VNU UNIVERSITY OF
ECONOMICS & BUSINESS

# PROCEEDINGS

## INTERNATIONAL CONFERENCE FOR YOUNG RESEARCHERS IN ECONOMICS AND BUSINESS (ICYREB 2022)

# ECONOMIC RESILIENCE, RECOVERY, AND GROWTH

VIETNAM NATIONAL UNIVERSITY PRESS, HANOI

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# CONTENTS

## THEME 1. BUSINESS AND MANAGEMENT


- ASSESSING PARTICIPATION OF VIETNAM IN GLOBAL VALUE CHAINS: OECD TIVA DATABASE 2021.....21
  Le Ha Trang

- FACTORS CONTRIBUTING EMPLOYEE TURNOVER DECISION IN VIETNAM HOTEL SECTOR.....36
  Nguyen Thi Ngoc Dung

- HOW DOES DIGITAL TRANSFORMATION IMPACT ON THE SUSTAINABLE DEVELOPMENT OF FMCG BUSINESS?.....66
  Dinh Tien Minh, Nguyen Thi Kim Loan, Nguyen Thi Lan, Nguyen Thu Uyen

- MEASUREMENT OF OPERATIONAL EFFICIENCY OF INFORMATION AND COMMUNICATION TECHNOLOGY ENTERPRISES IN VIETNAM.....86
  Tran An Quan

- PERSONALITY TRAITS AND INNOVATIVENESS: THE MODERATED MEDIATION OF KNOWLEDGE SHARING AND TRANSFORMATIONAL LEADERSHIP.....102
  Vo Hoang Kim An, Nguyen Ha Lien Chi, Le Yen Nhi,
  Cao Ngoc Quynh Huong, Le Ngoc Thanh Van, Huynh Khanh Linh

- STUDENTS' PERCEPTION OF INTERNATIONAL FINANCIAL REPORTING STANDARDS IN ECONOMIC TRAINING PROGRAMS AT HIGHER EDUCATION IN HANOI.....129
  Van Anh Doan, Tuong Tran Manh

- THE EFFECT OF GREEN SUPPLY CHAIN MANAGEMENT ON THE SMES' PERFORMANCE: A SURVEY OF THE LITERATURE.....151
  Le Thanh Binh

- THE EFFECT OF WORKING REMOTELY ON WORKER'S PRODUCTIVITY AND SATISFACTION DURING THE COVID-19 PANDEMIC.....175
  Truong Hoang Diep Huong, Quach Thu Trang

- THE INFLUENCE OF PERCEIVED SUPERVISOR SUPPORT, ECONOMIC VALUE, JOB CHARACTERISTICS, REWARDS AND RECOGNITION, AND WORK-LIFE BALANCE ON JOB AND ORGANISATION ENGAGEMENT.....189
  Viet Quoc Cao, Hai Phuoc To, Uyen Phuong Le Nguyen, Phat Thuan Doan

- THE INFLUENCE OF USER-GENERATED CONTENT (UGC) ON THE PURCHASE INTENTION OF GENERATION Z.....215
  Chung Tu Bao Nhu, Le Minh Anh, Nguyen Ngoc Hoang, Hoang Ngoc Mai, Huynh Nhu Ngoc, Phung Hieu Minh

- RESEARCH ON FACTORS AFFECTING THE START-UP INTENTION OF UNIVERSITY STUDENTS IN VIETNAM.....216
  Thi Huong Dinh

- THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON STRATEGIC OBJECTIVES: EVIDENCE FROM VIETNAM.....217
  Tran Nguyen Hop Chau, Tran Ngoc Mai, Vu Thi Kim Chi, Nguyen Duc Dung, Nguyen Thi Thanh Tan

- CUSTOMER CHOICE BEHAVIOUR IN EDUCATION SECTOR: AN APPROACH USING INFORMATION PROCESSING CHOICE MODEL.....218
  Tong Viet Bao Hoang , Hoang Viet Hanh Nguyen, Le Thi Phuong Thanh, Le Thi Phuong Thao, Bui Thi Thanh Nga

- EFFECTS OF NETWORKING BEHAVIORS ON SUBJECTIVE CAREER SUCCESS OF MANAGERS IN HANOI.....219
  Nguyen Thi Lien Huong, Nguyen Van Toan

## THEME 2. ECONOMICS

- ANALYZING THE RELATIONSHIP BETWEEN FDI, FISCAL POLICY DEVELOPMENT AND GREEN ECONOMIC GROWTH IN SOUTHEAST ASIAN REGION.....223
  Phung Thanh Quang, Luong Thi Thu Hang

- CONTRIBUTION OF LABOR RESTRUCTURING TO ECONOMIC GROWTH: A CASE STUDY OF THE MANUFACTURING INDUSTRY IN VIETNAM.....244
  Pham Thi Du

- DETERMINANTS INFLUENCING VIETNAM'S FRESH FRUIT EXPORT COMPETITIVENESS.....266
  Doan Nguyen Minh, Nguyen Thi Minh Nguyet, Pham Thi Lua, Vu Le Cong

CONTENTS


- FACTORS AFFECTING ELECTRICITY-SAVING INTENTION AND BEHAVIOR OF VIETNAMESE HOUSEHOLDS: AN EMPIRICAL STUDY USING NORM ACTIVATION MODEL.....283
  Nguyen Thi Phuong Linh

- MENTAL HEALTH AND ACADEMIC PERFORMANCE OF UNIVERSITY STUDENTS IN THE CONTEXT OF COVID-19.....299
  Nguyen Thi Phuong Linh

- POLICIES TO ATTRACT FOREIGN ENTERPRISES TO INVEST IN VIETNAM TOWARDS IMPROVING THE QUALITY OF HUMAN RESOURCES IN THE NEW CONTEXT....317
  Tran Thi Kim Lien, Hoang Thi Minh Chau, Vu Thi Mai

- PUBLIC SERVICE MOTIVATION IN POST-PANDEMIC: A CROSS-SECTIONAL DESIGN.....334
  Nguyen Le Hoang Long

- THE ECONOMIC RELATIONS BETWEEN THE PHILIPPINES AND CHINA (2001-2021) AND SOME POLICY SUGGESTIONS.....348
  Tran Thai Bao, Duong Quang Hiep , Tran Xuan Hiep

- THE EFFECT OF EXCHANGE RATE ON INFLATION IN VIETNAM: 1999 - 2021.....370
  Dang Ngoc Bien

- THE IMPACT OF UKVFTA ON VIETNAM'S IMPORTS OF SEAFOOD: AN APPLICATION OF SMART MODEL.....378
  Nguyen Ngoc Diep

- THE RELATIONSHIP BETWEEN PLACE ATTACHMENT, RESIDENTIAL SATISFACTION AND HOUSING BEHAVIORAL INTENTION: A CASE STUDY IN VIETNAM.....403
  Nguyen Thanh Lan, Nguyen Thanh Ha, Pham Quynh Chi,
  Nguyen Cong Hao, Do Thi Len, Le Quynh Mai

- TOURISM AND UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS.....420
  Nguyen Thi Quynh Trang, Nguyen Thi Thu Ha

- TRADE RESILIENCE AND GOVERNMENT RESPONSE DURING COVID-19 PANDEMIC: A STUDY IN VIETNAM.....442
  Le My Linh

- EXCHANGE RATE MISALIGNMENT: AN APPLICATION OF THE BEHAVIORAL EQUILIBRIUM EXCHANGE RATE TO VIETNAM.....454
  Nguyen Ngoc Dinh

- IMPACT OF FISCAL DOMINANCE ON INFLATION IN VIETNAM: EVIDENCE FROM THE PERIOD 2001-2020.....455
  Than Thi Vi Linh, Le Ha Thu, Nguyen Thanh Nam, Nguyen Thi Thai Hung
- RESILIENT TACTICS FOR CREATIVE ECONOMY GROWTH BASED ON DIGITAL TRANSFORMATION IN DEVELOPING COUNTRIES.....456
  Cao Hai Van
- THE IMPACT OF LAND FRAGMENTATION IN RICE PRODUCTION ON HOUSEHOLD FOOD INSECURITY IN VIETNAM.....457
  Nguyen Thai Phan, Ji-Yong Lee, Nguyen Duc Kien

## THEME 3. FINANCE

- BANKIBANKING VOLATILITY, ARE THERE ANY DIFFERENCES ACROSS INCOME GROUPS AND ACROSS REGIONS?.....461
  Quoc Thanh Tran, Xuan Vinh Vo
- BEHAVIORAL FACTORS AFFECTING INVESTORS' DECISIONS IN THE VIETNAM'S STOCK MARKET.....489
  Dao Thi Huong, Nguyen The Anh, Nguyen Thi Quynh Cham
- DETERMINANTS OF CAPITAL ADEQUACY RATIO IN VIETNAMESE COMMERCIAL BANKS.....506
  Nguyen Thi Minh Huong
- EFFECTS OF THE COVID PASSION ON VIETNAM STOCK MARKET IN POST-PANDEMIC PERIOD.....516
  Le Thi Thuy Hang
- EXPERIENCE IN HANDLING DOUBLE TAXATION ON INCOME IN THE CONTEXT OF GLOBALIZATION.....530
  Nguyen Tien Kien
- FINANCIAL FLEXIBILITY, INVESTMENT AND FIRM VALUE: EVIDENCE FROM VIETNAMESE FIRMS DURING COVID-19 PANDEMIC.....540
  Le Thi Phuong Vy, Vo Thi Thuy Duong, Nguyen Thi Ngoc Huyen
- GAME THEORETICAL ANALYSIS ON HEALTH INSURANCE FRAUD.....565
  To Minh Huong

CONTENTS


- IMPACTS OF THE EMERGENCY ASSISTANCE PACKAGES ON ADAPTABILITY OF MICRO, SMALL AND MEDIUM ENTERPRISES IN THE POST-COVID-19.....587
  Do Thi Thu, Le Thi Hong Thuy

- IMPROVING FINANCIAL LITERACY FOR A FURTHER RESILIENT FINANCIAL SYSTEM: WHAT TO FOCUS?.....603
  Ngo Thi Hang, Nguyen Thi Hoai Le

- INCREASE THE MARKET SHARE OF CUSTOMERS TRANSACTION ON DIGITAL BANKING PLATFORM OF SOME SOUTHEAST ASIA COUNTRIES.....621
  Le Thi Thuy Hang

- LIQUIDITY FACTORS AND PROFITABILITY OF VIETNAM COMMERCIAL BANKS.....634
  Nguyen Thi Dieu Chi

- REQUIREMENTS ON HUMAN RESOURCE DURING THE PROCESS OF THE FOURTH INDUSTRIAL REVOLUTION AT THE BANKS AND THE ISSUES ASSOCIATED WITH TRAINING AT VIETCOMBANK.....644
  Nguyen Duc Tuan

- RISK MANAGEMENT IN THE ERA OF BIG DATA - THE CASE OF BANKING INDUSTRY IN VIETNAM.....678
  Hien Thi Thu Hoang, Trung Hai Le

- STATE OWNERSHIP STRUCTURE AND FINANCING DECISIONS OF LISTED COMPANIES ON VIETNAM STOCK MARKET: A BAYESIAN APPROACH.....693
  Duong Thuy Phan, Thanh Thi Hoang, Ngoc Mai Tran

- THE DETERMINATION OF PROFESSIONAL SKEPTICISM OF INDEPENDENT AUDITORS IN VIETNAM.....706
  Hoang Ha Anh, Do Lan Nhi

- THE FEASIBILITY OF CENTRAL BANK DIGITAL CURRENCY (CBDC) IN VIETNAM.....723
  Mai Truong Khanh Linh, Dang Quang Linh, Vu Van Duc

- THE IMPACT OF DIVIDEND POLICY ON STOCK PRICE OF COMPANIES LISTED ON THE VIETNAM STOCK MARKET.....742
  Manh Hung Pham, Nhat Minh Nguyen, Van Ha Le

- THE IMPACTS OF CAPITAL INFLOWS ON BANK LENDING: EVIDENCE FROM VIETNAM.....759
  Trung H. Le, Nhung T. Nguyen, Minh N.N. Pham

- THE RELATIONSHIPS BETWEEN FIRM-SPECIFIC CHARACTERISTICS AND SHORT-TERM PROFITABILITY FORECASTING OF VIETNAMESE LISTED COMPANIES.....787
  Pham Van Tue Nha
- THE ROLE OF THE CENTRAL BANK IN PROMOTING CARBON FINANCE POLICY AND REGULATION.....810
  Tran Nguyen Phuoc Thong
- TOTAL FACTOR PRODUCTIVITY: EMPIRICAL STUDY FROM VIETNAMESE SMES.....831
  Trang Ngo Hoang Thao
- EARLY WARNING MODEL FOR COMMERCIAL BANKS IN VIETNAM.....849
  Nguyen Thi Nhung, Do Quyen, Nguyen Hoang Mai Lan, Luu Khanh Linh
- EFFECT OF INTANGIBLE ASSETS ON THE VALUE RELEVANCE OF ACCOUNTING INFORMATION: EVIDENCE FROM VIETNAM.....850
  Nguyen Hoang, Do Song Huong, Ha Ngoc Long
- EMPIRICAL TESTS ON THE ASSET PRICING MODELS WITH STOCK MARKET LIQUIDITY IN A FRONTIER MARKET.....851
  Pham Quoc Khang, Katarzyna Kuziak, Marcin Hernes
- FACTORS AFFECTING THE POSSIBILITY OF ADOPTING IFRS ON FINANCIAL INSTRUMENTS: THE CASE OF COMMERCIAL BANKS IN VIETNAM.....852
  Nguyen Quynh Trang
- HOW DOES FIRM LOCATION AFFECT CASH HOLDINGS?.....853
  Duc Kien Vu
- IMPACTS OF COVID-19 ON VIETNAMESE BANK PERFORMANCE: THE ROLE OF BANK DIVERSIFICATION.....854
  Thao Thi Minh Giang
- IMPRESSIVE EMPIRICAL EVIDENCE ON THE RELATION BETWEEN BOARD CHARACTERISTICS AND ASYMMETRIC INFORMATION.....855
  Thuy Gia Phan Bui, Khanh Thuy Hong Thai, Phuc Tran Nguyen, Trong Vi Ngo
- OIL PRICE AND STOCK INDEX CORRELATION: EMPIRICAL EVIDENCE FROM VIETNAM'S STOCK MARKET.....856
  Pham Xuan Truong, Le Phuong Thao Quynh

- THE APPLICATION OF RESPONSIBILITY ACCOUNTING TOWARDS THE SUSTAINABLE DEVELOPMENT OF VIETNAMESE ENTERPRISES IN INTEGRATION STATE...857
  Thi Huyen Chu

- THE EFFECT OF MOBILE BANKING APPLICATIONS' DESIGN FEATURE ON PERCEIVED AESTHETICS, PSYCHOLOGICAL ENGAGEMENT, AND BEHAVIORAL INTENTION...858
  Loan Pham Thi Be, Quyen Nguyen Hoang Diem, An Nguyen Ngoc Ha, Anh Hoang Thi Van, Tung Nguyen Huu

- THE IMPACT OF DEVELOPED STOCK MARKETS ON VIETNAM STOCK MARKET DURING THE COVID-19 PANDEMIC.....859
  Nguyen Thanh Dat, Nguyen Ha Hoang Long


## THEME 4. INFORMATION MANAGEMENT AND INFORMATION SYSTEM


- CONCEPTUALIZATION OF MOBILE AUGMENTED REALITY APPLICATIONS - ENHANCED CUSTOMERS' IMMERSIVE EXPERIENCE.....863
  Vo Kim Nhan, Doan Minh Nguyet

- EFFECTS OF TECHNICAL INFRASTRUCTURE AND HUMAN CAPITAL ON ICT APPLICATION OF LOCAL AGENCIES IN VIETNAM.....882
  Nguyen Thi Ngoc Mai, Pham Ngoc Huong Quynh

- TESTING MODERATING ROLE OF SOFTWARE TYPE IN THE RELATIONSHIP BETWEEN ORGANIZATIONAL COMMITMENT FACTOR TO ACCOUNTING INFORMATION QUALITY IN THE ENTERPRISES IN VIETNAM.....901
  Luong Duc Thuan, Truong Thi Thu Huong

- FACTORS AFFECTING TO THE PROBABILITY OF BIGTECH EXPANDING TO CREDIT SEGMENT...920
  Dao My Hang, Trinh Thuy Trang

- ORGANIZATIONAL INFLUENCES ON THE APPLICATION OF BLOCKCHAIN - A NEW TECHNOLOGY IN TOURISM.....921
  Vi C. Le, Phuong Anh Tran Le

- PRIVACY RISK AWARENESS AND INTENT TO DISCLOSE PERSONAL INFORMATION OF USERS USING TWO SOCIAL NETWORKS: FACEBOOK AND INSTAGRAM.....922
  Nguyen Thi Ngoc Duyen, Pham Thi Truc Ly, Dinh Tien Minh

## THEME 5. REGIONAL STUDIES, PLANNING AND ENVIRONMENT

- ANALYSIS OF FACTORS AFFECTING PEOPLE'S SATISFACTION ON THE NATIONAL TARGET PROGRAM FOR NEW RURAL CONSTRUCTION IN VIETNAM: A CASE STUDY IN TIEN GIANG PROVINCE.....925
  Ngo Thanh Phong, Nguyen Anh Tuan

- THE IMPACT OF CLIMATE CHANGE ON AGRICULTURE IN VIETNAM.....938
  Ho Ngoc Khuong

- COST AND BENEFIT ANALYSIS OF ADAPTATION METHODS TO CLIMATE CHANGE: A CASE OF SALTWATER INTRUSION IN CENTRAL COASTAL REGION OF VIETNAM.....951
  Nguyen Thi Dieu Linh, Brent Bleys

- THE EFFECTIVENESS OF FINANCIAL SOURCES FOR CLIMATE CHANGE IN VIETNAM.....952
  Nguyen Thi Nhung, Nguyen Minh Hoa, Vu Thi Phuong Anh, Do Thi Hoang Anh

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# PREFACE

Succeeding the highly successful conferences held in the previous years, with the great desire to create a forum for young domestic and foreign researchers who are interested in economics and business research, the 8th International Conference for Young Researchers in Economics and Business (ICYREB 2022) is hosted by the VNU University of Economics and Business in 2022. The conference is one of the events to celebrate the 15th anniversary of the establishment of VNU University of Economics and Business (2007-2022). The ICYREB 2022 attracted the participation of 10 universities and institutes as co-hosts, namely VNU University of Economics and Business; National Economics University; Foreign Trade University; Thuongmai University; Academy of Finance; Banking Academy of Vietnam; University of Economics Ho Chi Minh City; VNU HCMC University of Economics and Law; University of Economics - The University of Danang; and University of Economics - Hue University.

