chi^2 / DF=2.446 < 3$, CFI = 0.939 > 0.9, TLI = 0.931 > 0.9, NFI = 0.901 > 0.9, GFI=0.931>0.9, RMSEA = 0.048) (Preacher and Hayes 2008).

Figure 2: SEM analysis



The direct influence of extracurricular activities on entrepreneurial intention is significant (standardized β : .093*), supporting Hypothesis 1. This result confirmed the important role of extra-curricular activities to entrepreneurial intention. This result is consistent with the previous studies of Couetil et al. (2016), where extra-curricular activities was significantly, directly associated with entrepreneurial intention. This finding supports the theoretical connection between experience based entrepreneurial education and intention. The finding is not in line with Arranz et al. (2017) study that found extracurricular activities do not impact on entrepreneurial intention. The inconsistent finding may result from the fact that our sample include students in both business - economics and non-business degree while Arranz et al. (2017) research were conducted on sample of Business and Marketing students only. Field

of study may have a certain role in explaining this inconsistent result. This will be discussed in detail when we take a closer look at field of study as moderator later on.

Similarly, entrepreneurial inspiration was found to directly and significantly impact on entrepreneurial intention (standardized β .157**) supporting Hypothesis 2. This is consistent with findings of Souitaris, et al. (2007) and Nabi et al. (2018) who argued that entrepreneurial inspiration can move the individual towards entrepreneurship, and entrepreneurship inspiration rather than knowledge and learning in university increase entrepreneurial intention. The change in hearts and minds from these various types of inspiration lead to higher entrepreneurial intentions. This illustrates a strong emotional rather than purely rational basis to entrepreneurial intentions (Nabi et al. 2018). Thus, it is important for education institutions to understand how students have been inspired or deterred from entrepreneurial intentions. Universities instead of teaching knowledge on entrepreneurship and business only, should also instil an entrepreneurial spirit, merely and hopefully such social persuasion will motivate students to become successful entrepreneurs in their fields. Supporting previous researches of Peterman and Kennedy (2003); Saeed et al. (2014) findings that university’s entrepreneurship education and training activities positively affects entrepreneurial intentions, our results again demonstrate the significant role of entrepreneurship educational activities in influencing students’ entrepreneurial intentions.

Table 1: Unstandardized Regression Weights

Hypothesis	Estimate	S.E.	C.R.	P	Result
H4: EI <--- EA	.219	.044	5.024	***	Significant
H5: EI <--- INS	.221	.039	5.725	***	Significant

(Source: our study)

***Correlation is significant at the 0.001 level;

EA: extracurricular activities; EI: entrepreneurial intention; INS: Entrepreneurship inspiration

The results confirmed that entrepreneurship inspiration and entrepreneurial extra curricular activities influence on entrepreneurial intention of students to start a new business (table 4). This evidence supports the theoretical argument of Arranz, et al. (2017) Krueger et.al. (2000) that external factors influence entrepreneurial intentions.

A multiple group analysis was performed to estimate the moderating effects of academic major. In this research, respondents were split into two groups based on their

field of study. The first group consists of 288 respondents with science, engineering and technical majors, whereas 352 respondents with business and economics majors were placed into the second group. The significance of the difference between the two groups were estimated by comparing the Chisquare (χ^2) statistics of the cross-group unconstrained and constraint model. If the differences between them is significance, academic major moderates the relations between extracurricular activities, inspiration and entrepreneurial intention. The Structure equation modelling for testing academic major as moderator between entrepreneurship extracurricular activities and inspiration on intention is shown in table 5. The difference in χ^2 value is >3.84 at the 0.05% significance level ($p < 0.01$). The result shown the moderate effect was significant. The goodness-of-fit of unconstraint model indices met the recommended level (chisquare/df=1.736 < 3, TLI = 0.931 > 0.9, NFI = 0.894, GFI = 0.931, CFI = 0.943, RMSEA = 0.041). The effect of entrepreneurship extracurricular activities on intention was not significant for the business- economics group ($p > 0.010$). The impact of entrepreneurship extracurricular activities on intention was only significant for the technical group ($p < 0.001$). Therefore, the hypothesis H3 is supported, academic major fully moderate the relation between extracurricular activities and entrepreneurial intention. The results indicated that entrepreneurship inspiration significantly and positively affected intention for the both business ($\beta = 0.257, p < 0.01$) and non-business ($\beta = 0.234, p < 0.01$) groups (table 5). This has also showed that the effect of entrepreneurship inspiration on entrepreneurship intention were stronger for non-business group than the business group. Therefore, the hypothesis 4 is supported, academic major partly moderate the relation between inspiration and entrepreneurial intention.

Table 2: Unstandardized estimates-unconstrained Model.

Independent Variable	Dependent Variable	Regression weights		Result
		Technical - engineering (N = 277)	Business - economics (N= 363)	
EA	EI	.307***	.164	Supported
INS		.234***	.257***	Supported

This research findings confirm that field of study is a significant moderator of the relationship between entrepreneurship education factors and entrepreneurial intentions. The positive impact of entrepreneurship education factors on entrepreneurial intentions is

significantly stronger among technical -engineering major than among the others. This indicates that important differences exist between how students in various areas of study perceive entrepreneurial opportunities in their future career. This finding is consistent with findings from Herman and Stefanescu (2017), who found the impact of entrepreneurship education on entrepreneurial intentions is significantly different between business students and engineering students in 2 universities. This results also in line with Couetil et al. (2016) research which showed that engineering students with technical major do benefit from attending entrepreneurial orientation and extracurricular activities. Our current findings support the view that technological degrees have a higher intent to engage in entrepreneurship activities than traditional degrees on business and economics if they were well educated with entrepreneurship program and training (Roberts et al. 2014). The development of entrepreneurship among science and technical students very potential because technical student have capacities and skills to create new products and services. This research finding supports proposal of Herman, and Stefanescu (2017) that it is necessary to integrate entrepreneurship education and training with scientific and technical studies within technical institutions, in order to facilitate spinoffs and innovative start-ups.

5. CONCLUSION

The results of this study increase our understanding about the relationship between entrepreneurship extra-curricular activities, inspiration and entrepreneurial intentions. The study found that educational factors including entrepreneurship extra-curricular activities, entrepreneurship inspiration are significantly associated with entrepreneurial intentions through its effect on perceived self-efficacy. This empirical study evidence the fact that entrepreneurial self-efficacy was positively related to students' intentions. Thus, enhancing students' confidence to become an entrepreneur through self-efficacy beliefs appears to have an important impact at the early, prelaunch stage of an entrepreneurial venture. Previous studies indicated that entrepreneurial intention can be impacted by entrepreneurship extra-curricular activities and entrepreneurship inspiration, but the role of perceived self-efficacy remained vague, now we better understand its relation. Another interesting point from the research is that technical- engineering students acquire more benefit from participating in entrepreneurship extra-curricular activities and

inspiration than business -economics students do. This knowledge is important for university to design their programs in a more targeted and effective manner. The results of this study suggest several implications to promote entrepreneurial intentions through effectively designed entrepreneurship training activities.

- Entrepreneurship education should incorporate diverse types of entrepreneurship extra-curricular activities as supplementary to formal education curriculum. There should be an increase in interactive activities which encourage experience oriented pedagogy learning, learning by doing such as group work, project, business plan and new product development competition, ideas workshop, etc., which combine academic teaching with greater professional business experience.

- Educators, teachers, and instructors engaged in entrepreneurship courses should be aware of their role in inspiring students with entrepreneurship spirit. Entrepreneurship education course design should include more emotional dimension, that specifically provide positive emotions, for example experiencing happiness and excitement when successfully launching a new product, commercializing a business ideas. Educators not only teach knowledge and skills, but also to change perception, change 'hearts and minds' of students.

- The objectives of higher education should aim not only at developing entrepreneurial intention in students through an increase in entrepreneurship awareness, motivation and experiences; but also enhancing and maximizing entrepreneurial self-efficacy needed to identify and exploit business opportunities. Entrepreneurship self-efficacy play important role in educational program design and achievement and is an essential element determining the readiness to implement entrepreneurial activities. Educators should incorporate teaching activities that are principal sources of entrepreneurial self-efficacy or help students develop positive judgments about their self-capacities. Entrepreneurship programs framework should use experimental design that provide successful and vicarious experiences, verbal or social persuasion which lead to an increase in their entrepreneurial self-efficacy and, in turn, can increase the entrepreneurial intentions.

- Entrepreneurship programs should develop entrepreneurship orientation activities for technical – engineering students to improve the students' entrepreneurial self-efficacy, and entrepreneurial intentions. Technical and science learning with the development of specific vocational skills must be synchronized with entrepreneurship activities and social persuasion so graduates of technical degrees, besides being qualified to work in industry, are also be attracted and qualified to create new venture leveraging their technical expertise.

This study have several limitations. This study use only self-report measures. The cross-sectional study method limits us to see changes intention over time. Longitudinal which follows individuals over time, is better for understanding the process of becoming new entrepreneurs. Future researches should apply longitudinal studies to discover the relationship between extra-curricular activities, entrepreneurship self-efficacy, entrepreneurial intention and entrepreneurship behaviours. Longitudinal research that keep track on who actually becomes successful entrepreneur is an important direction for future research. Finally, the supportive results of our study suggest that future research should fully evaluate the effectiveness of different entrepreneurship extra-curricular activities components. Future research should make detailed assessments of the content, design, and delivery of each entrepreneurial extra-curricular activities which was beyond the scope of this study.

6. REFERENCES

- [1] Ajzen, I. 1991. "The theory of planned behavior." *Organizational Behavior and Human Decision Processes* 50 (2): 179-211.
- [2] Arranz, N., F. Ubierna, M.F. Arroyabe, C. Perez and J.C.F. Arroyabe. 2017. "The effect of curricular and extracurricular activities on university students' entrepreneurial intention and competences." *Studies in Higher Education* 42:11: 1979-2008.
- [3] Chen, S. C., H. C. Hsiao, J. C. Chang, C. M. Chou, C. P. Chen and C. H. Shen. 2013. "Can the entrepreneurship course improve the entrepreneurial intentions of students?" *International Entrepreneurship and Management Journal* 11(3): 557-569.

- [4] Couetil, N.D., A. Shartrand, and T. Reed. 2016. "The Role of Entrepreneurship Program Models and Experiential Activities on Engineering Student Outcomes." *Advances in Engineering Education*, 1-27
- [5] Doan, T. T. and E. H. Sung. 2018. "Relationship between entrepreneurship education and innovative startup intentions among university students." *International Journal of Entrepreneurship* 22(3): 1-16.
- [6] Farashah, A. D. 2015. "The effects of demographic, cognitive and institutional factors on development of entrepreneurial intention: Toward a socio-cognitive model of entrepreneurial career". *Journal of International Entrepreneurship* 13(4): 452-476.
- [7] Frazier, P. A., A. P. Tix, and K. E. Barron. 2004. "Testing Moderator and Mediator Effects in Counseling Psychology Research." *Journal of Counseling Psychology* 51(1): 115-134.
- [8] Graevenitz, G.V., D. Harhoff, and R. Weber. 2010. "The effects of entrepreneurship education." *Journal of Economic Behavior and Organization* 76(1): 90-112.
- [9] Hamidi, D. Y., K. Wennberg, and H. Berglund. 2008. "Creativity in entrepreneurship education". *Journal of Small Business and Enterprise Development* 15(2): 304-320.
- [10] Herman, E., and D. Stefanescu. 2017. "Can higher education stimulate entrepreneurial intentions among engineering and business students?" *Educational Studies* 43(3): 312-327.
- [11] Hair, Joseph F., William C. Black, Barry J. Babin, Rolph E. Anderson. 2009. *Multivariate Data Analysis*, 7th Edition. Pearson.
- [12] Krueger, N. F., M. D. Reilly, A. L. Carsrud. 2000. "Competing models of entrepreneurial intentions." *Journal of Business Venturing* 15 (5/6): 411-432.
- [13] Liñán, F. and Y. W. Chen. 2009. "Development and Cross-Cultural Application of a Specific Instrument to Measure Entrepreneurial intentions." *Entrepreneurship Theory and Practice* 33 (3): 593-617.
- [14] Liñán, F., and A. Fayolle. 2015. "A systematic literature review on entrepreneurial intentions: citation, thematic analyses, and research agenda." *International Entrepreneurship and Management Journal* 11(4): 907-933.
- [15] Lüthje, C., and N. Franke. 2004. "Entrepreneurial Intentions of Business Students: A Benchmarking Study." *International Journal of Innovation and technology Management*, 1 (3): 269-288.
- [16] Martin, B. C., J. J. McNally, and M. J. Kay. 2013. "Examining the formation of human capital in entrepreneurship: a meta-analysis of entrepreneurship education outcomes." *Journal of Business Venturing*, 28(2): 211-224.
- [17] Nabi, G., A Walmsley, F. Liñán, I. Akhtar, and C. Neame. 2018. "Does entrepreneurship education in the first year of higher education develop entrepreneurial intentions? The role of learning and inspiration." *Studies in Higher Education*, 43(3): 452-467,
- [18] Nowiński, W., M. Y. Haddoud, D. Lančarič, D. Egerová, and C. Czeglédi. 2017. "The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries." *Studies in Higher Education*, 1-19.
- [19] Oosterbeek, H., M. van Praag, and A. Ijsselstein. 2010. "The impact of entrepreneurship education on entrepreneurship skills and motivation." *European Economic Review* 54(3): 442-454.
- [20] Peterman, N.E., and J. Kennedy. 2003. "Enterprise Education: Influencing Students' Perceptions of Entrepreneurship." *Entrepreneurship Theory and Practice*, 28 (9) 2: 129-144.
- [21] Pittaway, L. and E. Rodriguez-Falcon, O. Aiyegbayo, and A. King. 2011. "The role of entrepreneurship clubs and societies in entrepreneurial learning." *International Small Business Journal* 29: 37-57.
- [22] Pittaway, L., and J. Cope. 2007. "Entrepreneurship education - A systematic review of the evidence." *International Small Business Journal* 25: 477-506.
- [23] Preacher, K.J., and A.F. Hayes. 2008. "Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models." *Behavior Research Methods* 40: 879-891.
- [24] Roberts, J., F. Hoy, J. A., Katz, and H. Neck. 2014. "The Challenges of Infusing Entrepreneurship within Non-Business Disciplines and Measuring Outcomes." *Entrepreneurship Research Journal* 4(1): 1-12.

- [25] Saeed, S., M. Muffatto, and S. Yousafzai. 2014. "A Multi-level Study of Entrepreneurship Education among Pakistani University Students." *Entrepreneurship Research Journal* 4(3): 297-321.
- [26] Souitaris, V., S. Zerbinati, and A. Al-Laham. 2007 "Do entrepreneurship programs raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources." *Journal of Business Venturing* 22 (4): 566-591.
- [27] Vesa P. T. 2010. "Learning entrepreneurship in higher education", *Education and Training*, 52 (1): 48-61.
- [28] Wilson, F., J. Kickul, and D. Marlino. 2007. "Gender, Entrepreneurial Self-Efficacy, and Entrepreneurial Career Intentions: Implications for Entrepreneurship Education." *Entrepreneurship Theory and Practice* 31(3): 387-406.
- [29] Wu, S. and L. Wu. 2008. "The impact of higher education on entrepreneurial intentions of university students in China." *Journal of Small Business and Enterprise Development* 15(4): 752-774.

AUTOMATED STORAGE AND RETRIEVAL SYSTEM - A NEW SOLUTION FOR STORAGE AND WAREHOUSE MANAGEMENT IN VIETNAM

Huynh Minh Anh¹, Dang Thi Kim Thoa^{2*}

¹ Robotics and High-tech Department, National Research Institute of Mechanical Engineering, Hanoi, Vietnam

² Faculty of Business Management, National Economics University, Hanoi, Vietnam

*Corresponding author: kimthoa_hc@yahoo.com

Abstract

The article introduces an overview of the Automated Storage and Retrieval System solution, including structure and characteristics of AS/RS warehouse. Through the survey of the current state of the warehouse of LIX Detergent Company in Binh Duong, the article points out the problems the warehouse is facing, introduces the design, installation and the difficulties in implementation of AS/RS warehouse of National Research Institute of Mechanical Engineering.

Keywords: Automated Storage and Retrieval System, AS/RS, Warehouse Management.

1. INTRODUCTION

Currently, the trend of modernization and automation in industries in general and in warehouse has been developing strongly in the world for hundreds of years. The aim of industrial automation is to reduce labor and productivity. Today, this process is a fierce race around the world, a battle between regions and between peoples. In the coming time, the unit that can produce better products, with lower prices and faster will be the winner.

The development of science and technology creates a dramatic life change and at a faster rate than ever before. In the past, the globalization process was based on cheap labor. Today, this process is mainly based on automation and intelligent machinery systems, reducing labor costs, increasing production productivity and product quality.

Industrial AS/RS warehouses have been researched and applied in the world for more than 70 years. However, this system has only appeared in Vietnam in the past 20 years. Automated warehouse system is applied in many other economic sectors and fields to improve service capacity, reduce manpower and warehouse management, reduce storage area and accuracy for delivery. products, such as industries: tobacco, alcohol, beverage, pharmaceutical, and chemical factories; supermarket; ecommerce; container handling and handling at port warehouses; parcel courier; library, etc.

National Research Institute of Mechanical Engineering (NARIME) is a public agency under the Vietnam Ministry of Industry and Trade. The Institute was established in 1962 and is the leading research and design agency in Vietnam in the mechanical engineering

industry - automation. The Institute is responsible for researching and proposing national development strategies and technical standards for the mechanical engineering industry; organization and leadership of domestic enterprises implementing localization programs; consulting, designing, manufacturing, transferring technology, putting into operation the production line; develop scientific research and postgraduate training.

Realizing the potential for developing AS/RS warehouse products in Vietnam, the Institute has started researching AS/RS warehouse solutions in the world and is building a strategy for product development and manufacturing, designing and installing AS/RS warehouses in major manufacturing companies in Vietnam, such as Truong Hai Auto Joint Stock Company (THACO Chu Lai), Southern Battery Cell Joint Stock Company (PINACO), Hanoi Beer - Alcohol - Beverage Corporation (HABECO), LIX Detergent Joint Stock Company, etc.

Automated Storage and Retrieval System (AS/RS) Warehouse is new in Vietnam, so the implementation, research, manufacture and installation have many difficulties in project management. In addition, AS/RS warehouse projects include a lot of components of mechanical equipment, electric-automation, and information technology, so there is a need for coordination between many specialized centers in the institute to implement equipment. design, fabrication and installation. This makes the management more difficult and complicated than in previous projects.

Therefore, the research and development of AS/RS is essential to improve the productivity and quality of

Vietnam's industries, especially in the storage sector, as well as bring revenue to for units that design, manufacture and provide domestic mechanical-automation solutions in Vietnam.

2. THEORY OF AUTOMATED STORAGE AND RETRIEVAL SYSTEM

2.1. Concept of Automated Storage and Retrieval System

The concept of "warehouse" has appeared for a long time in the world and undergoes a long history of development. AS/RS warehouse solutions are associated with the rapid development of logistics and mechanical technology - automation - IT. Industrial AS/RS warehouses have been researched and applied in the world for more than 50 years.

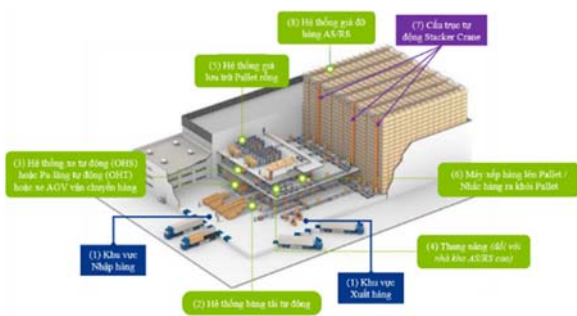


Fig. 1: The structure of a typical AS/RS warehouse

Source: us.blog.kardex-remstar.com/automated-storage-and-retrieval-systems
 asrs#what_is_asrs_automated_storage_and_retrieval_system_defined

AS/RS warehouse usually includes:

- Storage racks include extremely high, multi-story shelves with a variety of storage loads, from a few kilograms to several tons.
- Conveyor system transports goods from the production area to the warehouse or from the warehouse to the truck area.



Fig. 2: Typical AS/RS warehouse conveyor and shelf system

- Specialized pallet, container or shelf.
- Automatic actuator for storing and exporting goods: AGV (Automated Guided Vehicle) or Stacker Crane with rails.

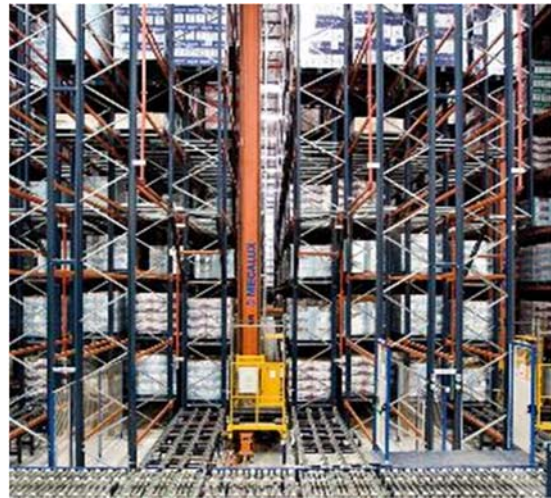


Fig. 3: Stacker Crane of Mecalux (USA) in the AS/RS warehouse



Fig. 4: The Automated Guided Vehicle in the Vinamilk warehouse in Binh Duong province

- Warehouse Management System (WMS)

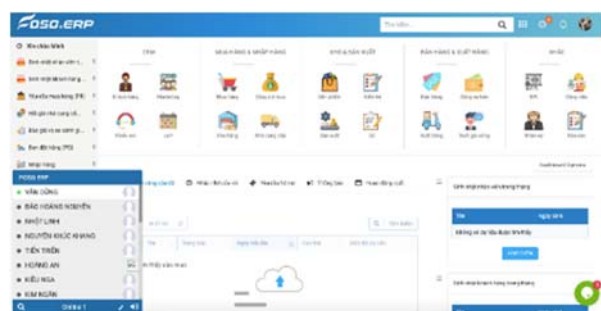


Fig. 5: Interface of Warehouse management system of FOSO (Vietnam)

Source: fososoft.com/san-pham/phan-mem-quan-ly-kho-hang-cong-ty/

- Control system for actuators and receive feedback signals (Warehouse Controller System - WCS).

2.2. Operation principle

- Import:

+ The pallets will be transported to the AS/RS warehouse through the automatic conveyor system or forklift and put into the loading conveyor station.

+ At the loading conveyor station, the pallet is scanned with barcode automatically to send information to the database of WMS Warehouse Management software. This system selects the optimal storage location and saves it on the database.

+ This system sends signals to the control system WCS (Warehouse Control System).

+ Stacker Crane or self-propelled AGV receive orders from WCS to pick up the goods and store them in the designated location.

- Export:

+ The warehouse keeper receives information about the order, enters the WMS warehouse management software and sends the signal to the WCS (Warehouse Control System) control system.

+ The crane truck picks up from WCS to pick up the goods at the designated position and send it to the delivery conveyor station.

+ Pallets are scanned with barcode codes to send information to the database of WMS warehouse management software. This system will delete the information of the pallet that has just been exported from the database automatically.

+ The forklift pulls the pallet from the conveyor to the truck.

2.3. Characteristics of AS/RS warehouse

- Automation: The AS/RS warehouse solution uses fully automatic mechanisms, such as Stacker Crane with rails or AGV (Automated Guided Vehicle) to import and export goods. Managing information about imported and exported goods is also completely automatic, using barcode labels and automatic barcode scanners.

- Large storage capacity: Because the warehouse is built with a high shelf system, many floors, so the capacity to store is large.

- Real-time information management: Real-time inventory management using WMS - Warehouse Management System software to manage and store goods data.

- Manage information about the date of entry, product name, specifications of the goods, import position through the barcode system or magnetic card.

- Use WMS Warehouse Management software to manage pallet information, manage processes and operations directly at the warehouse, including delivery, location identification of goods in warehouse, delivery, check current inventory. The warehouse management system can optimize storage space and eliminate manual and redundant tasks because the equipment and structures in the warehouse are completely programmed automatically.

3. AS/RS INSTALLATION AT LIX COMPANY

3.1. Current situation

Previously, LIX Binh Duong factory had 4 main warehouses, including warehouse No. 1 (attached to production and packaging area), warehouse No. 2, warehouse number 3 and warehouse for materials.

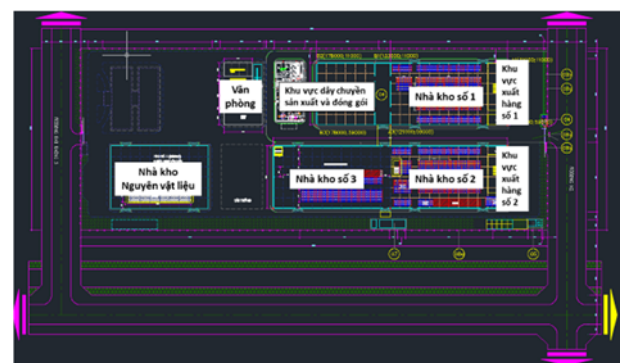


Fig. 6: Overview of LIX factory in Binh Duong

Finished goods cartons, after being packed and loaded on pallets, will be film-wrapped and manned by forklifts or pulled by the worker to the warehouse No. 1 or warehouse No. 2 and 3. Then, the pallet is loaded by a forklift truck (Forklift) to store to the corresponding position. When loading, the forklift will pick up the pallet with the corresponding location and bring it to the shipping area for loading onto the truck.

Table 1: Current specifications of 3 warehouses of LIX Binh Duong

No.	Item	Information provided by LIX Binh Duong			
		Warehouse 1	Warehouse 2	Warehouse 3	Total
1	Maximum number of pallets that can be stored (pallet)	4.600	5.220	3.268	13.088
2	Average loading frequency/day (pallet/day)	400	400	400	1.200

No.	Item	Information provided by LIX Binh Duong			
		Ware-house 1	Ware-house 2	Ware-house 3	Total
3	Average loading frequency/hour (pallet/hour)	17	17	17	51
4	Average shipment frequency /day (pallet/day)	400	400	400	1.200
5	Average shipment frequency /hour (pallet/hour)	50	50	50	150



Fig. 7: Picture of the current situation of LIX warehouse in Binh Duong

Table 2: Parameters about the current working environment of the LIX warehouse

No.	Item	Information provided by LIX Binh Duong
1	Project construction condition	Renovations
2	Planning area	- Finished goods warehouse: 12,960 m ² - Material Warehouse: 3,600 m ²
3	Usable height	7.5 m
4	Existing racking system	Yes
5	Height of existing racking system (if any)	6.8 m
6	Use environment	In house
7	Operating temperature	0°C~+40°C

Table 3: Information about the types of goods stored

No.	Item	Information provided by LIX Binh Duong
1	Material type	Liquid chemicals
2	Packing	Carton package, pallet
3	Number of SKUs	~153 SKUs
4	Information carrier	Required
5	Stock carrier	Wooden and plastic pallet
6	Material size	1.200 x 1.000 x 1.600 mm
7	Material weight	1.000 kg



Fig. 8: Picture of a pallet of goods in LIX Binh Duong warehouse

3.2. LIX warehouse current problems

- Difficult to apply First in - First out (FIFO).

LIX Warehouse Binh Duong is using all Drive-in racks. This shelf system consists of many rows, each row consists of many adjacent blocks. Each block has 4 floors, each floor has 5 positions for pallet.

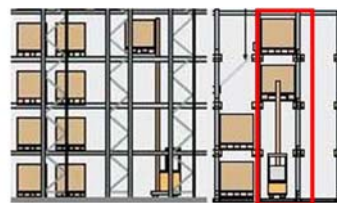


Fig. 9: Picture of 1 block of Drive in shelf

When loading the goods, the forklift truck enters the shelf to load the goods. When loading, the forklift cannot pick up goods according to the First In - First Out (FIFO) rule because the outside pallets must be removed,

creating space for the forklift to get in and get the pallets inside. The shipment order is shown as shown below.

The export order is the opposite of the import order, which makes it impossible to apply the First in - First Out (FIFO) rule. This is important for FMCG because it is a mass-produced product with a short shelf life (from 6 months to 1 year). If they are not released early, there is a danger of being overdue, they must be destroyed and wasted.

It takes a long time for the forklift to reverse cargo (goods inside and out before importing new goods to the block), it can be estimated that it can take up to 15 minutes / time for a reversing of goods in a block.

- Difficult to manage inventory.

The maximum number of pallets stored in 3 warehouses is up to 13,088 pallets. The large number of pallets creates a great workload for warehouse managers to check, make statistics, and report inventory here may be errors or mistakes. Drive-in shelf with 4 floors, up to 6.8m. It is difficult for warehouse staff to check and statistic goods with the naked eye without tools (such as ladders, etc.)

Must use a forklift to take out goods, create space to go in inventory or use a forklift to take goods from above to the face for easy inventory, which is time consuming. If there is no forklift, warehouse staff must get inside the shelf or use the high ladder to check the pallets, there is a possible occupational accident (such as falling, banging heads or crates or pallets falling on people., etc.).

Commodity data updated manually; statistical data is not updated continuously, online. It is difficult for managers to access online information for timely management or reporting to their superiors or to make production plans for next week. Management goods are difficult to check, statistic and report; The status of goods is not updated online and continuously; Potential risk of mistakes and errors.

- Import and export of crafts.

Use forklifts to import / export, arrange goods. Large average import-export time, highly dependent on truck speed, equipment condition in the forklift, driver's experience. There is a case of falling, causing an occupational accident due to inexperienced forklift driver, forklift fork loosened or bent, broken.