ICYREB Conferences aim at promoting young researchers who seek opportunities to publish their papers in prestigious national and international journals. Moreover, these conferences even create a forum for them to exchange, connect, and share their research. Submitted manuscripts will be reviewed by experts who have suitable expertise; they will be further revised before being submitted by young researchers to domestic and international journals for publication.

The Covid-19 pandemic caused an unprecedented social and economic crisis globally. After more than two years since its outbreak, the pandemic has been controlled, however, its consequences are still present and continue to create both challenges and opportunities for individuals, businesses, and the economy worldwide. Accordingly, the ICYREB 2022 was themed *Economic Resilience, Recovery, and Growth*. It successfully

attracted the participation of hundreds of young researchers from 34 schools/institutions and training organizations in economics and business with a total of 170 articles submitted. After two blinded review rounds, 115 submissions were accepted to be published in the 2022 ICYREB Proceedings. In addition to young domestic scientists, the conference also attracted authors from Belgium, Russia, South Korea, etc. The submitted manuscripts demonstrated the competencies of young researchers through the application of modern methodologies, the design of well-structured research, and the presentation of coherent arguments. The research papers discussed a wide range of issues possibly grouped into five themes including *(1) Finance; (2) Information Management and Information System; (3) Business and Management; (4) Economics; and (5) Regional Studies, Planning, and Environment*.

The ICYREB 2022 Organizing Committee would like to express our special thanks to the co-hosts for their significantly effective support and collaboration; to reviewers for their objective, straightforward comments to the submissions; and to young researchers both domestic and international for their highly enthusiastic participation. We look forward to receiving more attention, assistance, and facilitation of leaders of universities/ academies within the ICYREB network, and especially the participation of more young researchers in the following conferences.

*Thank you very much!*

Hanoi, October 10, 2022

**Assoc. Prof. Nguyen Anh Thu**

VICE RECTOR OF VNU UNIVERSITY OF ECONOMICS AND BUSINESS

# Theme 1
# Business and Management

# ASSESSING PARTICIPATION OF VIETNAM IN GLOBAL VALUE CHAINS: OECD TIVA DATABASE 2021

**Le Ha Trang**[1]

***Abstract:*** *This article uses scatter charts built by the author based on OECD TiVA database 2021 for the period 2000-2018 combined with import-export data to assess the participation of Vietnam in global value chains (GVCs) in general and by industry and trading partner. During the study period, Vietnam's backward participation in GVCs increased significantly while domestic value added in foreign exports remained low and did not improve over time. Thus, Vietnam has successfully integrated into a few global production networks but its role in these value chains has been small and has not created much value added for the economy. A remarkable positive point is that Vietnam is still taking advantage of its strengths to affirm its position in the logistics and tourism value chains. In terms of partners, Korea and ASEAN countries have the strongest influence on Vietnam's contributions in GVCs. The above important findings help the research to provide some policy implications for enhancing the position and participation of level of Vietnam in GVCs in the short and long term.*

***Keywords:*** *Backward, forward, global value chain, OECD TiVA 2021, participation, Vietnam.*

## 1. INTRODUCTION

Global value chain (GVC) is a concept recently mentioned more and more because of its great significance for countries in the context of international economic integration. Kaplinsky and Morris (2002) defined that the global value chain is a production and business chain in the form of globalization, in which mainly enterprises from different countries participate in various stages from design, manufacturing, marketing, distribution and consumer support.

GVCs reflect the remarkable trends of the world economy today. First, GVCs link geographically dispersed production activities into a unified chain and reflect shifting patterns of global trade and production.

[1] Banking Academy of Vietnam, Hanoi, Vietnam. Email: tranglh@hvnh.edu.vn

Second, the specialization of nations today is focused on business tasks and functions, rather than on the production of specific products. Third, GVCs emphasize the significant roles of supplier and consumer global networks (Backer, 2013).

Therefore, the country positioning in the GVC map is very important to help policy makers take advantage of trade competitiveness based on efficiently sourcing of input materials and the ability to access final foreign producers and consumers, thereby providing appropriate directions to strengthen the country's competitiveness in GVCs. GVC analysis also provides insights into the agents that control and coordinate activities in international production networks, helping to assess the effectiveness of policies on GCV participation and the economic benefits of joining GVC.

Many researches have used various indicators to assess a country's level of GVC participation. Van der Marel (2015) studied countries in the OECD TiVA database 2013 while Cadestin et al. (2016) researched Latin American countries. However, there are few studies to analysis Vietnam's GVC participation and their finding were not comprehensive. Dang Thi Huyen Anh (2017), Nguyen Viet Khoi and Chaudhary (2019), and Chaudhary, S. (2021) made some reviews about position and participation of Vietnam in GVCs but these reviews were still general and these authors did not have detailed analyses by updated period, by industry or by trading partner.

Therefore, the objectives of the study include: (i) building scatter charts based on OECD TiVA database 2021 for the period 2000 - 2018 combined with import and export data to give analyses of the Vietnam's participation in GVCs in general and specific by industry and trading partner; then (2) suggesting some policy implications to help Vietnam improve its GVC position and enhance the value added (VA) content obtained when participating in the global production network in the future.

## 2. LITERATURE REVIEW

### 2.1. GVC participation indicators

The method of measuring GVC participation that has attracted the most attention is the "vertical specialization" designated by Hummels et al.

(2001), then further developed by Koopman et al. (2010). The participation in GVCs is determined by the source of the VA embodied in exports from both backward linkages and forward linkages from a reference country.

The backward participation is calculated for the value of imported intermediate goods and services that are embodied in a domestic industry's exports, thereby measuring the role of any foreign industry upstream in the export production chain of a reference country. The higher the indicator, the more the country uses foreign inputs in production for export.

The forward participation captures the VA contents of exports originated in the source country, and embodied in the exports of the exporting country, divided by the gross exports of the source country. When the country provides intermediate inputs for export production of other economies, the domestic VA will be reflected in foreign exports, so the high forward participation indicates the high contribution of a reference country to the subsequent links in the global production chains.

Due to the rising trade linkages between countries, especially the import and export of intermediate goods, there are some limitations when using traditional indicators such as "import content in exports" or "intra-industry trade" to estimate trade level in GVCs. In order to measure the net domestic VA generated by trade, Input-Output (I-O) analyses provide a useful alternative to trade data. An important advantage of I-O data is that goods are categorized according to their intended use (inputs for the production of another industry or final products), and information on the input of service industries is also counted, so the data provides a more comprehensive analysis for both trade and services. In 2013, the OECD-WTO published a joint initiative on the Index of Value Added in Trade (TiVA-Trade in Value Added), statistics for 58 countries (all OECD countries, BRICS and some others). in 1995, 2000, 2005, 2008 and 2009 through the use of the harmonized I-O table of these countries. Currently, OECD TiVA 2021 has updated data for 65 countries for the period 1995-2018.

Based on the OECD TiVA 2013, Banga (2013) concluded that in the case of industrialized countries such as the US, Japan and the UK, the forward linkages are much stronger than the backward linkages, leading the net VA gains from linking to GVC. In contrast, developing countries such as India, Vietnam, Thailand, Malaysia and Philippines generally have

a lower forward participation than backward participation in GVCs. It is suggested that international trade growth can be futile without creating linkages with production activities generating domestic VA. Therefore, it is important to "gainfully link into GVCs" in sectors which will create positive domestic VA.

Cadestin et al. (2016) studied the GVC participation of six Latin American countries in the OECD TiVA 2015 and found that Latin American countries with high backward participation have low forward participation and vice versa, respectively corresponding to specialization in downstream or upstream of GVCs. For example, countries that assemble, process and export intermediates such as Mexico and Costa Rica, will have a strong backward linkage and a weak forward linkage with GVCs. In contrast, Chile that is a main supplier of copper and copper-based materials to foreign assemblers, will have a high forward participation. Accordingly, the GVC backward and forward participation indicators by industry also show significant heterogeneity among Latin American countries because each country has its own strengths when participating in GVCs.

### 2.2. GVC length index

The GVC length index or production staging index reflects how many stages on average enter the production chain. The position of the country on the GVC map will be more clearly explained with this index. For example, a high backward participation could be due to importing high value raw materials in a simple GVC with very few stages.

According to the method proposed by Fally (2012), the index equals one if there is only single production stage without any intermediate inputs. If there are more production stages using inputs from the same or different industries, the index is measured by the average number of stages involved in the production chain, weighted by the value added at each stage.

At the country level, this index reflects the ability to exploit domestic production stages for export. At the industry level, the GVC length index represents the degree of fragmentation of the production process by different industries and sectors.

De Backer (2013) found that manufacturing industries typically have the longest production chains such as: "TV and communication equipment",

"motor vehicles", "basic metals", "textiles, leather and footwear", etc... Agriculture and some services industries have medium GVC length such as "construction", "hotels and restaurants", "research and development" and "transport and storage". "Education" and "real estate" have the shortest production chains without almost any fragmentation (Fig. 1).

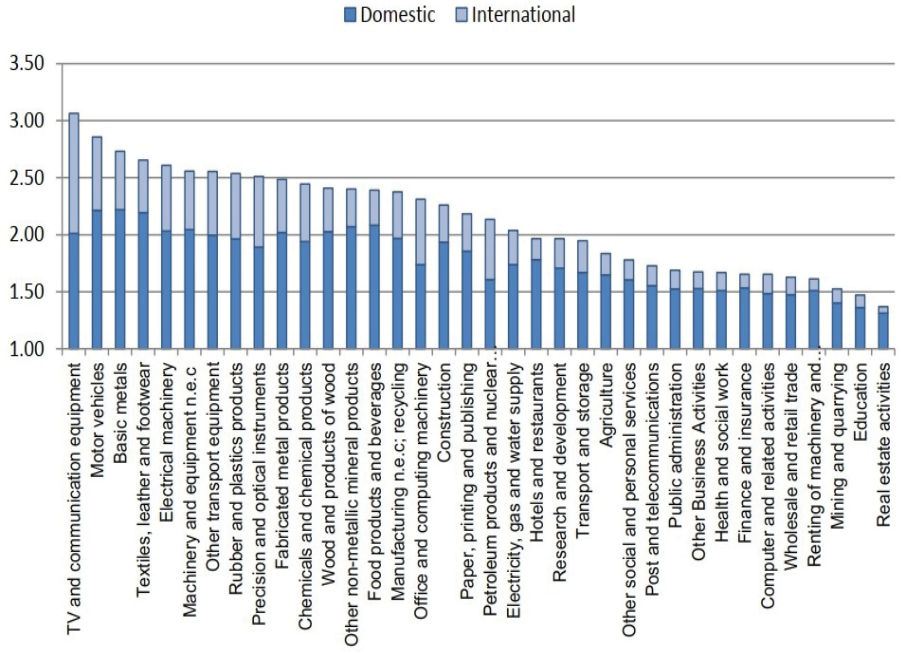


**Fig.1. Length of GVCs by Industry, 2008**

*Source: De Backer (2013).*

### 2.3. Distance to final demand index

The distance to final demand index is the final piece to assess the effectiveness of a country's GVC participation. Starting from a reference country, the distance to final demand index reflects the number of stages that have yet to be achieved before reaching final demand (Fally, 2012). A country can be upstream or downstream, depending on the stage of production it undertakes. Countries in charge of upstream stages will have a high distance index, conversely, downstream countries often have a lower distance index. Upstream countries are involved in the production of related intangible or raw materials at an early stage of production (e.g.

research and design), while downstream countries carry out production stages such as: manufacturing and assembling or distribution and customer support services.

Nguyen Viet Khoi and Chaudhary (2019) used OECD TiVA 2016 to calculate the distance to final demand index, in order to assess Vietnam's position in the international production network in the period 2005-2011. The results reinforced the view that in most of the industries in which Vietnam participates in GVCs, our position is in the midstream or downstream, ie assembly and processing stages.

My research focuses on analyzing GVC participation indicators from OECD TiVA 2021 combined with available finding on two another indices in previous studies in order to assess the position of Vietnam in GVC map in general and by industry and trading partner. The industries studied include: Manufacturing, Services, and Agriculture[1]. Since backward and forward participation indicators are not available for industry level in OECD TiVA database 2021, the article uses two similar indicators "Foreign value added share of gross exports" and "Domestic value added embodied in foreign exports as share of gross exports" respectively instead of the backward and forward participation.

## 3. ASSESSING PARTICIPATION OF VIETNAM IN THE GLOBAL VALUE CHAIN

### 3.1. Overview

In recent years, Vietnam, with the characteristics of a developing country and an attractive destination for foreign direct investors, has constantly taken advantage of its potential and available opportunities to integrate deeper into the global production network. According to the General Statistics Office of Vietnam (GSO), the total export and import turnover of goods reached 669.01 billion USD, went up 22.7% over the previous year, equaling 182.74% of GDP. This figures show a high degree of openness of the Vietnamese economy when compared to the trade-to-GDP ratio of some other developing countries such as China (37.43%), India (43.68%), Thailand (116.68%), Malaysia (130.73%), and the world average (52.1%) (the World Bank).

[1] Agriculture in this article is short for agriculture, hunting, forestry and fishing.

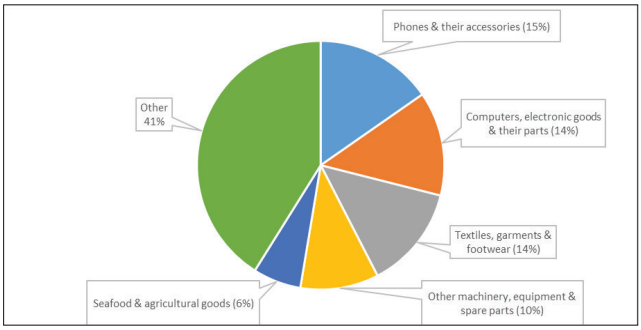


**Fig.2. Key Export Items Based on Export Value of Vietnam, 2021**

*Source: General Statistics Office of Vietnam.*

Looking at the current key export items of Vietnam, it can be seen that Vietnam has participated strongly in GVCs of some industries such as: phones and their accessories, electronic equipments, textiles, garments and footwear, and agriculture (Fig. 2).

### 3.2. Assessing participation of Vietnam in the global value chain

#### *3.2.1. Vietnam's GVC participation during 2000 - 2018 period*

The article uses a scatter chart based on OECD TiVA database 2021 to simultaneously analyze and compare the GVC backward and forward participation indicators of Vietnam and other countries (Fig. 3).

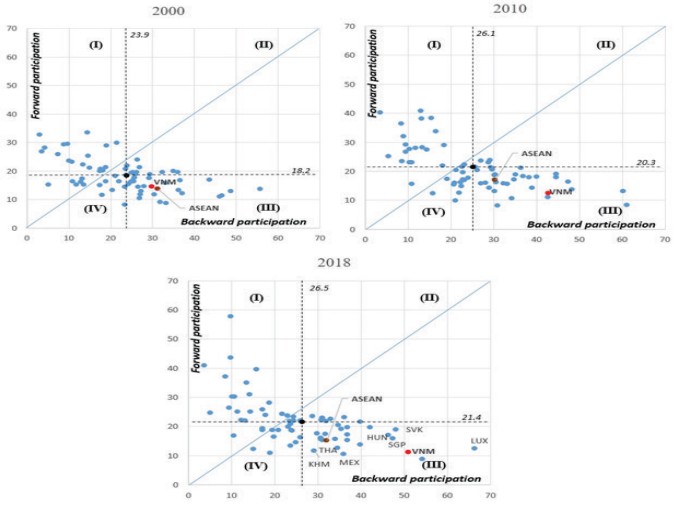


**Fig. 3. GVC Participation of Countries in 2000, 2010 and 2018 (%)**

*Source: Author's own compilation from OECD TiVA Database 2021.*

The two black dashed lines show the world average forward and backward participation and divide the chart into four quadrants. The blue 45-degree diagonal bisects the chart to help compare the correlation of forward and backward participation of countries. Overall, the GVC participation of most countries are distributed in quadrants (I), (III) and (IV), indicating that very few countries have both strong backward linkage and forward linkage in GVCs.

During the period 2000-2018, many countries experienced significant changes in GVC participation in both linkages, the world average also increased from 23.9% for backward participation and 18.2% for forward participation (in 2000) to 26.5% and 21.4% respectively (in 2018). These changes demonstrate the general tendency of countries to become more deeply involved in GVCs. In addition, the increasing dispersion of countries on the GVC map shows that each country is taking advantage of its unique features to integrate into the production chain by different degrees and various ways as well.

Vietnam is located in quadrant (III) of the graph, which shows that we have a higher backward participation but a lower forward participation than the world's one. A high backward participation and low forward participation is also a common pattern for many other developing countries such as: Thailand, Cambodia, Mexico, Hungary, Slovenia... In the early stages of integration, Vietnam's GVC participation idicators in both linkages were quite similar to the average in the ASEAN (in 2000), but later on, these indicators became more and more differentiated (in 2010, 2018). Although our backward participation went up rapidly, our forward participation showed a slight decrease over the period. The backward participation increased from 29.9% (in 2000) to 42.8% (in 2010) and 51.1% (in 2018). Meanwhile, the forward participation decreased from 14.5% (in 2000) to 12.4% (in 2010) and 11.1% (in 2018). These trends imply that Vietnam's exports is highly dependent on foreign inputs, but exports themselves carry very little domestic value added.

#### *3.2.2. Vietnam's GVC participation by industry*

The difference between backward participation and forward participation can vary depending on the nature of each industry. Vietnam

has the strongest backward linkage in global manufacturing sector (55.9%). Manufacturing industries often have the longest production chains from the stages of R&D - satellite manufacturing - production and assembly - marketing - distribution - consumption (De Backer, 2013). A strong backward linkage and weak forward linkage indicate that Vietnam still mainly handles the satellite manufacturing, production and assembly of intermediates stages located at the middle of the production chain. Vietnam is also involved in upstream activities but predominantly in low value added products such as plastic, glass, and packaging. Therefore, although exports of manufacturing sector such as electronic equipments and components, textiles, garments and footwear, etc... account for a large proportion of Vietnam's total exports, more than half of value added in this export is from imported inputs. According to the GSO, the group of production materials accounted for 89.2% of the total import turnover in 2021 with mainly inputs for manufacturing sector such as: machinery and equipment. computers, telephones and electronic components, iron, steel, plastic and chemical products.

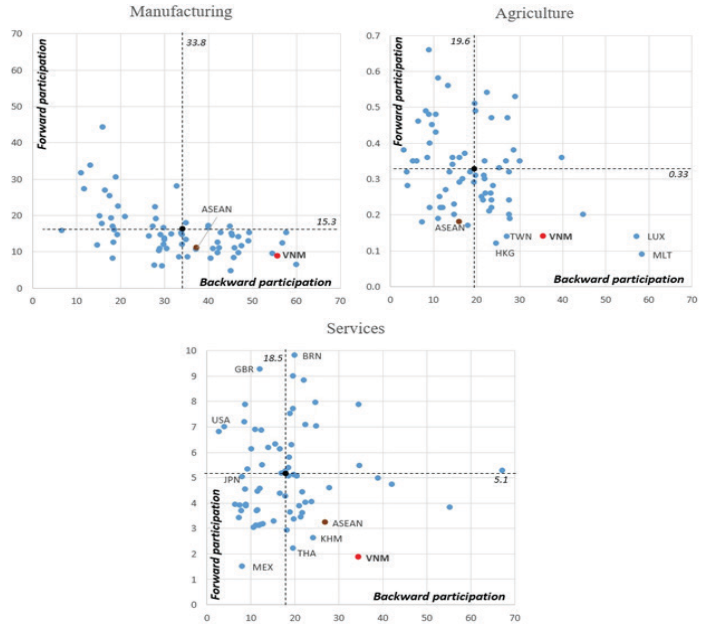


**Fig.4. GVC participation of Vietnam, 2018: Manufacturing, Services, and Agriculture (%)**

*Source: Author's own compilation from OECD TiVA Database 2021.*

The dependence on foreign supplies in the service and agriculture sectors is lower than that in manufacturing sector, but still higher than the world average. This can be seen in agricultural industries where we have not yet been able to self-supply fertilizer, seed and animal feed for production. For example, according to the Vietnam Fertilizer Association, Vietnam still has to import about 35% of the country's fertilizer demand each year, including 100% foreign fertilizers such as potassium, SA which cannot be produced domestically.

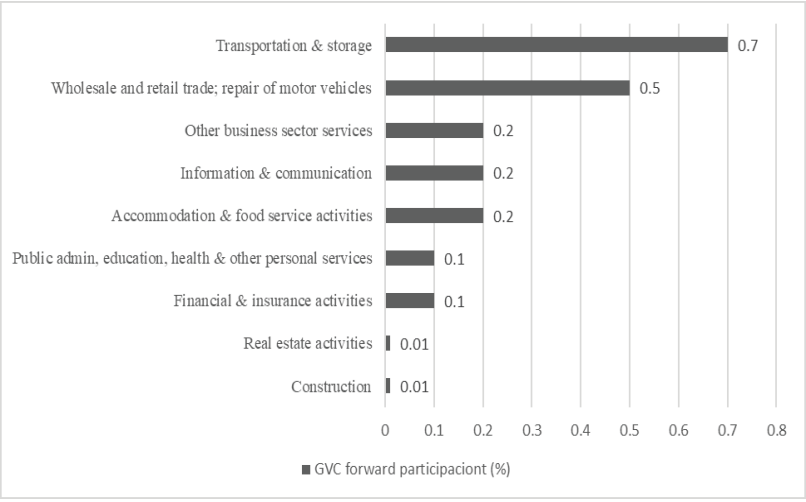


**Fig.5. GVC forward participation of Vietnam in 2018: Service industries (%)**

*Source: Author's own compilation from OECD TiVA Database 2021.*

Agricultural and service industries have a shorter GVC length than manufacturing industries, and the domestic value added of these industries embodied in foreign exports also account for a little share of total exports. In 2018, Vietnam's forward participation in agricultural and service sectors were at the lowest level compared to other countries on the scatter chart (Fig. 4).

It is noted that the value added contribution of Vietnamese agricultural goods to GVC was lower than that of major competitors in this field such as China, India, Thailand, Indonesia..., and only higher than Malta and Hong Kong, and equal to Taiwan and Luxembourg, which are countries and territories with no agricultural strengths. Meanwhile, agricultural and aquatic product are one of important exports of Vietnam, account for 6% of the total export turnover in 2021, with some export items in the top of

the world. This problem can come from the lack of branding in agricultural marketing. Most of agricultural and aquatic products of Vietnam now are exported in raw and unprocessed form, and must go abroad through foreign intermediary brands.

Regarding for the service sector, developed countries often have the strength to contribute more in the GVC forward linkage. Manufacturing-centric countries such as Vietnam, Thailand, and Mexico often have little competitive advantage when they want to climb in the service industry value chain (Fig. 4). The main challenge of Vietnam for this goal is that domestic logistics industry is still highly fragmented with a large number of small and medium enterprises providing low value added services. Moreover, the connection between different modes of domestic transport is weak. Despite of these limitations, a remarkable positive point is that the forward participation of Vietnam in the service sector mainly comes from "transportation and storage", and "trade services" (Fig. 5). It is suggested that Vietnam has the full potential for development in logistics activities thanks to taking advantage of its geographical location and the nation's strategy of integration and trade liberalization through many free trade agreements in recent years. In addition, tourism-related activities such as accommodation, food service and communication activities are also other forces that lift Vietnam up GVCs of the service sector.

#### *3.2.3. Vietnam's GVC participation by trading partner*

The connection between Vietnam and the global production network has grown continuously since 1995 when Vietnam's Vietnam officially opened to the world. Vietnam's GVC participation by partner shows the impact of geographical distance and regionalization in production on value chain linkages. Although the US and EU are currently two major trading partners of Vietnam, accounting for 17.18% and 8.78% respectively of Vietnam's total import and export turnover in 2021 (According to the GSO), the level of GVC link in both directions between Vietnam and these two partners is relatively low, especially compared to other major Vietnam's trading partners in Asia (Fig. 6). There are two reasons for that fact. First, regionalization still exists in many value chains to a certain extent. And up to now, Vietnam has mainly participated in GVC through the East Asian value chains.

Korea has gradually become the country with the closest connection with Vietnam in GVC since 2008. The value added of Korean goods to Vietnam's exports and the value added of Vietnamese goods to Korea's exports are both high when compared with other major Vietnam's Asian partners such as China and Japan. The robust cooperation in trade and investment between the two countries has been demonstrated through the Vietnam - Korea FTA 2015 and many large-scale investment projects of Korea in Vietnam over the past 10 years. Besides, Vietnam also shows a firm link with ASEAN partners in GVCs, especially to backward. Because the input sources for Vietnam's industries to join the global production network are mainly from this region. So that close economic links in the ASEAN region, especially the development of the ASEAN Economic Community (AEC), have a sizeable influence on the way Vietnam engages in GVCs, particularly in terms of backward linkages.

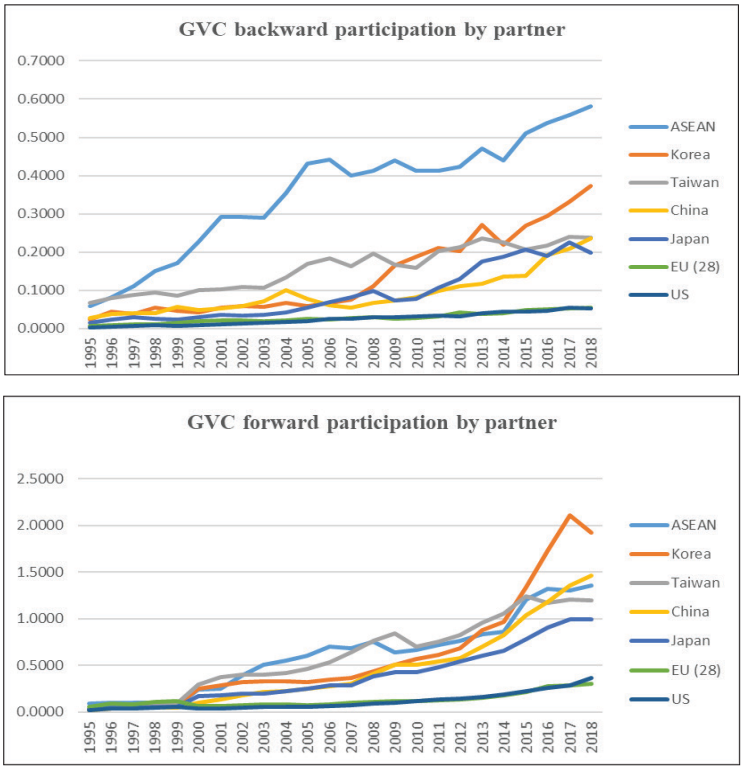


**Fig.6. GVC participation of Vietnam by trading partner, 1995-2018 (%)**

*Source: Author's own compilation from OECD TiVA Database 2021.*

## 4. CONCLUSION AND POLICY IMPLICATIONS

In conclusion, Vietnam's GVC backward participation increased steadily, but its forward linkage in GVC did not improve accordingly in the period 2000-2018. Although Vietnam has integrated more and more deeply into the global production network, its role in these value chains has been small and has not created much value added for the economy. A remarkable positive point is that Vietnam is still taking advantage of its strengths to move up the logistics and tourism value chains. In terms of partners, Korea and ASEAN countries have the strongest influence on Vietnam's contributions in GVCs.

Based on above important findings, Vietnam needs greater policy efforts to enhance both its position and participation in GVC linkages in both directions. This goal can be achieved through taking on more intermediate stages of production, shifting to more value added stages in the value chain such as R&D and marketing, or enhance the level of specialization of existing domestic production stages.

In the short term, Vietnam should still maintain its advantages in terms of geographical location, labor and natural resources to exploit value added from existing production stages such as outsourcing, assembly and processing. We should also emphasize on raising domestic production capacity to get better benefits from the stages that Vietnam is undertaking in GVC.

In the long term, in order to effectively upgrade Vietnam's role in GVCs, especially in the forward linkage, it is necessary to have comprehensive policies to stimulate the capacity of distribution, sales and brand promotion of Vietnam to foreign markets. Policies related to human resource training, development and technology transfer are always necessary to not only improve labor productivity and the ability to specialize in each production stage in the chain, but also help Vietnam initially penetrated into high-tech industries as well as upstream stages of the value chain.

Second, we need to continue to use our existing advantages of geographical location to develop logistics activities and trade services, turning these activities into leverage for upgrading the business functions of the country in the global network, thereby increasing the gains obtained from GVCs.

Third, according to GVC by partner analysis, the top countries investing in Vietnam are also countries with close linkages with Vietnam in value chains. Therefore, suitable FDI incentive policies are also key factors leading to a stronger GVC participation in the next future. FDI attraction in high-tech and service sectors allow faster technological progress and productivity spillovers, and provide new opportunities for Vietnam to engage in higher value and more complex activities.

Fourth, the establishment and development of supporting industries is very important to create autonomy for domestic production and business activities, in order to limit the risks of relying too much on foreign raw materials and intermediates, as well as boost the country's contribution to the next linkages in GVCs. A mature supporting industry system will help Vietnam both strengthen its existing position in the GVC map, and at the same time can improve its GVC forward participation.

Finally, Vietnam needs to continue to maintain its close connection with East Asian value chains, and at the same time take advantage of opportunities from new generation free trade agreements such as EVFTA and CPTPP to expand its presence in value networks in Europe and North America, thereby helping Vietnam to strengthen the extent and scope of its influence on GVCs.

In summary, a focus on resource- or labor-intensive sectors is an important first step to entering GVCs for industrialization of developing countries in the age of globalization. However, this is not in itself the end goal. Continuous upgrading is a must and not a choice if a country were to achieve sustained economic development.