The performance is not high due to the time it takes for the forklift driver to rest, have lunch, go to the toilet every day or the time it takes for the truck to do monthly preventive maintenance. Warehouse staff record and paste pallet information paper on each pallet to manage manually. Takes time for bookkeeping, recording, and pasting on each pallet. There is a possibility that

warehouse staff make mistakes or mistakes There is a possibility that the recording paper is smudged or dropped. High annual salary and benefits expenses (7)

The import / export and management depend much on people, the performance is not high, potential risk of mistakes and errors.

3.3. AS/RS warehouse solution for LIX Binh Duong

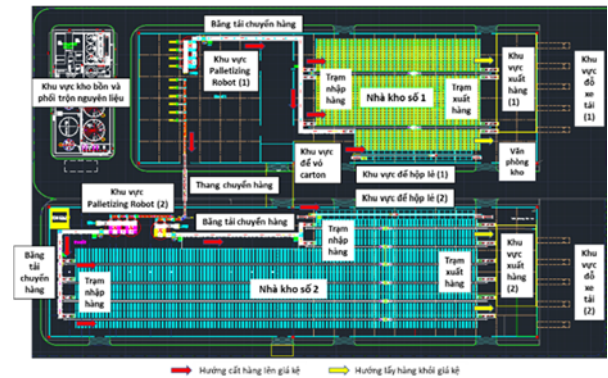


Fig. 10: Layout of the AS/RS warehouse of LIX Binh Duong

AS/RS warehouse system with maximum storage capacity of 11,238 pallets and 6,624 individual cases. The system uses an automated system of equipment to import and export goods: 2 Shuttle cranes to transport the Shuttle in the warehouse, 4 Shuttle trucks running on the rails of the warehouse No. 1, 6 cranes for the handler cranes in the warehouse No. 2, 2 small truck cranes in two odd tank areas in each warehouse. For each crane, there will be a separate track system, with an import conveyor station (red arrow) and a loading conveyor station (yellow arrow) at each end of the track.

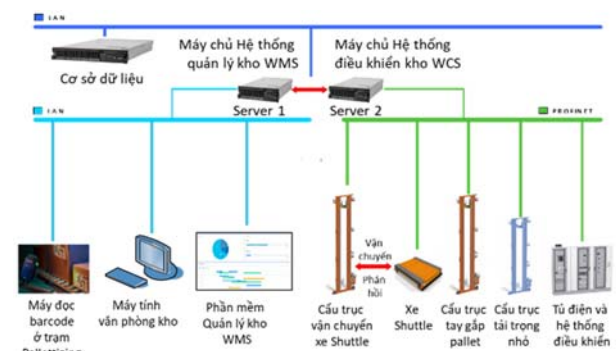


Fig. 11: Overview diagram of AS/RS warehouse system designed for LIX Binh Duong

The AS/RS warehouse system according to the plan of using the Shuttle and the forklift includes 4 main parts: database system, WMS warehouse management system, WCS warehouse control system and warehouse equipment clever.

- The database system stores all data about the locations and information in the warehouse, allowing the manager to access to check in real time.

- Warehouse Management System WMS (Warehouse Management System) is responsible for managing information about goods, shelf positions, inventory information, and receiving import and export orders, inventory from warehouse staff.

Warehouse Control System (WCS) is responsible for monitoring the status of the actuators in the warehouse (such as the Shuttle), receiving command to control the Shuttle from the HMI screens mounted on the Forklift truck, receive feedback from electrical cabinets, safety sensors in the warehouse.

The equipment in the warehouse includes:

Warehouse office computer: display information, receive information of warehouse staff and send

feedback to WMS warehouse management system.

Barcode reader at palletizing Robot station: register pallet information to WMS warehouse management system so that the system will notify forklift drivers to put goods into warehouse.

Crane Truck: Stacker Crane: the system uses 3 different types of crane (small load crane for import / export in bulk box, crane truck for import / export of pallet, crane for import / export) export pallet).

Automatic Shuttle: Pallet truck runs on rails to store or pick up cargo under the control of forklift driver via tablet

Electric cabinets and control system: control actuators in the warehouse.

3.4. Implementation LIX AS/RS warehouse

Table 4: The overall process of implementing the LIX Binh Duong AS/RS warehouse project of the NARIME

No.	Name	Detail	Person In Charge
1	Factory survey	An engineer in the research team will be sent to the factory to get input. The input form is already listed, the engineer only needs to fill out. In addition, the factory needs to provide a drawing of the warehouse space.	Project manager 01 Engineer of Robot Center and High Technology.
2	Design proposal	Based on the input information and requirements of the factory, the Institute will establish a research team consisting of engineers of the Mechanical Manufacturing Center (fabricating, processing pallet racks, crane trucks) and engineers. Center of Robot and High Technology (manufacturing AGV vehicles, writing WMS warehouse management software, WCS warehouse control software, etc.)	Project manager Engineer of Mechanical Manufacturing Center. Engineer Robot and High Technology Center.
3	Documentation of technical and financial proposals	Engineers write technical and financial proposals and send them to the secretary for synthesis. The secretary synthesizes, prints, closes the book and sends it to the Science and Technology Advisory Council and the Economic Advisory Council for comments and corrections. Secretary making presentation slides. The director of the topic prints the book, asks the Director to review and send it to the client.	Project Manager Secretary

No.	Name	Detail	Person In Charge
4	Present technical proposals to customers	The topic manager presents technical proposals to clients and collects suggestions. 2 cases (5-A and 5-B).	Project Manager
5-A	Editing of technical and financial proposals	If there is any feedback, the manager gives feedback to the design engineers to make corrections as required. If there is any feedback on the financial proposal, edit the topic. Secretary synthesizes edits and consolidates, reprints the record to send back to the customer. Repeat step 4 onwards.	Secretary
5-B	Contracting	If satisfactory, the project manager reports to the Director and draft a contract to sign contracts with customers.	Project Manager
6	Plan	Project manager and engineers plan the implementation of the project, send it to the engineers of the Center for Mechanical Engineering and TT Robot and High Technology for feedback and complete.	Project Manager
7	Manufacturing or order equipment	Mechanical Engineering Center and Robot and High Technology Center rely on design to order equipment from foreign suppliers or fabricate at the Institute's Mechanical workshop.	Project manager Engineer of Mechanical Manufacturing Center. Engineer TT Robot and High Technology Center.
8	Installation	The Mechanical Manufacturing Center and the Robot and High Technology Center hire contractors to transport and install the items they oversee. Engineer of TT Mechanical Engineering and TT Robot and High Technology perform system integration.	Engineer of Mechanical Manufacturing Center. Engineer TT Robot and High Technology Center.
9	Comissioning	Engineers of the Center for Mechanical Engineering and Robot and High Technology Centertest and complete the system according to customer requirements.	Engineer of Mechanical Manufacturing Center. Engineer TT Robot and High Technology Center.
10	Handing over	Hands over the equipment to the investor.	Team

4. BENEFITS OF AS/RS WAREHOUSE FOR LIX BINH DUONG

- The first in/out of goods First In - First Out (FIFO).

Both smart warehouse design proposals can apply the First In - First Out (FIFO) rule. Minimize the status of

overdue goods, which must be destroyed, causing waste. No more time for forklifts to rotate goods (inside out before importing new goods into the block) like before.

- Easily manage inventory.

Use information technology software, manage 100% of

import and export activities. The workload for warehouse managers to check, make statistics, and report inventory is significantly reduced due to the implementation of entering orders on the computer. errors and errors are approximately 0%.

Smart warehouse system using fully automated equipment. People do not have to do visual inspection and statistics, thus reducing wasted time. It does not take much time for stock reversing, rearranging for inventory like before. Warehouse staff do not have to crawl into shelves or use high ladders to check pallets, minimizing occupational accidents (such as falling, banging heads or crates or falling pallets, etc.). Data of goods updated continuously and online on WMS software. Managers can access online information for timely management or reporting to superiors or to make production plans for next week.

- Automatic import and export.

Use automation equipment (crane truck, Shuttle bus) to import / export and arrange goods. The average import / export time is very small, even, the import / export productivity increases 4-5 times compared to before. Minimize the situation of falling goods causing occupational accidents. High performance due to 24/24 hours of operation, no need for lunch and night breaks (3).

Recording pallet information on each pallet using the automatic bar code reader and reader system and 100% automatic management. No wasting time on checking, recording, and pasting on each pallet. Minimize the phenomenon of warehouse staff incorrectly recording information on pallets. Minimize the loss of pallet information during movement.

5. DIFFICULTIES IN IMPLEMENTING AS/RS

- High cost of design and investment in equipment.

Most of the equipment in AS/RS system must be imported from abroad, such as stacker crane, shuttle bus, warehouse management software system (WMS), warehouse control system (Warehouse Control System - WCS), automatic barcode scanner system from SSI SCHÄFER (Germany), Swisslog (Switzerland), Daifuku (Japan), SIASUN (China), so the cost is very high. In addition, the design, design consultancy and installation supervision also coordinate with foreign experts, so the cost is extremely high. In addition, for the No. 1 warehouse, the racking system must be renovated so that the rail shuttle can be used to pick up goods. Specifically, additional rails had to be installed under each shelf for shuttle buses to run on and to the pallet pick up location. This costs extra time, material costs, disassembly, installation, reinforcement, personnel costs, surveys, inspections, and operations for the shelving

system. Some equipment in the system can be processed domestically such as conveyors, rails for stacker crane, power lines, Wi-Fi, etc., but the proportion in this project cost is exceptionally low. High costs make it difficult to auction to get the project, making AS/RS solution providers must calculate and use the equipment properly, optimize personnel costs, and install systems to reduce costs, improve competitiveness.

- The design of the AS/RS warehouse is difficult because there are not enough Vietnamese standards.

Characteristics of AS/RS warehouse is that the higher the efficiency. Some AS/RS warehouses in the world can be up to 20-30m high. Meanwhile, safety standards in construction, high standards for warehouses are lacking, plus standards for electrical safety and automation in Vietnam have not completely reached warehouse parameters. AS/RS, the design, installation, and construction of the warehouse encountered many difficulties and risks, such as having no project approval, no acceptance, no safety certification. This makes it difficult to convince companies in Vietnam.

- Difficult to convince businesses that have a need to improve their warehouse.

A major warehouse renovation to become an AS/RS warehouse can range from millions of dollars to tens of millions of dollars. It is exceedingly difficult to invest such a large amount of money for Vietnamese enterprises or even foreign-invested enterprises because the capital recovery is long and takes a long time to evaluate the effectiveness. In addition, currently in Vietnam, only Vinamilk warehouse in Binh Duong is the complete AS/RS warehouse system. Therefore, very few enterprises in Vietnam know about this AS/RS system to evaluate the feasibility and effectiveness. Finally, the confidence in the qualifications of domestic engineers and the stability of smart devices in the AS/RS warehouse system of enterprises is not high, so it is difficult to convince enterprises to invest in the system. big system.

- Installation, commissioning, and testing were difficult due to lack of experience.

AS/RS warehouse system has just appeared for more than twenty years, so almost Vietnamese engineers do not have much experience in surveying, designing, consulting, installing, and operating. AS/RS warehouse opening faced many difficulties. In addition, the AS/RS warehouse system is a large, complex, interdisciplinary system between mechanics - information technology - automation, so it requires many engineers from the above industries, with good coordination and a lot of experience.

- High costs of hiring and training personnel to operate and maintain the system.

The operation and maintenance of AS/RS warehouse system requires highly qualified, well-trained, disciplined compliance workers and maintainers. This makes businesses must invest a large amount of money and in a methodical way to recruit highly qualified personnel, to train knowledge and skills to operate and maintain the system. In addition, the design consultant and equipment supplier must also have a plan to train the staff in a methodical, scientific, complete manner, but also brief and easy to understand. This requires a lot of time, effort, and cost, not all investors are ready to fully implement and not all consulting units are capable and experienced.

6. CONCLUSION

Industrial AS/RS warehouses have been researched and applied in the world for more than 70 years. However, this system has only appeared in Vietnam in the past 20 years. This solution is applied in many other industries and economic fields to improve service productivity, reduce manpower costs and manage warehouse storage, reduce storage area and accuracy for delivery. products, such as: tobacco, alcohol, beverage, pharmaceutical, and chemical factories; supermarket; ecommerce; parcel courier; etc.

In Vietnam, for the past few years, due to the need to modernize the fields of production and trade, the need for industrial AS/RS warehouse solutions has appeared and thrived. Some businesses have applied this model and gave good results, typically Vinamilk company with AS/RS warehouse in Binh Duong province, etc.

Currently, most of Vietnamese enterprises have handcrafted warehouses, employing a lot of manpower, and forklifts, so they are ineffective and cost large. For these warehouses, the application of AS/RS warehouse solutions will be more efficient and cost-effective. Therefore, the development of AS/RS warehouse solutions is an urgent issue and has great potential in terms of science, technology, and economics, opening up new development directions for the National Institute of Mechanical Engineering.

7. ACKNOWLEDGMENTS

I would like to sincerely thank my colleagues at NARIME, the leaders of LIX Binh Duong and the lecturers at the National Economics University for helping me to complete this report.

8. REFERENCES

- [1] National Research Institute of Mechanical Engineering, (2020), Dossier proposing the technical part of designing, supplying, manufacturing, installing automatic loading and unloading system and AS/RS warehouse of LIX Binh Duong detergent,
- [2] National Research Institute of Mechanical Engineering, (2020), Dossier proposing the financial part of designing, supplying, manufacturing, installing automatic loading and unloading system and AS/RS warehouse of the company for the cost of washing powder LIX Binh Duong.

IMPROVING THE LOGISTICS PERFORMANCE OF LAST MILE DELIVERY IN E-COMMERCE BY OPTIMIZING PARCEL LOCKERS AND TRAVELING SALESMAN PROBLEM

Nguyen Thi Xuan Hoa^{1 (*)}, Vu Hai Anh², Nguyen Duc Viet Ha³

^{1 2 3} Industrial Management Department, School of Economics and Management,
Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author. Email: hoa.nguyenthixuan@hust.edu.vn

Abstract

As recent growth of e-commerce, logistics plays a very important role to improve customer's satisfaction. Last-mile product delivery (LMD) is the last stage of the supply chain, where the ordered product is delivered to the final consumer's location. The traveling salesman problem (TSP) is a well-known combinatorial optimization problem in LMD. In this problem, the salesman wants to minimize the tour length when visiting all the cities in his visiting list. This method helps to reduce cost and improve service quality for e-commerce. In addition, parcel lockers is an effective solution for e-commerce in technology era 4.0.

In this research, we combine both traveling salesman problem and parcel lockers to increase efficiency in LMD. This method will help to answer the question of how to deliver faster, cheaper cost, more convenient to pick up and be environmentally friendly. The results prove clearly that salesman could reduce 57,8% of total distance, customers to pick-up e-purchased goods from designated 24 hour and we reduces the number of traffic jams and noise associated with transport, and thus reduces emissions.

Keywords: e-commerce, last-mile delivery (LMD), traveling salesman problem (TSP), parcel locker.

1. INTRODUCTION

With social media growing exponentially in recent years, the conversation between businesses and consumers has become more engaging, making it easier for transactional exchanges to happen online. E-commerce becomes more popular and brings many benefits for both customers and sellers. Electronic commerce or e-commerce refers to a wide range of online business activities for products and services. It also pertains to "any form of business transaction in which the parties interact electronically rather than by physical exchanges or direct physical contact. E-commerce is usually associated with buying and selling over the Internet, or conducting any transaction involving the transfer of ownership or rights to use goods or services through a computer-mediated network. Though popular, this definition is not comprehensive enough to capture recent developments in this new and revolutionary business phenomenon. A more complete definition is E-commerce is the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals.

From customer viewpoint e-commerce brings benefit for customers as follows:

- Reduced transaction costs for participating exchange in a market.
- Increased comfort - transactions with 24 hours a day, without requiring the physical interaction with the business organization.
- Saved time, can buy or sell any product at any time with the help of internet.
- Make convenience, all the purchases and sales can be performed from the comfort sitting a home or working place or from the place a customer wants to.

From sellers' point of view, benefits of e-commerce include as below:

- Increases revenue.
- Reduces operation and maintenance costs.
- Reduces purchase and procurement costs.
- Reduces transportation costs.
- Improves speed of the process of selling.

Therefore, E-commerce is booming and is an inevitable development trend in the future. However, online buying and selling cannot eliminate the traditional shipping process. E-commerce wants to thrive,

indispensable with quality logistics and delivery services. However, the current logistics systems of e-commerce enterprises are not efficiency in term of Logistics performance. The process of planning, implementing, and controlling the flow and storage of goods, services, and related information from point of origin to point of consumption conforming to customer’s requirements is not really well performed.

The relatively high proportion of costs spent on logistics and courier services in the online selling prices of tangible products is one of the factors that lead to significantly lower prices for online purchases compared to traditional purchases. At the same time, the quality of the courier service is not high. According to a survey by the Department of E-Commerce and Information Technology about obstacles in online shopping, up to 40% of consumers said that buying prices online are not lower than buying directly.

Last-mile delivery is most important to decide the development and competition with other commercial forms. As research of Consumer study of Rob Taylor (2019) showed about the expectations of consumers on last-mile delivery statistics that:

- 93% of consumers want to stay informed throughout delivery process, from first mile to last-mile delivery,
- 47% of consumers will not order again from a brand that offers poor delivery visibility,
- 44% of consumers accept that brands are not creating a positive delivery experience,
- 98% of consumers accept that delivery is a key part of brand loyalty.

Parcel locker is an extremely efficient method to improve logistics performance. This method allows shippers to only travel a short distance because they just need to fill the goods in some specific locations instead of directly delivery to customers. Many countries apply it and receive great results. However, it is challenging to find which place to build lockers or how to find the shortest tour for all lockers.

Therefore, this paper will aim at a new method to improve efficiency in last mile delivery, minimize transportation costs, as well as negative environmental impacts. From there, it will help e-commerce thrive and compete well with other commercial markets.

2. LITERATURE REVIEW

2.1. Last mile delivery in urban area

Last mile is a term used in supply chain management and transportation planning to describe the movement of people and goods from a transportation hub to a final destination or customer. It is evident that transportation goods via rail network or shipping is often efficient and

cost-effective. However, when the goods are transported to station or port which have high capacity, we face a new challenge that how to distribute goods to their final destinations. According to Capgemini Research Institute, last mile delivery holds 41% of the total cost to move goods. This proportion could be more in the city center which have complex transportation network, and traffic congestion. For example, big cities in Vietnam like Ha Noi or Ho Chi Minh are suffering quite often from traffic congestion. During the day, it is almost impossible to travel across the city without witnessing traffic jam, meaning that warehouse units on one side of the city can serve only particular areas. Congestion is even more severe in other cities; the chart below shows Top 25 Global Congested Cities: increase in travel times compared with free-flowing traffic (minutes) (Kevin Mofid, 2019).

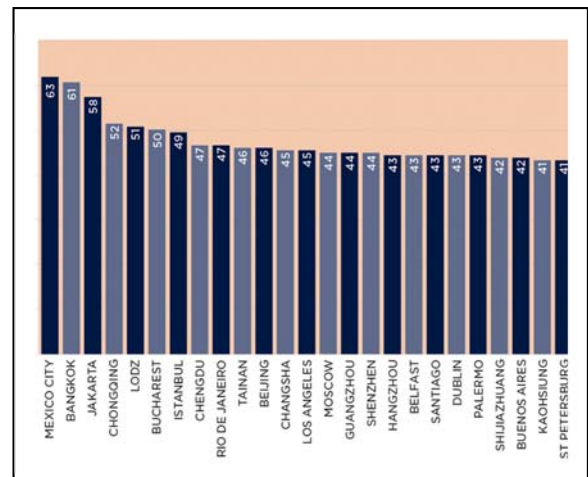


Fig.1: Top 25 Global Congested Cities
(Kevin Mofid, 2019)

Thus, the last mile problem could also include the challenge of delivering in the urban area. Delivers to retail stores, restaurants, and other merchants in a central business district often contribute to congestion and safety problems (Marcia S. Scott, 2019; Allen Brigitte, 2012).

Moreover, people’s shopping habit is changing rapidly, they have the tendency to make purchase online due to the affection of COVID-19 and social distancing. U.S. retailers' online year-over-year (YoY) revenue growth is up 68% as of mid-April, surpassing an earlier peak of 49% in early January. There has been a 129% year-over-year growth in U.S. & Canadian e-commerce orders as of April 21 and an impressive 146% growth in all online retail orders (Louis Columbus-Forbes, 2020). The role of last mile delivery is more significant as the demand of online shopping increases. Last mile deliveries are one of the major effectors of heavy traffic of commercial vehicles in the urbans. Their essential features,

significantly lowering the rational functioning of the transport system, include high degree of fragmentation and low range of use of the cargo load compartment of vehicles. The importance of this type of deliveries grows with the increasing interest in remote shopping (Stanislaw et al., 2015).

Nowadays, place, cost, time are not the only concerns in delivery but also environment issue. Environment is the important factor that we must concerns since climate change had seriously observable effects on the environment. The last mile delivery stands out from the crowd by being known as the highest cost and polluting segment of the supply chains. Jay.R. Brown and Alfred L. Guiffrida (2014) compared carbon emissions resulting from conventional shopping involving customer pickup with trip chaining versus e-commerce-based online retailing involving last mile delivery to customers' homes.

2.2. Apply parcel locker in logistics

A few company had take parcel locker into their consideration as a logistics solution. DHL has a network of 340,000 lockers in Germany and major UK fashion brands like ASOS utilizes them to let customer return products anytime they want. Sportswear brand Decathlon also installed 1,500 lockers to support its click-and-collect delivery option (Minh An, 2019). This phenomenon rased researcher concern for deeply analyze the new technological solution. Kum Fai Yuen et al. (2019) survey data were collected from 230 smart locker users in China and analysed using structural equation modelling. The results show that the effects of convenience, privacy security, and reliability on customers' intention are fully mediated by perceived value and transaction costs. Stainislaw et al. (2015) analyzed usability and efficiency of parcel based on the example of Polish InPost Company system and they conclude that the total time is decreased by 25% and 50% by using path length matrix and path time matrix respectively. Enviroment friendly is also the considerable factor of the parcel locker method. CO₂ emission decreased by about 20% by delivering to city collection or locker (Pasquale Carotenuto et al., 2018). Furthermore, Karl Hofer et al. (2020) had a research by using online panel survey in a living lab area, they estimated a reduction potential of 27% for emissions and vehicle kilometres per picked-up/dropped off parcel and a modal shift of 12% from car to environmental friendly transport modes is possible due to the introduction of a parcel locker system.

2.3. Travleing travel salesman problem (TSP) and set covering problem (SCP)

TSP is very well-known in mathematics. There are many approachs and algorithmin solving this problem. Saleem Ramadan (2013) had a research on Reducing

Premature Convergence Problem in Genetic Algorithm: Application on Travel Salesman Problem. Furthermore, excel is also a useful tool to work with TSP. Ramus ramuseen solved many variant TSP, using worksheets and formula in excel. TSP could also be solved by the combination of a special purpose linear programming model, zero-one programming, and Microsoft Excel Solver (Mike.C.Patterson, Bob Harmel, 2003). Similarly, Charles Reville et al., (2010) analyze applications of location set-covering to different situations such as a mobile unit departs from one of the locations to be chosen and picks up the demand, providing service at a still more distant point. Moreover, SCP could be applied in teaching students by using it to solve the location-assignment model. It shows the students how to develop a linear programming spreadsheet model with binary variables to find the minimum number of locations that can cover a particular area (Raida Abuzam, 2014).

3. METHODOLOGY AND MODEL

As the above-mentioned, last mile delivery is the most expensive and time-consuming part in supply chain. Moreover, this part directly interacts with customer, making it become one of the most competitive tools. Thus, Parcel locker stand out to be an effective method. This study's purpose was to implement it properly by using excel solver based on optimization model.

We aimed to work out with 2 questions:

- How to identify the best path to fill all the lockers. This path must have the same start point and finish point?
- What is the most effective way to allocate parcel lockers among the city?

Travel salesman problem (TSP) and set covering problems are very popular optimization model and they are perfectly designed to answer these questions.

3.1. Optimization model

Firstly, we built the optimization model for travel salesman problem (TSP). There are many methods to solve this problem such as branch and bound approach (B&B), Heuristic, integer programming (IP). However, B&B and Heuristics didn't clearly give us general view for the TSP. We must identify the constraints, objective function in order to optimize the model and choose suitable formula in excel solver. Thus, IP was the only approach that meet our requirement by including constraints and objective function.

The integer programming suppose the TSP consists of places 1, 2, 3,... N. For $i \neq j$, let c_{ij} = distance from place i to place j and let $c_{ii} = M$ where M is a very large number.

$$\text{Let } x_{ij} = \begin{cases} 1, & \text{if the solution for TSP goes from} \\ & \text{place } i \text{ to place } j \\ 0, & \text{otherwise} \end{cases}$$

Then the solution to a TSP could be found by solving:

Objective function:

$$\min z = \sum_i \sum_j c_{ij} x_{ij}$$

Constraints:

$$\sum_{i=1}^N x_{ij} = 1 \text{ (for } j=1 \text{ to } N); \text{ (1)}$$

$$\sum_{j=1}^N x_{ij} = 1 \text{ (for } i=1 \text{ to } N); \text{ (2)}$$

$$u_i - u_j + N x_{ij} \leq N - 1 \text{ (for } i \neq j; i=1, 2, \dots, N; \\ j=1, 2, \dots, N); \text{ (3)}$$

$$\text{All } x_{ij} = 0 \text{ or } 1; \text{ All } u_j \geq 0 \text{ (4)}$$

It was evident that the objective function is to minimize the total traveling length. The constraints in equation (1) ensure that we arrive once at each city. The constraints in (2) ensure that we leave each city once. The constraint (3) ensure that any set of x_{ij} 's containing a subtour will be infeasible and any set of x_{ij} containing a tour is feasible, u is the order of a city in that tour or subtour; for example, consider the path 1-3-4-5-2-1, we have $u_1 = 1, u_3 = 2, \dots$. A subtour is a round trip that does not pass all the city. In short, TSP requirements are:

1. Each city is only allowed to arrive and leave once (constraint).
2. The solution must be a tour (constraint).
3. The total trip length is minimized (objective).

With constraints, objectives found, the idea was to put the model in excel solver. However, it is extremely hard and time consuming to type all these constraints function in excel. It may be easier for the small data, however, when encountering the bigger data which can reach up to 30 or even 100 destinations, more efficient way to input the constraints was required. Furthermore, people, who don't study or specialize in applied mathematics, could find this model difficult to understand. Our aim was to create the approach that even a typical worker could easily execute it. We will explain it in experiment section.

There were 3 steps to solve TSP by excel solver:

1. Collect the data (name, distance, ordinal numbers column).
2. Input excel formula.
3. Identify the constraints, variable cells, and objective function for excel solver.

In this study, we collected 28 location located mostly in universities, hospitals, historical sites, markets in Hanoi (Vietnam) due to great accessibility and security. As to the case of TSP, choosing the approach included constraints and objective was our top priority and IP fulfilled that requirement again.

$$x_i = \begin{cases} 1 & \text{if a locker is built in area } i \\ 0 & \text{otherwise} \end{cases}$$

$$x_i \text{ is binary variable, } i=1, 2, \dots, 28$$

Objective function:

$$\text{Min } z = \sum_{i=1}^{28} x_i$$

Constraints:

$$\sum_{i=\text{area having the locker which can response to area } i} x_i \geq 1 \text{ (for area } i)$$

Obviously, objective is to minimize number of lockers built. The constraint ensures that at least one locker is within 2.5 km of each area. In other words, each city has its own constraint and the model have i constraints for i city. For instance, we have lockers in area 3,4 which can response to customers in area 1; the constraint of area 1 can be written as $\sum_{j=1}^{28} x_{13} + x_{14} \geq 1$. To conclude, the set covering requirements are:

1. Minimize number of lockers built.
2. At least one locker is within 2.5 km of each area.

3.2. Solving traveling salesman problem

We solved set covering problems following the same steps as solving TSP by excel solver. There are 3 steps:

- Collect the data (name, distance, ordinal numbers column).
- Input excel formula.
- Identify the constraints, variable cells, and objective function for excel solver.

The only difference is step 2, in contrast to TSP, set covering optimization mentioned above can be easily input into excel by using simple formula like SUM, IF and SUMPRODUCT. SUM and SUM PRODUCT aim to recreate the constraints and objective function in excel, IF function is used to convert all the data which are greater or smaller than 2.5 km to 0 or 1. We will show it clearly in the experiment section

To gain a general view on how we applied the methodology, a process diagram is illustrated below.

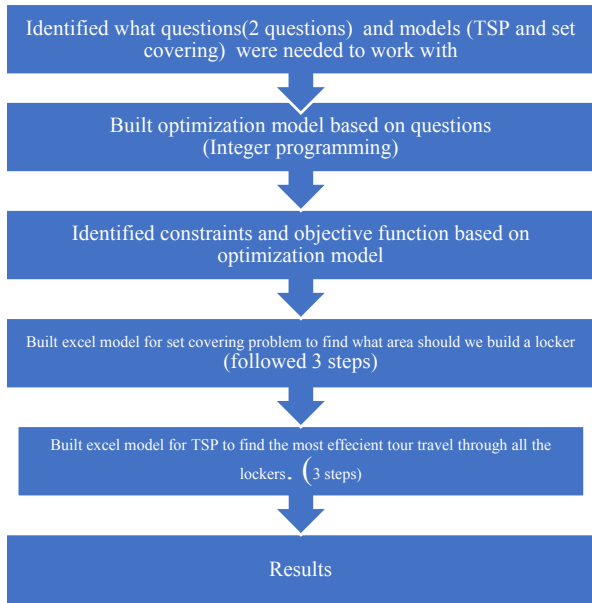


Fig.2: A process diagram

It is obviously that set covering problem and TSP are strongly connected by its function. The former provides the list of location that we can build a locker with respect to a particular requirement (the distance is within 2.5km), while TSP found the shortest tour to visit all the lockers.

4. EXPERIMENT RESULT

4.1. Determine allocation of parcel lockers

We conducted computational experiments on selected instances. We consider a system consisting of one depot and 28 customers who are in 6 districts in Ha Noi. The distance of customers' locations base on Google map. Obtained results are summarized in the table 1.

We suppose that at least one locker is within 2.5 km of each area (equivalent to 5 minutes movement with 30 km/h in urban area). So we can transform the distance matrix to binary matrix with:

$$\begin{cases} 1 & \text{if the distance between 2 places less than or equal 2,5} \\ 0 & \text{otherwise} \end{cases}$$

Obtained results are summarized in the table 2. From the result, the optimized model has been solved with 9 lockers located in “Trung tâm rạp chiếu phim quốc gia”, “Bệnh viện Quân y 354”, “Bảo tàng Lịch sử quân sự Việt Nam”, “Đại học kinh doanh và Công nghệ”, “Công viên Yên Sở”, “Cửa hàng xăng dầu Việt Vương”, “Đại học Thăng Long”, “Khu đô thị Royal City”, “Bảo tàng Phòng không không quân”.

Table 1: Experiment data of depot and customers' locations

DEPARTURE	DESTINATION	Dong Da District				Hoan Kiem District				Ba Dinh District				Hai Ba Trung District				Hoang Mai District				Thanh Xuan District				Warehouse							
		HVPNN	TTCPOG	HVNH	DH	CHNVX	DHD	CDX	DHD	TT PLAZA	HK LAKE	354 HOSPITAL	THCS GV	CXHB	BTLQS VN	HOM MARK	HVNX HOSPITAL	DH KTQD	DH KDCN	YEN SO PARK	Times city	CHND VIET	ROYAL CITY	THD HOOSHOO	BTPKK Q	HVQLG D	DH KHTN	SAI DONG INDUS ZONE					
DONG DA DISTRICT	1 HVPNN	0.00	1.80	3.60	2.50	3.10	6.20	7.40	7.00	6.00	6.80	7.80	3.50	3.30	7.90	5.40	7.20	8.30	5.30	9.80	9.90	9.00	16.20	6.60	3.90	4.70	4.40	6.30	4.70	12.60			
	2 TTCPOG	1.80	0.00	2.40	3.40	1.30	4.40	5.60	5.30	4.30	5.00	6.00	3.80	1.70	5.70	3.70	5.80	6.60	5.40	8.40	9.90	8.20	11.00	8.70	2.90	5.10	3.90	5.90	3.90	12.30			
	3 HVNH	3.60	2.40	0.00	4.70	2.80	3.80	5.20	5.40	4.40	4.70	6.10	5.00	3.50	5.90	3.90	3.90	5.30	2.80	6.50	8.00	6.20	9.10	7.90	1.90	4.30	1.70	3.50	2.90	10.40			
	4 DH GTYT	2.50	3.40	4.70	0.00	3.00	4.90	6.00	5.70	4.70	5.50	6.50	2.30	2.00	6.60	4.10	6.30	7.00	7.40	11.00	13.70	10.00	12.90	10.70	5.10	6.60	5.50	8.00	5.30	12.60			
	5 DH MITCN	3.10	1.30	2.80	3.00	0.00	3.00	5.00	4.70	3.70	4.40	5.40	3.10	1.10	5.10	3.10	4.50	6.00	4.10	7.10	8.60	6.80	9.80	9.40	3.20	5.70	4.00	4.70	4.30	11.00			
HOAN KIEM DISTRICT	6 CHNVX	6.20	4.40	3.80	4.90	3.00	0.00	1.70	2.90	1.40	1.20	2.60	4.80	3.90	3.70	1.70	1.30	2.10	3.50	5.40	7.90	5.00	7.70	9.00	4.50	6.90	4.40	4.00	6.40	8.90			
	7 DHD	7.40	5.60	5.20	6.00	5.00	1.70	0.00	2.40	2.00	0.60	2.10	5.50	4.80	3.70	2.40	1.40	0.80	5.10	4.00	9.60	3.70	6.40	10.60	6.20	8.50	6.40	5.60	7.10	7.60			
	8 CDX	7.00	5.30	5.40	5.70	4.70	2.90	2.40	0.00	1.30	2.20	1.70	4.50	4.90	1.80	2.20	3.60	3.60	5.90	6.50	10.40	6.30	9.10	11.50	6.90	9.20	7.20	6.50	7.80	7.10			
	9 DHD	6.00	4.30	4.40	4.70	3.70	1.40	2.00	1.30	0.00	1.40	1.70	4.20	3.60	2.50	1.10	2.30	3.30	4.60	6.20	9.10	6.20	8.70	10.10	5.40	4.70	5.60	5.20	6.30	7.90			
	10 TT PLAZA	6.80	5.00	4.70	5.50	4.40	1.20	0.60	2.20	1.40	0.00	1.30	4.70	4.10	3.50	1.60	1.10	1.80	4.60	4.70	9.10	4.70	7.30	10.20	5.70	8.20	5.70	5.00	6.70	8.00			
BA DINH DISTRICT	11 HK LAKE	7.80	6.00	6.10	6.50	5.40	2.60	2.10	1.70	1.30	0.00	4.90	4.30	3.70	1.70	1.60	2.30	4.70	5.20	9.40	6.00	7.80	10.40	6.00	8.50	6.20	5.20	7.00	8.50				
	12 354 HOSPITAL	3.50	3.80	5.00	2.30	3.10	4.80	5.50	4.50	4.20	4.70	4.90	0.00	4.30	3.70	1.70	1.60	2.30	4.70	5.20	9.40	9.40	12.90	11.00	5.50	7.40	6.40	8.50	6.40	10.80			
	13 THCS GV	3.30	1.70	3.50	2.00	1.10	3.90	4.80	4.90	3.60	4.10	4.30	4.30	0.00	4.60	2.60	4.80	5.50	5.30	8.30	9.80	8.00	10.90	9.80	4.00	6.20	5.00	5.90	5.00	11.00			
	14 CX HB	7.90	5.70	5.90	6.60	5.10	3.70	3.70	1.80	2.50	3.50	3.70	3.70	4.60	0.00	2.50	3.60	3.70	6.20	6.60	10.70	7.30	9.20	11.70	7.10	9.50	7.50	6.70	8.10	7.20			
	15 BTLQS VN	5.40	3.70	3.90	4.10	3.10	1.70	2.40	2.20	1.10	1.60	1.70	1.70	2.60	2.50	0.00	2.70	3.40	4.40	6.60	8.80	6.50	9.20	9.90	4.70	7.10	5.40	4.90	5.70	8.50			
HBT DISTRICT	16 HOM MARK	7.20	5.80	3.90	8.30	4.50	1.30	1.40	3.60	2.30	1.10	1.60	1.60	4.80	3.60	2.70	0.00	1.70	4.10	4.20	8.60	4.10	6.80	9.60	5.20	7.50	5.40	4.40	6.10	8.10			
	17 HVNX HOSPITAL	8.30	6.60	5.30	7.00	6.00	2.10	0.80	3.60	3.30	1.80	2.30	2.30	5.50	3.70	3.40	1.70	0.00	5.10	2.90	9.50	2.70	5.60	10.60	7.00	9.40	5.90	5.20	8.00	6.80			
	18 DH KTQD	5.30	5.40	2.80	7.40	4.10	3.50	5.10	5.90	4.60	4.60	4.70	4.70	5.30	6.20	4.40	4.10	5.10	0.00	4.60	5.50	4.60	8.10	6.00	3.30	5.70	2.40	1.60	4.30	9.40			
	19 DH KDCN	9.80	8.40	6.50	11.00	7.10	5.40	4.00	6.50	6.20	4.70	5.20	5.20	8.30	6.60	6.60	4.20	2.90	4.60	0.00	8.20	1.60	3.70	10.10	8.10	10.50	7.20	6.70	9.10	6.70			
	20 YEN SO PARK	9.90	9.90	8.00	13.70	8.60	7.90	9.60	10.40	9.10	9.10	9.40	9.40	9.80	10.70	8.80	8.60	9.50	5.50	8.20	0.00	7.20	6.20	7.60	9.40	10.60	8.50	6.40	12.10	9.60			
HOANG MAI DISTRICT	21 Times city	9.00	8.20	6.20	10.00	6.80	5.00	3.70	6.30	6.20	4.70	6.00	9.40	8.00	7.30	6.50	4.10	2.70	4.60	1.60	7.20	0.00	4.60	9.10	7.20	10.30	6.20	5.50	8.10	5.70			
	22 CHND VIET																																
	23 VUONG	16.20	11.00	9.10	12.90	9.80	7.00	6.40	9.10	8.70	7.30	7.80	12.90	10.90	9.20	9.20	6.80	5.60	8.10	3.70	6.20	4.60	0.00	10.60	10.80	12.60	3.00	2.40	0.00	11.80	7.90	11.80	7.90
	24 DH TL	6.60	8.70	7.90	10.70	9.40	9.00	10.60	11.50	10.10	10.20	10.40	11.00	9.80	11.70	9.90	9.60	10.60	6.00	10.10	7.60	9.10	10.60	0.00	5.00	3.00	5.30	7.40	4.20	16.10	16.10		
	25 ROYAL CITY	3.90	2.90	1.90	5.10	3.20	4.50	6.20	8.90	5.40	5.70	6.00	5.50	4.00	7.10	4.70	5.20	7.00	3.30	8.10	9.40	7.20	10.80	5.00	0.00	2.40	2.30	4.40	1.00	12.60	12.60		
THANH XUAN DISTRICT	26 THD HOOSHOO	4.70	5.10	4.30	6.60	5.70	6.90	8.50	9.20	7.70	8.20	8.50	7.40	6.20	9.50	7.10	7.50	9.40	5.70	10.50	10.60	10.30	12.60	3.00	2.40	0.00	3.90	6.00	2.70	15.50	15.50		
	27 BTPKK Q	4.40	3.90	1.70	5.50	4.00	4.40	6.40	7.20	5.60	5.70	6.20	6.40	5.00	7.50	5.40	5.40	3.90	2.40	7.20	8.50	6.20	11.80	5.30	2.30	3.90	0.00	2.10	3.30	11.00	11.00		
	28 HVQLG D	6.30	5.90	3.50	8.00	4.70	4.00	5.60	6.50	5.20	5.00	5.20	8.50	5.90	6.70	4.90	4.40	5.20	1.60	6.70	8.40	5.50	7.90	7.40	4.40	6.00	2.10	0.00	4.90	10.90	10.90		
	29 DH KHTN	4.70	3.90	2.90	5.30	4.30	6.40	7.10	7.80	6.30	6.70	7.00	6.40	5.00	8.10	5.70	6.10	8.00	4.30	9.10	12.10	8.10	11.80	4.20	1.00	2.70	3.30	4.90	0.00	13.20	13.20		
	WAREHOUSE	29 SAI DONG INDUS. ZONE	12.60	12.30	10.40	12.60	11.00	8.90	7.60	7.10	7.90	8.00	8.50	10.80	11.00	7.20	8.50	8.10	6.80	9.40	8.70	9.60	5.70	7.90	16.10	12.60	15.50	11.00	10.90	13.20	0.00		

Table 2: Binary matrix of customers' location

		Dong Da District					Hoan Kiem District					Ba Dinh District					Hai Ba Trung District					Hoang Mai District					Thanh Xuan District						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28				
Departure	Destinations	HVP NVN	TTCPQG	HVN H	DH GTV	DH MTCN	CHNV	DHD	CDX	DHD	TT PLAZA	HK LAKE	354 HOSPTAL	THCS GV	CX HB	BTLSQSVN	HOM MARK	HNVX HOSPITAL	DH KTCN	YEN SO PARK	Times city	CHXD VIET VUONG	DH TL	ROYAL CITY	THD HIGH SCHOOL	HIG HSHOOL	BTPKKQ	HV QLD	DH KHTN	total lockers	constraints		
		variable	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	1	1	0	1	0	0	0	0		
Dong Da District	1 HVP NVN	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1		
	2 TTC PQG	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1		
	3 HVNH	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	3	1	1		
	4 DH GTVT	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1		
	5 DH MTCN	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1		
Hoan Kiem District	6 CHNVX	0	0	0	0	1	1	0	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1			
	7 DHD	0	0	0	0	0	1	1	1	1	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1			
	8 CDX	0	0	0	0	0	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1			
	9 DHD	0	0	0	0	0	1	1	1	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1			
	10 TT PLAZA	0	0	0	0	1	1	1	1	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1			
Ba Dinh District	11 HK LAKE	0	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1			
	12 354 HOSPITAL	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	2	1	1			
	13 THCS GV	0	1	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1			
	14 CX HB	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1			
	15 BTLSQSVN	0	0	0	0	1	1	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	1	1			
Hai Ba Trung District	16 HOM MARK	0	0	0	0	1	1	0	1	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1			
	17 HNVX HOSPITAL	0	0	0	0	1	1	0	0	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1			
	18 DH KTQD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	1			
	19 DH KDCN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	1			
	20 YEN SO PARK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1			
Hoang Mai District	21 Times city	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	1			
	22 CHXD VIET VUONG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1			
	23 DH TL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1			
	24 ROYAL CITY	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1			
	25 THD HIGH SCHOOL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1		
Thanh Xuan District	26 BTPKKQ	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	1			
	27 HVQLGD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	1			
	28 DH KHTN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1			
	Objective function		= 9																														

4.2. Identify the best path to fill all the lockers.

After find the optimal locker's location, we could summarize the data in the table 3. To find the best path to fill all lockers, we use the input data as the table 4. Based on optimal solution result which is presented below, total distance needed to travel was 48,7 km. From the optimization result of number of parcel lockers and optimal travelling distance, we see that the optimization

model has improved the logistics performance. In this case total traveling distance reduces from 115.5 km to 48.7 km, which improves 57.8%. If, we apply the travelling salesman problem only, the total distance reduces 28.1% as shown in table 7. Therefore, this research apply both travelling salesman problem and parcel locker to optimize the total travel distance, which contribute to improve the logistics performance of e-commerce company.

Table 3: Depot and locker distances matrix

Departure	1	2	3	4	5	6	7	8	9	10
Destination	TTCPQG	354 HOSPITAL	BTLSQSVN	DH KDCN	YEN SO PARK	CHXD VIET VUONG	DH TL	ROYAL CITY	BTPKKQ	SAI DONG INDUS. ZONE
TTCPQG	0	3.8	3.7	8.4	9.9	11	8.7	2.9	3.9	12.3
354 HOSPITAL	3.8	0	1.7	5.2	9.4	12.9	11	5.5	6.4	10.8
BTLSQSVN	3.7	1.7	0	6.6	8.8	9.2	9.9	4.7	5.4	8.5
DH KDCN	8.4	5.2	6.6	0	8.2	3.7	10.1	8.1	7.2	6.7
YEN SO PARK	9.9	8.4	9.8	8.2	0	6.2	7.6	9.4	8.5	9.6
CHXD VIET VUONG	11	12.9	9.2	3.7	6.2	0	10.6	10.8	11.8	7.9
DH TL	8.7	11	9.9	10.1	7.6	10.6	0	5	5.3	16.1
ROYAL CITY	2.9	5.5	4.7	8.1	9.4	10.8	5	0	2.3	12.6
BTPKKQ	3.9	6.4	5.4	7.2	8.5	11.8	5.3	2.3	0	11
SAI DONG INDUS. ZONE	12.3	10.8	8.5	6.7	9.6	7.9	16.1	12.6	11	0

Table 4: Distance from depot to parcel lockers

NAME	PLACE	DISTANCE	STOPS	SAI DONG INDUS. ZONE	
TTCPQG	1	3.8	1	10	0
354 HOSPITAL	2	1.7	2		
BTLSQS VN	3	6.6	3		
DH KDCN	4	8.2	4		
YEN SO PARK	5	6.2	5		
CHXD VIET VUONG	6	10.6	6		
DH TL	7	5	7		
ROYAL CITY	8	2.3	8		
BTPKKQ	9	11	9		
SAI DONG INDUS. ZONE	10	0	10		
TOTAL DISTANCE	55.4				

Table 5: Optimal travelling distance with parcel lockers

NAME	PLACE	DISTANCE	STOPS	SAI DONG INDUS. ZONE	
SAI DONG INDUS. ZONE	10	6.7	1	10	1
DH KDCN	4	3.7	2		
CHXD VIET VUONG	6	6.2	3		
YEN SO PARK	5	7.6	4		
DH TL	7	5.3	5		
BTPKKQ	9	2.3	6		
ROYAL CITY	8	2.9	7		
TTCPQG	1	3.8	8		
354 HOSPITAL	2	1.7	9		
BTLSQS VN	3	8.5	10		
OBJECTIVE FUNCTION	48.7				

Table 6: Total distance before apply optimization model

NAME	PLACE	DISTANCE	STOP	CHECK SAI DONG INDUS. ZONE
HVPNVN	1	1.80	1	29
TTCPQG	2	2.40	2	
HVNH	3	4.70	3	
DH GTVT	4	3.00	4	
DH MTCN	5	3.00	5	
CHNVX	6	1.70	6	
DHD	7	2.40	7	
CDX	8	1.30	8	
DHD	9	1.40	9	
TT PLAZA	10	1.30	10	
HK LAKE	11	4.90	11	
354 HOSPITAL	12	4.30	12	
THCS GV	13	4.60	13	
CX HB	14	2.50	14	
BTLSQS VN	15	2.70	15	
HOM MARK.	16	1.70	16	
HNVX HOSPITAL	17	5.10	17	
DH KTQD	18	4.60	18	
DH KDCN	19	8.20	19	
YEN SO PARK	20	7.20	20	
Times city	21	4.60	21	
CHXD VIET VUONG	22	10.60	22	
DH TL	23	5.00	23	
ROYAL CITY	24	2.40	24	
THD HIGHSHOOL	25	3.90	25	
BTPKKQ	26	2.10	26	
HVQLGD	27	4.90	27	
DH KHTN	28	13.20	28	
Sai Dong Indu. Zone	29	0.00	29	
Sai Dong Indu. Zone	29			
OBJECTIVE FUNCTION		115.50		

Table 7: Total distance after applying travelling salesman problem

Name	Place	Distance	Stop	Check Sai Dong Indus. Zone	
Sai Dong Indu. Zone	29	6.80	1	29	1
HNVX Hospital	17	0.80	2		
DHD	7	2.10	3		
HK Lake	11	1.60	4		
Hom Mark.	16	1.10	5		
TT Plaza	10	1.20	6		
CHNVX	6	4.40	7		
BTPKKQ	26	3.30	8		
DHKHTN	28	1.00	9		
Yoyal city	24	1.90	10		
HVNH	3	3.60	11		
HVPNVN	1	1.80	12		
TTCPQG	2	1.30	13		
DHMTCN	5	1.10	14		
THCS GV	13	2.00	15		
DH GTVT	4	2.30	16		
354 Hospital	12	1.70	17		
BTLSQS VN	15	1.10	18		
CHD	9	1.30	19		
CDX	8	1.80	20		
CXHB	14	4.60	21		
DH TL	23	10.60	22		
HVQLGD	27	5.00	23		
CHXD VV	22	2.40	24		
Yen So Park	20	3.90	25		
THPT THD	25	2.10	26		
ĐHKQTQD	18	4.90	27		
ĐHKDCN	19	1.60	28		
Times city	21	5.70	29		
Sai Dong Indus. Zone	29				
	Objective	83.00			

5. CONCLUSIONS

This research has been motivated by the importance of last mile delivery in logistics system which is the essential part of e-commerce industry. Last mile delivery determines customer service's quality due to its direct interaction with end-customers. Furthermore, this process holds the considerable proportion of cost and CO₂ emission compared with other activities in supply chain, making it becomes a main factor in both financial and environment aspects. Thus, improving last mile delivery performance is the main objective of this study. If we can somehow optimize this last segment, we will be able to fulfil 3 targets (customers services, environment, finance) at once. Our groups came up to the idea of using parcel locker which have been applied to several countries. However, the challenging of this method is how to implement it, which is can be solved by answering 2 questions "Where should we put the lockers?" and "How can we travel through all the lockers". TSP and set covering problem are well-known in mathematics and they are perfectly designed to answer the above-mentioned questions. The most remarkable point in this study are combinations of optimization model and excel model, set covering and TSP. Optimization model provides constraints and objective functions to build excel model following 3 steps. Set covering sort the given list of possible locker location by distance within them, while TSP finds minimized distance of traveling through all the lockers.

We worked with a group of data containing 28 real locations in Hanoi, the point-to-point distance was measured by google map. We applied the method and the result is 48.7 km and points needed to travel through was 9 point instead of 28. This outcome shows that our model has effectively solved the problem due to decrease in lockers to place and solve. Moreover, cost and CO₂ emission could considerably fall because the number of lockers was cut down to half of quantity and the distance was minimized by TSP. The downside of this study is that excel solver can only solve up to 200 variables and 100 constraints. Thus, more advanced solver may be required for bigger data.

6. REFERENCES

- [1]. Abdul Gaffar Khan (2016), "Electronic Commerce: A Study on Benefits and Challenges in an Emerging Economy", *Global Journal of Management and Business*, Vol. 16 (1), 19-22.
- [2]. Anjali Gupta, (2014) "E-commerce: role of e-commerce in today's business", *International Journal of Computing and Corporate Research*, Vol. 4(1).
- [3]. Allen Brigitte, (2012), Improving freight efficiency within the 'last mile': A case study of Wellington's Central Business District, Thesis, Master of Planning – University of Otago.
- [4]. Charles Revelle, Constantine Toregas, Louis Falkson, (2010) "Applications of Location Set-Covering Problem", *Geographical Analysis*, Vol. 8 (1), 65-76.
- [5]. Jay R. Brown & Alfred L. Guiffrida, (2014) "Carbon emissions comparison of last mile delivery versus customer pickup", *International Journal of Logistics Research and Applications*, Vol.14 (6), 503-521.
- [6]. Karl Hofer, Stefan Flucher, Martin Fellendorf, Michael Schadler, Nober Hafner (2020) "Estimation of Changes in Customer's Mobility Behaviour by the Use of Parcel Lockers", *Transportation Research Procedia*, Vol. 47, 425-432.
- [7]. Kevin Mofid (2019) "Challenges facing urban logistics", <https://www.savills.com/impacts/market-trends/challenges-facing-urban-logistics.html>
- [8]. Kum Fai Yuen, Xueqin Wang, Fei Ma, Yiik Diew Wong, (2019) "The determinants of customers' intention to use smart lockers for last-mile deliveries", *Journal of Retailing and Consumer Services*, Vol. 49, 316-326.
- [9]. Marcia S. Scott, (2009), "Improving Freight Movement in Delaware Central Business Districts, Institute for Public Administration College of Education & Public Policy, University of Delaware.
- [10]. Mike. C. Patterson, Bob Harmel (2003), "An Algorithm for Using Excel Solver for the Traveling Salesman Problem" (2003), *The Journal of Education for Business*, Vol. 78(6), 341-346.
- [11]. Minh An (2019) "Parcel lockers have great potential in Vietnam's delivery industry: JLL", <http://hanoitimes.vn/parcel-lockers-have-great-potential-in-vietnams-delivery-industry-jll-45611.html>
- [12]. Louis Columbus-Forbes (2020), How COVID-19 Is Transforming E-Commerce; <https://www.forbes.com/sites/louiscolombus/2020/04/28/how-covid-19-is-transforming-e-commerce/#25a9863544f2>

- [13]. Pasquale Carotenuto et al., (2018) "Comparison of various urban distribution systems supporting ecommerce. Point-to-point vs collection-point-based deliveries", *Transportation Research Procedia*, Vol.30, 188-196
- [14]. Raida Abuzam, (2014), "The Potential Deployment Of Set Covering And Location-Assignment Model: The Case Of Locating Trauma Centers At The Midwest Region", *Journal of Business Case Studies*, Vol. 10 (4), 395.
- [15]. Rasmus Rasmussen, (2011) "TSP in Spreadsheets – a Guided Tour", *Journal of Computer and Information Science*, Vol. 6, 47-57.
- [16]. Rob Taylor, (2019), "How a lack of delivery visibility produces frustrated customers", *Digital Commerce 360*,
<https://www.digitalcommerce360.com/2019/04/05/how-a-lack-of-delivery-visibility-produces-frustrated-customers/>
- [17]. Stanisław Iwan, Kinga Kijewska, Justyna Lemke, (2016) "Analysis of parcel lockers' efficiency as the last mile delivery solution – the results of the research in Poland", *Transportation Research Procedia*, Vol. 12, 644-655.
- [18]. Saleem Ramadan, (2013) "Reducing Premature Convergence Problem in Genetic Algorithm: Application on Travel Salesman Problem". *Computer and Information Science*, Vol.6 (1).
- [19]. Tim Bridges et al., (2019) "The last-mile delivery challenge", *Capgemini Research Institute*.
- [20]. Yulia Vakulenko, Daniel Hellstrom, Klas Hjort, (2018) "What's in the parcel locker? Exploring customer value in e-commerce last mile delivery", *Journal of Business Research*, Vol. 18, 421-427.

SERVICE FAILURES IN HIGHER EDUCATION: A CASE STUDY OF NATIONAL ECONOMICS UNIVERSITY

Nguyen Minh Hoa^{1*}, Do Thi Dong²

^{1 2} Faculty of Business Management, National Economics University, Hanoi, Vietnam

*Corresponding author: minhhoa@neu.edu.vn

Abstract

The study investigates the magnitude of service failures and students' responses to problems in higher education context. The paper begins with literature reviews on service failures and customers' responses in higher education sector. By using critical incident technique (CIT), the study identifies and classifies common service failures, which lead to student dissatisfaction. A comprehensive list of 29 types of service failures grouped into seven categories was developed for higher education service. The categories include teaching, examination, library, computer lab, administration, infrastructure, and miscellaneous. A questionnaire was designed to investigate how students in National Economics University in Vietnam identify, assess the magnitude of service failures and respond to service problems. The result of a survey with 186 observations revealed that 98.9% of respondents said they had been faced with at least one of the listed service failures in the questionnaire. Among seven categories, service failures relating to administration and teaching ranked the top two in terms of magnitude. In addition, students' responses to service problems are found to be different. The paper came up with some implications to improve service.

Keywords: customer attitude, service failure, service quality, the magnitude of service failure.

1. INTRODUCTION

Although the first law in delivering service is: Do it right at the first time, service failure is inevitable due to various internal and external elements of service organizations. Breakdowns can be happened in many service encounters. The main reasons leading to such situation are characteristics of services, such as people involvement, stimulus processing and heterogeneity and perishability. Types of service failures are varied and bring about negative feeling from customer (Zeithaml et al., 2017). However, customers' responses to service failure are very different, researches showed that on average, only 5%-10% of customers who has been unhappy with a service actually complain (Tax and Brown, 1998).

Realizing the importance of managing service failure and recovery, a large number of researches relating to the issues have been conducted in vary sectors such as online retailing (Holloway and Sharon, 2003), hotel industry (Lewis and McCann, 2004), banking (Matos et al., 2013), etc. Nevertheless, there are neglected researches examining service failure and the way customers respond in higher education service.

Recently, higher education service becomes increasingly competitive in Vietnam, with the development of private colleges and new and innovative programs. That put the

education service under pressure of improving service quality to increase student satisfaction. Identification and investigation types and the magnitude of service failures in higher education will contribute the important evidences to education organizations to develop appropriate service recovery strategies and thus, enhance service quality.

This paper investigates types and magnitude of service failures and students' responses to service problems. The paper begins with literature reviews on service failure and customers' responses to problems of higher education service. In order to get insight into a specific higher education service, National Economics University (NEU) in Vietnam was chosen as a case study. Critical incident technique (CIT) is then adopted to identify and classify common service failures leading to student dissatisfaction at NEU. After that, a survey questionnaire is applied to discover students' assessment of service failures' magnitude and students' responses to service problems. The paper concludes with some implications to reduce service failures.

2. CONCEPTUAL FRAMEWORK

2.1. Service failure in higher education

A service failure is generally described as service performance that falls below a customer's expectation in such a way that leads to customer dissatisfaction

(Zeithaml et al., 2017). From customers' perspective, Lewis and Spyropoulos (2015) defined service failure is any dissatisfaction and problem that customer perceives in relation to a service or service provider, regardless of sources of causes. They also pointed out that quality-driven service organization, however, will find themselves in situations where failures occur in their encounters with customers.

Service failure left unfixed problems can result in dissatisfied customers, customer leaving, negative word-of-mouth and losing profits. However, service failure can also be considered from the bright side. Customers who complain give firm a chance to correct problems (including some the firms may not even know they have), restore relationships with the complainer, and improve future satisfaction for all customer (Wirtz & Lovelock, 2018).

Desai et al. (2001) argued that "teaching in a higher educational setting is analogous to service delivery in the business sector. Students, as consumers of professorial output, have needs and wants, which, if better understood, should result in an improved educational experience". The success of any colleges depends on the effort of both students as customers and teachers/ non-teaching staffs as service employees (Cooper, 2007).

Chahal and Devi (2013) classified service failures in education sector into seven categories, including teaching, examination, library, laboratories, administration, infrastructure and miscellaneous such as canteen and hostel facilities. Based on previous researches, Voss et al. (2010) confirm three incident groups in student - professor encounters, namely: Group I, Group II and Group III. Group I is professors' response to service delivery system failure. For example, inability to respond to students' questions, non-availability of faculty during office hours, absent/late arrival in scheduled meeting with student/s, poor presentation, fast communication, and poor writing skills (Chahal and Devi, 2015). Group II is service failures which related to faculty's response to students' needs and requirements. To illustrate, unwilling to assist the student in solving education - related problems, not responding to the request of student for additional lectures (Chahal and Devi, 2015). Group III is un-promoted and unsolicited professors' action. Typical failures related to professor's actions are lacking ability to control his/her temper and impatient or rude behaviors. Iyer and Muncy (2008) gave some examples of service failures related to examination, such as ambiguous exam questions, mis-graded exam answers, and misreported grades.