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# FACTORS CONTRIBUTING EMPLOYEE TURNOVER DECISION IN VIETNAM HOTEL SECTOR

**Nguyen Thi Ngoc Dung**[1]

***Abstract:*** *The aim of the research demonstrates an insightful look into the factors affecting the employee turnover decision in the hotel industry by measuring and explaining employee turnover decisions in the hotel industry in Vietnam. The theory and model of the research used will divide the factors into three main categories: dismissal, employee quitting and independent reasons, which include two sub-categories: termination and resignation. In terms of employees' turnover decision due to dismissal as the employers are not satisfied with the employees, there are six factors: poor work performance and attitudes, insubordination, employees being laid off due to economic conditions, failure to get along with co-workers or supervisors, rules violation, and alcohol, drug abuse or bad personal habits. Regarding employee quitting as the employees are not satisfied with their employers, there are eight factors: compensation and benefit, working conditions, poor management, better offer, sexual harassment, inadequate orientation and training, not matched to the job, no chance for promotion, and job security. In terms of independent reasons, there are three factors for termination, including retirement, end of temporary contract, and transfer or promotion to another property while there are also three factors for resignation, including health problems, home responsibilities, and accident or death.*

***Keywords:*** *Employee, hotel sector, factors, turnover decision.*

## 1. INTRODUCTION

The global hotels and resorts industry witnessed a steady growth over the past 10 years due to the significant increase in international travel rates. Excluding 2020, a year with the spread of the Covid-19 leading to the massive fall of the global travel rate, the number of international tourist arrivals has increased dramatically. Evidence is that the market size of the global hotels and resorts industry is worth 1 trillion US dollars with the number of businesses around 606.492 and the industry employment is up to approximately 10 million people. In which, we reached a peak

[1] Foreign Trade University, Hanoi, Vietnam. Corresponding author. Email: dungntn@ftu.edu.vn

of revenue for the hotel industry at 620 trillion Vietnam dong in 2018. The figure for international tourists has risen 3 fold since 2010, from 5 to more than 15 million in 2018, in which capital city Hanoi attracted 28 million tourists in total, accounting for 5.5% in the market. The hospitality industry accounts for a large amount of the labor force due to its diversity in their services, ranging from the food and beverage services such as fine dining, restaurants, bars and lounges to the room services in the hotel. Despite the fact that the hospitality sector is growing, it still faces a lot of challenges related to the workforce. In fact, the employee turnover rate in the hospitality sector is extremely high, compared with other sectors. According to the Bureau Labor Statistics, before the Covid-19 outbreak, the employee turnover rate in this industry was approximately 73.8%, higher than the average amount of other sectors around 10-15%. After the Covid-19 outbreak, the problem of employee turnover rate has become more serious when after the hit of the pandemic, the hospitality industry witnessed a loss of 7.7 million jobs. The whole hospitality industry is still facing the "talent crisis". According to the Covid-19. Employee Impact survey, among 8000 hotel employees, 75% of them were found leaving the industry due to reasons such as poor job security, health and safety practices, etc. To understand the factors affecting the turnover issues, a framework and research design determining the variables affecting employee turnover were developed. This research aims to identify the factors affecting employees' resignation decisions in the hotel industry, especially in the luxury hotel segment, thus giving recommendations for employers to decrease the rate of employee turnover.

To achieve the purposes of the research, this study will focus on answering the following questions:

- What are the variables affecting the employees' turnover decision in the hotel industry in Vietnam?
- How are these variables associated with the employees' turnover decision?
- What are the solutions to tackle this problem?

To answer these questions, the research set three objectives as followings:

- Determine the categorizes and causes of employees' turnover decision in the hotel industry.
- Analyze how categorizes and causes shape the employees' turnover decision.
- Propose recommendations to reduce the rate of the employees' turnover decision in the hotel industry.

## 2. LITERATURE REVIEW AND CONCEPTUAL MODEL

### 2.1. Definition of employee turnover

The employees' turnover is a phenomenon that has been a popular topic of previous studies and research (Shaw et al., 1998). However, the most common definition of this phenomenon is the loss of talent in the workforce over time. The term "employee turnover" refers to the rotation of employees within the labor market; between organizations, occupations and works; and between the situations of employment and unemployment (Abasssi et al., 2000). The term "turnover" was first defined as the proportion of the number of organizational employees leaving the organization during the period divided by the average number of people currently working in that organization (Martin et al., 1981). Traditionally, employers often refer to the term "turnover" as a process including filling the vacancy with new employees who will be hired and trained either voluntarily or involuntarily. The reasons leading to the employee turnover may include dismissals as employers are not satisfied with their employees, quitting because employees are not satisfied with their employers, and independent reasons such as end of contract, retirements, resignations, etc.

### 2.2. Employee turnover decision process

We were able to base our research on a vast amount of previous information in terms of voluntary employee turnover, especially because this topic is very relevant for firms all over the world. Organizations can retain their personnel and use their resources more effectively by understanding and minimizing turnover. Below is the model of Mobley, which was developed in 1977 to clarify the process of an employee turnover decision:

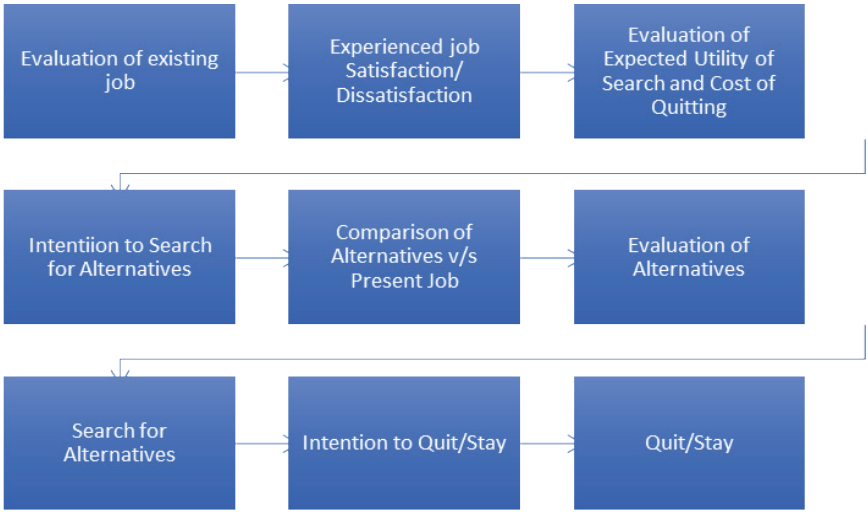


**Figure 1. Employee turnover decision process**

### 2.3. Types of employee turnover

Although the term "turnover", to some extent, indicates a negative meaning as well as connotation, not all turnover is negative, depending on the reasons leading to the turnover and what happens to the firm after the turnover. Businesses regardless of its types and models will always encounter two main types of employee turnover: voluntary turnover and involuntary turnover. In which, voluntary turnover occurs when employees are not satisfied with their employers, resulting in their decisions to quit their job. The factors that lead to the employees' dissatisfaction of the employees towards their employers are compensation and benefit, working conditions, poor management, better offer, sexual harassment, inadequate orienation and training, job task, promotion and job security. Meanwhile, involuntary turnover roots from the fact that employers are not satisfied with their employees, resulting in their action of dismissal. Also, involuntary turnover also includes independent reasons of the employees, including termination and resignation.

#### *2.3.1. Voluntary turnover*

Voluntary turnover refers to the employee turnover when the employees voluntarily leave their jobs due to different reasons. These types of turnover often cost the company more, compared with the other type of turnover as they often involve the loss of employees that perform well.

As mentioned in the section above, voluntary turnover means that the employees voluntarily take action to quit the company due to their dissatisfaction with the organization or their employers. According to previous research, the sources of employees' dissatisfaction may come from nine main reasons as followings: compensation and benefit, working conditions, poor management, better offer, sexual harassment, inadequate orientation and training, job task, promotion and job security.

***Compensation and benefit***

A lot of previous studies have been conducted on the matter of employee turnover decisions due to compensation and benefit. In fact, studies show that salary was one of the main factors leading to the problem of employee turnover, especially in the hotel industry. A case of the Macao hospitality industry indicated that poor compensation and benefits motivated employees to leave their jobs for other firms who are willing to offer the better price (Chan & Kuok, 2011). Furthermore, the more the companies perform well, the higher the expectations of employees for higher compensation (Yang et al., 2012). Therefore, firms that make higher payment for employees will better decreasing the turnover decision of their employees (Blomme et al., 2010).

Moreover, there are some mixed findings showing that not only salary but also careers would attract employees in the hospitality sector. Although these findings are difficult to synthesize employee turnover problems when taking different demographics into account, they demonstrated that payment is a reason for either leaving a job or taking a job. Apart from basic salary, benefits also affected the employee turnover, but less significant, compared to the compensation (Su et al., 2011).

***Working conditions***

A number of studies indicated the positive correlation between employee turnover decision and the working conditions (Lee & Way, 2010) as an organization with poor working conditions which lacks will result in the increase of the employee turnover decision (Morcarz et al., 2009). Moreover, the working conditions that are full of pressure, negative competitions and politics will discourage the employee and lead to the employee turnover decision (Yang et al., 2012).

In addition to facilities, equipment, and work location, working culture is also considered as a contributor to the working conditions (Moncartz, 2009). Among a variety of organizational cultures, empowerment was found to have a huge impact on the employee turnover decisions. Employees that are given greater freedom to work are more creative and confident, which leads to higher job satisfaction (Vasquez, 2015). In the hotel sector, "turnover culture" is described as "workgroup conviction in the legitimacy of labor turnover" (Iverson & Deery, 1997), implying that staff turnover is accepted as a standard.

***Poor management***

There is a strong connection between the poor management and the employee turnover decision. Poor management has a detrimental impact on turnover intentions, implying that poor management signals an unequal social exchange among subordinates, prompting them to look for work elsewhere (Memon et al., 2016). Employee satisfaction with management has been proven to be more significant in retaining employees, and it has a negative effect, meaning that poor management will lead to higher turnover (Sherman, 1989).

***Better offer***

According to the Gallup report, employees who are not engaged in the organization are likely to leave for a better job. Employees may be content in general, but they are neither cognitively nor emotionally engaged to their work or workplace; they will typically show up to work and accomplish the bare minimum, but will swiftly leave for a little better offer.

***Sexual harassment***

Sexual harassment appears to be linked to employee turnover intentions or employees considering quitting their jobs, according to research (Merkin, 2008). Furthermore, data reveal that when women managers, in particular, are subjected to sex discrimination, they are more likely to quit their professions (Ng & Chakrabarty, 2005).

***Inadequate orientation and training***

Staff training has been proven to have a favorable impact on employees by lowering employee turnover rates (Choi & Dickson, 2009), regardless

of job type. In addition, employee training is critical because it is the key to achieving higher levels of service quality in the hotel sector. In addition, a training program can boost employee confidence, minimizing the likelihood of resigning (Shreedaran, 2010).

***Job task***

The work scope, also known as job task or job quality, is referred to as job design. A variety of previous studies have been undertaken to examine the association between job design/job task and employee turnover decisions. Job classifications, shifts, and levels in the hotel industry can all influence turnover decisions. In fact, those who work in a hotel's.

Front Office department at a managerial level or on early shifts tend to stay longer (Lee & Way, 2010). Regarding job task quality, four various employment attributes, such as "unchallenging", "abundant knowledge", "daily work repetition" and "changing corporate philosophy", can have a substantial impact on employee attrition decisions (Yang et al., 2012). Aside from the impact of job design, there are three qualities that influence employee turnover decisions: necessity, utility and interest (Dipietro & Condly, 2007).

A job with an intriguing and fascinating scope of work, for example, will result in a lower employee turnover rate. Flexible working hours were another job quality element that influenced turnover decisions (Kim et al., 2016).

***Promotion***

Promotion has been shown in prior studies to have an impact on employee turnover decisions. Employees will be more ready to quit for another job if they do not have the possibility to advance in their firm (Qui et al., 2014). This observation is also consistent with Yang et al. (2012).

***Job security***

Covid-19 has wreaked havoc on the world's industries in unprecedented ways. The hotel business, in particular, has seen huge revenue losses as occupancy rates have fallen dramatically as a result of social estrangement and a sharp drop in the number of tourists, thus increasing the job insecurity as a lot of employees were laid off due to this crisis (Sobieralski, 2020). To some extent, job instability is a major source of stress for employees,

and it has a detrimental impact on characteristics such as job attitudes and employee psychological health (Jordan et al., 2002) (De Witte et al., 2015).

### 2.3.2. Involuntary turnover

Involuntary turnover, in contrast, refers to the employee turnover when the employers voluntarily make a decision about layoffs or the force reductions and cut down the number of employees who have poor performance. Therefore, involuntary turnover will be resulted from independent reasons or dismissal. In which, dismissals mean that the employers do not satisfy their employees due to reasons such as poor work performance and attitudes, insubordination, economic conditions, bad relationship with co-workers or supervisors, rules violation and alcohol and drug abuse. In addition, independent reasons will cover two main factors: termination and resignation. This type of turnover indicates the inefficiency and ineffectiveness in the employers' management of finance and operations within the company. However, this type of turnover may help save the costs of the company. To understand each term more thoroughly, followings are the detailed explanations with previous research of these terms.

***Employers are not satisfied with their employees leading to dismissal***

***Job performance and attitudes***

Although there is no specific measure of this, there is no question that this element had a significant role in employee turnover (Pizam & Thornburg, 2000). Nonetheless, due to the nature of the hospitality industry, job performance has a direct correlation with employee turnover. Because hotel employees are expected to multitask at work, those who are more adaptable and multifunctional are believed to perform better, boosting job satisfaction and lowering attrition (Jang & George, 2012).

Furthermore, emotional intelligence was seen as a factor that helps minimize the turnover choice (Lee et al. 2011), as individuals with high emotional intelligence tended to stay in their jobs longer. Furthermore, those with a greater level of emotional intelligence are better able to manage the rigorous schedules of the hospitality industry, resulting in a better work-life balance (Lee et al., 2011). As a result, they will be more

satisfied with their jobs. This study suggests that emotional intelligence has an indirect impact on the decision to change jobs.

***Insubordination***

Misconduct or insolence are frequently confused with insubordination. When an employee mocks, insults, disrespects, or behaves in an unacceptable manner toward a boss or supervisor, this is known as insolence. When an employee engages in unlawful, harassing, or unethical behavior, this is referred to as misconduct. A code of conduct is frequently used to define this behavior. This has a huge impact on the employee turnover decision as well.

***Economic crisis***

Covid-19 has given implications on the impact of financial and economic crisis on both the organization and the employees. Due to the economic downturns, there was a higher number of job losses as employers are not capable of paying for their employees (Greenhalgh & Rosenbalt).

***Failure to build relationship with co-workers and supervisors.***

Employee-employer relationships have also been considered as a factor in employee turnover decisions (Kim, 2014); (Choi, 2006); (Lee et al., 2012). However, the significance of it is still unknown, as some research has found that this association does not significantly influence turnover decisions (Lam et al., 2012).

***Independent reasons***

***Termination***

The end of an employee's employment with a corporation is referred to as termination of employment. An employee may be fired from a job voluntarily or as a result of a decision made by the employer. If the relationship with the employer has not been formally terminated with a notice of termination, an employee who is not actively working due to illness, leave of absence, or temporary layoff is still deemed employed.

**Table 1. Sources of employee turnover decision**

| Category A: Employer not satisfied with employee | Category B: Employee not satisfied with employer | Category C: Independent reasons | |
|---|---|---|---|
| Class I turnover: Dismissal | Class II turnover: Quiting | Class III turnover: Termination | Class IV: Registration |
| Unstatisfactory work performance and poor attitudes | Insufficient pay or fringe benefit | End of temporary contract | Health problems |
| Repeated rules violations | Dissatisfied working conditions: location, hours, etc. | Transfer or promotion to another property | Accident or death |
| Lay off due to economic conditions | Poor quality of supervision | | |
| Failure to get alonng with co-workers or supervisors | Better offer, move to a better job | | |
| Alcohol or drug abuse or other personal habits | Sexual harrasment | | |
| Poor quality of the work force (can't find good help) | Inadequate orientation and training | | |
| | Not matched to the job: bored with job, job too difficult | | |
| | Dead end, no chance for promotion | | |
| | Job insecurity | | |

### 2.4. Effects of employee turnover

From the perspective of the company, employee turnover is costly. Voluntary quits, which constitute an outflow of human capital investment from organizations (Fair, 1992) and the replacement procedure that follows, entail a slew of costs for the organizations. These costs include, for example, searching the external labor market for a potential substitute, selecting among competing substitutes, inducting the chosen substitute, and formal and informal training of the substitute until he or she achieves performance levels comparable to the individual who quit John (2000). In addition to these replacement expenses, output would be harmed to some extent or maintained at the expense of overtime pay. Because turnover has some significant effects on organizations, it has gotten a lot of attention (Denvir & Mcmahon, 1992). A lot of previous research believes that the inefficiency in the turnover rate management will exert a negative impact on a company's profitability (Wasmuth & Davis, 1993). A single line

employee resigning cost between $1400 and $4000 in direct and indirect costs over twenty years ago (Hogen, 1992). There are numerous hidden or intangible costs associated with turnover. Entering employees, coworkers closely related with incoming personnel, coworkers closely associated with departing employees, and positions being filled while empty are all examples of hidden costs, according to Philips (1990). Employee turnover not only has an impact on the company's profitability but also on the customer service and satisfaction. Catherine (2002) claims that turnover costs include lost productivity, lost sales, and management time, and estimates that an hourly employee's turnover costs range from $3,000 to $10,000. According to research, hiring and training a replacement worker for a lost employee costs about half of the person's annual wage (Byrd et al., 2006) - but the costs don't stop there. We assume that when an employee quits the company, productivity suffers as a result of the time it takes to learn the job and the organization. Lack of intellectual capital contributes to this cost, because not only do businesses lose the departing employee's human capital and relational capital, but competitors may gain these assets as well, according to Meaghan et al. (2002). As a result, if staff turnover is not well handled, it will have a negative impact on the organization's personnel costs and, in the long run, its liquidity situation. Voluntary turnover, on the other hand, comes at a high price, both in terms of direct costs (replacement, recruitment and selection, temporary staff, management time) and indirect costs (morale, pressure on remaining employees, costs of learning, product/service quality, organizational memory) as well as the loss of social capital (Dess et al., 2001).

### 2.5. Strategies to minimize employee turnover

When faced with employee turnover issues, management has numerous policy alternatives, including modifying (or improving current) policies in the areas of recruitment, selection, induction, training, job design, and salary payment. Policy selection, on the other hand, must be tailored to the problem's specific diagnosis. Employee turnover caused by inadequate selection procedures, for example, is unlikely to decrease if policies were changed to focus solely on the induction process. Similarly, if the policy change is just to improve the organization's provision of on-the-job training opportunities, employee turnover related to wage rates

that produce earnings that are not competitive with other enterprises in the local labor market is unlikely to reduce. Because the direct and indirect costs of labor turnover are increasing, management is usually urged to understand the reasons why employees leave organizations so that appropriate action can be done by management. According to extensive research, the following categories of human capital management elements constitute a core set of measurements that senior management may utilize to improve the effectiveness of their people investments and overall corporate performance: Employee engagement, or an organization's ability to engage, retain, and maximize the value of its people, is dependent on how well roles are created, how employees' time is used, and how management's commitment and support motivates individuals to stay in the organization. Employee retention would be influenced by knowledge accessibility, the extent of the organization's "collaborativeness", and its ability to make knowledge and ideas widely available to employees. At all levels of management, information should be shared. This information accessibility would result in high employee performance and a healthy business culture, according to Meaghan et al. (2002). As a result, information accessibility will help employees feel valued for their efforts, reducing the likelihood of them leaving the company.

Workforce optimization, or an organization's achievement in improving employee performance by developing critical processes for getting work done, providing acceptable working conditions, establishing responsibility, and making good hiring decisions, will keep employees on board (Sherman, 1986). Work engagement refers to an individual's ego involvement with work and the degree to which he or she psychologically identifies with his or her job (Kanungo, 1982). Employees who were involved in internalizing ideals about the goodness or importance of work were less likely to quit, and these involvements were linked to task features (Couger, 1988). Organizational commitment refers to an employee's emotional response to the organization as a whole, as well as the degree of attachment or loyalty they have to it. The degree to which employees are engaged in or preoccupied with their jobs, as well as the degree to which an individual identifies with his or her job, is measured by job involvement (Brooke et al., 1988).

Employee empowerment has the potential to improve employee satisfaction in organizations, thus reducing the rate of employee turnover (Malone, 1997). Managers take on the role of coaches, assisting staff in resolving issues. Employees now have more responsibilities, he concludes.

## 3. METHODOLOGY

The framework connected with a certain set of hypotheses that can be employed for research is known as research technique (O'Leary, 2004). Data gathering methods, as well as the study topic's ideas and concepts, are all factors to consider in research methodology. The research procedure, data collecting, research instrument, and data analysis are all part of the methodology. Qualitative methods are adopted in this research to address the research questions. This approach will be used with a view to determining the factors affecting the employee turnover decision in the hotel industry in Hanoi. In this research, a questionnaire will be conducted with a sample of 165 employees who used to work in different luxurious hotels in Hanoi to indicate the employees' perspective towards their jobs as well as the reasons why they left their job. Moreover, an in depth interview will be conducted with a sample of 19 employees who used to work in Capella Hanoi Hotel - a typical 5 star hotel in Hanoi for further insights, including their emotions, behaviors and mindset about this topic, thus understanding the real struggles of employees in the hospitality industry and their recommendations for better improvement. Hence, qualitative research will help give a deeper understanding of how the hotel employees think about their hotels as well as the hotel industry on the whole.

## 4. FINDINGS

### 4.1. Landscape of hotel industry

#### *4.1.1. Hotel industry in the world*

Because of the huge increase in international travel rates, the worldwide hotel and resorts industry has seen continuous expansion over the last ten years. With the exception of 2020, when the spread of Covid-19 resulted in a large drop in worldwide travel rates, the number of international visitor arrivals has risen dramatically. According to evidence, the global hotel and

resorts industry is worth $1 trillion dollars, with 606.492 enterprises and around 10 million people employed in the industry.

#### *4.1.2. Hotel industry in Vietnam, especially in Hanoi*

The considerable increase in tourist revenues we have received in Vietnam since 2011 reflects the country's growing appeal as a tourism destination around the world. In 2018, we hit a revenue high of 620 trillion Vietnam dong for the hotel business. Since 2010, the number of international tourists has increased threefold, from 5 to more than 15 million in 2018, with the capital city of Hanoi attracting 28 million visitors, accounting for 5.5% of the market. The hotel industry, on the other hand, has had a difficult time throughout the Covid-19 pandemics. With a general decline in the number of customers traveling globally and locally, the pandemic has put a severe financial burden on the whole sector.The tourist industry's real global revenue is expected to drop by roughly 35% by 2020, compared to the predicted value of $447.4 billion. The tourism industry has lost 1.5% of global GDP after only four months of closure, according to the United Nations Conference on Trade and Development. The hospitality industry in the United States, in particular, has lost roughly $46 billion in room revenue due to low occupancy rates (below 20%), despit the fact that the minimum occupancy rate to stay open is 35%. Because of their large variable and semi-fixed costs, this problem poses a danger to the whole hospitality business, particularly luxury hotels. Currently, in the year 2021, the pandemic Covid-19 is slowing the industry's development and recovery, resulting in a higher rate of staff turnover.

### 4.2. A case study of Capella Hotels and Resorts in Hanoi

#### *4.2.1. Overview of Capella Hotels and Resorts in Hanoi*

Capella Hotel Group is a corporate providing high - end services with two famous luxurious brands: Patina Hotels and Resorts and Capella Hotels and Resorts, in which, the latter focuses on crafting authentic, personalized cultural experiences and sophisticated design, thus being awarded as 2nd best hotel brand in the world in Travel + Leisure World's best awards 2020. Capella Hotels and Resorts in Hanoi was first brought

to Hanoi by Sun Group - a key player in the hotel industry in Vietnam in 2020. Located at the heart of Hanoi City, Capella Hotel and Resorts in Hanoi is expected to be a precious pearl in the hotel industry in Vietnam. Being inspired by the Hanoi Opera House in the 1900s, the legendary architecture Bill Bensley conjures up a stunning experience of ageless splendor, which is Capella Hanoi. Thematic suites, epicurean selections by world-class chefs, and curation of daily rituals highlight Hanoi's gems are all found within the charming 47-room boutique hotel tucked along Hoan Kiem Lake. Capella Hanoi, a living time capsule of Opera in the Roaring Twenties, is a balancing act of quirky design and elegance, stunning discerning discoverers with a potpourri of original artifacts, costumes, and set exhibits from the wonderful era.

#### *4.2.2. Employees turnover problems in Capella Hotels and Resorts in Hanoi*

With a variety of awards and compliments on the Forbes magazines and Travel Leisure, employees of the Capella Hotels and Resorts in the world work with pride. Furthermore, Capella Hotels and Resorts has become an ideal hotel for all employees working in the hotel industry due to its professional procedures, high quality training and the luxurious beauty of it. Despite the reputation of Capella Hanoi and Sun Group in Vietnam and around the world, the hotel is still facing difficulties in the employee turnover rate, like other hotels. The employee turnover rate in the hotel within one year was 16%, which is relatively high, compared to other hotels. The cost of the employee turnover accounts for most of the financial losses of the hotel as it is not only time-consuming to find the new ones but also costly when it comes to training cost per employee to meet the harsh service standards. There are numerous reasons leading to the employee turnover decisions here. The in-depth face to face interview will clarify the underlying reasons and some insights that drive the employees in Capella Hotels and Resorts to the decision of job turnover.

#### *4.2.3. Findings of the in depth interviews*

The in-depth face to face interview was conducted with 19 employees who used to work in Capella Hanoi.

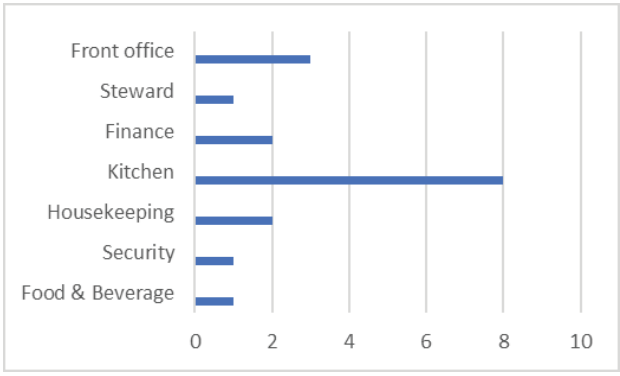


**Figure 2. Number of participants from different departments of Capella Hanoi Hotel**

According to the chart above, among the 19 employees who used to work in Capella Hanoi, 8 people were from the Kitchen department, indicating that this was the department that owns the highest turnover rate in the hotel. To understand more about the insights of these employees, the in-depth interview was conducted to determine some underlying perspectives of the employees here. Based on the interview, which were amalgamated to acquire a better understanding of the reasons for high rate of employee turnover and to determine some insights of the employees leaving the hotel, several topics with different themes and focus groups emerged.

There will be three themes:

Theme 1: Analysis - factors leading to the employee's satisfaction when working in Capella Hanoi.

Theme 2: Analysis - factors that have huge impact on the employee turnover decisions.

Theme 3: Analysis - recommendations for minimizing the employ.

**Theme 1: Analysis - factors leading to the employee's satisfaction when working in Capella Hanoi**

According to the interview, there are a lot of factors leading to the employees' satisfaction when working in the hotel. In which, colleagues and the working conditions in the hotel were the top two important factors that results in the employees' satisfaction, thus being selected to analyze below:

### Colleagues

A wide variety of arguments have been made to explain the importance of teamwork in improving organizational performance (Becker, 1997). Collaborative teamwork is a powerful motivator that will motivate people to be more devoted, committed to their job, thus increasing the efficiency and effectiveness in work (Manz & Sims, 1980). Teamwork among co-workers plays a crucial role in job satisfaction due to a lot of reasons. Thanks to the great teamwork among employees and employers in the workplace, the employees will work harder, which will increase the job satisfaction, thus driving them to unite and collaborate with each other to work towards a final goal. This point was clearly illustrated by a lot of employees who used to work in Capella Hanoi: "I feel motivated whenever I come to Capella Hanoi because of the Capella spirit, which is the way we work together to create profession and excellence in services", "What I feel most impressed about Capella Hanoi was the teamwork spirit here. I will never forget the 30 minute motivational meeting of the entire hotel in every working day", "I will never forget the my colleagues and their being supportive to me all the time". Apart from the great teamwork, employees feel most committed to the hotel due to the rapport between them and their colleagues. Employees have a tendency to stay longer with the organization when they have great relationships with their co-workers (Clarke, 2001). When the rapport among employees increases, their commitment to the organization also increases as the connection among people will result in the connection between employee and organization (Harpaz & Meshoulam, 2009). This point was also clearly proved with some interview scripts in Capella Hanoi:

"I feel like I can be what I really am when I'm with my co-workers a.k.a my good friends".

"I feel happy whenever I see my co-workers. They are very nice and supportive".

"I love the way my colleagues are always willing to help each other in work".

"What I will always remember is not only the effort that we made to create the best service for the hotel but also the connection between me and my colleagues".

**Working conditions**

Apart from colleagues, working conditions are also a main factor that has an impact on the satisfactory experience of the employees in the hotel. The interviews indicated that employees who used to work in Capella Hanoi showed their satisfaction towards the working conditions here. For instance, they think that the hotel has enough facilities and equipment. Furthermore, the hotel provides them adequate training and development so that they can perform well with their work, thus being able to deliver excellent services to the customers. This point is strongly proved with some interview scripts in Capella Hanoi:

"I really like working in the kitchen here. Everything was very handy and I never have to complain because I don't have my pan".

"Great training. I have never experienced any hospitality training that is customer-centric and attention to detail like this before".

"I have learnt a lot about services during 3 months here. It's bad that I do not have the opportunity to stay here longer".

As previously stated in the literature study, poor working conditions will cause employees to seek employment elsewhere, and there is a strong link between the happiness of the employees and the working conditions. People will not leave their existing employment if they are content in their current working environment, even if they are offered better compensation from another organization (Loquercio, 2006).

**Theme 2: Analysis - factors that have huge impact on the employee turnover decision**

According to the interviews, a lot of factors have a huge influence on the increase of the employee turnover rate. In this analysis, the top important factors that have been selected the most by employees who used to work in Capella Hanoi will be listed as below:

**Poor management leading to the unfair evaluation**

According to the interviews, in some departments such as Kitchen and Stewards, there is a growing concern for the poor management of the supervisors of these departments. Most people working in these departments complain that the reason why they left their job is the poor

management of the managers and the supervisors. Therefore, they lack recognition, thus being upset they are treated unfairly. As a result, they start to grow conflicts and bad relationships with their employers, thus leading to the employee turnover decision.

This point is clearly illustrated in the in-depth interviews with such comments as below:

"I quitted because I was not recognized enough".

"My manager was horrible, she treated people unfairly and she was always biased when making decisions in terms or work".

"I don't have a good relationship with my employers. I feel like she never listens to what I'm saying and I feel that it is so disrespectful".

According to previous research, poor management is one of the main factors contributing to the high employee turnover rate. Poor management leading to false evaluation makes the employees feel that they are not appreciated. Most employees want to perform at their best. As a result, it is natural that they want to be praised and recognized for it. Even the casual and seasoned employees need to have feedback for better performance. Therefore, when employees feel that they are unrecognized due to poor management, they are willing to leave the jobs.

**Stressful working environment**

Based on the results of the interviews, one of the biggest factors leading to the employee turnover decision is the working environment, including the procedures or work load that leads to the stress among employees, thus increasing the rate of employee turnover. In Capella Hanoi, employees have to work under two authorities, one is Sun Group - the owner, and the Capella Hotels and Resorts in Singapore. The cooperation between these big corporations put a constraint on the employees on high demanding services quality, complicated procedures and workload. A lot of employees are no longer able to balance their work life, leading to much stress. The feedback of the interviewees are listed below:

"What I made me uncomfortable is the inefficient cooperation between the two corporates, thus putting the so much workload and stress on their employees".

"The procedures in the hotel was too strict and complicated".

"The heavy workload made me unable to spend time with my family, especially my children".

**Theme 3: Analysis - recommendations for minimizing the employee turnover decisions**

Based on the previous interviews, most people agree that they would want to improve the managerial quality and the working environment to minimize the employee turnover decisions. Also, some of the people think that they would want an increase in the basic salary as well as benefits to compensate for the heavy workload when they work in the hotel. Some of the interviewees' feedback are listed below:

"The hotel should improve managerial quality. The manager should be fair to all people and be able to recognize the employees' work".

"I want to have a raise in my basic salary and more benefits when I was forced to work overtime".

"I want a clear career path and growth in the hotel".