2.2. The magnitude of service failure

The magnitude of service failure (also called service failure severity) refers to a customer intensity of a

service problem, the more intense or severe the service failure, the greater customer's perceived loss (Weun et al., 2004). The magnitude of service failure can be classified into high, medium and low levels (Singhal et al., 2013). Prior studies have suggested that identify service failure and understanding the magnitude of service failure is the key to address service problems (Krishna et al., 2011, Webster and Sundaram, 1998, Tax and Brown, 1998). Weun et al. (2004) also indicated that despite of adequate service recovery process and outcomes, a severe service failure will produce a perceived loss even when a sufficient recovery has taken place. As the service problem becomes more severe, the customers' tolerance zone gets narrower, thus increasing the potential for customer dissatisfaction (Hoffman et al., 1995). Previous researches (Butter and Burton, 2006, Weun et al., 2004) have warned about the negative effects of severe service failures on provider's reliability, customers' trust and confidence in a service firm and future relationship between customers and organization. Therefore, analyzing the magnitude of service failure is the key to employ appropriate recovery actions and mitigate negative impacts of failure on customer satisfaction.

2.3. Students' responses to service failures

Customer can respond to service failure in variety of ways, including complaint actions and non-complaint actions (Zeithaml et al., 2017, Kim et al., 2003). Complaint actions can be divided in three types: (1) complain to provider, (2) negative word-of-mouth, (3) third-party actions (Zeithaml et al., 2017, Wirtz & Lovelock, 2018). Nevertheless, Wirtz & Lovelock (2018) also indicated that most people decide not to complain, especially if they think it will do no good. Many customers are unwilling to talk about his/her dissatisfaction experiences to service provider due to time limitation, customer personality or reputation of provider, etc. Customers who do not complain are not very likely to return, that is a threat to future success of service firms (Zeithaml et al., 2017).

Bougie et al. (2005) showed that angry customers often tell many other people about their problems. Dissatisfied consumers tell more people about their negative experiences comparison to satisfied customers (Matos et al., 2009). Today, thanks to the development of the Internet and social media, unhappy customers can easily spread their complaints and negative information to thousands of people if they had bad experience with a specific service. Hence, it is important for service providers to not only pay attention to consumer complaints but also to make efforts to offer good service recovery to overcome failures (Chahal and Devi, 2015).

In the concept of higher education service, student are not only customers but also "partners", "product"

(Clayson and Haley, 2005) and even “co-creators of value” (Vargo and Lusch, 2004). They have different needs, unique demands and various ways to react to service failures they meet at their colleges. Unfortunately, although service failures is inevitable, with the exception of student evaluation, which regular occurs at the end of courses, faculty receive minimal formal feedback on their service delivery decisions (d’Appolonia and Abrami, 1997). Since obviously the switching costs are high in an university setting, service failures that are not addressed probably will have a larger effect on students’ attitudes than student attrition.

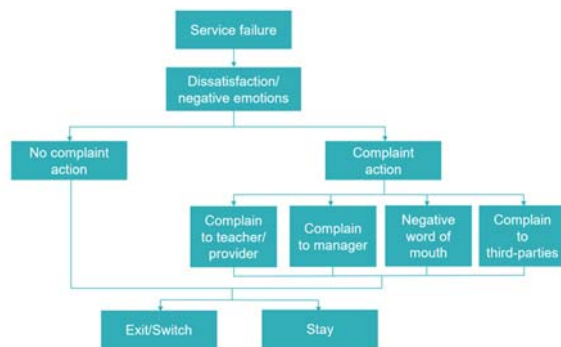


Fig. 1: Students’ reactions to service failure in higher education

Source: Adapted from Zeithaml et al., 2017

As indicates in Fig. 1, students’ reaction to service failure at colleges can be of various types. A dissatisfied student can speak directly to lecturer about his/her experiences related to lessons taught in the class. Students who do not want to complain immediately may choose to complain by phone, email or social media. These kinds of actions are the best-case scenario for the lecturer or service provider, give them the second chance to satisfy customers (Zeithaml et al., 2017). Some students choose to complain to their friends, relatives, families, which is called negative word of mouth (NWOM). Today, the development of the Internet and social media, blog, forum allows them to spread NWOM to a much broader audience. The third parties who can react to students complains are governments’ organizations, they can take some legal actions. No matter students select complaint or no complaint actions, they determine whether to stay with the current service provider or switch to another university or even give up pursuing higher education. It’s important to remember that a student can take any one of action or a combination of actions (Wirtz & Lovelock, 2018).

3. METHODOLOGY

3.1. Critical incident technique (CIT)

Critical incident technique (CIT) is used in many researches (Voss et al., 2010, Casado et al., 2011, Lewis

& Spyropoulos, 2001) to collect service incidents that generate dissatisfaction for customers. The CIT is qualitative interview procedure in which customer are asked to provide verbatim stories about satisfying and dissatisfying service encounters they have experience (Zeithaml et al., 2017). CIT is a powerful method to collect, analyze and classify observation of human behavior that allows researchers to gain valuable insight into phenomena that have not been documented well (Germler, 2004).

CIT data can be collected in several ways. Traditionally, researchers conduct interviews or hand out questionnaires (Voss et al., 2010). More recently, online using web-based CIT questionnaire has also been broadly used (Warden et al., 2003) thank to its considerable benefits. Firstly, this helps to eliminate stressful and fear for students when criticizing their teachers. Secondly, online participants are not influenced by an interviewers’ appearance, tone of voice and body language during CIT interviews (Voss et al., 2010). Thirdly, respondents are also willing to reveal more personal information and deeper feelings in computer-mediated communication than in traditional face-to-face discussion due to visual anonymity and higher levels of private self-awareness (Hanna et al., 2005).

In this study, critical incident technique was used to identify service failures in higher education and classify them into a comprehensive list. The authors combined two methods to collect CIT data. Initially, online CIT was conducted with 10 students. They were asked to answer open-ended questions related to their practical experiences relating to service failure when studying at NEU. Questions divided into seven main groups, including: teaching, examination, library, computer lab, administration, infrastructure, and miscellaneous. Students had to think of their personal experiences of problematic education service: When did the incident happen? What specific circumstances led up to this situation? What resulted that made you feel the interaction was dissatisfying? Additionally, CIT data via social media is also collected through some NEU’s Facebook groups, where students can post their complaints relating to service failures they faced and expectation of service recovery from teachers and administration system. This is a very effective channel to collect CIT data about service mistakes and student dissatisfaction situations in NEU. 20 CIT samples with different problems was collected and classified into mentioned seven groups.

From the results of critical incident research and literature review, a comprehensive list of 29 types of service failures grouped into seven categories was developed for higher education service. They are as follows:

(1) Teaching

- Inability to respond to students' questions
- Non-availability of teachers during office hours
- Absent/late arrival in scheduled meeting with student/s
- Poor presentation
- Fast communication
- Lacking ability to control his/her temper
- Insufficient study document

(2) Examination

- Ambiguous exam questions
- Invigilator gossiping/speaking loudly in the examination hall
- Miss graded exam answers
- Misreported/incorrect grade report

(3) Library

- Shortage of necessary reading materials such as books, journals, etc.
- Librarians behavior is not friendly and empathetic
- Lacking effective guidelines to use library

(4) Computer lab

- Outdated software
- Unavailability of computer lab

(5) Administration

- Incorrect tuition information
- Late updated tuition information
- Unwilling to assist students in solving education-related problems
- Credit course registration system is overloaded.

(6) Infrastructure

- Overloaded elevator
- Temperature in study area is not comfortable
- Uncleanliness and untidy classroom
- Classroom equipment (micro, projector, speaker) is not working
- Unstable wi-fi connection

(7) Miscellaneous

- Canteen is not guarantee hygiene and food safety
- Insufficient parking space
- Uncleanliness of dorm
- Noisy and disturbing atmosphere in dorm area

3.2. Survey questionnaire

The comprehensive list of service failure and the ways student react to the such problems were then incorporated into a structure survey questionnaire designed to investigate customers' perception about the magnitude of service failure and their responses in the situations. The survey questionnaire began by asking some personal information related to gender, year of study, course of study. The answers could remain completely anonymous depending on respondents' decision. The following part of survey is questions about students' perception about the magnitude of service failure. In this part, respondents were asked to put themselves in the situation of the person experiencing the service mistakes and rate the magnitude of service failure on five-point scale from not severe to extremely severe. In the final part, respondents were asked to recall their actual service failure and describe their reactions in this scenario. If respondents had experienced the service mistake in the past, they can select one or combination of actions in two groups complaint and no complaint action. If they had not met the problems, they can overlook this question.

4. FINDINGS

4.1. Characteristic of samples

The sample consisted of 185 undergraduate students at National Economic University in Vietnam. The gender of respondents was 58% females and 42% males. The academic classifications of the students were 20.6% freshmen, 14.3% sophomores, 28.6% juniors and 36.5% seniors. Students participated in the survey came from 21 different faculties and programs of NEU. From the 186 questionnaires returned, 183 (98.9 per cent) said that they had been faced with at least one of the listed service failures in the questionnaire.

4.2. Magnitude of service failure

According to Slater (1995), the Cronbach's Alpha (α) coefficient is used to measure reliability of survey data. When the Cronbach's Alpha (α) coefficient has value from 0.8 to 1, the data is very high reliability and scale selected very well. When the Cronbach's Alpha (α) coefficient valued from 0.7 to 0.8, the data have good reliability. When the Cronbach's Alpha (α) coefficient valued from 0.6 to 0.7, the data can be acceptable (Hair et al, 1998). The reliability test in Table 1 shows that all Cronbach's Alpha of seven dimensions are bigger than 0.6; and item-total correlation coefficient are all bigger than 0.3. The result confirms the reliability of the constructed service failure list.

Table 1: The Cronbach's Alpha test result

	Cronbach's Alpha	N	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Teaching 1	0.778	7	.391	.771
Teaching 2			.551	.740
Teaching 3			.388	.773
Teaching 4			.552	.743
Teaching 5			.491	.752
Teaching 6			.536	.744
Teaching 7			.619	.725
Exam 1	0.874	4	.800	.816
Exam 2			.739	.836
Exam 3			.804	.808
Exam 4			.603	.893
Lib 1	0.793	3	.634	.721
Lib 2			.729	.612
Lib 3			.552	.810
Com 1	0.79	2	.657	
Com 2			.657	
Admin 1	0.886	4	.795	.838
Admin 2			.806	.834
Admin 3			.800	.834
Admin 4			.620	.899
Infras 1	0.76	5	.396	.760
Infras 2			.649	.671
Infras 3			.647	.670
Infras 4			.599	.695
Infras 5			.373	.771
Miscell 1	0.68	4	.421	.641
Miscell 2			.416	.644
Miscell 3			.488	.598
Miscell 4			.529	.570

Fig. 2 compares the severity of seven service failure categories. Among seven categories, service failure related to administration and teaching are most intense, following by examination and computer lab service problems. Problems related to library and infrastructure

are less considerable than the remaining groups. However, the difference between mean rating of the magnitude of seven service failure group in higher education is insignificant, ranging from 3.14 to 3.75.

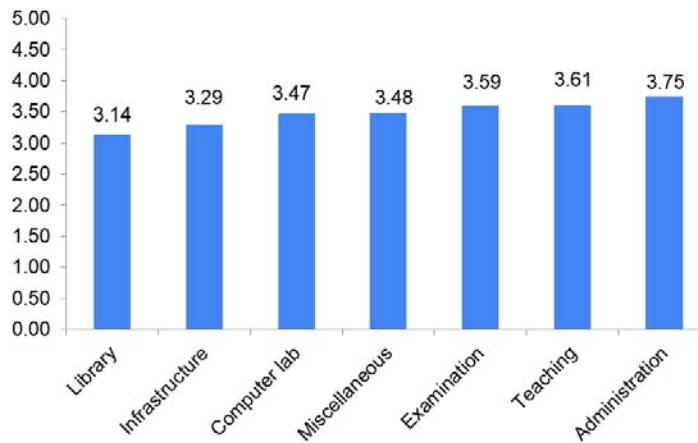


Fig. 2: Mean rating of the magnitude of service failure

The rating mean of magnitude of each failure are shown in Table 2. In teaching category, the most severe service failure was “poor presentation” and “insufficient study document”, while, students were more understanding with other mistakes of professors such as “Absent/late arrival in scheduled meeting with student/s” and “Non-availability of teachers during office hours”.

The magnitude of service failure relating to administration problems took the first position and “Credit course registration system is overload” was the most serious mistake. Besides, students were dissatisfied with problems relating to “unwilling administration staff” and “incorrect/late updated tuition fee information”.

Regarding the examination groups, problems related to

grades is very important with students, this is intelligible because these mistakes have immediate effects on the academic results of students.

Students seemed slightly relax their expectation with services related to Computer lab, Library and other Infrastructures. In Infrastructures category, “unstable Wi-Fi connection” is the most important service mistake, while, “Librarian behavior” and “unavailable of computer lab” correspondingly depressed students most in Library and Computer lab groups.

Service problems related to miscellaneous category led to deep dissatisfaction among students. In this group, “Canteen is not guarantee hygiene and food safety” and “Noisy and disturbing atmosphere in dorm area” were the most intense service mistakes.

Table 2: The magnitude of service failure in higher education

Service failure categories	Types of service failures	Mean rating	Rank
1. Teaching	Inability to respond to students’ questions	3.52	2
	Non-availability of teachers during office hours	3.40	
	Absent/late arrival in scheduled meeting with student/s	3.32	
	<u>Poor presentation</u>	<u>4.13</u>	
	Fast communication	3.43	
	Lacking ability to control his/her temper	3.58	
	Insufficient study document	3.92	

2. Examination		3.59	3
	Ambiguous exam questions	3.57	
	Invigilator gossiping/speaking loudly in the examination hall	3.27	
	<u>Miss graded exam answers</u>	<u>3.77</u>	
	Misreported/incorrect grade report	3.76	
3. Library		3.14	7
	Shortage of necessary books and documents	3.04	
	<u>Librarians behavior is not friendly and empathetic</u>	<u>3.27</u>	
	Lacking an effective guideline to use library	3.12	
4. Computer lab		3.47	5
	Outdated software	3.47	
	<u>Unavailability of computer lab</u>	<u>3.48</u>	
5. Administration		3.75	1
	Incorrect tuition information	3.56	
	Late updated tuition information	3.31	
	Unwilling to assist the student in solving education-related problems	3.82	
	<u>Credit course registration system is overloaded</u>	<u>4.30</u>	
6. Infrastructure		3.29	6
	Overloaded elevator	3.05	
	Temperature in the study area is not comfortable	3.48	
	Cleanliness and untidy classroom	3.00	
	Classroom equipment (micro, projector, speaker) is not working	3.37	
	<u>Unstable Wi-Fi connection</u>	<u>3.56</u>	
7. Miscellaneous		3.48	4
	<u>Canteen is not guarantee hygiene and food safety</u>	<u>3.55</u>	
	Insufficient parking space	3.39	
	Cleanliness of dorm	3.48	
	Noisy and disturbing atmosphere in dorm area	3.51	

Respondents of students to service failure

As indicated in Table 3, 29% of service failure scenario, students did not take any action in response to their negative experience. This percentage is higher in categories like Library (35%) and Infrastructure (33%). This result is reasonable because when the service failure is less important, and does not have critical consequences for the customer, then she/he is less likely to complain.

Unlike other service industries such as hotel, travel, and fast-food, where customers can easily defect or switch to another service provider when they felt dissatisfied, in education service, a few customers did so due barriers such as time, money, and personal efforts. As a result, they must choose other types of responses to “vent” their anger. In 46% of unhappy situations, respondents chose to spread negative word of mouth (WOM) to their friends and relatives or even much broader audience like social media and online forum. Angry customers often tell many people about their problems.

Table 3: Surveyed students' responses to service failures

	Complaint actions (%)				No complaint actions (%)	Exit/Switch (%)
	Complaint to professor/ service provider	Complaint to manager	Complaint to third parties	Negative word of mouth		
Teaching	30	15	1	48	26	0
Examination	46	26	5	34	20	0
Library	26	18	3	36	35	0
Computer lab	39	22	2	37	24	0
Administration	33	34	2	35	19	1
Infrastructure	34	17	5	29	33	0
Miscellaneous	27	22	5	49	16	0
Overall	38	25	4	46	29	0

5. DISCUSSION AND IMPLICATIONS

The study provides valuable insight into the concept of service failure and customers' reaction in higher education. By using critical incident technique, the study identified 29 different types of service failures which classified into 7 groups. These were investigated further through survey questionnaire, to discover students' assessment of the magnitude of service failures and students' responses to the mistakes.

The most serious service failures related to administration, teaching and examination group. The result is in line with the finding of previous researches that indicated the importance of professor in higher education service (Chahal and Devi, 2015, Voss et al., 2010, Swanson and Davis, 2000). The most severe service failure at NEU related to administration system like credit course registration system, tuition fee information and unwilling attitude of service staff. These problems have been existed at NEU for many years and trigger to extremely dissatisfied experience for students. Thus, the managers of NEU should set priority to resolve such problems. Although faculty is an important attribute effecting student satisfaction, service incidents like "absent/late arrived" or "non-available during office hours" were less important than other professors' mistakes. However, teachers should focus on enhancing the quality of lecture and study materials, improving communication skills, adopting polite behavior, instant response to student's queries, etc. to minimize teaching service failures. Regarding to the examination groups, service failure generally occurred because of grade problems, ambiguous exam question and noisy atmosphere in the examination hall. When students faced with these problems, 46% decided to complain

with teachers and service staff. Such kinds of service failure can be reduced if an effective and standard procedure in issuing and marking exam are followed. Beside that, previous research also indicated that maintaining silence in examination hall by avoiding gossiping and taking on the cell phone should be adopted by college staff to reduce disruption to students in the examination hall (Chahal and Devi, 2015).

The study paves the way for enhancing student satisfaction through identification and investigation the magnitude of service failure in higher education. This will be prominent proof for higher education institutions to develop appropriate service recovery strategies and thus, improve service quality. Additionally, the study helps management authorities realize students' common reactions to service mistakes in university. NEU should encourage students to "vent" their anger through making complaints, rather than letting students' negative WOM be spread. Complaints from dissatisfied students give the education organization chances to correct services and thus, learn from mistakes. In recent years, NEU has taken advantages of the social media platforms like Facebook

(fanpage and group) to connect, communicate and listen to customers. Many students have selected them as channels to complain about dissatisfaction situations they faced in the university. Moreover, NEU should implement other channels for students to raise their problems such as web-based student opinion platform, forum or other social media channels e.g. Twitter and Instagram. Many students may hesitate to make complaint because of a prospect of confrontations with professors or service employees. Hence, beside public forms, the university should implement private channels such as email, hotline, and mailbox to receive students'

feedback. In some situations, many students feel uncertain and believe that no one would be concerned about their problems or willing to deal with it. Thus, managers, service employees and faculty should show their willingness to correct the errors, their empathy and responsiveness to encourage their students to complain about service failures.

6. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The study has some limitations. Firstly, the scope of the study is limited to students of National Economics University in Vietnam. Further research studies should expand to different universities in Vietnam or different cultural contexts and might reveal variation in service expectations, perception of service failures, complaining behavior and expectations and perception of service recovery. Results from these studies should be then compared and differences and similarities revealed.

Secondly, the research focused on student's assessment of service failure and their reactions in these scenarios, rather than implementation of service recovery. Continuing research activities might focus on finding suitable solutions for each service failure in practice. This could include investigation of the problems from the perspective of both students and service providers. From students' perspective, research effort might investigate the impact of service recovery on customer satisfaction, customer loyalty and WOM communication. Regarding service providers' side, attention could be given to assessment of service recovery process, role of service employees and managers to prevent service failures and facilitating service recovery.

Thirdly, as the sample of the study was selected by convenience method, the results may not be generalized to the student population as a whole. Thus, similar researches should use purposive sampling method to select different levels of students' academic performance or studying time to ensure data reliability. Further research could also explore gender differences in their assessment of service failure and the way they react in a dissatisfied situation.

7. REFERENCES

- [1] Berry, C. R. and Parasuraman, A. (1991), *Marketing Services: Competing Through Quality*, Free Press, New York, US.
- [2] Bougie, R., Pieters, R., and Zeelenberg, M. (2003) "Angry Customers Don't Come Back, They Get Back: The Experience and Behavioral Implications of Anger and Dissatisfaction in Service," *Journal of the Academy of Marketing Science*, **31**, (4), 377-393.
- [3] Buttle, F. and Burton, J. (2006), "Does service failure influence customer loyalty?", *Journal of consumer behavior*, 1, (3), 217-227.
- [4] Casado, A.B, Nicolau, J.L, Mas, F.J (2011), "The harmful consequences of failed recoveries in the banking industry", *International Journal of Bank Marketing*, 29, (1), 32-49.
- [5] Chahal, H. and Devi, P. (2013), "Identifying satisfied/dissatisfied service encounters in higher education", *Quality Assurance in Education*, 21, (2), 211-222.
- [6] Chahal, H. and Devi, P. (2015), "Consumer attitude towards service failure and recovery in higher education", *Quality Assurance in Education*, 23, (1), 67-85.
- [7] Clayson, D.E. and Haley, D.A. (2005), "Marketing models in education: students as customers, products, or partners", *Marketing Education Review*, 15, (1), 1-10.
- [8] Cooper, P. (2007), "Knowing your 'lemons': quality uncertainty in UK higher education", *Quality in Higher Education*, 13, (1), 19-29.
- [9] d'Appolonia, S., & Abrami, P. C. (1997). Navigating student ratings of instruction. *American Psychologist*, 52, 1198-1208.
- [10] Desai, S., Damewood, E., & Jones, R. (2001). "Be a good teacher and be seen as a good teacher". *Journal of Marketing Education*, 23, 136-143.
- [11] Gremler, D.D. (2004), "The critical incident technique in service research", *Journal of Service Research*, 7, (1), 65-89.
- [12] Hair, J. F., Black, W.C., Babin, B.J., Anderson, R.E. & Tatham, R.L. (1998), *Multivariate data analysis*, Pearson Prentice Hall, NJ.
- [13] Hanna, R.C., Weinberg, B., Dant, R.P. and Berger, P.D. (2005), "Do internet-based surveys increase personal self-disclosure?", *Database Marketing & Customer Strategy Management*, 12, (4), 342-56.
- [14] Hoffman, K.D., Kelley, S.W. and Rotalsky, H.M. (1995), "Tracking service failures and employee recovery efforts", *Journal of Services Marketing*, 9, (2), 49-61.
- [15] Holloway, B.B and Beatty, S.E (2003), "Service Failure in Online Retailing: A Recovery Opportunity", *Journal of Service Research*, 6, (1), 92-105
- [16] Iyer, R. and Muncy, J.A. (2008), "Service recovery in marketing education: it's what we do that counts", *Journal of Marketing Education*, 30, (1), 21-32.

- [17] Kim, C., Kim, S., Im, S. and Shin, C. (2003), "The effect of attitude and perception on consumer complaint intentions", *Journal of Consumer Marketing*, 20, (4), 352-371.
- [18] Kim, M.G., Wang, C. and Mattila, A.S. (2010), "The relationship between consumer complaining behavior and service recovery", *International Journal of Contemporary Hospitality Management*, 22, (7), 975-991.
- [19] Krishna, A., Dangayach, G. S., & Jain, R. (2011). Critical factors of service failure and corresponding recovery system. *Advances in Management*, 4, (7), 39-44.
- [20] Matos, C. A., Ross, C. A. V., Veiga, R. T. and Viera, V. A. (2009), "Consumer reaction to service failure and recovery: the moderating role of attitude toward complaining", *Journal of Services Marketing*, 23, (7), 975-991.
- [21] Matos, C.A, Henrique, J.L and Rosa, F. (2013), "Customer reactions to service failure and recovery in the banking industry: the influence of switching costs", *Journal of Services Marketing*, 27, (7), 526-538.
- [22] Lewis, B.B and Spyropoulos, S. (2001), "Service failures and recovery in retail banking: the customers' perspective", *International Journal of Bank Marketing*, 19, (1), 37-48.
- [23] Lewis, B.R. and McCann, P. (2004), "Service failure and recovery: evidence from the hotel industry", *International Journal of Contemporary Hospitality Management*, 16, (1), 6-17.
- [24] Singhal, S., Krishna, A., and Lazarus, D. (2013), "Service Failure Magnitude and Paradox: A Banking Perspective", *Journal of Relationship Marketing*, 12, (3), 191-203.
- [25] Slater, Stanley F. and Narver, John C. (1995), "Market Orientation and the Learning Organization", *Journal of Marketing*, 59, (2), 63-64.
- [26] Swanson, S. R. and Davis, J. C. (2000), "A view from the aisle: classroom successes and failures and recovery strategies", *Marketing Education Review*, 10, (2), 17-25.
- [27] Tax, S. S., & Brown, S. W. (1998), "Recovering and learning from service failures", *Sloan Management Review*, 40, (1), 75-88.
- [28] Vargo, S. L. and Lusch, R.F. (2004), "Evolving to a new dominant logic for marketing", *Journal of Marketing*, 68, (1), 1-17.
- [29] Voss, R., Gruber, T. and Reppel, A. (2010), "Which classroom service encounters make students happy or unhappy?", *International Journal of Educational Management*, 24, (7), 615-636.
- [30] Warden, C.A., Liu, T.-C., Huang, C.-T. and Lee, C.-H. (2003), "Service failures away from home: benefits in intercultural service encounters", *International Journal of Service Industry Management*, 14, (4), 436-57.
- [31] Weun, S., Beatty, S.E, Jones, M.A (2004), "The impact of service failure severity on service recovery evaluations and post-recovery relationships", *Journal of Services Marketing*, 18, (2), 133-146.
- [32] Webster, C., Sundaram, D.S (1998), Service consumption criticality in failure recovery, *Journal of Business Research*, 41, (2), 153-159.
- [33] Wirtz, J., Lovelock, C. (2018), *Essentials of Service Marketing*, Person Education Limited, London, British.
- [34] Zeithaml, V.A, Bitner, M.J and Gremler, D.D (2017), *Service marketing: Integrating Customer focus across the firm*, McGraw-Hill Education, New York, NY.

ENTREPRENEURSHIP INTENTIONS OF YOUNG PEOPLE: A CASE STUDY IN HAI DUONG PROVINCE, VIETNAM

Nguyen Thanh Do^{1,*} and Bui Duc Thinh²

¹²National Economics University

*Corresponding author: thdoneu@yahoo.com, nguyenthanhdo@neu.edu.vn

Abstract

Entrepreneurship is currently the focus of Vietnamese government to push up the nation economy and encourage higher quality and quantity of new start-ups. This study examines the relationship and measures the impacts of different factors on entrepreneurship intention of young people in Hai Duong province, Vietnam using Theory of Planned Behaviour from Ajzen (1991) as the framework with an extension of other factors. This study uses questionnaires with Likert 5-scale to collect data from 1600 young people in Hai Duong province with the support of Hai Duong Youth Union. The results show that all five factors - Attitude toward entrepreneurship, Social norms, Entrepreneurship training, Personal traits and Perceived behavioural control – have direct positive relationships with Entrepreneurial intentions (dependent variable). Among these determinants, personal traits have the strongest impact. In other words, Hai Duong youth believes that personal traits play a significant impact to a person entrepreneurial intention and business pathways. In addition, perceived behavioural control also shows the strong influence on entrepreneurial intentions while the remaining three factors (Attitude toward entrepreneurship, Social norms and Entrepreneurship training) have weaker impacts.

Keywords: Entrepreneurship, Hai Duong province, Vietnam, Entrepreneurial intentions, Young people, entrepreneurial training, personal traits.

1. INTRODUCTION

In recent years, entrepreneurship has been a global topic which was researched and implemented in practices in many countries. There has been a wide acceptance of the fact that SMEs and start-ups play a crucial and irreplaceable role in building up, developing and sustaining prosperity for a nation (Schramm, 2006; Giagtzis, 2013). Many scholars have mentioned the essential role of entrepreneurship in sustaining the dynamics of the modern market economy and the competition creation and economic growth impact that emergence of new businesses brought (Wong et al, 2005; van Praag & Versloot, 2007, Altinay et al, 2011; Sorensen, 2011). As a result, entrepreneurship as the spearhead of economic growth is undisputed, thanks to its ability to create new jobs, promote creativity, increase competition and improve productivity (Acs et al, 2004, Wong et al, 2005; Altinay et al, 2011; Sorensen, 2011).

In Vietnam, research in entrepreneurship are getting more attention but their application has only been conducted in the past few decades. The term "entrepreneur" was first introduced into the Constitution of Vietnam in 2013 and a lot of efforts are currently underway to develop a team of Vietnamese entrepreneurs in order to enhance their role in the period of industrialization, modernization and international integration of the country (T. H. Phuong & T. T. Hi u,

2015). A recent report shows that the number of Vietnamese who intend to start a business is declining from 24.1% in 2013 to 18.2% in 2014 and much lower than that of other countries which are at the same economic development level of Vietnam (T. H. Phuong & T. T. Hi u, 2015). Since 2016, the Government of Vietnam has issued many policies to encourage entrepreneurship activities in general and youth entrepreneurship in particular. Accordingly, many ministries, local agencies and organizations have set up a lot of support funds, established and organized clubs, training and research courses on entrepreneurship for youth. The initial results show that the percentage of young people who intend to start a business in the next 3 years is the highest among the group of working age in our country (accounting for 24.2%) and this figure is about 10.7 % in the middle-aged group. This figure is quite similar to other countries in the region and other developing countries in the world. Thus, Vietnam needs to direct their focus on young people in the nation effort to increase individual entrepreneurship intention. In addition, the policy of building a start-up nation must also pay special attention to this target segment.