### 4.3. Findings of the questionnaire

The questionnaire was conducted among 165 employees who used to work in the hotel industry. In particular, these participants used to work in famous luxurious hotels in Hanoi such as JW. Marriott, Melia, Intercontinental Hotel Group, Wyndham Garden Hanoi, Metropole and Capella Hanoi. The questionnaire aims to survey the perspectives of the employees who used to work in the hospitality sector towards reasons leading to the employees' turnover decisions and the reasons why they decided to leave their job. According to the theoretical framework, there are three main categories of reasons leading to employee turnover decisions, each category has its own factors as below:

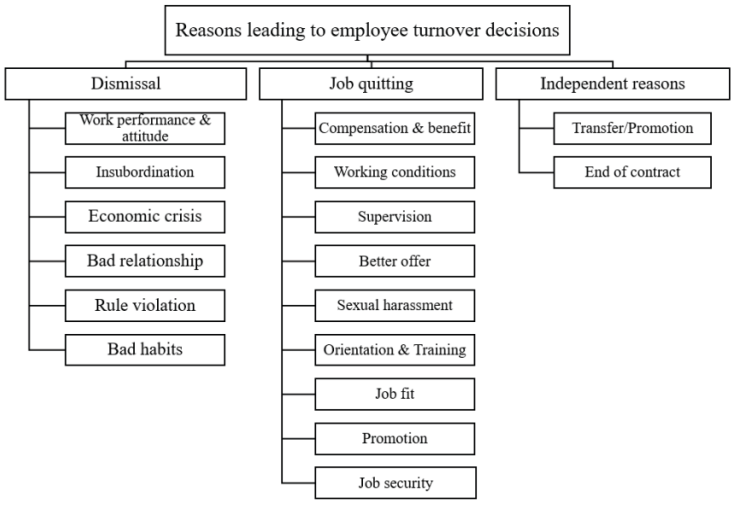


**Figure 3. Reasons leading to the employee turnover decision in the survey**

## 5. DISCUSSION AND CONCLUSION

### 5.1. Discussion of the case study research via in depth interview

As the in depth interviews were conducted with 19 employees of a particular 5 star hotel in Hanoi, which is Capella Hanoi, the findings might tend to be biased in this particular hotel. However, it can illustrate specific and profound insights of the employees who decided to leave their job for different reasons. Also, with both ended and opened questions and the form of interviewing face to face, these in depth interviews can not only illustrate the real factors that employees concern when deciding to leave their job but also dig deeper in their emotional and attitude perspectives as well as the real recommendations for better improvement from the people who have truly experienced the best and the worst perspectives of the hotel that they used to work for.

#### *5.1.1. Analysis of employees and job satisfaction*

##### *Relationship with colleagues*

The findings of the in depth interview show that there are two main factors that contribute to the job satisfaction of the employees when working in the hotel, which are colleagues and working conditions. It seems that

people working in the hotel have a real and close connection with others. These characteristics may come from the characteristics of the hospitality industry, in which people are put under a lot of pressure and have to work as a team to deliver the best services to their customers. Furthermore, in the hospitality industry, employees do not have holidays or celebrations as these days are the time when the hotel has a lot of customers. The fact that people work together in holidays and meaningful celebrations, to some extent, may connect people with their colleagues stronger than ever. Therefore, the relationship among colleagues plays an important role in contributing to the job satisfaction of the employees working in this hospitality sector. This analysis is also similar with the previous work of Clarke in the hotel industry in 2001. His research indicates that the employees often stay longer with their hotel when they have rapport with their co-workers. Furthermore, the increase in the good relationship with colleagues will lead to the higher commitment of the employees to the hotel that they are working for as there will be a strong connection between the employees and the hotel (Harpaz & Meshoulam, 2009).

***Working conditions***

Apart from the good relationship with colleagues, the working conditions prove to be one of the main factors contributing to the job satisfaction of the employees when working at Capella Hanoi hotel. Most of the employees working in Capella Hanoi and attending the in depth interviews agree that the hotel provides them working conditions with adequate facilities and equipment that help them to perform their work well. Also, they agree that they find the orientation and training methods of the hotel are very helpful, giving them a lot of learning points on not only professional procedures but also how to deliver the best services. These findings are similar to the previous research of Loquercio in 2006 as he claimed that the working conditions have a huge impact on the job satisfaction, thus becoming one the factors that employees will consider carefully when they decide to leave their job.

### *5.1.2. Analysis of job dissatisfaction*

In addition to the two factors affecting the job satisfaction of the employees working in the hotel industry, the in depth interviews also

give insights of the factors that have an impact on the employee turnover decision. Revolving around the case of Capella Hanoi Hotel, there are top factors that lead to the employee turnover decision, including the poor supervision and management and stressful working environment.

***Stressful working environment***

The in depth interviews show that people working in departments such as Kitchen and Stewards were put under a lot of pressure on delivering services. Furthermore, due to a lot of procedures and requirements, they suffered from constraints of workload and the high quality demands from the customers and the hotels as well as the corporations. This leads to their imbalance in their life, leading to much stress.

***Poor management and supervision***

Furthermore, the findings of the in depth interviews show that the poor management and supervision is one of the factors leading to their dissatisfaction with their hotel. As most of the people need recognition, the fact that poor management leads to unfair treatment and biased decisions makes the employees feel upset as they are not recognized in the right way. Gradually, the hostility of the employees towards their employers increases, thus leading to their turnover decision.

All of the findings of the in depth interviews are similar to the findings of the questionnaire, showing that the factors such as working conditions, working environment, relationship among employees have a huge impact on the employee turnover decision not only in a specific hotel but also luxurious hotels in Hanoi in general. These findings turn out to support the points of huge impact of these factors on the employee turnover decision in a more profound approach.

#### *5.1.3. Employees' recommendation for better improvement*

In addition to giving the findings on the factors that contribute to the job satisfaction as well as factors affecting the employee turnover decision, the in depth interviews illustrate the useful recommendations on this matter from the real people who experienced the turnover decision at least once. Based on the responses from the participants of the in depth interviews, compensation and benefits as well as improvement in management and

supervision becomes the two top things needed to minimize the employee turnover decisions.

Both findings of the questionnaire and in depth interviews are consistent and supportive with each other, showing that factors such as compensation and benefits, supervision and management, working conditions, better offer, orientation and training, promotion and security all contribute to the job satisfaction of the employees towards their employers, thus contributing to their employee turnover decision. Furthermore, the economic crisis is also a factor that influences the employers' dismissal decisions. Also, there are some popular independent reasons for employee turnover decisions such as transfer or promotion and end of the contract.

### 5.2. Discussion of questionnaire findings

In general, both in depth interviews and questionnaires give similar findings on factors affecting the employee turnover decision. These findings are supportive of each other. Findings from the questionnaire have indicated some insights on the employee turnover decision. First of all, the demographics statistics of the questionnaire give some insightful information about the length of employment. Among 165 participants coming from different 5 star hotels in Hanoi, most of them were single (78.2%) and were quiet at a young age, from around 18 to 27. Furthermore, most of the participants attained a high educational level, mostly bachelor's degree and higher. In addition, they have a tendency to leave their job in a short time, making the average length of employment pretty short as most of the people leave their job within 1 year.

Taking a closer look at the insights of employees who leave their job in a very short time. Participants who are older and at the managerial level tend to stay longer at their organization, compared with ones that are younger and currently working at the nonmanagerial level.

According to the questionnaire, 89.1% of the participants agree that they voluntarily quit their jobs as they are not satisfied with their organizations at some points, and 9.1% of them resigned from their jobs for independent reasons. Rarely were people dismissed from their hotels.

#### *5.2.1. Factors affecting employers' dismissal decisions*

***Economic crisis***

For people who were dismissed, the finding indicates that the only reason was because of the detrimental impact of Covid-19, which led to the economic crisis and the bad performance of the tourism and hospitality industry. This was because most of the participants participating in the questionnaire do not have any problems relating to the factors affecting the dismissal decisions mentioned in the theoretical framework, such as alcohol, drug abuse, insubordination and rules violation, or bad relationship with coworkers and supervisors/managers.

#### *5.2.2. Factors leading the action of quitting job of employees*

For people who decided to quit their job, the questionnaire findings show that there are a lot of factors that contribute to the dissatisfaction of the employees towards their hotel. These factors are the factors that are mentioned in the previous research, including compensation and benefits, working conditions, supervision and management, better offer, orientation and training, job tasks and job fit, promotion opportunities and job security.

***Better offer and job security***

According to the survey, the top factors that contribute to the employee turnover decision are better offer and poor job security. In the questionnaire, 87% of the participants agree that one of the main reasons that they decided to leave their job is that they received a better offer. Furthermore, 63% of the participants agree with the idea that after the pandemics Covid-19, they realized that the job security of the hospitality industry is very weak. During the pandemic Covid-19, the hospitality industry shows that it is not able to guarantee employees working in this industry a stable job with stable income. To some extent, it relates to the fact that an amount of the employees' income comes from bonuses and service charges, which only occurs when the hotels have guests. However, during the pandemic Covid-19, the government has issued some policies on quarantine and the people tend to stay at home for the sake of their health. This leads to the fact that hotels do not have guests, thus increasing the rate of room unoccupied and decreasing the profit when restaurants, lounges and coffee bars are required to close down.

***Compensation and benefits and promotion***

Moreover, compensation and benefits as well as opportunities for promotion and the working conditions are of their concern when considering leaving their current job. Followings are the concern about job tasks and job fit, supervision and management, and orientation and training.

***Working conditions and adequate orientation and training***

Most of the people agree that working conditions and adequate orientation and training are the factors that contribute to their satisfaction at their previous workplaces, indicating that participants are also aware of these factors when making the turnover decision. However, sexual harassment was not one of the factors that contribute much to the employee turnover decision in this questionnaire. This result may stem from the fact that most of the luxurious hotels in Hanoi do not occur sexual harassment situations, thus this factor was disqualified.

#### *5.2.3. Independent factors*

***Termination of contract***

For the employees who resigned from their hotel due to independent reasons, the findings show that most of the reasons leading to the employees' decision to resign was termination which includes employee transfer or promotion and end of contract. Figures show that 60% of people who resigned from their hotel due to independent reasons were transferred to another job or promoted. Meanwhile, 40% of them decided to resign when that reached the end of the contract.

### 5.3. Recommendations for employers working in hotel industry

Based on the recommendations of participants from the in depth interviews as well as the current problems of the hospitality industry, the research indicated that the results of the in depth interviews and the questionnaire are quite consistent as all the factors mentioned do affect the decision of the employees whether to stay or to leave. Depending on the particular hotel with a specific working place environment, these levels of effects of the factors can be different. However, to some extent, these factors still have huge impact on the decision to leave the jobs of the employees.

***Orientation and training***

Through training and education, difficult assignments, and increased responsibility, top management should create opportunities for professional and personal advancement. This will help to increase employee loyalty and trust in the company, resulting in lower staff turnover.

***Compensation and benefit***

Employee salary and benefits should be connected with current economic conditions, with employees being paid the fair going rate (or greater) for their work and receiving competitive benefits. According to research, 95% of employees regard salary to be vital to their job happiness. Employee engagement diminishes when they don't believe they're being fairly compensated for the work they do. They might even start looking for a new job where they can make more money. To prevent employee turnover, management should recognize great performance and, more importantly, correlate pay to performance. When employees' above-average efforts are recognized and rewarded, they become more driven. Employee attachment to the organization is strengthened as a result, and employee turnover is reduced.

***Supervision and management***

Management should encourage and provide opportunities for employees to engage with one another through acts of charity and expressions of gratitude to ensure work-life balance among employees. Employees will be healthier, happier, and more at ease in their work environment, making them less inclined to resign. The report also suggests that management consider enhancing the working environment, such as providing safe working conditions and a flexible work schedule. Flexible working hours will aid in the creation of a healthy work-life balance, hence reducing stress.

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# HOW DOES DIGITAL TRANSFORMATION IMPACT ON THE SUSTAINABLE DEVELOPMENT OF FMCG BUSINESS?

**Dinh Tien Minh[1,*], Nguyen Thi Kim Loan[2], Nguyen Thi Lan[2], Nguyen Thu Uyen[2]**

***Abstract:*** *The purpose of this study is to determine the influence of digital transformation technology platforms on the sustainable pillars of a business in the Fast-Moving Consumer Goods (FMCG) industry, which is economy sustainability, social sustainability and environmental sustainability. The studied platforms are Cloud Computing, Social Computing, Mobile Computing, Big Data, Data Science & Business Analytics, and Internet of Things. As a result, a total of 18 hypotheses are put forward. to describe the research model. The results of the study accepted 14 hypotheses and rejected 4 hypotheses. The 5 platforms were proven to have a positive impact on the economic pillar and the environmental pillar are Cloud Computing, Social Computing, Mobile Computing, Big Data, and Internet of Things. The finding also shows that out of a total of 6 transformational platforms, only 4 have a positive impact on the social pillar: Cloud Computing, Social Computing, Big Data and Internet of Things. This shows that these technological factors have positive benefits for the sustainable development of a business in this industry, but each platform will have its own levels of impact and its own aspects in different industries. The backbone of the business. In addition, based on the analyzed results, the article also makes recommendations to bring practical values to businesses in the FMCG industry to help businesses apply new technology platforms to increase sales, working efficiency, increasing the relationship of the business with stakeholders such as investors, suppliers and customers.*

***Key word:*** *Digital transformation, FMCG, Sustainable development.*

## 1. INTRODUCTION

Today, with the proliferation of FMCG businesses, digital transformation businesses are important when the impact of argument shifting is positive on the industry (Komarova et al., 2021). FMCG companies apply information

[1] University of Economics Ho Chi Minh City (UEH), Ho Chi Minh City, Vietnam

* Corresponding author. Email: dinhtienminh@ueh.edu.vn

[2] Department of International Business - Marketing, University of Economics Ho Chi Minh City (UEH), Ho Chi Minh City, Vietnam

technologies such as DMS, SAP, Oracle, MS, AX, MS NAV, etc. These applications integrate big data, Cloud Computing or some other elements to maximize benefits for businesses.

One of the results of the digital transformation platform is the formation of fast payment banking, e-commerce platform, advertising on social media or simply a utility capable of connecting devices (Internet of things). The key to success is being able to adapt and shift the focus of business on accommodating changes in the way which business is done (Nee & Tu, 2018). There are many studies on the beneficial effects which digital transformation has on the FMCG industry (Iliashenko et al., 2019; Johansson & Wilhelmsson, 2018; Steuernagel, 2020), but some of which show that FMCG is experiencing significant technological turbulence and competitive advantage because they place a lot of emphasis on customer experience (Brewis & Strønen, 2021).

Therefore, how does digital transformation affect the sustainable development of the FMCG industry? And how does each platform in argumentation impact on each aspect of sustainability of the business differently? To accurately answer the questions mentioned above, this research is conducted to study "How does digital transformation impact on the sustainable development of FMCG business?"

## 2. LITERATURE REVIEW AND RESEARCH MODEL

This study includes research on each technology platform that converts arguments to the three sustainability pillars of the business. Therefore, the study is a synthesis of many other related studies and provides its own model. Regarding the three main pillars of the businesses, the article is based on the study "Modelling sustainability" (Todorov & Marinova, 2011). In addition, a number of studies related to the Three-pillar impact of the fundamental factors "Expected impact of industry 4.0 technologies on sustainable development: A study in the context of Brazil's plastic industry" (Nara et al., 2021) and "Digital transformation and sustainability: Study and analysis" (Chandola, 2015). However, the above studies only stop at a separate study between the sustainability of the business or a general study of the impact of technology on the business without much distinction of each pillar. Therefore, this study was carried out in order

to better distinguish the different impacts of each technology platform on each aspect of sustainability of a business and develop the topic of expanding research in the Consumer Goods industry fast (FMCG).

The study applies two important theories, which are the social representations theory (Moscovici, 1981) and the framing theory (Benford & Snow, 2000), to clarify the perception of employees in the enterprise towards the relationship between digital transformation and human sustainability and bigger is business sustainability. Framing theory presents the format and structure of research papers (Reyes-Sosa et al., 2020). Social representations theory (Durkheim, 2014; Moscovici, 1981) indicates that human behavior is viewed as rational in the cultural context and is consistent with that behavior (Sammut et al., 2015). On the other hand, a social group develops an overview of the practical aspects that can shape the views of its members, in this case, an understanding of the relationship between digital transformation and sustainability. Social phenomena manifest themselves in the form of shared insights through social actors (Moscovici, 1988). From there, people's thoughts about digital transformation can originate in a group and spread across the organization. Employees involved with and using these platforms within the company form a relationship between digital transformation and organizational growth, and this awareness spreads and forms a basis for research.

This study includes six independent variables: Cloud Computing (CC), Social Computing (SC), Mobile Computing (MC), Big Data (BD), Data Science & Business Analytics (BDA) and Internet of Things (IT) and 3 dependent variables: Economy, Society, Environment.

The impact of Cloud Computing (CC) on Economic Sustainability (ES), Environmental Sustainability (ENS), and Social Sustainability(SS): (Etro, 2009) believes that the introduction of CC will significantly reduce fixed input and production costs, convert part of them into variable costs related to necessary production needs, making a significant contribution to economic sustainability (ES). Using CC not only reduces operating costs but also reduces environmental problems (Kumar & Vidhyalakshmi, 2012) and businesses using cloud computing tools also have a positive impact on the environment (Spaltini et al., 2021). Especially the impact of cloud computing on the environment by relying on collected information and

offering good solutions, improving the environment. On the other hand, Puica (2020) argues that CC from a social perspective (SS) has an impact on the communication between the parties in the process, making it work more efficiently (suppliers, customers, companies, etc.), but also on how they collaborate to complete work tasks.

H1a: Using Cloud Computing in business will have a positive impact on the Economy in the sustainability of the business.

H1b: Using Cloud Computing in business will have a positive impact on Society in the sustainability of the business.

H1c: Using Cloud Computing in business will have a positive impact on the environment in the sustainability of the business.

The impact of social computing (SC) on Economic Sustainability (ES), Environmental Sustainability (ENS), and Social Sustainability (SS): Fernando et al. (2016) research has shown that SC helps businesses take action and causes positive business results. such as cost reduction, revenue growth and sustainability, these are the directions to an ES. Hoffman & Fodor. (2010) suggested that SC has a positive effect on ENS. Specifically, businesses can build a marketing campaign on social media platforms and increase brand awareness, reduce costs if not having to print content in the traditional way, and increase marketing spread, thereby reducing the negative impact on the environment. In addition, SCs are also used in the HR field as they are used to recruit and manage personnel, communicate, and understand employees, their partners, and suppliers, which increases SS (HBR, 2014).

H2a: Using Social Computing in business will have a positive impact on the Economy in the sustainability of the business.

H2b: Using Social Computing in business will have a positive impact on Society in the sustainability of the business.

H2c: Using Social Computing in business will have a positive impact on the environment in the sustainability of the business.

The impact of Mobile Computing (MC) on Economic Sustainability (ES), Environmental Sustainability (ENS), and Social Sustainability (SS): MC is a technology that allows the transmission of data, voice and video

through a computer or any other wireless enabled device without need to connect to a permanent physical link. In terms of ES, the increase in the use of MCs, this also changes the retail market, including FMCG, especially with the participation of e-commerce as it contributes a lot to revenue if businesses keep up with change (Nee & Tu, 2018). In addition, in terms of SS, MC has the effect of increasing employee efficiency, enhancing employee cooperation and flexibility in data conversion. Some business functions may be run over secure links, and information sharing between business partners may also take place. With the increased effort of mobile devices, MC tries to take responsibility for the sustainability of ENS (Joseph et al., 2014).

H3a: Using Mobile Computing in business will have a positive impact on the Economy in the sustainability of the business.

H3b: Using Mobile Computing in business will have a positive impact on Society in the sustainability of the business.

H3c: Using Mobile Computing in business will have a positive impact on the environment in the sustainability of the business.

The impact of Big data (BD) on Economic Sustainability (ES), Environmental Sustainability (ENS), and Social Sustainability (SS): Santoro et al. (2018) shows that BD helps businesses target customers, optimize processes, reduce costs operate; improve the quality, efficiency and accuracy of deliveries and inventories; optimized HRM, more detailed planning and more accurate forecasting budgets for the retail segment, which improves economic sustainability (ES). Furthermore, this technology platform has an impact on increasing organizational performance (Mayhew et al., 2016) and it has an impact on other segments of society (individuals, businesses or governments) (Chen et al., 2012). In 2020, Balogun et al. (2020) said that digital workplaces actually contribute to improving environmental sustainability (ENS) when conducting a case study in 9 countries that used BD in improving the environment (Yalina & Rozas, 2020).

H4a: Using Big Data in business will have a positive impact on the Economy in the sustainability of the business.

H4b: Using Big Data in business will have a positive impact on Society in the sustainability of the business.

H4c: Using Big Data in business will have a positive impact on the Environment in the sustainability of the business.

The impact of Data Sciences and Business Analytics (BDA) on Economic sustainability (ES), Environmental sustainability (ENS), and Social sustainability (SS): In previous empirical studies (Akter et al., 2016; Gupta & George, 2016), people have noted that BDA has a positive impact on firm's ES. This impact is due to the ability to analyze data and provide a good strategic direction for the business economy. Song et al. (2017) argue that BDA has enough potential to improve social sustainability (SS). In terms of ENS, scholars sought to investigate the influence of big data and predictive analytics on reducing the negative consequences of carbon emissions in recent research (An et al., 2017; Xie et al., 2017; Zhao et al., 2017), but from the business perspective, there are still many considerations.

H5a: Using Data Sciences and Business Analytics in business will have a positive impact on the Economy in the sustainability of the business.

H5a: Using Data Sciences and Business Analytics in business will have a positive impact on the Economy in the sustainability of the business.

H5c: Using Data Sciences and Business Analytics in business will have a positive impact on the Environment in the sustainability of the business.

The impact of Internet of things (IoT) on Economic sustainability (ES), Environmental sustainability (ENS), and Social sustainability (SS): According to the Institute of Electrical and Electronics Engineers (IEEE), the Internet of Things (IoT) is a network of things - objects - implanted with sensors and connected to the 'internet,' and the actual value of IoT is found in the data of networked products (Minerva et al., 2015). (Manyika et al., 2011) argued that IoT has economic and social impacts. Thanks to IoT, devices can communicate with each other, helping to store information or use large amounts of information for marketing. Human participation in the work stream: data collection, processing and analysis. Moreover, the presence of IoT makes it possible for smart devices, renewable sources to work together to improve the sustainability of ENS (Mahmood, 2013).

H6a: Using Internet of Things in business will have a positive impact on the Economy in the sustainability of the business.

H6b: Using Internet of Things in business will have a positive impact on Society in the sustainability of the business.

H6c: Using Internet of Things in business will have a positive impact on the Environment in the sustainability of the business.

The research model in Fig. 1 represents the hypotheses given above:

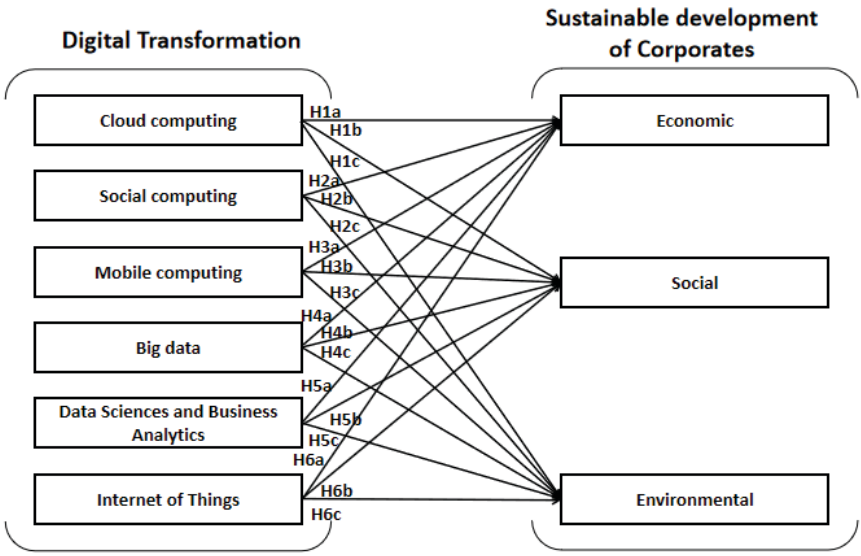


**Figure 1. Research Framework**

## 3. METHODOLOGY

### 3.1. Qualitative research

The technique used for the qualitative research is in-depth interviews with two experts working in the FMCG field.

The qualitative interviews were conducted to check the fit of the model and the scale. Experts have assumed that digital transformation is extremely important and is widely applied. Especially in the current Covid epidemic period, businesses have to carry out digital transformation towards sustainable development. Digital transformation is a tendency and a must in the current situation where consumer trends begin to change and

gradually move online. Moreover, regarding the economic aspect, digital transformation helps problem-solving and accelerate the work progress, save data and transfer files quickly at low cost. Digital transformation is also beneficial for business situation analysis; hence the enterprise is exposed to new directions to increase customer access and expand their market share.

Regarding the social aspect: At present, everyone in the corporation is in a good mood as their work is done smoothly and they are satisfied with the adoption of tools based on these platforms. The staff also think this helps them to communicate well, especially when there is a Covid outbreak. Employees' skills are improved as they get access to innovation.

As for the environmental aspect, digital transformation helps cut down on travel, thus reducing emission to the environment. In addition, electronic inventory control and prediction of the required number of products that should be produced reduces the pressure on the environment compared to traditional forecasting. Exchange and sales on online platforms help the company to limit the size of its stores in unnecessary locations.

Besides, experts believe that the current group model is suitable for FMCG businesses in Vietnam, but the scale needs to be adjusted to be more appropriate. Therefore, the scale was adjusted, and then the research model moved to the quantitative research step.

### 3.2. Quantitative research

#### *3.2.1. Population Identification*

Employees and managers of FMCG enterprises in Ho Chi Minh City.

#### *3.2.2. Sample size*

The survey period lasted nearly 8 weeks (from November 1, 2021 to December 25, 2021), the survey got three hundred and fifty seven responses voluntarily. In which, there are seven responses with the same rate for the entire questionnaire. Due to doubts about the quality of these seven responses, they have been removed. In the end, there are three hundred and fifty valid responses.

#### *3.2.3. Sampling method*

The samples were selected according to the convenience sampling method. Data was collected through interviews; questionnaires were built from the official scales (obtained after qualitative research).

#### *3.2.4. Sampling selection approach*

The data for the study was collected using a cross-sectional questionnaire survey. The survey is designed on the Google Form platform and is randomly sent to FMCG-related groups on Facebook. Designing the online survey such that answering all questions is required, otherwise respondents are not allowed to submit the final answer.

## 4. RESULTS AND DISCUSSION

### 4.1. Results

#### *4.1.1. Sample description*

We used an online survey form through Google form platform to obtain data from the respondents. After gathering and testing, three hundred and fifty encrypted copies are analyzed by SPSS 21 software. The sample selected was diverse in terms of age (21 -30: 83.14%, 31-40: 13.43%, 41-50: 2.57%, others: 0.86%), gender (male: 36.57%, female: 63.43%), position characteristics (Employee: 82.29%, Manager: 11.43%, Director: 2.29%, Others: 4%) and diversity in working departments (Sales department: 34.57%, Engineering & Production department: 14%, Accounting department: 8%, Office Administration department: 15.43%, Marketing department: 23.71%, Others: 4.29%).

#### *4.1.2. Scale evaluation*

First, the reliability of the scale was assessed by using Cronbach's Alpha coefficients. Then, the eighteen observed variables were performed by exploratory factor analysis (EFA). Finally, six elements are identified from eighteen observable variables, which are then put through Pearson correlation analysis to assess the study model's hypotheses.

### *4.1.3. Analysis of the Cronbach's Alpha*

Cronbach gives the reliability coefficient for the research scale. Cronbach's Alpha measures the reliability of the scale for variables with three or more observed variables, rather than calculating the reliability for each observed variable (Thọ, 2014).

If a measurement variable has the correlation coefficient of the total variable, Corrected Item - Total Correlation ≥ 0.3, then the variable meets the requirements (Nunnally, 1975), if not, the variable will be removed. Therefore, the variable BDAXH and BDAMT are eliminated after analyzing the reliability coefficient (see Table 1).

**Table 1. Results of Cronbach's Alpha analysis**

| Economic variables | | Social variables | | Environmental variables | |
|---|---|---|---|---|---|
| **Encryption** | **Cronbach's Alpha** | **Encryption** | **Cronbach's Alpha** | **Encryption** | **Cronbach's Alpha** |
| CCKT | 0.618 | CCXH | 0.692 | CCMT | 0.774 |
| SCKT | 0.760 | SCXH | 0.879 | SCMT | 0.659 |
| MCKT | 0.775 | MCXH | 0.440 | MCMT | 0.600 |
| BDKT | 0.722 | BDXH | 0.773 | BDMT | 0.607 |
| BDAKT | 0.827 | BDAXH | 0.207 | BDAMT | -0.108 |
| ITKT | 0.767 | ITXH | 0.725 | ITMT | 0.767 |

### *4.1.4. Structural model evaluation*

As for the EFA exploratory factor analysis, the indices must have the following values: KMO coefficient above 0.5, sig Bartlett's Test under 0.05, total Variance Explained above 50%, and factor loading values above 0.30 (Hair, 2009), respectively. The hypothesized measurement model was verified using the Regression analysis method. The direct effects of Digital Transformation factors and Sustainable development of corporates were analyzed using standardized regression coefficients obtained from the Regression analysis. The results of the regression analysis are presented in Table 3.

The results of testing the research model show that there are 14/18 hypotheses are supported, including H1a, H1b, H1c, H2a, H2b, H2c, H3a, H3c, H4a, H4b, H4c, H6a, H6b, H6c (Table 2). No multicollinearity phenomenon occurs between independent factors in the research model. The standardized regression equations of the research model have the following forms:

Economic sustainability
(ES) = 0.199CCKT + 0.180SCKT + 0.153MCKT + 0.171BDKT + 0.206ITKT.

Economic sustainability
(ES) = 0.199CCKT + 0.180SCKT + 0.153MCKT + 0.171BDKT + 0.206ITKT.

Social sustainability (SS) = 0.168CCXH + 0.140SCXH + 0.109BDXH + 0.277ITXH.

Environmental sustainability
(EMS) = 0.106CCMT + 0.153SCMT + 0.187MCMT + 0.388ITMT + 0.099BDMT.

**Table 2. Structural Model Evaluation Result**

| No. | Hypotheses | Beta | VIF | Sig. | Status |
|---|---|---|---|---|---|
| H1a | ES ß CC | .199 | 1.301 | .000 | Supported |
| H2a | ES ß SC | .180 | 1.331 | .000 | Supported |
| H3a | ES ß MC | .153 | 1.343 | .002 | Supported |
| H4a | ES ß BD | .171 | 1.296 | .000 | Supported |
| H5a | ES ß BDA | -.017 | 1.322 | .733 | Unsupported |
| H6a | ES ß IT | .206 | 1.495 | .000 | Supported |
| H1b | SS ß CC | .168 | 1.204 | .001 | Supported |
| H2b | SS ß SC | .140 | 1.320 | .009 | Supported |
| H4b | SS ß BD | .109 | 1.353 | .044 | Supported |
| H6b | SS ß IT | .277 | 1.375 | .000 | Supported |
| H1c | EMS ß CC | .106 | 1.026 | .015 | Supported |
| H2c | EMS ß SC | .153 | 1.147 | .001 | Supported |
| H3c | EMS ß MC | .187 | 1.157 | .000 | Supported |
| H4c | EMS ß BD | .099 | 1.087 | .028 | Supported |
| H6c | EMS ß IT | .388 | 1.212 | .000 | Supported |