Literature review of previous studies in Vietnam shows that there is no specific study on entrepreneurship for young people and young workers in a single particular region or province. To the best knowledge of the authors, there are a few articles and reports before that discuss

aspects of entrepreneurship, but mostly surveyed students. However, the limitation of student sample has been discussed by authors around the world and there has been a call to further extend survey to other respondents other than student. In addition, there is a lack of more systematic and comprehensive research on the influence of a combination of factors on the intention/behaviour and the entrepreneurial process of young people in different region and in Hai Duong province in particular. It is worthwhile to note that entrepreneurship is a big topic and relates to many aspects from human perception, legal & policy mechanisms and participation of organizations, businesses etc. Therefore, it is impossible only through a few studies to solve all the problems and existed black boxes to promote start-up activities in general and start-up activities among young workers of the province in particular. In the future, more studies need to be carried out in other regions with more diversified factors and respondents to gradually gain a deep understanding in this subject.

From the above findings, alongside the need of Hai Duong to better encourage entrepreneurship in the province, the authors figure out the need for a comprehensive and systematic study to identify the factors that influence entrepreneurship intentions and processes, measure their influence and conduct implementation with different start-ups that currently up and running in the region. Through phase 1 of theoretical research, a phase 2 of experimental practices has been applied to two entrepreneurial start-ups of young workers in Hai Duong province (one in the agricultural sector and the other in the service sector). This research aims to provide a more comprehensive and in-depth look at the entrepreneurial situation in Hai Duong province. Also this study recommends some education and region policies in order to support entrepreneurial training and assist local youth start-up founders. This is especially important for young workers because according to survey data, this age group has the highest rate of entrepreneurship intention in our country (over 24.2%). For young workers in Hai Duong province, in addition to factors affecting the general entrepreneurship intention of Vietnamese youth, it is also necessary to identify the specific factors here to have specific region-fit appropriate policy solutions to promote and encourage Hai Duong youth to start their own businesses in the coming time.

2. LITERATURE REVIEW

Entrepreneurship, according to the Vietnamese dictionary, is starting a new business. In the field of academic research, it is a multidimensional concept. Entrepreneurship can be: i) starting a new business, a new venture creation or ii) self-employment.

According to the Webster dictionary, entrepreneur is defined as the person organizing or administering the enterprise, especially highly risky and uncertain businesses. Bird (1988) defines an entrepreneur as a person starting or creating a new job/business. MacMillan and Katz (1992) argue that an entrepreneur is someone who makes money by starting or managing a risky business. An entrepreneur is a person who creates and develops new businesses and is active in economic activities, technical and organizational change management activities, creates a culture of innovation and learning in business. Thus, in this study, we define a start-up entrepreneur as the individual who creates a new job or business.

The importance of entrepreneurship to economic growth and technological change was under debate for years both at national, regional and international scale. After World War II, scientists around the world believed that large-scale enterprises must be developed to benefit a nation economy. The reason is that large firms have an advantage over small ones because of their economy of scales, international competitiveness and a better chance to survive in this ever-changing environment. But in recent years, studies and facts have shown that small businesses play an important role in economic development and start-up activities motivate socio-economic development in many countries around the world. Entrepreneurship is considered as the fourth variable, named entrepreneurship capital in the "New growth theory" next to the 3 traditional variables of physical capital, human capital and knowledge capital.

Research results both domestic and abroad so far have confirmed there is no unified conceptualization about entrepreneurship process (cycle and content of each step in the entrepreneurial cycle). Different studies stand on different perspectives and gap to consider entrepreneurship intention and explain from such perspectives. However, researchers all agree that the stages of entrepreneurship process won't happen in accordance with a pre-defined sequence. Some newly established businesses move from start-up stage to disbandment stage very quickly because they cannot survive (according to a global average study, 75% of start-ups cannot survive after 3 years). During their short-lived process, these businesses will skip certain phases of entrepreneurship process. Research result also shown that entrepreneurial intention plays an important role in the decision of entrepreneurs as to whether or not they will conduct start-up behaviours. Thus it is important to conduct different studies to gain a more comprehensive understanding of this intention period to minimize the chance of "sudden death" in start-up companies.

Taking in to account contextual factors that are unique to Vietnam and inherited from previous famous studies, the authors identified 5 main variables affecting the entrepreneurship intention of young people in Hai Duong province. These include attitudes toward entrepreneurship, social norms, perceived behavioural control, entrepreneurship training and personal traits. These factors will be discussed in more detail below.

3. METHODOLOGY

3.1. Research model

Based on previous researches in combination with analysis of expert opinions at Centre for Social Innovation and Entrepreneurship of National Economics University as well as that of NAFODEV Centre from Hanoi University of Science and Technology, through discussions at the Conferences held at Hai Duong Union of Science and Technology Associations for the project, the research team selects Theory of Planned Behaviour (TPB) model from Ajzen's research (1991) as a theoretical framework to apply and evaluate the impact of independent variables on entrepreneurship intention.

The TPB model can be applied to study any pre-planned behaviour. This model has been repeatedly tested and proven its effectiveness in predicting behaviour and intention in many different research areas (Ajzen, 1987; Ajzen & Fishbein, 1980; Sheppard, Hartwick, & Warshaw, 1988) including career options (Kolvereid, 1996). In entrepreneurship, the TPB model is one of the dominant theory used to study entrepreneurial intentions so far (Kolvereid, 1996; Tkachev & Kolvereid, 1999; Autio et al., 2001; Fayolle et al, 2006; Gelderen et al, 2008; Krueger et al, 2000; Souitaris et al, 2007; Veciana et al, 2005). Research in the 1990s by Kolvereid (1996) or Tkachev and Kolvereid (1999) show that attitudes, social norm and perceived behavioural control have a significant effect on entrepreneurship intention. In more recent studies by Autio et al. (2001), the TPB is applied to the same subjects in many countries and has been proven to be an accurate predictive model of entrepreneurship intention in which perceived behavioural control is considered the most important indicator.

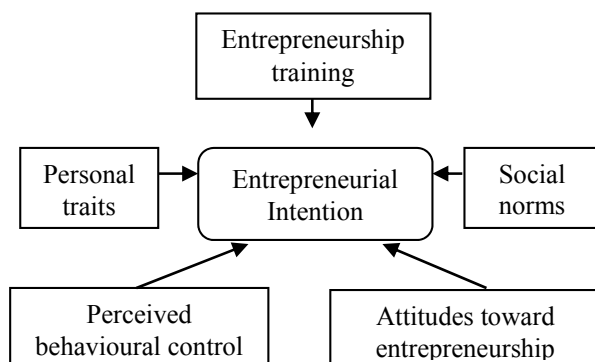


Fig. 1: Theory of "Planned Behaviour" research model

Moreover, studies conducted previously reported mix results about the impact of personal traits on entrepreneurial intention (Shaver & Scott, 1991; Sagie and Elizur, 1999; Littunen, 2000; Khan et al., 2011). A growing number of research in recent decade has shown considerable attention to the impact of entrepreneurial training on entrepreneurial intention with mix results. Thus, this paper proposed to test these variables to examine their impact in the specific case of young workers in Hai Duong province.

3.2. Research hypothesis

3.2.1. Attitudes toward entrepreneurship

Literature review shown that the factor of "Attitude toward entrepreneurship" is gradually explained more thoroughly and fully about its concept over the years. Most commonly, Ajzen (1991) considers attitudes toward behaviour as the extent to which an individual has positive or negative assessments of a particular behaviour. Xavier et al. (2012) considered "Attitude toward entrepreneurship" as the extent to which people perceive good opportunities for themselves to start a business or their degree of commitment to the title of entrepreneur. Kolvereid and Tkachev (1999); Dohse and Walter (2009); Paco et al (2011) find out attitudes toward behaviour are directly positively related to entrepreneurial intentions.

In their research, Krueger et al. (2000) examined the relationship between entrepreneurship attitude and intention of students and identified that attitudes toward entrepreneurship have a significant effect on a student's entrepreneurship intention in general. According to Tam (2009) and N. T. Thùy (2014), empirical results show valuable evidence of the change in students' attitude towards entrepreneurship and entrepreneurship intention when they are exposed to entrepreneurship training. This is because entrepreneurship training can help students build their confidence and increase their personal competencies. N.A.Tuan (2018) concludes that attitude toward entrepreneurship are positively related to entrepreneurship intentions of young Vietnamese.

Previous research results all agree that attitude toward behaviour is an important variable when researching entrepreneurial intentions. Based on what has just found, the authors propose to include this variable in the proposed research model with the hypothesis:

H1: Attitude toward entrepreneurship positively affects entrepreneurship intention.

3.2.2. Social norms

Pressure from family, friends and society affects the individual's behaviour to become an entrepreneur. Social

norm has been tested by many previous studies on the ability to predict entrepreneurship intention and the results are relatively different. Some empirical studies show that "social norm" does not predict entrepreneurship intention such as the works of Reitan (1997), Krueger et al. (2000), Autio et al. (2001), Linan (2004), Linan and Chen (2009). However, some other studies have demonstrated a close relationship between the two factors above (Kolvereid, 1996; Kolvereid & Tkachev, 1999; Kolveried & Isaksen, 2006; Yordanova & Tarrazon, 2010). Some other studies completely do not use this factor when measuring entrepreneurship intention (Peterman & Kennedy, 2003; Vecianne et al, 2005). In his research, Linan (2004) also found a relationship between social norm and attitude toward entrepreneurship. Krueger et al. (2000) found a relationship between social norms, attitudes towards behaviour and perceived behavioural control. This suggests that social norm is not merely a single variable, but can be used to moderate or mediate relationships among other variables of intention as suggested by Reitan (1997).

Previous studies have shown that there seem to be many factors influencing how social norms will affect entrepreneurial intentions, so a clear conclusion about the accurate influence of this factor on entrepreneurship intention has not yet been reached. It is clear that more empirical studies in different contexts are needed to contribute to the clarification of the problem that still has these differing observations. Therefore, the authors propose to include the variable "social norms" in the proposed research model to test the role of this factor in the selected context and research object with the hypothesis:

H2: There is a positive relationship between social norms and entrepreneurship intention.

3.2.3. Perceived behavioural control

Perceived behavioural control indicates how easy or difficult it is to perform a particular behaviour. This variable is assumed to reflect the experience of individuals in the past and to help predict entrepreneurial difficulties (Ajzen, 1991). Perceived behavioural control is compatible with the "self-efficacy concept" of Bandura (1977). The results of empirical research by Obschonka et al. (2010) show that those with early entrepreneurial traits will have a higher degree of control over entrepreneurial confidence, resulting in a higher entrepreneurial intention and often exhibit a higher level of confidence in success. Obschonka et al. (2010) also pointed out that "control beliefs" are closely related to the "self-efficacy concept" in Bandura's research (1977) and the locus of control in the research of Rotter (1990). In the studies of Kolvereid (1996); Chen et al. (1998);

Basu and Virick (2008); Zaidatol (2009); Ruhle et al (2010); Paco et al. (2011) both stated that there is a positive relationship between the perceived behavioural control and the entrepreneurial intention in which Basu and Virick pay special attention to an individual's previous entrepreneurial experience and its significant influence on personal empowering personal ability and positive attitudes toward entrepreneurship. Based on the content just analysed above, the authors propose to include the variable "perceived behavioural control" in the expected research model to test its relationship with the entrepreneurial intention of young people in Hai Duong province with the hypothesis:

H3: There is a positive relationship between perceived behavioural control and entrepreneurship intention.

3.2.4. Entrepreneurship training

Entrepreneurship training is understood as the range of lectures or courses that can provide students with the entrepreneurial skills and knowledge to pursue the entrepreneurial path (Clouse, 1990; Ekpoh & Edet., 2011; Ooi et al., 2011). Lack of business knowledge leads to risky behaviours and reduces the likelihood of entrepreneurship success (Wang & Wong, 2004; Zhou et al., 2012). Researchers have experimented and demonstrated that entrepreneurship training is an effective way to incubate entrepreneurship intentions and lead entrepreneurship behaviours to improve individual entrepreneurship rates (Lee et al., 2005; Fayolle et al., 2006; Matlay, 2008; Ooi et al., 2011). Matlay (2008) found that after 10 years of his empirical research on a sample of 64 graduates, all the trainees who had received training in entrepreneurship became entrepreneurs. Tam (2009) and Dell (2008) also conclude that entrepreneurship training and change in entrepreneurship attitudes have a close relationship.

Regarding practical entrepreneurship training, Taatila & Down (2012) suggested that students in different training programs have different entrepreneurial trends; students with business experience tend to start a business higher than students who have not had; students who view entrepreneurship as a positive profession will have a higher tendency to start a business than students who view entrepreneurship as a negative career. This result contradicts the research results of Kuckertz & Wagner (2010) because this group of authors proves that people who have not had any practical contact with the business tend to be more consistent about entrepreneurship than those who have had practical contact with the business. Meanwhile, Dodescu et al (2014) concluded that the internship period motivates students to start a business.

Based on the above mentioned issues, the authors propose to include the variable "entrepreneurship

training" in the intended research model to test the relationship of this variable with the entrepreneurial intention of young workers in Hai Duong with the hypothesis:

H4: *Entrepreneurship training positively affects entrepreneurship intention.*

3.2.5. Personal traits

Personal trait has been tested as an indicator of many entrepreneurial-related aspects (Shaver & Scott, 1991). Research by Littunen (2000) affirms that personal trait is the most important factor in helping a person to be successful in the business process. The research results of Sagie and Elizur (1999) show that McClelland's "need for achievement theory" shows that this need is one of the most powerful psychological factors affecting entrepreneurship behaviour. Besides, Khan et al. (2011) finds that with the ability to control themselves, people will have a positive attitude towards entrepreneurship and have a high chance of becoming an entrepreneur. Therefore, the higher your personal control capacity is, the higher your entrepreneurial intention is. According to Cantillion's work, the main factor that distinguishes an entrepreneur from an employee is the amount of risk and uncertainty they take.

In Vietnam, research by Nguyen & Phan, (2014) shows that there are differences in different trait groups for the surveyed groups such as entrepreneurs, employees and students. The results show that "enthusiasm", "open thinking", "responsibility", "sincerity" are the traits that a young entrepreneur needs.

It can be said that most previous studies have concluded that a person with a high need for achievement, better personal control and a higher willingness to take risks will have more entrepreneurial intentions. Based on the above findings, personal trait is an important indicator of entrepreneurial intentions (Costa & McCrae, 1984; Singh & DeNoble, 2003; Zain et al., 2010), N.T.Do (2018). Therefore, the research team proposed the hypothesis:

H5: *There is a positive relationship between personal traits and entrepreneurship intention.*

3.3. Proposed research method

Sample was taken from different regions in Hai Duong with the support of Hai Duong Youth Union. The respondents were asked to gather at the Youth Union Hall and were supported by trained personnel of the Hai Duong Union of Science and Technology. The questionnaire inherited from the previous work of Linan and Chen (2009), Littunen (2000) and Tam (2009). There were 1500 qualified answers being coded for the

hypotheses test. First, we use the exploratory factor analysis (EFA) method to evaluate two important values of the scale: convergent value and discriminant value. In addition, Cronbach's Alpha method is used to evaluate the reliability of the scale based on collected data. The purpose of this test is to find out whether observed variables together measure for a concept to be measured. Having good reliability test results will allow readers to have more confidence in the accuracy of the survey results. This is very important when dealing with measurement problems for unobserved variables (Flynn, Schroeder and Sakakibara, 1994). After testing the reliability of the scales, the satisfactory scales would be determined with the mean value and the control variables would be coded to conduct correlation analysis. The study uses Pearson's correlation coefficient (r) to check the linear relationship among the factors. If the correlation coefficient between the dependent and independent variables is large, it proves that they are related to each other and can be suitable for linear regression analysis. The absolute value of r tells us how strict a linear relationship is. The closer the absolute value of r is to 1, the more closely correlated the two variables are and vice versa (Hoang Trong and Chu Nguyen Mong Ngoc, 2008). After analysing the correlation, the authors conducted a multivariate regression analysis according to the Enter method with the significance level of 5% to test the research hypotheses and the relevance of the model as well as the impact level of variables up the dependent variable.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics of Sample Demographics

The research sample is formed from a survey of 1600 people in 5 districts and Hai Duong city in 2018 and 2019. The subject of the study is young workers in Hai Duong province.

After checking and removing the unqualified questionnaires due to missing data or uniform answers, a total of 1,500 questionnaires are used for data analysis. The sample has the following main features:

Table 1: Demographics of the sample

Sample Information	Frequency	Percentage
<i>Gender</i>	<i>1.500</i>	<i>100 %</i>
Male	631	42.1
Female	869	57.9
<i>Age</i>	<i>1.500</i>	<i>100 %</i>
Under 18	68	4.5
18 - 30	576	38.4
31 - 40	748	49.9

Sample Information	Frequency	Percentage
Others	108	7.2
Literacy	1.500	100 %
Primary school	19	1.3
Secondary school	255	17.0
High school	289	19.3
Vocational school	153	10.2
College	242	16.1
University	451	30.1
Higher learning	87	5.8
Others	4	0.3
Survey area	1.500	100 %
Binh Giang district	300	20.0
Cam Giang district	300	20.0
Kim Thanh district	300	20.0
Kinh Mon district	300	20.0
Hai Duong city	300	20.0

4.2. Empirical results

4.2.1. Cronbach' Alpha

Table 2: Cronbach' Alpha test results

	Observed Variable	Scale Mean if Item deleted	Scale Variance if Item deleted	Corrected Item-Total Correlation	Alpha if Item deleted	Cronbach's Alpha
(ATE) Attitude toward Entrepreneurship	ATB1	20.8786	19.991	.645	.804	0.836
	ATB2	20.7005	20.691	.680	.798	
	ATB3	20.4817	21.873	.634	.807	
	ATB4	20.4777	21.184	.674	.800	
	ATB5	20.5644	21.476	.637	.806	
	ATB6	20.4570	21.900	.587	.814	
	ATB7	20.6044	23.743	.304	.860	
(SN) Social norms	SN1	24.0160	33.193	.446	.776	0.790
	SN2	23.9200	34.104	.610	.756	
	SN3	23.7153	36.286	.377	.784	
	SN4	24.2860	31.604	.577	.754	
	SN5	24.2373	30.197	.467	.781	
	SN6	24.1580	33.461	.622	.752	
	SN7	24.0913	33.552	.599	.755	

	SN8	23.9547	33.383	.420	.781	
(PBC) Perceived Behavioural Control	PBC1	27.9840	36.207	.664	.840	0.862
	PBC2	27.8347	37.045	.671	.839	
	PBC3	27.7113	37.799	.642	.842	
	PBC4	27.6793	37.331	.661	.840	
	PBC5	27.6467	37.811	.619	.844	
	PBC6	27.5367	37.483	.643	.842	
	PBC7	27.5373	38.453	.567	.849	
	PBC8	27.4507	39.124	.541	.852	
	PBC9	27.3660	39.620	.356	.874	
(ET) Entrepreneurship Training	ET1	21.6302	24.590	.460	.730	0.750
	ET2	21.4039	27.278	.644	.688	
	ET3	21.3899	28.446	.611	.699	
	ET4	21.1676	26.710	.452	.724	
	ET5	21.4186	27.598	.321	.762	
	ET6	21.3218	28.842	.552	.708	
	ET7	21.1515	30.047	.435	.728	
(PT) Personal traits	PT1	27.6940	36.610	.587	.799	0.824
	PT2	27.5600	37.812	.673	.793	
	PT3	27.5113	38.788	.632	.798	
	PT4	27.5553	39.001	.582	.802	
	PT5	27.5113	40.018	.440	.816	
	PT6	28.1227	33.934	.561	.807	
	PT7	27.7707	37.292	.423	.824	
	PT8	27.6467	39.499	.527	.807	
	PT9	27.6360	39.182	.468	.813	
(EI) Entrepreneurship Intentions	EI1	24.7607	34.888	.650	.810	0.839
	EI2	24.6887	34.895	.723	.804	
	EI3	24.7787	35.272	.675	.809	
	EI4	24.5753	34.645	.568	.820	
	EI5	24.5320	35.997	.643	.813	
	EI6	24.5900	35.375	.676	.809	
	EI7	24.9713	36.907	.488	.830	
	EI8	24.3867	34.312	.364	.867	

The results of testing the reliability of the scale according to Cronbach's Alpha coefficient show that the factor "Attitude to entrepreneurship", "Perceived

behavioural control”, “Social norms”, “Entrepreneurship training”, “Personal traits” and “Entrepreneurship intention” have Cronbach's Alpha coefficient greater than 0.7, at an appropriate scale for use in ongoing research. On the other hand, for the questions of the above variables, the total variable correlation coefficients are all above or very close to 0.6 and all meet the required standards greater than 0.3. After the process of testing the reliability of the scale Cronbach's Alpha, 48 observed variables after analysing the reliability of the scale were consistent and none of them were excluded from the factor groups.

4.2.2. Exploratory factor analysis (EFA)

Table 3: KMO coefficient and Bartlett’s test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.960
Bartlett's Test of Sphericity	Approx. Chi-Square	2.877E4
	df	780
	Sig.	.000

KMO coefficient is quite large with value of 0.960, proving that factor analysis is appropriate. Bartlett's test has a Sig coefficient < 0.05, which implies that the observed variables are correlated with each other in the population. Factor loading after processing and running the data all meet the requirements.

4.2.3. Correlation coefficients between variables

Table 4 explains the correlation relationships between the dependent variable and the independent variables.

Table 4: Correlation coefficients between variables

	ATE	SN	PBC	ET	PT	EI
ATE	1					
SN	.681**	1				
PBC	.706**	.716**	1			
ET	.609**	.615**	.655**	1		
PT	.653**	.673**	.738**	.725**	1	
EI	.672**	.674**	.748**	.672**	.772**	1

** Correlation is significant at the 0.01 level (2-tailed)

Correlation analysis results show that the correlation coefficients between the dependent variable Entrepreneurship intentions (EI) and the independent variables are statistically significant (Sig < 0.05). On the other hand, the magnitude of the correlation coefficients ensure that there is no multicollinearity phenomenon. Thus, other statistics can be used to test the relationship between the variables.

4.2.4. Linear regression analysis

After analysing the correlations, the authors conduct a linear regression analysis according to the Enter method with the significance level of 5% to test the research hypotheses and the relevance of the model as well as the impact level of variables up the dependent variable.

Table 5: Regression analysis results of factors affecting the entrepreneurial intention

	B	β	Sig.
Constant	-0.004		0.952
ATE	0.139	0.126	0.000
SN	0.102	0.099	0.000
PBC	0.277	0.252	0.000
ET	0.106	0.110	0.000
PT	0.394	0.358	0.000
F	665.891		
R ²	0.690		
Adjusted R ²	0.689		
Sig.	0.000		

The linear regression equation takes the following form:

$$EI = 0.126ATE + 0.099SN + 0.252PBC + 0.110ET + 0.358PT$$

When all independent variables are included in the model, this model is statistically significant with adjusted R² = 0.689; F = 665.891; p = 0.000 < 0.05. According to this result, all factors SN, ATE, PBC, ET and PT have normalized β coefficients > 0 and p < 0.05. Therefore, it can be concluded that entrepreneurial intentions (EI) are positively influenced by attitudes toward entrepreneurship (ATE), social norms (SN), perceived behavioural control (PBC), entrepreneurship training (ET) and personal traits (PT). Thus, all the hypotheses proposed in the study (H1, H2, H3, H4 and H5) are accepted.

Table 6: Summary of hypothesis testing results

Hypothesis	Result
H1: Attitude toward entrepreneurship positively affects entrepreneurship intention.	Accepted
H2: There is a positive relationship between social norms and entrepreneurship intention.	Accepted
H3: There is a positive relationship between perceived behavioural control and entrepreneurship intention.	Accepted
H4: Entrepreneurship training positively affects entrepreneurship intention.	Accepted
H5: There is a positive relationship between personal traits and entrepreneurship intention.	Accepted

5. DISCUSSION AND IMPLICATION

Research results show that the entrepreneurial intention is strongly influenced by "personal traits", followed by "perceived behavioural control"; "attitudes toward entrepreneurship", "entrepreneurship training" and "social norms" respectively. This result is in consistent with previous studies by Krueger et al. (2000), Linan & Chen (2009).

With regard to personal traits, previous studies (Tong et al., 2011; Sagie and Elizur, 1999; Littunen, 2000) have similar conclusions with this paper. Individuals with personal traits such as a need for high achievement, greater personal control, and a greater willingness to take risks are more likely to start a business.

The research results of perceived behavioural control factor are similar to those of Kolvereid (1996); Chen et al. (1998); Basu and Virick (2008); Zaidatol (2009); Ruhle et al (2010); Paco et al. (2011). There is a close, positive relationship between the perceived behavioural control and the entrepreneurial intention.

Kolvereid and Tkachev (1999); Dohse and Walter (2009); Paco et al (2011) have found a direct positive relationship between attitude toward entrepreneurship intention. The study of Krueger et al. (2000) has verified and have similar results with the authors. This shows that people with a serious attitude in entrepreneurship have a higher chance of growing into businesses than others. This factor is very important for young people when they start their own businesses.

Social norms is a controversial factor in the study of its impact on entrepreneurship. Here, the research results of the authors agree with the studies of Kolvereid, 1996; Kolvereid & Tkachev, 1999; Kolvereid & Isaksen, 2006; Yordanova & Tarrazon, 2010 that Social norms have an imperative relationship with entrepreneurship intentions. However, some studies by Reitan (1997), Krueger et al (2000), Autio et al. (2001), Linan (2004), Linan and Chen (2009) suggest that this factor is not predictable. Some other studies do not use this factor completely when measuring entrepreneurial intention (Peterman & Kennedy, 2003; Vecianne et al, 2005). The inconsistency on the results of these studies can be attributed to the differences in culture, geography, politics and society of each subject in the studies. There would be stronger social prejudice in Asian countries than in Western countries.

The research results of Lee et al., 2005; Fayolle et al., 2006; Matlay, 2008; Ooi et al., 2011 show similar results with the research team on a positive relationship between entrepreneurship education and entrepreneurship intentions. This is completely understandable because the entrepreneurial knowledge will help entrepreneurs more easily and smoothly on their entrepreneurial way as well as the success rate of entrepreneurship will also be higher.

These results also carry important implications for Hai Duong province on how to promote their entrepreneurship activities. To promote entrepreneurial activities of young workers, Hai Duong province needs to strengthen propaganda measures to disseminate policies and laws related to entrepreneurship to local people in general and young employees in particular, thereby arousing the entrepreneurship spirit. Through enhancing the role of universities, colleges, professional high schools and vocational schools in the province in training human resources, the province should promote training and retraining activities for young workers in order to improve their entrepreneurial knowledge, skills and confidence. It is necessary to review and complete the legal corridor towards fairness, transparency and publicity in order to create conditions for young workers' entrepreneurial activities in the province and help them develop on the right track. In addition, it is also essential to complete policies and regulations to support entrepreneurial activities of young people and promote support activities of legal advice, business, access to capital from start-up support funds, venture capital funds.

6. REFERENCES

- [1] Acs, Z. J., Audretsch, D. B., Braunerhjelm, P., & Carlsson, B. (2004). "The missing link: The knowledge filter and entrepreneurship in endogenous growth", Discussion paper on Entrepreneurship, Growth and Public Policy, Jena, Germany.
- [2] Altinay, L., & Wang, C. L. (2011). 'The influence of an entrepreneur's socio-cultural characteristics on the entrepreneurial orientation of small firms'. *Journal of Small Business and Enterprise Development*, 18(4), 673-694.
- [3] Ajzen, I. (1987), "Attitudes, traits and actions: dispositional prediction of behaviour in personality and social psychology", *Advances in Experimental Social Psychology*, 20, 1-63.
- [4] Ajzen, I. (1991), "The Theory of Planned Behaviour", *Organizational Behaviour and Human Decision Processes*, 50(2), 79-211.
- [5] Autio, E., Keeley, R.H., Klofsten, M., Parker, G.G.C., & Hay, M. (2001). Entrepreneurial intent among students in Scandinavia and in the USA. *Enterprise and Innovation Management Studies*, 2(2), 145-160.
- [6] Bandura, A. (1986), *Social Foundations of Thought and Action: A Social Cognitive Theory*, Englewood Cliffs, NJ: Prentice-Hall.
- [7] Bandura, A. (1997), *Self-efficacy: The exercise of control*, New York, Freeman.
- [8] Bird, B. (1988). 'Implementing entrepreneurial ideas: The case for intention'. *Academy of Management Review*, 13(3), 442-453.
- [9] Costa, McCrae & Holland. (1984). Personality and vocational interests in an adult sample, *Journal of Applied Psychology*, 69(3), 390-400
- [10] Dell, M. (2008). An investigation of undergraduate student self-employment intention and the impact of entrepreneurship education and previous entrepreneurial experience. Doctor of Philosophy, School of Business University The Australia.
- [11] Dohse, D.; Walter, S. (2009). 'The interplay between entrepreneurship education and regional knowledge potential in forming entrepreneurial intentions'. *Kiel, Germany: Kiel Institute for the World Economy*, 1549.
- [12] Fayolle, A., Gailly, B., & Lassas-Clerc, N. (2006). Assessing the impact of entrepreneurship education programmes: A new methodology. *Journal of European Industrial Training*, 30(9), 701-720.
- [13] Fishbein, M., Jaccard, J., Davidson, A. R., Ajzen, I., & Loken, B. (1980). Predicting and understanding family planning behaviours. In I. Ajzen, & M. Fishbein (Eds.), *Understanding attitudes and predicting social behaviour* Prentice Hall.
- [14] Flynn, B.B., Schroeder, R.G., Sakakibara, S., 1994. A framework for quality management research and an associated measurement instrument. *Journal of Operations Management*, 11 (4), 339-366.
- [15] Giagtzis, Z., (2013), How perceived feasibility and desirability of entrepreneurship influence entrepreneurial intentions: A comparison between southern and northern European countries, (Unpublished Master thesis), Erasmus School of Economics, Rotterdam.
- [16] Hessels, J., van Gelderen, M., Thurik, R., 2008. 'Entrepreneurial aspirations, motivations, and their drivers'. *Small Business Economics*, 31(3), 323-339.
- [17] Khan, M. M., Ahmed, I., Nawaz, M. M. and Ramzan, M. (2011). Impact of personality traits on entrepreneurial intentions of university students. *Interdisciplinary Journal of Research in Business*, Vol. 1, No. 4, pp. 51-57.
- [18] Kolvereid, L. (1996). Prediction of employment status choice intentions. *Entrepreneurship Theory and Practice*, 21(1), 47-57.
- [19] Kolvereid, L. & Isaksen, E. (2006). New business start-up and subsequent entry into self-employment. *Journal of Business Venturing*, 21(6), 866-885.
- [20] Krueger, N.F., Reilly, M.D., Carsrud, A.L. (2000), "Competing models of entrepreneurial intentions", *Journal of business venturing*, 15(5), 411-432.
- [21] Kuckertz A, Wagner M. 2010. The influence of sustainability orientation on entrepreneurial intentions – investigating the role of business experience. *Journal of Business Venturing* in press.

- [22] Lee, S. M., Chang, D., & Lim, S. B. (2005). Impact of entrepreneurship education: A comparative study of the US and Korea. *The international entrepreneurship and management journal*, 1(1), 27-43.
- [23] Liñán, F. (2004). "Intention-based models of entrepreneurship education". *Piccola Impresa/ Small Business*, 3(1), 11-35.
- [24] Liñán, F., & Chen, Y. W. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship theory and practice*, 33(3), 593-617.
- [25] Littunen, H. (2000). Entrepreneurship and the characteristics of the entrepreneurial personality. *International Journal of Entrepreneurial Behavior & Research*, 6(6), 295-310.
- [26] MacMillan, I.; Katz, J. 1992. "Idiosyncratic milieus of entrepreneurship research: The need for comprehensive theories". *Journal of Business Venturing*, 7, 1-8.
- [27] Matlay, H. (2008), "The impact of entrepreneurship education on entrepreneurial outcomes", *Journal of Small Business and Enterprise Development*, Vol. 15 Iss 2 pp. 382-396.
- [28] Nguyen, M., & Phan, A. (2014). Entrepreneurial Traits and Motivations of the Youth-an Empirical Study in Ho Chi Minh City-Vietnam. *International Journal of Business and Social Science*, 5(5).
- [29] N.T.Do (2018), Nguyen nhan that bai trong khoi su kinh doanh: tong ket tu cac nghien cuu o trong va ngoai nuoc, Ky Yeu HTKHQG 4.2018, Truong DH Tai chinh QTKD.
- [30] Ooi, Y.K., Selvarajah, C. and Meyer, D. (2011), "Inclination towards entrepreneurship among university students: an empirical study of Malaysian university students", *International Journal of Business and Social Science*, 2(4), 206-220.
- [31] Peterman, N.E. & Kennedy, J. (2003). Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrepreneurship Theory and Practice*, 28(2), 129-144.
- [32] Phuong, T.H. & Hieu, T.T. (2015). "Predictors of Entrepreneurial Intentions of Undergraduate Students in Vietnam: An Empirical Study". *International Journal of Academic Research in Business and Social Sciences*, 5(8), 46-55.
- [33] Reitan, B. (1997). 'Where do we learn that entrepreneurship is feasible, desirable, and/or profitable?' Paper presented to the *ICSB World Conference*: San Francisco, CA.
- [34] Rotter, J.B. (1990). 'Internal Versus External Locus of Control: A Case Story of an Variable'. *American Psychologist*, April, 489-493.
- [35] Sagie, A. and Elizur, D. (1999), "Achievement motive and entrepreneurial orientation: a structural analysis", *Journal of Organizational Behavior*, Vol. 20(3), 375-87.
- [36] Schramm, C. J. (2006). *The Entrepreneurial Imperative: How America's Economic Miracle Will Reshape the World*. New York, NY: HarperCollins.
- [37] Singh, G., & DeNoble, A. (2003). Views on self-employment and personality: An exploratory study. *Journal of Developmental Entrepreneurship*, 8(3), 265-281.
- [38] Shaver, K. G., & Scott, L. R. (1991). Person, process, choice: The psychology of new venture creation. *Entrepreneurship: Theory and Practice*, 16(2), 23-45.
- [39] Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). 'The theory of reasoned action: A metaanalysis of past research with recommendations for modifications and future research'. *Journal of Consumer Research*, 15, 325-343.
- [40] Souitaris, V., Zerbinati, S., Al-Laham, A., 2007. 'Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources'. *Journal of Business Venturing*, 22, 566-591.
- [41] Taatila, V., & Down, S. (2012). Measuring Entrepreneurial Orientation of University Students. *Education and Training*, 54(8), 744-760.

- [42] Tam, H. W. (2009). How and to what extent does entrepreneurship education make students more entrepreneurial? A California case of the Technology Management Program. University of California, Santa Barbara.
- [43] Tkachev, A. & Kolvereid, L. (1999). "Self-employment intentions among Russian students". *Entrepreneurship and Regional Development*, 11(3), 269-280.
- [44] Thuy, N. T. (2014). Nghiên cứu các nhân tố ảnh hưởng đến tiềm năng khởi sự kinh doanh của sinh viên đại học. PhD Thesis, National Economics University.
- [45] Tong, X. F., Tong, D. Y. K., & Loy, L. C. (2011). Factors influencing entrepreneurial intention among university students. *International journal of social sciences and humanity studies*, 3(1), 487-496.
- [46] Tuan, N.A. (2018) "Các nhân tố tác động tới dự định khởi nghiệp của thanh niên ở Việt Nam", Ministry of Education and Training Research Project.
- [47] van Praag, C.M., & Versloot, P. H. 2007. "What is the value of entrepreneurship? A review of recent research". *Small Business Economics*, 29, 351-382.
- [48] Veciana, J.M., Aponte, M., Urbano, D. (2005). "University students' attitudes towards entrepreneurship: A two countries comparison". *International Entrepreneurship and Management Journal*, 1(2), 165-182.
- [49] Xavier, S. R., Kelley, D., Kew, J., & Herrington, M. (2013). *Global entrepreneurship monitor. 2012 global report*. London: GERA.
- [50] Yordanova, Desislava I., and Maria-Antonia Tarrazon. 2010. "Gender Differences in Entrepreneurial Intentions: Evidence from Bulgaria." *Journal of Developmental Entrepreneurship*, 15 (3), 245-261.
- [51] Wong, P. K., Ho, Y. P., & Autio, E. (2005). "Entrepreneurship, innovation, and economic growth: Evidence from GEM data". *Small Business Economics*, 24(3), 335-350.
- [52] Zain, Z. M., Akram, A. M., & Ghani, E. K. (2010). Entrepreneurship intention among Malaysian business students. *Canadian social science*, 6(3), 34-44.

APPLICATION OF IPCC METHODOLOGY FOR NATIONAL GHG INVENTORY TO VIETNAM FLAT GLASS MANUFACTURING

Dang Vu Tung

School of Economics and Management,
Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: tung.dangvu@hust.edu.vn, dangvutung@gmail.com

Abstract

Glass is an important building material in construction, alongside with cement, lime, brick and tile, ceramics and sanitaryware, whose production processes are associated with heavy natural resource consumption and huge sources of green house gas emission. Currently Vietnam produce approximate one million tons of flat glass for construction a year, emitting thousands of tons of CO₂ to the atmosphere year around. However, there is so far no estimate of the amount of emission of this glass industry as well as other industries.

This paper presents the methodology adopted by the United Nations Intergovernmental Panel on Climate Change (IPCC) for countries to carry out emission inventories. The three tier approach for glass industry was briefly described with their formulae for CO₂ emissions based on data of total production output or on the input carbonate consumption. Application of the method for flat glass manufacturing in Vietnam, the total emissions each year from 2010 to 2015 were estimated. Results show that the industry will emit nearly 200 thousand tons of CO₂ in the year 2020. The results of CO₂ inventory data give certain insights for the policy makers in making regulations for emission reduction in Vietnam building material manufacturing sector, in response to the country's Climate Change commitments.

Keywords: glass manufacturing emission, GHG inventory, climate change, Vietnam glass industry.

1. INTRODUCTION

Climate change has caused more and more severe impacts to countries through unprecedented natural disasters. Global climate change is considered by science a consequence of global warming. Human processes overuse of fossil fuels (such as coal, oil, gas) emitting CO₂ or destroy CO₂ absorbing tanks (deforestation). Therefore, to respond to global climate change, we must first address how to reduce CO₂ emissions into the atmosphere.

The reduction of CO₂ emissions is essentially cutting down the use of fossil fuels by using energy saving and efficient solutions, developing renewable energy, more advanced technologies and materials, and capturing and storing carbon through afforestation.

Currently 20 developing countries have completed and submitted their National Adaptation Plan (NAP); 189 parties have ratified the Paris Agreement on climate change [1]. Implementing the Paris Agreement on climate change, formerly voluntary contributions, now become mandatory contributions to the parties, especially the reduction of greenhouse gas emissions.

Vietnam has gone through almost a decade implementing the National Strategy on Climate Change

(NSCC) and the National Action Plan to respond to climate change. In July 2020, the Prime Minister has issued the National Plan to Adapt to Climate Change for the period 2021 - 2030, with a vision to 2050 [2].

In the 2021 - 2030 period, Vietnam need to develop a long-term strategy on GHG emission reduction. For that purpose, GHG emission data from every sector need to be collected. Estimate of annual GHG emissions from each particular sector will provide baseline data for decision makers to project and plan GHG emission reduction actions.

Vietnam rapid economic growth and urbanization in the last few decades lead to ever increasing demand on building materials for infrastructure development. The building material industries not only supply for domestic consumption but also export cement, glass, ceramics, sanitaryware. Manufacture of building materials plays a major part in the emitting of green-house-gas (GHG) of the whole manufacturing industry.

This paper briefly presents and employs the methodology recommended by the United Nations Intergovernmental Panel on Climate Change (IPCC) to calculate CO₂ emissions from flat (construction) glass manufacturing, with data from Vietnam as illustration.

2. FLAT GLASS MANUFACTURING

2.1. Production process

The products of glass industry can be divided into four main categories: containers, flat (window or construction) glass, fiber glass, and specialty glass. The great volume of commercial glass falls in the first two categories.

Flat glass is used to make glass windows, doors, glass display counters, for inside and outside the house. In addition to ordinary glass, special flat glasses are also manufactured such as heat-absorbent glass, reinforced glass, tempered glass, low-e glass, art decorative glass... As per the technology process used in flat glass manufacturing, it can be divided to float glass and rolled glass, pulled glass and pressed glass.

Float process, invented by Alastair Pilkington in 1952, is so far the most popular technology to manufacture flat glass for purposes of construction (in buildings) and transportation (in vehicles). More than 90% of total output of flat glass produced worldwide are using this technology. There are around 260 float plants worldwide with a combined output of about 800,000 tons of glass a week. [3]

A float line can be nearly half a kilometer long. Raw materials enter at one end and from the other end plates of glass emerge, cut precisely to specification. A float line typically includes highly integrated stages [3]:

- Melting and Refining. Fine-grained ingredients are mixed to make a batch, which flows into the furnace which is heated to 1500°C. The melting process is key to glass quality; and compositions can be modified to change the properties of the finished product.
- Float Bath. Glass from the melter flows gently over a refractory spout on to the mirror-like surface of molten tin, starting at 1,100°C and leaving the float bath as a solid ribbon at 600°C.
- Annealing. The ribbon undergoes heat-treatment in a long furnace known as a lehr to relieve internal stresses within the glass.
- Inspection. Automated on-line inspection reveals process faults upstream that can be corrected, enabling computers downstream to steer cutters round flaws.
- Cutting to order. Diamond wheels trim off selvedge – stressed edges – and cut the ribbon to size dictated by computer. Float glass is sold by the square meter.

2.2. Input materials

Common glass is of soda-lime type, consisting of silica (SiO₂), soda (Na₂O), and lime (CaO), with small amounts of alumina (Al₂O₃), and other minor

ingredients. The main raw materials for making glass are silica sand (making up 60% of glass mass), limestone, soda ash, dolomite and sodium sulfate. Suitable sand for glass making should have grain size within 0.1 ÷ 0.5 mm, contain at least 99.5% SiO₂, not more than 0.1% Fe₂O₃ and 0.3% volatile (loss in burning) contents.

Raw materials are cooked in glass furnaces to a temperature of 1,500°C. The temperature of 800 ÷ 900°C is the temperature of silicate formation. At the end of the silicate formation at the temperature of 1,150 ÷ 1,200°C, the glass block becomes transparent but not much air bubbles, the separation of air bubbles ends at 1400 ÷ 1,500°C. At the end of this stage the gas is completely removed from the glass and it becomes homogeneous. To have the forming plasticity, it is necessary to lower the temperature to 200 ÷ 300°C. The plasticity of a glass block depends on its chemical composition. SiO₂, Al₂O₃ oxides increase the plasticity, while in contrast Na₂O, CaO oxides decrease plasticity.

In practice, glass makers do not produce glass only from raw materials, but common practice is to use a certain amount of recycled scrap glass (broken glass, or 'cullet'). Most operations will use as much cullet as they can obtain, sometimes with restrictions for glass quality requirements. The cullet ratio (the fraction of the furnace charge represented by cullet) will be in the range of 0.4 to 0.6 for container applications, and quite lower for flat glass production.

Cullet comes from two sources: in-house return of glassware broken in process or other glass spillage or retention, and foreign (i.e., external to the plant) cullet from recycling programs or cullet brokerage services. This second source is important in developed economies, but will be less so in developing countries, where recovery of glassware is not popular.

2.3. Source of emissions

During the manufacturing process, CO₂ emissions including direct and indirect ones come from different sources:

+ CO₂ emissions from material decomposition. The major glass raw materials which emit CO₂ during the melting process are limestone (CaCO₃), dolomite Ca.Mg(CO₃)₂ and soda ash (Na₂CO₃). These materials are mined as carbonate minerals for their use in the glass industry, they represent primary CO₂ production.

+ CO₂ emissions from fuel combustion. Fuel oil (FO), diesel oil (DO) and liquified petroleum gas (LPG) are used to provide thermal energy for the glass furnace, in which FO accounts for up to 99% of the total fuel used. Firing those hydrocarbons creates CO₂ and other GHGs like NO_x, SO_x,...

+ CO₂ emissions from electric power consumed by the production line. The generation process of electricity in thermal power plants (running by coal, LNG/LPG, diesel, biomass, solid-waste,...) emits CO₂, therefore it is an indirect emission in glass manufacturing.

+ CO₂ emissions from fuel use in mining and transport of raw materials from the mining areas to the production factory. It adds up indirectly to the emissions of glass industry.

2.4. Flat glass production in Vietnam

The current total design capacity per year of flat glass plants is about 190 million square meters measuring in standardized flat product of 2mm thick. The output of flat glass produced and market value in the period 2010 – 2015 summarized in [4] and shown in Table 1 below, have been steadily increased over the years:

Table 1: Output of flat glass in the period 2010 – 2015

Year	2010	2011	2012	2013	2014	2015
Output (million m ²)	78.9	121.7	93.29	156.7	178.9	180
Value (x10 ³ bil. VND)	4.58	7.06	5.41	9.01	10.47	10.89

During the first quarter of 2020, the country’s glass output is 55.8 million m² of standardized product of 2mm thick, a reduction of 4.2% compared to the same period in 2019 [5].

According to the master plan for development of building materials industry by 2020 and vision to 2030 [6], there will be no new investment or expansion of conventional glass production facilities, including float glass. Glass manufacturing facilities should renovate their technology and operations to fully meet environmental regulations.

The “Strategy for development of building materials in Vietnam in the period 2021 - 2030, orientation to 2050” [7] issued under Prime Minister decision No 1266/QĐ-TTg instructs that total design capacity of flat glass factories by 2025 may not exceed 350 million m² per year, and by 2030 not exceed 400 million m² per year. Noted that the current capacity around 190 million m² per year, it is obvious that the quantity of CO₂ emissions of glass industry is growing sharply over the next decade.

3. THE IPCC METHODOLOGY

3.1. IPCC history

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations’ body for assessing the science related to climate change. The IPCC was created to provide policymakers with regular scientific

assessments on current state of knowledge about climate change, its implications and potential future risks, as well as to put forward adaptation and mitigation options. [8].

The Panel was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), endorsed by UN General Assembly in 1988.

Its initial task, as outlined in UN General Assembly Resolution 43/53 dated 6 December 1988, was to prepare a comprehensive review and recommendations with respect to the state of knowledge of the science of climate change; the social and economic impact of climate change, and potential response strategies and elements for inclusion in a possible future international convention on climate change.

Since 1988, the IPCC has had five assessment cycles and delivered five Assessment Reports, the most comprehensive scientific reports about climate change produced worldwide. It has also produced a range of Methodology Reports, Special Reports and Technical Papers, in response to requests for information on specific scientific and technical matters from the United Nations Framework Convention on Climate Change (UNFCCC), governments and international organizations.

In 2007, the IPCC and U.S. Vice-President Al Gore were jointly awarded the Nobel Peace Prize for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change.

3.2. Guidelines on GHG inventory

To facilitate the climate change action efforts, the IPCC has a guidelines for national GHG inventories for key categories, i.e. sectors, that produce significant amount of GHG emissions.

The IPCC Guidelines were first accepted in 1994 and published in 1995, and revised for the first time in 1996. The UNFCCC COP3 held in Kyoto in 1997 reaffirmed that the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories should be used as "methodologies for estimating anthropogenic emissions by sources and removals by sinks of greenhouse gases" in calculation of legally-binding targets during the first commitment period. The 1996 series consists of three volumes [9]: The Reporting Instructions (Volume 1); The Workbook (Volume 2); and The Reference Manual (Volume 3).

The IPCC Guidelines for National Greenhouse Gas Inventories went through a thorough revision in 2006. The 2006 IPCC Guidelines provide methodologies for estimating national inventories of anthropogenic

emissions by sources and removals by sinks of greenhouse gases. It was developed to assist countries in fulfilling their commitments under the UNFCCC on reporting on inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol.

The 2006 IPCC Guidelines are bundled in five volumes [10]. Volume 1 describes the basic steps in inventory development and offers the general guidance in greenhouse gas emissions estimates based on the accumulated experiences of countries over the period since the late 1980s, when national greenhouse gas inventories started to appear in significant numbers. Volumes 2 to 5 offer the guidance for estimates in different sectors of economy:

- Volume 1. General Guidance and Reporting.
- Volume 2. Energy
- Volume 3. Industrial Processes and Product Use.
- Volume 4. Agriculture, Forestry and Other Land Use.
- Volume 5. Waste.

In its 26th meeting (2014), the IPCC Task Force Bureau (TFB) concluded that to maintain the scientific validity of the 2006 IPCC Guidelines, though a fundamental revision is unnecessary, certain refinements may be required, taking into account scientific and other technical advances that have matured sufficiently since 2006.

The 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories preparing by the Task Force on National Greenhouse Gas Inventories (TFI) since was adopted and accepted during the 49th Session of the IPCC in May 2019. The overall aim is to provide an updated and sound scientific basis for supporting the preparation and continuous improvement of national GHG inventories.

The 2019 Refinement was not to revise the 2006 IPCC Guidelines, but update, supplement and/or elaborate the 2006 IPCC Guidelines where gaps or out-of-date science have been identified, and should be used in conjunction with the 2006 IPCC Guidelines. Regarding the methodology on GHG inventories of the mineral industry (including cement, lime, glass, and other processes using carbonates), there was no further refinement to the 2006 IPCC Guidelines.

The 2006 IPCC Guidelines proposes three levels of estimates for countries based on availability of input data, from most aggregated data at national level (tier 1) to most breakdown data from factory level (tier 3) [11]. Details of each method are presented bellows.

3.3. Tier 1 method

The Tier 1 method (Equation 1) should be used where

data are not available on glass manufactured by process or the carbonates used in glass manufacturing, and only aggregated data on national production is available.

Tier 1 applies a default emission factor and cullet ratio to national-level glass production statistics. The uncertainty associated with this method may be considerably higher than the uncertainty associated with the Tier 2 and Tier 3 methods.

Tier 1: emissions based on glass production

$$CO_2 \text{ Emissions} = M_g \cdot EF \cdot (1 - CR) \quad (\text{Eq.1})$$

Where:

CO₂ Emissions = emissions from glass production, tons;

M_g = mass of glass produced, tons;

EF = default emission factor for manufacturing of glass, tons CO₂/ton glass;

CR = cullet ratio for process (either national average or default), fraction.

Tier 1 applies a default emission factor, based on a "typical" raw material mixture, to national glass production data. A "typical" soda-lime batch might consist of sand (56.2% in weight), feldspar (5.3%), dolomite (9.8%), limestone (8.6%) and soda ash (20.0%). Based on this composition, one metric ton of raw materials yields approximately 0.833 tons of glass, losing about 16.7% of its weight as volatiles, in this case virtually entirely CO₂. Thus the Tier 1 default emission factor for glass production takes value of:

$$EF = 0.167 / 0.833 = 0.20 \text{ tons CO}_2 / \text{ton glass.}$$

Data for the Tier 1 method includes national statistics for glass production by weight as well a correction for the quantity of cullet used in glass production. If country specific information is available for the average annual cullet ratio, the emission factor is modified accordingly: $[0.20 \cdot (1 - \text{country specific cullet ratio})]$. Otherwise, Tier 1 assumes a default cullet ratio of 50%. Therefore, national level data on the mass of glass produced can be multiplied by $0.20 \cdot (1 - 0.50) = 0.10$ tons CO₂/ton glass in order to estimate national emissions.

3.4. Tier 2 method

Tier 2 is a refinement of Tier 1. Instead of collecting national statistics on total glass production, emissions are estimated based on the different glass manufacturing processes (e.g. flat glass, container glass, fiber glass, etc.) undertaken in the country.

The Tier 2 method applies individual default emission factors to each glass manufacturing process. The emission estimate must, however, be corrected for the fact that a portion of recycled glass (cullet) may also be supplied to the furnace (Equation 2).

Tier 2: emissions based on glass manufacturing process

$$CO_2 \text{ Emissions} = \sum_i [M_{g,i} \cdot EF_i \cdot (1 - CR_i)] \quad (\text{Eq.2})$$

Where:

CO₂ Emissions = emissions from glass production, tons;

M_{g,i} = mass of melted glass of type *i*, tons;

EF_{*i*} = emission factor for manufacturing of glass of type *i*, tons CO₂/ton glass melted;

CR_{*i*} = cullet ratio for manufacturing of glass of type *i*, fraction.

The Tier 2 method relies on applying default emission factors and cullet ratios to the various types of glass produced in the country. Where country specific or even plant specific data are available it is encouraged to use these data to supplement or replace the defaults. Cullet ratios, in particular, can vary significantly.

It is a good practice to use the mid-point values of the ranges provided unless some other value in the range is known to be more representative of country specific circumstances. For float glass production, the default emission factors EF is 0.21kg CO₂/kg glass, and default cullet ratios CR range typically between 10% ÷ 25% [11].

The Tier 2 method requires, at a minimum, the collection of national level data on the quantity of glass melted by manufacturing process. Data for glass often is provided in different units (e.g., tons of glass, number of bottles, square meters of glass, etc.) and these should be converted into tons. Where possible, data should be collected on a plant-specific basis and aggregated to the national level. Although the Tier 2 method provides default factors for the cullet ratio, if country-specific or plant-specific data are available countries are encouraged to collect these data.

The emission factor for the Tier 1 and Tier 2 methodologies is based on the mass of CO₂ released per mass of carbonates consumed. The distinction between Tier 2 and Tier 1 is in the activity data details.

3.5. Tier 3 method

The Tier 3 methodology is based on accounting for the carbonate input to the glass melting furnace (Equation 3).

Tier 3: emissions based on carbonate inputs

$$CO_2 \text{ Emissions} = \sum_i (M_i \cdot EF_i \cdot F_i) \quad (\text{Eq.3})$$

Where:

CO₂ Emissions = emissions from glass production, tons;

EF_{*i*} = emissions factor for the particular carbonate material *i*, tons CO₂/ton carbonate;

M_{*i*} = weight or mass of the carbonate *i* consumed (mined), tons;

F_{*i*} = fraction calcination achieved for the carbonate *i*, fraction.

Where the fraction calcination achieved for the particulate carbonate F_{*i*} is not known, it can be assumed that the fraction calcination is equal to 1.00.

The Tier 3 emission factors are based on the actual carbonates consumed in the melting furnace. The Tier 3 approach requires the full accounting of carbonates (species and sources).

For the Tier 3 method application, plant-level activity data should be collected on the various types of carbonates consumed for glass production.

The Tier 3 emission factor represents the weighted average of the emission factors (tons CO₂/ton carbonate) of the individual carbonates. Typical values of emission factors EF_{*i*} show in Table 2 [12].

Table 2. Emission factors of carbonate materials

Carbonate	Mineral Name	Emission Factor *
Na ₂ CO ₃	Soda ash	0.41492
CaCO ₃	Calcite	0.43971
MgCO ₃	Magnesite	0.52197
CaMg(CO ₃) ₂	Dolomite	0.47732
FeCO ₃	Siderite	0.37987
MnCO ₃	Rhodochrosite	0.38286
Ca(Fe,Mg,Mn)(CO ₃) ₂	Ankerite	0.40822-0.47572

* Emission factors when assuming 100% calcination; e.g., 1 ton calcite fully calcined would yield 0.43971 tons of CO₂.

4. APPLICATION TO VIETNAM FLAT GLASS PRODUCTION

The IPCC methodology presented above is used below to calculate the total CO₂ emission and the per unit emission of flat glass production in Vietnam in period 2010-2015, and forecast for 2020, 2025 and 2030.

4.1. Input data

In Vietnam, the data from different glass producers are neither complete nor consistent. The IPCC 2006 Guidelines suggested that in case plant-level data to be unreliable or highly uncertain, then it is good practice to use Tier 2 for GHG inventory calculation. Therefore, Tier 2 was selected based on available data on nationwide flat glass production using float technology (Table 1).

Other parameters in the formula include:

- Emission factor EF = 0.21 (default value)
- Cullet ratio CR = 17.5% (mid point of the default value range 10%-25%)
- Specific mass of standardized glass product of 2mm thickness: 5 kg/m².

4.2. Inventory result

Using Eq.2 after converting from square meters to tons of glass product, we come up with the following results:

Table 3. CO₂ emissions of flat glass manufacturing

Year	2010	2011	2012	2013	2014	2015
Glass output (mil m ²)	78.9	121.7	93.29	156.7	178.9	180
Glass output (10 ³ ton)	394.5	608.5	466.5	783.5	894.5	900
Total emission (10 ³ ton)	68.3	105.4	80.8	135.7	155.0	155.9

The average emission per kg of glass produced is 0.173 kg CO₂.

The average emission per m² standard flat glass is 0.866 kg CO₂.

Projection with the same average unit emission for the near future yields emissions of the glass manufacturing industry as in Table 4:

Table 4. Projection of CO₂ emission from Vietnam glass manufacturing

Item	2020*	2025**	2030**
Glass output (mil m ²)	223	350	400
Total emissions (10 ³ ton)	193.3	303.2	346.5

* projection from Q1/2020 output of 55.8 million m² [5]

** maximum design capacity [7]

4.3. Reduction of emission

From Table 3 and Table 4, we can see CO₂ emissions in 2030 may increase 80% against the 2020 emission level.

The Strategy for development of building materials in Vietnam [7] dictates that to 2030, the energy consumption in glass manufacturing of 1 ton of product should be less than 1,500 kcal and 100 kWh. This is a huge improvement from the consumption of 4,500 kcal and 180 kWh per ton of product in 2015.

Reduction in energy use will cut down direct CO₂ emissions from manufacturing process. Therefore, investments should be put on the manufacturing technology, mainly the furnace and materials. In the manufacturing process, producers may consider:

- Using material mixture with low melting point,
- Increasing the cullet ratio,
- Using kilns with high productivity,
- Utilizing heat recovery from cooling air-flow,
- Enhancing thermal efficiency (insulation) of the kiln,
- Improving the process controls.

5. CONCLUSIONS

GHG inventory data is crucial for the sector’s development planning and practice. This paper presents the IPCC methodology to estimate total emissions of the glass industry and application to Vietnam. It is worth to mention that this GHG inventory method can be extended to use for other similar material processing industries as well.

However, the Tier 2 method only focuses on emissions from carbonation processes within but does not take into account indirect emissions occurring outside the manufacturing facility. Tier 3 method will cover this weakness with data from all processes involved in glass manufacturing, from raw materials to final products.

6. ACKNOWLEDGMENTS

The author gratefully acknowledges the contributions of experts from the Vietnam Institute for Building Materials (VIBM) and the USAID Vietnam Clean Energy Program (VCEP) for technical support.

7. REFERENCES

[1] <http://kinhtedothi.vn/danh-gia-thuc-hien-ke-hoach-hanh-dong-quoc-gia-ve-bien-doi-khi-hau-388032.html>

[2] Prime Minister (2014), *Decision No. 1055 / QD-TTg promulgating the National Plan to Adapt to Climate Change for the period 2021 - 2030, with a vision to 2050.*

[3] Eurotherm, Flat Glass Manufacturing Process, <https://www.eurotherm.com/en/glass-manufacturing-applications-en/flat-glass-manufacturing/>

[4] Vietnam Institute for Building Materials (VIBM) (2016), *Technical Reports No. 6D & 6C*, submitted to the USAID Vietnam Clean Energy Program (VCEP), Hanoi.

- [5] <http://moc.gov.vn/tl/tin-tuc/62316/kho-khan-trong-san-xuat-vat-lieu-xay-dung-choa-co-diem-dung.aspx>
- [6] Prime Minister (2014), *Decision No. 1469/QĐ-TTg on Approving the Master plan of building material development in Vietnam up to 2020, vision to 2030*.
- [7] Prime Minister (2020), *Decision No. 1266/QĐ-TTg on Approving the Strategy for development of building materials in Vietnam in the period 2021 - 2030, orientation to 2050*.
- [8] IPCC, <https://www.ipcc.ch/about/history/>
- [9] IPCC (1996), *Guidelines for National Greenhouse Gas Inventories*, <https://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html>
- [10] IPCC (2006), 2006 IPCC Guidelines for National Greenhouse Gas Inventories, <https://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>
- [11] IPCC (2006), 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol 3, Chapter 2: *Mineral Industry Emissions*, https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/3_Volume3/V3_2_Ch2_Mineral_Industry.pdf
- [12] CRC Handbook of Chemistry and Physics (2004), (David R. Lide, Ed in Chief); CRC Press, Boca Raton, FL.

AFFECTS OF ATTITUDE TOWARD ENTREPRENEURSHIP TO STUDENTS' ENTREPRENEURSHIP INTENTION: RESEARCH ON STUDENTS OF VARIOUS STUDY FIELDS AT HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Doan Thi Thu Trang*

Department of Industrial Management, School of Economics and Management,
Hanoi University of Science and Technology, Hanoi, Vietnam

*Corresponding author: trang.doanthithu@hust.edu.vn

Abstract

This paper researches the affects of attitude and its antecedents toward entrepreneurship intention of students in various study fields at Hanoi University of Science and Technology. For this purpose, the paper adopted a part of the Theory of Planned Behavior (TPB) framework, which is both well established in entrepreneurial intention research and has been shown to be robust cross-culturally. A survey method using a questionnaire in combination with multivariate data analysis (Cronbach Alpha test, EFA, CFA, SEM) are utilized. 596 full time students belonging to four study field groups of Hanoi University of Science and Technology have been chosen randomly as the respondents. The results gained from the data show that engineering students in Vietnam are quite interested in self-employment and their entrepreneurship intentions are firmly affected by attitude toward entrepreneurship and its antecedents. At the glance of dividing students to various groups basing on studying fields, the research results showed that the highest level of entrepreneurship intentions belongs to group of mechanical students while attitude toward entrepreneurship affected mostly to the same group. Implication of these results, suggested methods to promote entrepreneurship intention by enhancing positive attitude toward entrepreneurship of engineering students in Vietnam and limitations of the study are discussed.

Keywords: Entrepreneurship intention, attitude toward the entrepreneurship, engineering students, fields of study.

1. INTRODUCTION

According to the most popular opinion of the international community, entrepreneurship is the earliest stage in the life cycle of every business when its founder realizes his business idea. For many people, entrepreneurship is understood simply as pursuing risky decisions in the future; this is an almost indispensable process in business, but due to its risky nature, not all startups are successful [1].

In economics, entrepreneurship is always associated with two terms: setting up a new business (startup) and entrepreneurship. Starting a new business (start-up) is the establishment and operation of a new business, while entrepreneurship is defined as a form of personal competencies and motivation that motivates an individual to focus on enthusiasm and energy to create a new product or service. Entrepreneurship, also known as entrepreneurship spirit, is a term that has appeared in the world for a long time. From the researchers' point of

view, the true entrepreneurial entrepreneurs must be people whose ambition to surpass fate, take risks with the spirit of innovation and creativity; at the same time, bravely endure serious physical and spiritual disasters when doing business at a loss. Therefore, the positive attitude toward entrepreneurship plays an important role in promoting people to involve in the risky career as start-up [2].

To foster more entrepreneurship, it is therefore necessary to understand how people make that decision [3]. In dealing with this issue, much literature on entrepreneurship focuses on the concept of entrepreneurial intention with the view that, first, the formation of an intention to start a business is a necessary step in the process of founding an organization and second, most of entrepreneurship is intentional behavior [4] since acting entrepreneurially is something that people plan to do [5]. Entrepreneurial intention thus has proven to be a primary predictor of future entrepreneurial behavior [6].

In addition, in theory, entrepreneurship is considered the intentionally planned behavior and therefore should be best predicted through entrepreneurship intention precedencies [7]. Entrepreneurship is the only prefix to predict the formation of a start-up [8]. It is difficult to see someone start a firm just overnight or by accident [9]; rather, new ventures are the results of specific, intentional choices [8]. Ajzen with the famous Theory of planned behavior (TPB) has studied and proved that intentions serve as a channel to better understanding the act itself [10]. Bird (1988) also confirmed that intentions captures a state of mind that directs individuals' focus to achieve a goal. Individuals with intention to start a business are highly likely to carry it out [8]. Thus, it is reasonable to suggest examining entrepreneurial intentions as meaningful approach to studying actual entrepreneurial behavior and well predict the entrepreneurship action in the future [10].

Entrepreneurial intentions and its prefixes are influenced by internal and external factors, in which, for students with knowledge, internal factors such as positive attitude toward entrepreneurship plays an important role in leading to the behavior of choosing to start a career as a career after graduation [11].

For these reasons, the study to evaluate the internal factors such as attitude toward entrepreneurship influencing the formation of entrepreneurship intentions of students is a problem that receives the attention of a large number of scientists around the world, managers as well as international organizations, which are typically the GEM Global Entrepreneurship Index Research Organization, World Intellectual Property Organization (WIPO), Cultural, Scientific and Educational Organizations. United Nations (UNESCO), Organization for Economic Cooperation and Development (OECD).

Thus, this paper was conducted with the aims of researching how attitude toward entrepreneurship affects to entrepreneurship intentions of engineering students in Vietnam. We concentrate on engineering students because students are future entrepreneurs and graduates in engineering disciplines are more than others expected to found companies in dynamic and innovative areas which promote significant economic growth and increase in employment [12]. Engineering students thus will be the key sources of future innovative and knowledgeable business founders. The above arguments show the entrepreneurial intention' important role as a primary cognitive driver to new venture creation [11].

Specially, the focused engineering students in this research are divided in four groups according to their

studying fields; so that we can see the changes or the differences of the affect in each student group. The outcome of this paper will be suggestions and supporting schemes for educators and policy makers to promote individual entrepreneurship mindset as well as improve the rate of firm started in society. In addition, the government may know which field of study in technical group could produce graduates with high entrepreneurship intention level; from which concentrate the limited resources for this group only, instead of sharing the limited resources for all student groups.

The papers will be started with the literature review on entrepreneurship, entrepreneurship intention and attitude toward entrepreneurship. The next part will be research methodology, following by research results. In the final part, we will discuss the results and conclude some methods to promote entrepreneurship intention of Vietnamese students in engineering filed, especially for the group with high level of entrepreneurship intention. Limitations and suggestions on future research trends are also presented in the last words of the paper.

2. LITERATURE REVIEW

2.1. Entrepreneurship

According to Vietnamese dictionary, entrepreneurship means starting a new business [13]. Drucker, like many other scholars, affirms that entrepreneurship is always closely linked to innovation, or in contrast, creativity is the main tool of entrepreneurship [14]. Citing the classic economist Schumper' words, researcher Robinson makes clear the difference between a manager and an entrepreneur in that the manager simply runs a company while the entrepreneur is an innovator [15]. Shane's research introduces the basic concept of entrepreneurship as an activity that involves the discovery, evaluation, and exploitation of opportunities to introduce new products and services, new ways of running a business, new material markets or sources that have never appeared before [16]. Based on the viewpoint of research Barbara et al., "entrepreneurship indicates the start-up of a new business formed on the basis of scientific and technological results" [17].

American economist Drucker, PF in the study named 'Innovation and entrepreneurship' said that entrepreneurship spirit is understood as the actions of entrepreneurship - the person who transforms sensitive business, financial feelings and innovation into economic commodity products [18]. The results of these actions are to create new organizations or contribute to the re-creation of "old" organizations. The most obvious form of entrepreneurship is starting to build new

businesses. It can be said that entrepreneurship is the spirit of innovation and creativity. Entrepreneurship has an important social position because it motivates entrepreneurs to have a desire to understand the needs of potential customers. This is considered an important factor of contemporary society [19]. According to the research group Nabi & Holden, entrepreneurship expresses a personal perspective on career choices, thoughts and actions towards starting a new business [20].

In addition, there are many definitions and understandings of entrepreneurship, but in general, modern research in the world unifies that starting a business is the establishment and ownership of a new business [21].

2.2. Entrepreneurship intention and its role as a trigger point of the new venture creation

Cited by Oxford English Dictionary [23], entrepreneurship intention is defined as a plan or desire to create a new venture. Other famous definition of entrepreneurship intention should be from Birth that it is the commitment to starting a new business [8]. Bird also defines intention as a psychological state that directs an individual's attention to a specific object, goal, and journey to achieve a meaningful outcome for that individual. Bird, B. (1988) Implementing entrepreneurial ideas: The case for intention. *Academy of management Review*, 13(3), 442-453.

Popescu et al. say that the entrepreneurial intentions of an individual could be seen as the alleged desire to start a business or to form a new organization in the future [24] According to document Bagozzi, R. P., Baumgartner, J., & Yi, Y. (1989) An investigation into the role of intentions as mediators of the attitude-behavior relationship. *Journal of Economic psychology*, 10(1), 35-62 [25], intentions imply motivation for future behavior and these are important indicators of the amount of effort an individual put into performing this behavior. Researchers have refuted the notion that personality or demographic traits are the most accurate indicator of entrepreneurial behavior, and asserted that intent is the prefix that most accurately predicts planned behavior.

In the area of behavioral psychology, Ajzen's Planed Behavior Theory has proven intentions to be the most accurate indicator of future behavioral behavior with a predictive probability of success reaching more than 30% compared with 10% belonging to other predictable traits [10]. Ajzen, I. (1991) The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.

Entrepreneurship is considered an important and hidden aspect of entrepreneurship. In simple terms, we can

perceive behavior through exploring intent to perform the act [Ajzen, I. (1991) The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-21156]. Bird also asserted that the intention to start a business establishes the basic foundation for the startup action of the future [8].

Thus, studies around the world have agreed that entrepreneurship is a planned behavior, and it requires the effort of each individual to achieve that behavior. Therefore, the intention to start a business plays a very important role in the formation of entrepreneurial behavior, especially in the case of university students because they are in the future career orientation period.

In this study, entrepreneurial intent is defined from Krueger's point of view, which is a cognitive commitment to the willingness to start and own an innovative business in the near future [26] for two reasons: (1) Krueger's research is a proven model specifically for entrepreneurship, and (2) The theory of effective cohesion for motivating human intent has been demonstrated through numerous experiments with techniques different arts [27]. As such, understanding individual's intention towards entrepreneurship is important in fostering number of entrepreneurs in the country since entrepreneurs are made, not born [22]. In reality, both Global Entrepreneurship Monitor (GEM) and Panel Studies on Entrepreneurial Dynamics (PSED) use entrepreneurial intention as one variable of research to better understand what impacts entrepreneurship [28].

In summary, almost international researches confirm that entrepreneurial intention is a planned behavior and this requires the strong afford of a person to carry out the behavior. That is why entrepreneurial intention plays a central role in forming the new business, especially in the case of undergraduate students because they are on the period of deciding the life career.

2.3. Attitude toward entrepreneurship, its predictor and the proposed research model

Attitude toward the entrepreneurship refers to the degree to which a person has a favorable or unfavorable evaluation of creating a new venture in question. It also reflects the individual's assessment of the personal desirability of creating a new venture. It is the degree to which individuals perceive the attractiveness of the entrepreneurship behavior in question. In general, a person who believes that the performance of a given behavior will, with high probability, lead to mostly positive outcomes will possess a favorable attitude toward that behavior [10].

As the Theory of Planning Behavior (TPB) by Ajzen (1987, 1991); Ajzen & Fishbein (1980), attitude toward the entrepreneurship is influenced by an independent variable, that is Personal Expected Value. The higher the

individual's expected value, the more positive attitude towards a startup is. In other words, the higher the individual's expected value, there is a positive relationship with attitude to entrepreneurship.

According to Zhang et al., there are many different approaches to the factors influencing entrepreneurship, most of which are the Theory of Planning Behavior (TPB) by Ajzen (1987, 1991); Ajzen & Fishbein (1980) initiated [29]. TPB believes that the three factors of internal personal perception including Attitude toward the entrepreneurship, Subjective norm and Perceived behavioral control are the three direct prefixes of intention, in addition to three personal perception prefixes. The factors that indirectly influence the intentions are the individual's expected values, beliefs in social norms and perceptions of self-capacity. However, the Zhang team also suggested that, for each research environment and purpose, the researcher must select appropriate groups of impact factors in order to build the most appropriate research model.

Based on my review of contemporary studies, the researcher found that the studies applied the original or modified the original TPB model when considering the effect of groups of individual cognitive factors on intention to initiate entrepreneurship only gives relatively homogeneous results. Specifically: studies show that the stability of the factor Attitude towards entrepreneurship with positively affects on entrepreneurial intention. On the contrary, the relationship between Subjective norm and Perceived behavioral control to entrepreneurial intention do not show consistent results.

Therefore, in the framework of this study, the researcher will re-test the relationship of the impact of "attitude towards entrepreneurship" on "entrepreneurial intention" which has an important role in asserting the validity and generalization of the theory.

Basing on the TPB, the proposed model on researching the affect of Attitude toward the entrepreneurship to entrepreneurship intention of engineering students in Vietnam is depicted graphically as follows:

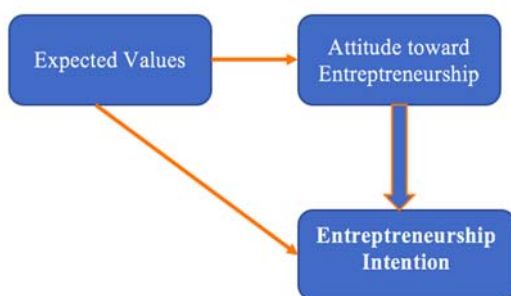


Fig. 1: Proposed entrepreneurial intention model

2.4. Research hypothesis

To test the model, three hypotheses are stated accordingly:

Expected Values (EXP) is an individual's desire for the abilities that they can perform a certain thing or action [30]. Expected value is a psychological variable that expresses an individual's sense of abilities and wants in relation to important tasks or actions. Expected values influence attitudes toward actions. People with a high expected values often have a positive attitude towards important jobs, plans or intention [31] In the study of entrepreneurial intentions, studies show that an individual's expectations and expected value have an impact on attitudes toward entrepreneurship and entrepreneurship intention. Therefore, this study suggests the two hypotheses:

Hypothesis 1: The more favorable the expected value with respect to self-employment, the more positive should be students' attitude toward entrepreneurship

Hypothesis 2: The more favorable the expected value with respect to self-employment, the stronger should be students' intention to become self-employed.

Attitude refers to the individual's perception of the personal desirability in performing the behavior, i.e. the creation of a new venture behavior [6]. In entrepreneurship research, the importance of domain-specific attitude in explaining entrepreneurial intention and behavior has been recognized and it acts as a primary determinant of students' willingness to be self-employed. [32]. Obviously, the more students value the entrepreneurial career path, the stronger their interest to start a business [33]. Therefore, we hypothesize that:

Hypothesis 3: The more favorable the attitude with respect to self-employment, the stronger should be students' intention to become self-employed.

3. METHODOLOGY

3.1. Research design and variable measures

A structured questionnaire form was used to survey engineering students of a leading engineering university in Vietnam: Hanoi University of Science and Technology - HUST. The survey time was during October, 2019. The items used to measure for the constructs in the model were based upon from previous papers (Krueger et al., 2000; Autio et al., 2001, Linan & Chen, 2009, Kolvereid & Isaksen (2006), Linan (2005), Dyssanayake (2014), Hisrich & Peters (2002), Leong (2008). The back-translation method was used to translate from English to Vietnamese to guarantee the original meaning of each item. A first testing survey was conducted with the participants of 20 HUST students in order to make sure the reliability, consistency and easy understanding of research constructs. Next, on the

evaluation results of a pilot survey with a small group of 150 students at HUST, we conduct further adjustment and refinement of the criteria necessary for each factor in the model. The result is a construction of the final 4 item scales assessed for expected value (EXP), 4 item scales assessed for attitude toward entrepreneurship (ATT) and 5 item scales assessed for entrepreneurship intention (INT).

The survey form is divided in two main parts: Part 1 with 13 items scales belonging to two impacting factors and one independent factor (entrepreneurial intention of engineering Vietnamese students). Part 2 is the information of students on socio-demographic characteristics. We measured all items on a five point Likert-scale with the levels 1 “completely uninterested” to 5 “strongly interested”, 1 “very improbably” to 5 “very probably” and 1 “strongly disagree” to 5 “strongly agree”, depending of the question.

3.2. Population and sample

University undergraduate students are deemed as viable samples because they are young and they will move on to their working life soon after graduation, being an entrepreneur can be a career option for them. A total of 596 undergraduate students at a well-known public engineering university in Vietnam (Hanoi University of Science and Technology - HUST) participated in this study by responding to a structured questionnaire in classrooms. The sample size is around 300 which is considered as good size according to the Comrey & Lee (1992)'s rule [34]. All participated students are the from 3rd to 5th year students because at the age from 20 to 25, the entrepreneurship intention is believed to be at the highest level [35]. Specifically, the selection of the sample will be done by using stratified sampling method according to faculties. It is believed that by using this sampling method, it is then able to representation of students from various fields of studies. After eliminating the missing forms, we collected 596 eligible survey forms for final analysis.

Table 1: The structure of the analyzed sample

Variable	Categories	Number of respondents	Percentage (%)
Gender	Male	469	78,7
	Female	127	21,3
Research activities	Yes	190	31,9
	No	406	68,1
Attending Entrepreneurship Program	Yes	65	10,9
	No	531	89,1

3.3. Methods and Data Analysis

Data will be collected in a classroom setting, whereby the respondents will be given 10-15 minutes to answer the questions. It is done so to ensure that respondents are

given enough time to answer the questions and to obtain a high response rate. All data collected will then be keyed into computer for further analysis. The study will use SPSS 18.0 and AMOS 18.0 to analyze the data collected based on a wide range of qualitative analysis methods. First of all, with the plenary sample (n = 150), we used Cronbach's Alpha analysis, Corrected Item-Total Correlation and Exploratory Factor Analysis (EFA) to analyze. The degree of internal consistency is considered acceptable if the Alpha coefficient is larger than 0.6 or better and the Corrected Item-Total Correlation higher than 0,3 ([36]. With Exploratory Factor Analysis (EFA), the criteria was used including: Kaiser-Meyer-Olkin (KMO) > 0,5; Sig. < 0.05; total variance explained > 50% and Factor loadings > 0.5 [36].

In the next step, we use Confirmatory Factor Analysis (CFA) with the official sample (n= 596) to access the model fit with the actual data and reliability and validity of each construct in the model (convergent and discriminant validity). The criteria of CFA include Chi – square/df < 3; CFI and IFI > 0.9 and RMSEA < 0.08 [36]. The factor loadings of each item in the constructs are larger than 0.5 showing that the constructs reach convergent validity, the square root of AVE larger than correlations coefficient between the constructs in the model.

In order to test the hypotheses, we use structural equation modelling (SEM) with common statistical significant at level 0.05.

4. RESULTS

4.1. Results on preliminary assessment on measures

The findings with plenary sample (n = 150) showed that all scales' Cronbach's alpha coefficient of internal reliability proved to be acceptable; hence, the scale seemed to have acceptable internal reliability. In addition, all variables' Cronbach's alpha coefficient of internal reliability proved to be better than 0,6. The contribution of individual items to overall internal reliability was checked and found to be positive in each case, with the corrected item–total correlation higher than 0,3.

At EFA step, we found that all factors got KMO > 0,5; Sig. < 0.05; variance explained > 50% and Factor loadings > 0.5.

4.2. Results on official assessment on measures

Confirmatory factor analysis further with official sample (n=596) supported unidimensionality, with GFI, CFI, TLI and IFI all were larger than 0.9, thereby indicating adequate model fit (Byrne, 2001; Hair et al., 2006): Chi-square/df = 1,969 < 3; CFI = 0.903; IFI = 0.905 which are both higher than 0,9 and RMSEA = 0.057 < 0,8.

After eliminating all item with small factor loading value, the remained item all have the factor loading values bigger than 0,5 which confirm that all factors reach convergent validity. Results also present that the correlation coefficient between correlated factors < 1 which means that all factors reached discriminant validity.

4.3. Result on SEM application and hypothesis testing

The finding of SEM analysis indicated that the model fit with actual data: Chi –square = 2.541 < 3, CFI = 0.903 và IFI = 0.904 (both are higher than 0.9); RMSEA = 0.072 < 0.08.

The result analysis indicated that entrepreneurship intention of engineering students in Vietnam is firmly influenced by attitude toward that entrepreneurship (β = 0,688) and expected value (β = 0,275); the attitude toward entrepreneurship is influenced by expected value (β = 0,275). This supported that we could accept all 3 hypothesizes suggested above.

Results on comparing the differences in attitude toward entrepreneurship and entrepreneurship intention of students in different studying field groups as bellows:

ANOVA analysis results show that there is a difference in entrepreneurship attitudes and intentions among students of different majors (p-value < 0.05) (Table 2).

Table 2: Table ANOVA analysis result

Constructs/ Groups		N	Mean	SD	p-value (Levene)	p-value (F)
Attitude	1	176	3.542	0.898	.069	.013
	2	157	3.837	0.774		
	3	158	3.668	0.826		
	4	105	3.629	0.778		
Intention	1	176	3.106	0.921	.728	.016
	2	157	3.294	0.878		
	3	158	3.113	0.866		
	4	105	3.198	0.819		

Note: Studying field groups:

- (1) Information Technology, Electricity, Electronics and telecommunications, Automation
- (2) Engineering, manufacturing engineering, and materials science
- (3) Physics, chemistry and biology
- (4) Other engineering studying fields

Post hoc test results show that attitude toward entrepreneurship of group 2 (Engineering, manufacturing

engineering, and materials science) tends to be more positive than other groups (p-value <0.1), meanwhile, there is no statistically significant difference in other industries. There is also a difference in entrepreneurship intention level between industry group (2) and industry group (1) and industry group (3) (Table 3). In other words, the affect of entrepreneurship attitude on entrepreneurship intentions of industry groups (2) is stronger than the rest of the industry groups.

Table 3: Post hoc test results

Dependent Variable		Mean Difference (I-J)	Std. Error	Sig.
ATT	1 2	-.29490*	.09077	.001
	3	-.12631	.09062	.164
	4	-.08653	.10196	.396
	2 1	.29490*	.09077	.001
	3	.16859	.09317	.071
	4	.20837*	.10424	.046
	3 1	.12631	.09062	.164
	2	-.16859	.09317	.071
	4	.03978	.10411	.702
	4 1	.08653	.10196	.396
	2	-.20837*	.10424	.046
	3	-.03978	.10411	.702
INT	1 2	-.18859	.09638	.051
	3	-.00698	.09621	.942
	4	-.09241	.10826	.394
	2 1	.18859	.09638	.051
	3	.18161	.09893	.067
	4	.09617	.11068	.385
	3 1	.00698	.09621	.942
	2	-.18161	.09893	.067
	4	-.08544	.11054	.440
	4 1	.09241	.10826	.394
	2	-.09617	.11068	.385
	3	.08544	.11054	.440

*. The mean difference is significant at the 0.05 level.

5. DISCUSSION aND CONCLUSION

The findings indicate that there is an unbalance in gender of HUST students with the proportion of 80:20 in which male students are much higher than female students. This reflects the real situation in engineering universities

of Vietnam since engineering field is considered being suitable with men.

The survey data also showed that only 32% respondents involve in scientific research activities and an extremely low percentage of respondents (nearly 11%) attend entrepreneurship education programs organized by HUST. This reveals that HUST has not strongly promoted entrepreneurship activities for its students. In fact, HUST is one of the leading universities in Vietnam promoting entrepreneurship mindsets for students such as organizing entrepreneurship competitions, encouraging extracurricular activities on start-ups, connecting university-industry to boost venture courses, running an incubation center inside university, establishing entrepreneurship club and launching some elective courses on start-ups but these kinds of activities are still under capability. In the main course, HUST students only have some general subjects in economics, not the concentrated entrepreneurship modules. This requires more affords from HUST as well as the higher education system in Vietnam in providing entrepreneurship education programs for students.

With regards to the entrepreneurship intention level, research findings present that it is at average point (3.2 point). Although this is not a high level but entrepreneurship is an important action, not all students have this intention. This point means that more than 50% of HUST students got the entrepreneurship intention and this is a positive number. However, as stated earlier, entrepreneurship is a very complicated and long-life process; the roadmap from intention to action is also non-predictable. Still, the long run from the readiness to own a business to the entrepreneurial action also suggests that there is room for entrepreneurship education to have an impact. Thus, entrepreneurship education can increase awareness, confidence and enthusiasm, but also realism of self-employment career. Universities and other learning/academic institutions should serve as important triggering environments for entrepreneurial spirits. History has proved universities and colleges as breeding grounds for ardent entrepreneurs. Universities and society should promote students to continuously mature and develop their entrepreneurship intention so that the entrepreneurship activities in the future are reachable.

The results show that there are two factors influencing entrepreneurship intention of engineering students: (1) Attitude toward the entrepreneurship action with direct affection and (2) Expected value with direct affection. This findings support the Theory of Planned Behavior in both developing and developed countries since previous researches in developed countries also got the same results. For instance, Autio et al. confirm a positive impact of attitude toward entrepreneurship on

entrepreneurial conviction [2]. In a survey of university business students, Krueger et al. additionally found that personal attitudes toward the act, i.e. entrepreneurship, and self-efficiency act as significant predictors of entrepreneurial intention [6]. In their analysis of the entrepreneurial aspirations of business students at two universities in German-speaking countries and one of the leading USA academic institutions, Lu'thje and Franke found a strong positive relationship between the attitude toward self-employment and the intention to become an entrepreneur [30]. In a survey of students of engineering disciplines at the Massachusetts Institute of Technology, this researcher group also revealed that the attitude toward entrepreneurship is the most important determinant of entrepreneurial intention. Ajzen summarizes the results of several recent studies that have dealt with a great variety of activities, from playing video games and losing weight to cheating, shoplifting, and lying. He noted also that, with only one exception, attitudes toward the various behaviors made significant contributions to the prediction of intentions.

In addition, this results suggest educators, policy makers, and other government bodies wishing to enhance entrepreneurial activity of engineering students and graduates focus first on increasing entrepreneurial attitude. In other words, if public policy and university administration want to raise the number of graduates who decide to start their own business, an improvement of the students' attitude towards entrepreneurship apparently is an effective lever. For instant, education programs that facilitate inspiration and passion for starting a business should be delivered by university main course. Educators may also point out the relative merits of self-employment versus working for others, highlight the advantages of self-employment. Besides, government policies should concentrate on programs that promote the interesting in venture creation and desirability of self-employment for engineering students.

A noteworthy point is that the results of the study show that the trend of students in Engineering, manufacturing engineering, and materials science having a higher start-up intention than students in the IT, Electrical, and Electrical industries. and Automation. This result is in stark contrast to the predictions of startup experts who are the leading IT students in startup activities. This may be because the "media magnification effect" distorts start-up reality when start-ups in the information technology industry often resonate, resulting in better communication effects, more spread; causing more confusion in the information technology industry with more startup activities. In fact, VCCI data shows that in the field, innovative startups in the financial technology sector call for the largest amount of investment capital, followed by e-commerce and education technology [37]. To explain this problem,

the researcher has discussed with some experts in teaching and developing startup policies at Hanoi University of Technology. It is known that after 5 years of organizing the Vietnam - Germany Creative Start-up Contest at the school, the number of mechanical engineering students applying is higher than that of IT students. Explaining the trend of heterogeneity with research in the world, experts agree that at the School of Mechanical Engineering, Hanoi University of Technology, extracurricular programs on entrepreneurship for students are very much done by the Board of Directors. focus and implement effectively on a large scale through extracurricular activities. The IT School also invests in professional entrepreneurial knowledge for students about entrepreneurship but in a limited number through elective entrepreneurship classes. Thus, the number of students who are exposed to knowledge, competence and experience in entrepreneurship at the Institute of Mechanical Engineering is now more. This shows that the percentage of students interested in startup activities will be more if they are exposed to entrepreneurship training programs. Besides, in Vietnam, the IT industry is an industry with the ability to bring high income for both excellent teachers and students in the last year. Therefore, the teachers and students themselves are interested in working with outside businesses with quite good remuneration, instead of pursuing a passion for a very risky startup. This again affirms that in Vietnam, startup activities often stem from the essential needs of life, not the passion and affirmation of oneself as in Western countries. Therefore, the research results in the world do not apply completely in Vietnam. Although the above results are not representative of the whole country about career trends with high startup potential, they reflect quite accurately the reality of startup intentions of students at HUST.

Finally, the research results found out that the affect of entrepreneurship attitude on entrepreneurship intentions of industry groups 2 (Engineering, manufacturing engineering, and materials science) is stronger than the rest of the industry groups. The above results bring important implications for shaping and enhancing the entrepreneurial intentions of Vietnamese engineering students: Macro policies and schools should firstly pay attention to enhancing positive perspectives of students with entrepreneurship, followed by building students' confidence with their entrepreneurial competencies and providing startup support resources to increase students' confidence in effective support from the university and society side. These are the two most important factors affecting students' entrepreneurship intentions.

In summary, the current study has made an important contribution to knowledge by a deep research on the best predictor of actual behavior: entrepreneurship intention

and its antecedents. However, some limitations still exist such as the limited sample on only one engineering university in Vietnam which may lead to the fact that our research sample might be not representative and our findings may not be generalizable to whole country. Additionally, the personal traits factor and the perceptions of entrepreneurship-related barriers and supporting factors have been seen as important variable impacting the entrepreneurship intention but this one has not been included in this paper. We suggest to increase the sample number in universities throughout the country in the future researches and more driving factors such as personal characteristics, the perceived contextual support and barriers factors should be taken into account in follow-up studies.

6. ACKNOWLEDGEMENT

This research is funded by the Hanoi University of Science and Technology (HUST) under project number T2018-TT-203.

7. REFERENCES

- [1] Nguyễn Quân (2016). *Việt Nam có trở thành Quốc gia khởi nghiệp?*. <http://www.hhttp.gov.vn/>. Truy cập ngày 15.2.2017 (Fayolle & Gailly, 2015).
- [2] Autio, E., H. Keeley, R., Klofsten, M., GC Parker, G., & Hay, M. (2001). Entrepreneurial intent among students in Scandinavia and in the USA. *Enterprise and Innovation Management Studies*, 2(2), 145-160
- [3] Schlaegel, C., & Koenig, M. (2014). Determinants of entrepreneurial intent: a meta-analytic test and integration of competing models. *Entrepreneurship Theory and Practice*, 38(2), 291-332.
- [4] Krueger, N. F., & Carsrud, A. L. (1993) Entrepreneurial intentions: applying the theory of planned behaviour. *Entrepreneurship & Regional Development*, 5(4), 315-330.
- [5] Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000) Competing models of entrepreneurial intentions. *Journal of business venturing*, 15(5), 411-432
- [6] Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000) *Competing models of entrepreneurial intentions*. *Journal of business venturing*, 15(5), 411-432.
- [7] Lee Wong, P. K., Der Foo, M., & Leung, A. (2011) Entrepreneurial intentions: The influence of organizational and individual factors. *Journal of business venturing*, 26(1), 124-136.

- [8] Bird, B. (1988) Implementing entrepreneurial ideas: The case for intention. *Academy of management Review*, 13(3), 442-453.
- [9] Davidsson, P. (2006) Nascent entrepreneurship: empirical studies and developments. *Foundations and Trends® in Entrepreneurship*, 2(1), 1-76.
- [10] Ajzen, I. (1991) The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.
- [11] Fayolle, A., & Gailly, B. (2015). *The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence*. *Journal of Small Business Management*, 53(1), 75-93.
- [12] Henderson, R., & Robertson, M. (1999). Who wants to be an entrepreneur? Young adult attitudes to entrepreneurship as a career. *Education+ Training*, 41(5), 236-245.
- [13] Hoàng Phê (2010). Từ điển Tiếng Việt. Nhà xuất bản Từ điển Bách khoa tái bản.
- [14] Drucker, P.F. (1999). *Innovation and entrepreneurship*. 2nd. ed. Oxford: Butterworth-Heinemann].
- [15] Robinson, P. B. (1987). Prediction of entrepreneurship based on attitude consistency model. Unpublished doctoral dissertation, Brigham Young University. *Dissertation Abstracts International*, 48, 2807B).
- [16] Shane, S. A. (2003). *A general theory of entrepreneurship: The individual-opportunity nexus*. Edward Elgar Publishing.
- [17] Barbara Bigliardi, Francesco Galati, Chiara Verbano (2013) Evaluating Performance of University Spin – Off Companies: lessons from Italy. *Journal of Technology Management & Innovation*. 2013, Volum 8, Issue 2.
- [18] Drucker, P.F. (1999) *Innovation and entrepreneurship*. 2nd. ed. Oxford: Butterworth-Heinemann.
- [19] Bellotti, F., Berta, R., De Gloria, A., Lavagnino, E., Antonaci, A., Dagnino, F., ... & Mayer, I. S. (2014). Serious games and the development of an entrepreneurial mindset in higher education engineering students. *Entertainment Computing*, 5(4), 357-366 [69].
- [20] Bruyat, C., & Julien, P. A. (2001) Defining the field of research in entrepreneurship. *Journal of business venturing*, 16(2), 165-180.
- [21] Mishra, C. S. and R. K. Zachary (2015) *The Theory of Entrepreneurship*. *Entrepreneurship Research Journal*, 5(4).
- [22] Mellor, R. (2008). *Entrepreneurship for everyone: A student textbook*. Sage.
- [23] Wilbard, F. (2009) *Entrepreneurship proclivity: an exploratory study on students' entrepreneurship intention*. Master), University of Agder.
- [24] Popescu, C., et al. (2016). "An Analysis of the Determinants of Entrepreneurial Intentions among Students: A Romanian Case Study." *Sustainability* 8(8): 771.
- [25] Bagozzi, R. P., Baumgartner, J., & Yi, Y. (1989) *An investigation into the role of intentions as mediators of the attitude-behavior relationship*. *Journal of Economic psychology*, 10(1), 35-62.
- [26] Krueger, N. (1993) The impact of prior entrepreneurial exposure on perceptions of new venture feasibility and desirability. *Entrepreneurship: Theory and practice*, 18(1), 5-22.143.
- [27] Fayolle, A., & Liñán, F. (2014) The future of research on entrepreneurial intentions. *Journal of Business Research*, 67(5), 663-666.(105).
- [28] Reynolds, P. D., Hay, M., Bygrave, W. D., Camp, S. M. and Autio, E. (2000) *Global Entrepreneurship Monitor, 2000 Executive Report*. Babson College Babson Park, MA.
- [29] Zhang, Y., & Yang, J. (2006) *New venture creation: Evidence from an investigation into Chinese entrepreneurship*. *Journal of Small Business and Enterprise Development*, 13(2), 161-173.
- [30] Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000) Competing models of entrepreneurial intentions. *Journal of business venturing*, 15(5), 411-432.
- [31] Kautonen, T., Gelderen, M., & Fink, M. (2015) Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions. *Entrepreneurship Theory and Practice*, 39(3), 655-674.

- [32] Kolvereid, L. (1996) Prediction of employment status choice intentions. *Entrepreneurship: Theory and Practice*, 21(1), 47-58.
- [33] Lüthje, C., & Franke, N. (2003) The 'making' of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT. *R&d Management*, 33(2), 135-147.
- [34] Comrey, A., & Lee, H. (1992) *A first course in factor analysis*. Hillsdale, New York, Erlbaum
- [35] Bosma, N., Jones, K., Autio, E., & Levie, J. D. (2008) *Global Entrepreneurship Monitor 2007*.
- [36] Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006) *Multivariate data analysis 6th Edition*. Pearson Prentice Hall. New Jersey.
- [37] VCCI (2017). Cơ chế hỗ trợ Doanh nghiệp khởi nghiệp sáng tạo. Báo cáo nghiên cứu phục vụ việc hướng dẫn thi hành Luật Hỗ trợ doanh nghiệp nhỏ và vừa 2016 về doanh nghiệp khởi nghiệp sáng tạo. <http://startuphaiphong.com/images/video/55478523ho-tro-doanh-nghiep-khoi-nghiep-sang-tao.pdf>. Truy cập 31.8.2020

IN WHAT INSTITUTIONAL ENVIRONMENT VIETNAM SMALL PRIVATE ENTERPRISES OPERATE

Truong Doan The, Cao Thuy Xiem

National Economics University, Vietnam

Corresponding author: thetd@neu.edu.vn

Abstract

The paper examines institutional environment in which small private enterprises operate in Vietnam. The quantitative research was conducted to identify advantageous and disadvantageous factors of the institutional environment and propose policy implications to promote development of the private sector in Vietnam. The institutional environment has been improved. However, the institutional environment still contains obstacles: there are differences between de jure institutional improvements and de facto ones. Of the organizational level disadvantageous factors are management's competence.

Keywords: Institutional environment, management's competence, small private enterprises, small private enterprises.

1. INTRODUCTION

The common practice in developed countries is the fact that private enterprises as driving forces of economic growth. State owned enterprises are one of the instruments that governments use to remedy market failures. In Vietnam, before 1986 the private economic sector had not been officially recognized. However, in 1975 this sector contributed 8.3 per cent of GDP in the North (GSO, 1984). In 1986 this sector created 15.3 per cent of the manufacturing output and hired 23.2 per cent of the labor force (GSO, 2019). Since 1986 the private sector was officially recognized when DoiMoi policy was adopted. In 2000, the new Law on Enterprises has been in effect, this led to a significant increase in non-state manufacturing output, from 23 per cent in 2000 to 26.1 per cent in the first half of the year 2003 (GSO, 2003). In spite of the increase in quantity, most of enterprises, 96 per cent, are small and medium, even though, micro in size. In the period 2010-2016 the private sector contributed more than 40 per cent of investment, production capital, assets and long term financial investments, and GDP, thereby improved employees' monthly income and gender equality (GSO, 2019). Unfortunately, until now the private sector still operates below its potential. This practice forced the government change its mindset on the role of the private sector and undertake policy adjustments to facilitate private economic activities. Generally speaking the institutional environment was said to be improved, but was it improved indeed on the private business' view?

The purpose of the research is to identify advantages and disadvantages of the institutional environment in which private enterprises operate, and thereby propose policy implications to promote development of the private sector in Vietnam. The research consists of two parts. The first part is theoretical background of private sector and institutional environment. The second part is the research results.

2. THEORETICAL BACKGROUND

Definition of the private sector

“The private sector comprises private corporations, households and non-profit institutions serving households”, (OECD, 2008, p. 423). The Development Assistant Committee (DAC) of Organization for Economic and Co-operation Development (OECD) define the private sector is the region where private ownership is an important element of economic activity, where markets and competition promote production, and where private initiatives and risks-taking activities are in motion.

The role of the private sector

According to Friedman (1970), the unique responsibility of the business is to increase its profits. While (Brainard, 2006) consider businesses as social organizations responsible for contributing to society's well-being. Contributions of the private sector possibly are made by its core activity (providing goods and services); by taking activities on behalf of the public

sector, and by acting as a partner in investment projects. However, the institutional environment in a particular country heavily influences how the private sector contributes for society's prosperity.

The private sector in successful countries

Japan

Most of studies of Japan's economic recovery from the Great Depression suggested that the expansionary fiscal policies adopted by the Japanese government in the 1930s were key factor. Recently Lee (2015) reassessed the impact of monetary and fiscal policies on real output and thereby on takeoff in the 1930s from private sector perspective. He found that the private sector, especially private sector consumption, made majority of fluctuations in output. The main conclusion of Lee's study is the Japan's economic recovery in the 1930s was initiated by the private sector and led by pump-priming effects of policy measures. The population growth in the 1920s lead to a dramatic increase in urbanization and Japanese lifestyle, change in consumer behavior, mass consumer society began to move in the 1930s. As a result, the increase in private spending on consumer goods, lead to an increase in the amount of money in circulation, has been the driving force of the Japan's economic recovery in the 1930s.

South Korea

Most of studies of the Korea's successful economic development showed crucial factors of the success are open and outward-looking strategies. Kim (n.d.) developed a policy-oriented institutional interpretation of the Korea's success which focuses on the private sector's contribution. According to his interpretation in the 1960s the Korean government provided private sector with strong financial incentives; The private sector contributed a large part of the export; The private sector has prepared for heavy industry and chemicals (HCIs) before the government; The rent-seeking culture has been transformed into productive entrepreneurship; The private sector has influenced evolution of development strategies and plans; Heavy-handed industrial and banking policies with limited negative side effects resulted from the transparent and predictable government and the open and market-friendly policies.

The lessons from Japanese and Korean cases

Vietnam may learn three lessons from Japan and Korea. Firstly, the private sector would prosper if there a recognition of the importance of the private sector. Secondly, the private sector development needs a favorable institutional environment. Thirdly, to promote private sector prosperity it is required an assurance of the transparent and predictable government.

Institutional environment

The organizational behavior can be disclosed and researched according to factors belonging to the external and internal environment (Hussain & Hoque, 2002). Institutional factors which perform irrespective of an organization are economic and coercive, other factors perform depend on the reaction of an organization are normative and mimetic (Zattoni & Cuomo, 2008; Analoui, 2009; He & Baruch, 2009; Gstraunthaler, 2010). Alternatively, institutional factors perform at two levels - environmental and organizational. At the environmental level, are economic constraints, competition, technological advancement, and coercive factors are accounting standards and financial legislation, socioeconomic-political institutions' pressures. At the organizational level, mimetic factor is copying best practices from others; normative factors are professionalism/competence; organizational strategic orientation; corporate culture; organizational characteristics.

Because institutional factors of the environmental level are out of control of an organization it has to comply with external pressures. The institutional factors of organizational level are represented by reactions of an organization towards business environment.

3. RESEARCH METHOD AND RESULTS

The research team conducted a discussion with teachers from *Business Management Department* in order to select appropriate variables for building a questionnaire to quantify the assessment of small private enterprises on factors of their business environment. Referring the research results of Lina Kloviene (2012) the our research selected factors belong to environment: *Economic constraints* (limited access to loan, land, logistics services, hard recruitment of skilled labor); *Competition* (fierce competition due to low demand for the firms' product, low priced imported goods, limited access to large distribution channels, easy entry of newcomers); *Technology Advancement* (technology advancement influences customer's needs which force business change itself, technology advancement especially information technology stimulates business to improve itself and apply new methods in production, information technology increase effectiveness), *Accounting Standards and Financial Legislation* (the compliance with national and international standards affects effectiveness), *Socioeconomic-political Institutions' Pressures* (administrative procedures are simple, easy to implement, transparent and fair taxation, equally treated economic sectors, complicated customs procedures); *Copying Best Practices from others* (copying best practices of how to get legitimation, production management, product promotion from others in the same activity); *Management's Competence* (limited management's competence, managers paid no attention

on designing and applying production management system, not being vehicle for spreading management and accounting practices from one business to another), *Organizational Strategic Orientation* (enterprise has a clear operational orientation, has a long-term plan or has only an annual plan, operates depending on the market situation). *Corporate Culture* and *Organizational Characteristics* were controlled in this case.

The online survey was conducted in March and April 2020 with the support of 59th and 60th intake students. The surveyed small private enterprises were randomly selected. Respondents mark on the Likert 5 level scale in the increasing order of agree (1 = completely disagreed, 2 = disagreed, 3 = neutral, 4 = agreed, 5 = completely agreed). Those small businesses that had not been able to respond online get support from students by answering over the phone and students ticking google forms through their accounts. 307 respondents were screened and 210 businesses with less than 200 employees sorted out. The largest part, 53 per cent, of surveyed businesses are in commerce and service sector,

18 per cent are in manufacturing, 4 per cent in agriculture and the rest are in health care, education, construction, real estate, information technology, law consultancy... More than half, 54 percent, has been in business less than 10 years, 38 per cent has been s in business more than 10 and less than 20 year, and 8 percent has been in business more than 20 year. After being coded the data was processed with SPSS 25.0 software.

The results of reliability test are shown in Table 1. Factors belong to environment are Economic Constraints (include 4 variables/items), Competition (include 4 variables/items), Technology Advancement (include 3 variables/items), Accounting standards and financial legislation (include 2 variables/items), Socioeconomic-political Institutions' Pressures (include 4 variables/items), Copying Best Practices from others (include 3 variables/items), Management's Competence (include 3 variables/items), Organizational Strategic Orientation (include 4 variables/items).

Table 1: The results of reliability test

Scale	Items	Cronbach's Alpha coefficient	Items deleted	Results
Economic constraints	4	.509	1	3 items left, all Corrected Item-Total Correlations > 0.3, Cronbach's Alpha > 0.5
Competition	4	.547	0	4 items, all Corrected Item-Total Correlations > 0.3, Cronbach's Alpha > 0.5
Technology advancement	3	.791	0	3 items, all Corrected Item-Total Correlations > 0.3, Cronbach's Alpha > 0.5
Accounting standards and financial legislation	2	.509	0	2 items, all Corrected Item-Total Correlations > 0.3, Cronbach's Alpha > 0.5
Socioeconomic-political institutions' pressures	4	.530	0	4 items, all Corrected Item-Total Correlations > 0.3, Cronbach's Alpha > 0.5
Copying best practices from others	3	.677	0	3 items, all Corrected Item-Total Correlations > 0.3, Cronbach's Alpha > 0.5
Management's competence	3	.792	0	3 items, all Corrected Item-Total Correlations > 0.3, Cronbach's Alpha > 0.5
Organizational strategic orientation	4	.642	1	3 items left, all Corrected Item-Total Correlations > 0.3, Cronbach's Alpha > 0.5

2 of initial 27 variables were deleted. Then the Exploratory Factor Analysis (EFA) was conducted with 25 variables left. Kaiser-Meyer-Olkin Measure of Sampling Adequacy is .770 ($0.5 < KMO < 1$) and Bartlett's Test of Sphericity is 1648.062, sig. = 0.000. The Rotation Method Varimax with Kaiser Normalization,

Rotation converged in 11 iterations was done, 8 components with Eigenvalues > 1 were extracted with total variance explained of 64.904%. None of 25 variables belong to more than one of 8 components, ensured Convergent validity and Discriminant validity. All Factor loadings are > 0.5 .

Table 2: Factors influence the business institutional environment of small private enterprises

Computed Institutional Factors	Loadings
<i>Technology Advancement</i>	
Technology, especially information technology encourages businesses to improve their production processes and apply new methods	.839
Technology, especially information technology affects customers' wants, forces businesses to change to adapt	.788
Technology, especially information technology allows businesses to work in a new way, without space and time constraints which leads to higher operational effectiveness	.654
<i>Management's competence</i>	
Managers not paid enough attention on designing and implementing of production management systems	.833
Managers have not yet become the means to spread the management and accounting practices from one business to another.	.782
<i>Limited managers' competence</i>	.761
<i>Competition-Economic Constraints</i>	
High degree of competition because imported products have lower selling prices	.762
High level of competition due to low product demand	.730
Difficult access to business logistics (warehouse, transportation, customs procedure...) due to expensive infrastructure	.590
<i>Competition-Copying Best Practices from others</i>	
Enterprises often learn and imitate how to get legitimation of their operations	.730
Enterprises often learn and imitate the way of promoting good products from other businesses in the same field of activity	.595
Enterprises often learn and imitate good production management from other businesses in the same field of activity	.568

Computed Institutional Factors	Loadings
The level of competition is high because many new businesses easily enter the market, so business have change itself to adapt	.519
<i>Organizational Strategic Orientation</i>	
Business has long-term plans	.822
Business has a clear business orientation	.743
<i>Socioeconomic-political Institutions' Pressures</i>	
The rules for licensing and certification are relatively simple and easy to follow	.735
Clear, transparent and fair tax and tax payment regulations	.701
State-owned, non-state and foreign-invested enterprises are treated equally	.700
<i>Accounting Standards and Financial Legislation-Socioeconomic-political Institutions' Pressures</i>	
Complying international accounting standards force enterprises to change their management systems because of their relationships with multinational companies	.736
The national accounting standards that must be complied with affect the business performance	.647
Complicated customs procedures	.543
<i>Economic Constraints</i>	
Lack of capital because it is difficult to access finance	.758
Lack of space for production and business because it is difficult to access land	.731

8 new components were created, included *Technology Advancement, Management's competence, Competition-Economic Constraints, Competition-Copying Best Practices from others, Organizational Strategic Orientation, Socioeconomic-political Institutions' Pressures, Accounting Standards and Financial Legislation-Socioeconomic-political Institutions' Pressures, and Economic Constraints*. 8 principal components were used to represent the institutional environment of small private enterprises in Hanoi.

Advantageous factors of environment are *Technology Advancement* with the mean value of 3.5397, showing facilitate environment, while *Economic Constraints* with the mean value of 2.9952 and *Competition-Economic Constraints* with the mean value of 2.9698 representing that they are not so binding, not so difficult to access loans and land for production space. *Socioeconomic-political Institutions' Pressures* with the mean value of 3.1953 which revealed the fact that

discrimination between private, state and foreign direct investment sectors was removed, and improved taxation, simplified administrative procedures.

At the same time, at the organizational level advantageous factors are *Organizational Strategic Orientation* with the mean value of 3.7143; enterprises have clear orientation and long-term plans, *Competition-Copying Best Practices from others* with the mean value of 3.300.

Disadvantageous factors of the institutional environment are *Accounting Standards and Financial Legislation-Socioeconomic-political Institutions' Pressures* with the mean value of 3.1921, showing that complying national and international accounting standards and financial legislations negatively affects enterprise's effectiveness, and an unfavorable organizational factor is management's competence with the mean value of 2.9587 (Figure 1).

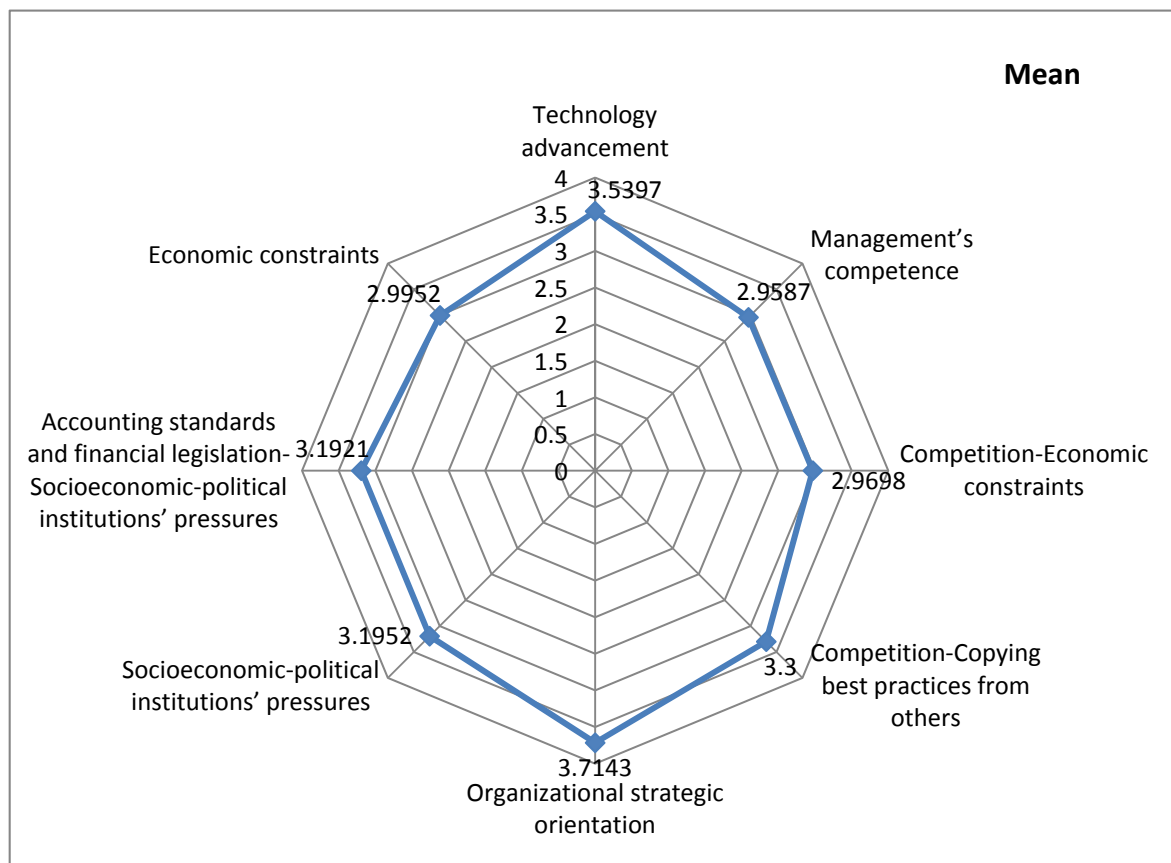


Figure 1: Business ecosystem of small private enterprises in Vietnam

4. CONCLUSION AND POLICY IMPLICATION

Conclusions

The institutional environment has been improved. In particular, technology advancement led to improved business' performance, administrative procedures have been simplified, enterprises have easier access to land, loans and infrastructure, discrimination between public and private sector in fact decreased, increased transparency of government administration. However, the institutional environment still contains obstacles: there are differences between *de jure* institutional improvements and *de facto* ones. Of the organizational level disadvantageous factors are management's competence.

Recommendations

Firstly, in order to alleviate economic constraints and competition pressures the further reform of institutional environment should emphasize enforcement characteristics. It is necessary to create a competent staff for fulfilling public services and control corruption.

Secondly, to upgrade management's competence the support by government is needed, e.g. training and

retraining courses would be provided for small private enterprises managers, the government ensures incentives in right time and right place.

Limitations

The research did not quantify impact of institutional factors on small private enterprises' performance due to unwillingness to answer of respondents.

5. ACKNOWLEDGEMENT

We would like to express our gratitude to groups of intake 59th and intake 60th students of the National Economics University, Vietnam, who supported conducting the online survey for the research.

6. REFERENCES

- [1] Barainard. (2006). "Transforming the Development Landscape: The Role of the Private Sector". Available online: <https://www.jstor.org/stable/10.7864/j.ctt6wpfx0> (Accessed on 22 June 2019).
- [2] GSO. (1984). *Statistical Year book 1983*. Hanoi.
- [3] GSO. (2003). *Statistical Year book 2002*. Hanoi.
- [4] GSO. (2019). *Statistical Year book 1988*. Hanoi.

- [5] Hussian, M. & Hoque, Z. (2002). "Understanding non-financial performance measurement practices in Japanese banks. A new institutional sociology perspective". *Accounting Auditing & Accountability Journal Organization*, 15(2), pp. 518-536.
- [6] Lina Kloviene, (2012). *Institutional factors as criteria for business environment identification*. *Journal of Economics and Management*. 17(4). pp. 1245-1251.
- [7] Zattoni, A. & Cuomo, F. (2008). "Why adopt codes of good governance? A comparison of institutional and efficiency perspectives". *Corporate Governance: An international Review*, 16, pp. 1-15.
- [8] Kim, J. (2013). *Korea's Economic Development and the Role of Private Sector*. Presentation, Hong Ik University.
- [9] Lee, C. (2015). "The role of the private sector in Japan's recovery from the Great Depression". *International Area Studies Review*. 2015 Vol. 18 (4). pp. 345-364.
- [10] OECD. (2008). *Glossary of Statistical Terms*. Available online: <http://stats.oecd.org/glossary> (Accessed on 20 June 2019).
- [11] Friedman, M. (1970). The Social Responsibility of Business is to Increase its Profits. *The New York Times Magazine* September 13.

Appendix 1

Case Processing Summary

		N	%
Cases	Valid	210	100.0
	Excluded ^a	0	.0
	Total	210	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's	
Alpha	N of Items
.454	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
EC1	8.87	5.494	.182	.457
EC2	8.99	4.957	.387	.266
EC3	9.08	5.137	.153	.509
EC4	8.83	5.163	.360	.296

Case Processing Summary

		N	%
Cases	Valid	210	100.0
	Excluded ^a	0	.0
	Total	210	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's	
Alpha	N of Items
.547	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
C1	9.25	4.515	.390	.422
C2	9.16	4.822	.400	.419
C3	9.02	4.990	.398	.424
C4	8.91	5.614	.166	.612

Case Processing Summary

		N	%
Cases	Valid	210	100.0
	Excluded ^a	0	.0
	Total	210	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's	
Alpha	N of Items
.791	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
TA1	7.10	3.367	.630	.720
TA2	7.01	3.301	.676	.670
TA3	7.12	3.516	.594	.758

Case Processing Summary

		N	%
Cases	Valid	210	100.0
	Excluded ^a	0	.0
	Total	210	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's	
Alpha	N of Items
.591	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
AF1	3.14	.971	.420	.
AF2	3.38	.877	.420	.

Case Processing Summary

		N	%
Cases	Valid	210	100.0
	Excluded ^a	0	.0
	Total	210	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's	
Alpha	N of Items
.530	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SP1	9.72	4.737	.205	.556
SP2	9.16	3.725	.581	.226
SP3	9.47	3.925	.497	.302
SP4	9.59	5.143	.087	.658

Case Processing Summary

		N	%
Cases	Valid	210	100.0
	Excluded ^a	0	.0
	Total	210	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's	
Alpha	N of Items
.677	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
CP1	6.78	2.892	.371	.724
CP2	6.59	2.253	.592	.443
CP3	6.63	2.330	.519	.543

Case Processing Summary

		N	%
Cases	Valid	210	100.0
	Excluded ^a	0	.0
	Total	210	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's	
Alpha	N of Items
.792	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
P1	5.94	3.088	.601	.752
P2	5.99	2.794	.677	.670
P3	5.82	3.039	.625	.727

Case Processing Summary

		N	%
Cases	Valid	209	99.5
	Excluded ^a	1	.5
	Total	210	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's	
Alpha	N of Items
.498	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SO1	10.17	3.861	.474	.258
SO2	10.39	4.094	.342	.378
SO3	10.92	5.056	.060	.642
SO4	10.51	4.299	.356	.372

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.770
Bartlett's Test of Sphericity	Approx. Chi-Square	1648.062
	Df	300
	Sig.	.000

Rotated Component Matrix^a

	Component							
	1	2	3	4	5	6	7	8
TA2	.839							
TA1	.788							
TA3	.654							
P2		.833						
P3		.782						
P1		.761						
SO4								
C2			.762					
C1			.730					
EC4			.590					
CP1				.730				
CP3				.595				
CP2				.568				
C4				.519				
C3								
SO2					.822			
SO1					.743			
SP1						.735		
SP2						.701		
SP3						.700		
AF2							.736	
AF1							.647	
SP4							.543	
EC1								.758
EC2								.731

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.^a

a. Rotation converged in 11 iterations.

Component Transformation Matrix

Component	1	2	3	4	5	6	7	8
1	.461	.362	.316	.436	.395	.332	.299	.106
2	-.415	.504	.505	.111	-.375	-.195	-.078	.350
3	.399	-.547	.489	-.181	-.125	-.317	.188	.344
4	-.412	-.148	.064	-.391	.070	.598	.466	.269
5	.379	.444	-.359	-.362	-.390	-.164	.468	.037
6	.344	.082	.275	-.324	-.358	.532	-.493	-.201
7	.144	-.097	-.445	.264	-.170	.209	-.289	.739
8	.060	.285	.007	-.553	.611	-.202	-.327	.298

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
TA	210	1.00	5.00	3.5397	.87663
P	210	1.00	5.00	2.9587	.82065
CEC	210	1.00	5.00	2.9698	.80511
CPC	210	1.00	5.00	3.3000	.69637
SO	210	1.00	5.00	3.7143	.90812
SP	210	1.00	5.00	3.1952	.75596
AFSP	210	1.00	5.00	3.1921	.71562
EC	210	1.00	5.00	2.9952	.89254
CC1	210	1	5	3.54	1.068
Valid N (listwise)	210				