**Table 3. Pearson Correlation**

| Correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Economic Sustainability | CCKT | SCKT | MCKT | BDKT | BDAKT | ITKT |
| Economic Sustainability | Pearson Correlation | 1 | .423** | .427** | .403** | .402** | .270** | .447** |
| | Sig. (2-tailed) | | 0 | 0 | 0 | 0 | 0 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| CCKT | Pearson Correlation | .423** | 1 | .321** | .364** | .282** | .321** | .327** |
| | Sig. (2-tailed) | 0 | | 0 | 0 | 0 | 0 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| SCKT | Pearson Correlation | .427** | .321** | 1 | .388** | .340** | .216** | .338** |
| | Sig. (2-tailed) | 0 | 0 | | 0 | 0 | 0 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| MCKT | Pearson Correlation | .403** | .364** | .388** | 1 | .233** | .290** | .354** |
| | Sig. (2-tailed) | 0 | 0 | 0 | | 0 | 0 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| BDKT | Pearson Correlation | .402** | .282** | .340** | .233** | 1 | .286** | .402** |
| | Sig. (2-tailed) | 0 | 0 | 0 | 0 | | 0 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| BDAKT | Pearson Correlation | .270** | .321** | .216** | .290** | .286** | 1 | .438** |
| | Sig. (2-tailed) | 0 | 0 | 0 | 0 | 0 | | 0 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| ITKT | Pearson Correlation | .447** | .327** | .338** | .354** | .402** | .438** | 1 |
| | Sig. (2-tailed) | 0 | 0 | 0 | 0 | 0 | 0 | |
| | N | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| ** Correlation is significant at the 0.01 level (2-tailed). | | | | | | | | |

| Correlations | | | | | | |
|---|---|---|---|---|---|---|
| | | Social Sustainability | CCXH | SCXH | BDXH | ITXH |
| Social Sustainability | Pearson Correlation | 1 | .338** | .337** | .324** | .435** |
| | Sig. (2-tailed) | | 0 | 0 | 0 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 |
| CCXH | Pearson Correlation | .338** | 1 | .306** | .236** | .365** |
| | Sig. (2-tailed) | 0 | | 0 | 0 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 |

| | | | | | | |
|---|---|---|---|---|---|---|
| SCXH | Pearson Correlation | .337** | .306** | 1 | .419** | .361** |
| | Sig. (2-tailed) | 0 | 0 | | 0 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 |
| BDXH | Pearson Correlation | .324** | .236** | .419** | 1 | .422** |
| | Sig. (2-tailed) | 0 | 0 | 0 | | 0 |
| | N | 350 | 350 | 350 | 350 | 350 |
| ITXH | Pearson Correlation | .435** | .365** | .361** | .422** | 1 |
| | Sig. (2-tailed) | 0 | 0 | 0 | 0 | |
| | N | 350 | 350 | 350 | 350 | 350 |
| ** Correlation is significant at the 0.01 level (2-tailed). | | | | | | |

| **Correlations** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Environmental Sustainability | CCMT | SCMT | MCMT | BDMT | ITMT |
| Environmental Sustainability | Pearson Correlation | 1 | .179** | .338** | .373** | .253** | .522** |
| | Sig. (2-tailed) | | 0 | 0 | 0 | 0 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 |
| CCMT | Pearson Correlation | .179** | 1 | .139** | .102 | .064 | .070 |
| | Sig. (2-tailed) | .001 | | .009 | .056 | .233 | .194 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 |
| SCMT | Pearson Correlation | .338** | .139** | 1 | .241** | .205** | .271** |
| | Sig. (2-tailed) | 0 | .009 | | 0 | 0 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 |
| MCMT | Pearson Correlation | .373** | .102 | .241** | 1 | .120* | .327** |
| | Sig. (2-tailed) | 0 | .056 | 0 | | .025 | 0 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 |
| BDMT | Pearson Correlation | .253** | .064 | .205** | .120* | 1 | .241** |
| | Sig. (2-tailed) | 0 | .233 | 0 | .025 | | 0 |
| | N | 350 | 350 | 350 | 350 | 350 | 350 |
| ITMT | Pearson Correlation | .522** | .070 | .271** | .327** | .241** | 1 |
| | Sig. (2-tailed) | 0 | .194 | 0 | 0 | 0 | |
| | N | 350 | 350 | 350 | 350 | 350 | 350 |
| ** Correlation is significant at the 0.01 level (2-tailed). | | | | | | | |

After analyzing the data, 4 hypotheses were eliminated. Most of the rejected hypotheses related to the BDA factor. This will be further clarified in the discussion section. After the analysis process, the official research model is presented in Fig. 2.

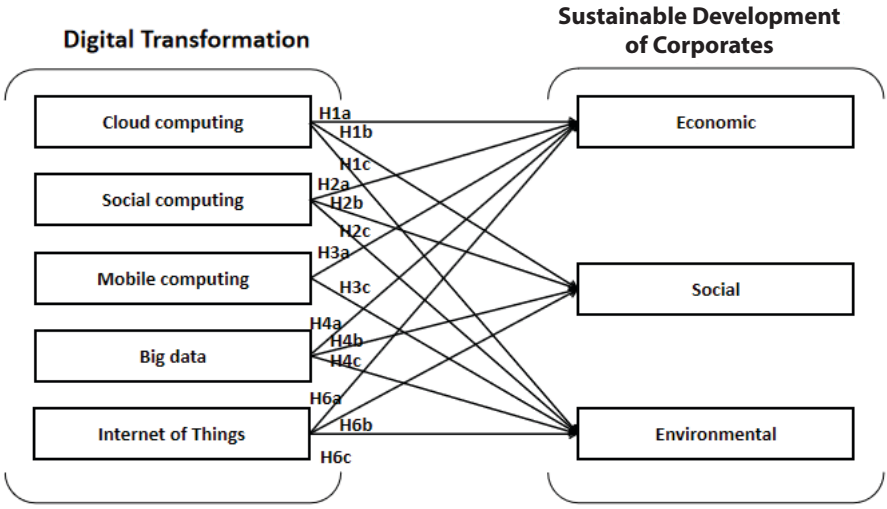


**Figure 2: The Official Research Model**

### 4.2. Discussion

Through data analysis and synthesis, the results are shown as follow:

IoT is the technology deemed best suited with a high impact on sustainable development of the three pillars: economic sustainability (beta = 0.206), social sustainability (beta = 0.277), environmental sustainability (beta = 0.388). The results are similar to the research results by (De Vass et al., 2021; Nara et al., 2021), IoT is the most suitable technology for sustainable development.

Social computing is also discovered to be one of the most used and influential platforms to the sustainable development plan of an FMCG business of the three pillars: economic sustainability (beta = 0.180), social sustainability (beta = 0.140), environmental sustainability (beta = 0.153) but Social computing is not very prominent compared to other factors.

Mobile computing has had an impact on two out of three sustainability pillars: economic sustainability (beta = 0.153) and environmental sustainability (0.187). This is a commonly used platform in the FMCG industry in particular and many other fields in general. New technologies like Mobile Technology have great potential for businesses (Kinitzki et al., 2018).

Big Data has impacts on the sustainable development of FMCG businesses through the three pillars of economic sustainability (beta = 0.301), social sustainability (beta = 0.099), and environmental sustainability (beta = 0.109). This is directly consistent with the findings by (Nara et al., 2021) and can also be understood through the interpretation of Wang et al. (2016).

Cloud Computing is the factor that strongly influences the sustainable development of FMCG businesses through the three pillars of economic sustainability (beta = 0.199), social sustainability (beta = 0.168), and environmental sustainability (beta = 0.106). This is completely consistent with the research results by (El Hilali & El Manouar, 2018).

BDA has no significant impact on the sustainable development of FMCG businesses through the three pillars. The results of this study are in stark contrast to previous studies of (Raut et al., 2019), BDA positively influences three pillars of sustainable development in the supply chain. However, the study by (Raut et al., 2021) clarified that BDA is only an intermediary factor that affects the sustainable development of enterprises, so it still needs to be considered in different business contexts.

## 5. CONCLUSION

The study analyzes three pillars of an enterprise: economic, social, and environmental aspects, with six technology platforms in the 4.0 era. There are 18 hypotheses put forward. Through the process of research and analysis using SPSS software, 4 hypotheses were rejected, and 14 hypotheses were accepted. In which, it must come to the surprise that the Data Sciences and Business Analytics platform does not have much impact on 3 pillars, therefore, 3 hypotheses are rejected. The other hypothesis, which is the impact of Mobile computing on social sustainability, is also rejected. However, through this result, the retained hypotheses also prove their importance and usefulness to the development of enterprises.

## 6. LIMIT AND FURTHER RESEARCH DISCUSSION

Even though our surveys are employees working in the FMCG industry, not everyone in the business acknowledges each of the platforms covered in the research paper. In particular, employees in departments such as salesmen scarcely know about Data Science & Business Analytics.

Therefore, this also affects the quality of the 'factors used inside the business yet unpopular to others.' The survey is too long and contains many questions, which makes it difficult for the participants to think, and sometimes the answers involve sentiment or personal emotions.

Future studies may focus on studying the impact of digital transformation on many other industries and delve deeper into each aspect of a business, be it economic or social or environmental, and thereby provide a comprehensive and complete work. For future studies on the FMCG industry, it is feasible to study the influence of digital transformation on corporate decisions and strategies, and how digitalization changes businesses' actions in the short term and long term.

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# MEASUREMENT OF OPERATIONAL EFFICIENCY OF INFORMATION AND COMMUNICATION TECHNOLOGY ENTERPRISES IN VIETNAM

**Tran An Quan**[1]

***Abstract:*** *In the era of digital transformation, Vietnam is catching up with the global trends with establishment and development of many Information and Communication Technology (ICT) companies. Therefore, the assessment on operational efficiency of these companies is necessary to use resources effectively and increase the competitiveness. The paper applies methods of Stochastic Frontier Analysis (SFA) and Data Envelopment Analysis (DEA) to evaluate the operational efficiency of enterprises in Vietnamese ICT industry. The paper uses 3 input variables and 1 output variable in each model to measure the efficiency of 30 Vietnamese ICT companies, and then ranks them. Through SFA method, it shows the efficiency scores of MSER, SMT, HPT and TGDD reach over 0.8 point as the highest scores. Meanwhile, DEA method with CRS and VRS models presents these enterprises achieving 1.0, the absolute efficiency score, along with other companies: ONECORP, VNPAY, INFONET... Otherwise, HNEL and MISA achieve the lowest efficiency score level, below 0.1 in DEA and below 0.2 in SFA measure. Based on these models, the research specifies that midsize ICT enterprises with good management might obtain higher technical efficiency compared with big ICT corporations.*

***Keywords:*** *ICT, SFA, DEA, operational efficiency.*

## 1. INTRODUCTION

In the boom of digital transformation and the breakthrough of 4.0 industrial evolution, ICT companies play important roles in process of technological improvement progress and enhance contribition to added-value chain. Especially, the outbreak of Covid-19 has caused the bankruptcy and stagnation of many enterprises that diminish the national yield. In that situation, governments over the world put the priority on digital economy including ICT industry. Particularly, Vietnamese government encourages enterprises to grow ICT business bringing the total revenue from goods

[1] Department of Development Economics, Vietnam National University, Hanoi, Vietnam. Email: anquan@vnu.edu.vn

production and service supply to reach 111,6 billion USD. The main business activities of ICT companies include: producing ICT products, supplying services, and distributing products. Domestically, there are 66.000 registered enterprises in ICT industry along with 1 million workers. ICT companies geographically spread over the whole country, but focus on key industrial zones. In fact, 58/63 provinces in Vietnam achieve revenue from ICT operations making Vietnam emerge as an attractive software exporter with 82.1% revenue from export activities, in term of ICT trading. Meanwhile, many multinational ICT corporations: Samsung, Foxconn, Intel… have chosen Vietnam as a destination for big investment. They compete or collaborate with big Vietnamese ICT companies including: Viettel, FPT, VNPT, CMC, regarded as domestic market leaders to catch up with new technological trend as well as deploy huge ICT projects. The above information and statistics show the strong importance of ICT industry in Vietnamese economy; thus, the research concentrates on this field to improve the effectiveness and output performance.

Although, Vietnam has many domestic ICT companies, they are almost small and medium-sized enterprises (SMEs) that face diffculties to compete with big enterprises and foreign companies. In the background of Covid-19, their profit and revenue dramatically decrease, severely impact on the output of business. Actually, both small and big enterprises have to struggle with operational efficiency issue, need to enhance their output in effective ways. Hence, efficiency measurement is necessary to evaluate these companies, helps managers and authorities to propose relevant policies for developing these companies in long term. This paper focuses on measuring operational efficiency of enterprises, ranking them and proposing appropriate policies to help these enterprises improve their efficiency in Covid-19 period.

In order to measure operational efficiency of the ICT companies, the research applies both parametric and non-parametric models and implements comparison between them. At first, DEA method represents non-parametric model, was invented by Charnes (1978) with type of linear programing problems. Continuously, Banker (1984) supplemented method of Variable Return to Scale (VRS) to the former Constant Return to Scale (CRS) model. Econometrically, the DEA model uses the most

efficient Decision-Making Units (DMU) to shape the envelope of dataset. The data inside represents the ineffective DMUs and their efficiency can be measured by their distance to the envelope. DEA model does not refer to error terms due to its non-parametric feature implying that the envelope is created by the most efficient DMUs, not by stochastic estimation.

Regarding to SFA model, many research projects implement this method as a substitute solution to measure and to rank DMUs along with DEA method. SFA model was proposed by Aigner, Meeusen and Van Den Broeck (1977) relating to error terms to build the frontier of dataset. In the model, the most effective DMUs created on the data frontier have the highest efficiency score. On the contrary, DMUs inside the envelope represent the insufficient efficiency. Statistically, the error terms have standard normal distribution. The SFA model applies linear regression with Ordinary Least Square (OLS) estimation to determine the frontier of dataset. In order to avoid biased problem in estimation, SFA model uses Maximum Likelihood Estimation (MLE) to measure distance of DMUs to the frontier and attains parameters of the model to calculate the efficiency score.

## 2. LITERATURE REVIEW, DATA AND METHODOLOGY

### 2.1. Literature review

It has a large number of international papers, relates to DEA and SFA methods, applies the methods in various situations of many fields. The researchers use them in term of both theory development and practical application. With DEA, Banker, R.D., Charnes, A. and Cooper, W.W (1984), in the paper named "*Some Models for Estimating Technical and Scale Inefficiencies in Data Envelopment Analysis*", developed VRS method from CRS method to measure DMU's efficiency in the case of varied scale. Relating to SFA model, Meeusen, Van De Broeck,J. (1977) completed the paper named "*Efficiency Estimation from Cobb-Douglas Production Function with Composed Error*", developed the method to measure efficiency of DMUs using stochastic frontier with error terms. With aggregate approach to apply for productivity aspect, Coelli, T.J et al., in the book named "An Introduction to Efficiency and Productivity Analysis", summarized and completed theory of DEA and SFA models for productivity and technical efficiency measurements. The author also

developed computer programs to estimate the coefficient of models and valued the effficient scores through DEAP 2.1 and Frontier 4.1 software packages. In empirical research, A.M. Theodoridis and A. Psychoudakis (2008) applied both DEA and SFA methods in agricultural economics field to measure efficiency of dairy farms in Greece. In environmental resource management, Elvira E.J. et al., (2020) also used these two methods to estimate the efficiency of water utilities for regulatory purposes. The research implements several adjustments of former DEA and SFA, divides data frontier into 2 scenarios to measure.

In Vietnam, there are many researchers applying DEA and SFA methods to measure efficiency of business activities in domestic enterprises. Specifically, Sang L B, Linh T Y, Ha P T M applied them in model for distribution systems performance evaluation. Similarly, Ha Thanh NT, Viet L H also used both methods to measure the operational efficiency of commercial banks in Vietnam. In general, these models can be implemented in research papers of many fields; agriculture, forestry, operational management and stock market are widely applied DEA and SFA models. However, it still has shortage of research on operational efficiency measurement specialized for ICT field, urges this paper to implement empirical research.

### 2.2. Data and methodology

The research collects data of 30 Vietnamese enterprises in ICT field in 2020, corresponding to 30 DMUs for each model. Both DEA and SFA models use 3 input variables, including: owner equity, number of staffs and asset, and 1 output variable is net revenue. In SFA model, all data is converted to natural logarithm, but data of DEA model is not. All data is filtered and synthesized from financial statement on the Vietnamese stock market including HNX, HOSE and UPCOM, and the published balance sheet of enterprises on their website. With SFA estimation, the research uses Frontier 4.1 computer program to process data; meanwhile, data in DEA estimation is computed by DEAP 2.1 program. The efficiency scores of DMUs in both methods are ranked in descending order.

Methodologically, relating to DEA model, there are some previous researchers developing the model with different variants. Firstly, Charnes,

Cooper and Rhodes proposed the Constant-Return to Scale (CRS) variant, called CCR model, which implied that efficiency of DMUs were not depended on the scale of envelop of dataset.

The ratio to measure the efficiency of DMUj: Output variables/Input variables

Efficiency score = [(weighted output variables) / (weighted input variables)]

The efficiency optimization of targeted unit $j_0$ for the purpose of maximizing output:

$$e_{j0} = max \frac{\sum_{r=1}^{s} u_r y_r j_0}{\sum_{i=1}^{m} v_i x_i j_0} \quad (1)$$

Transforming the equation of linear programing with duality vectors. Model is formed in type of guided-input for the purpose of minimizing input:

$$min\theta_0 - \varepsilon \left(\sum_{i=1}^{m} s_i^- + \sum_{r=1}^{s} s_r^+\right) \quad (2)$$

With restrictions:

$$\begin{aligned} &\theta_0 x_{ij0} - \sum_{j=1}^{n} \lambda_j x_{ij} - s_i^- = 0 \\ &y_{rj_0} = \sum_{j=1}^{n} \lambda_j x_{ij} - s_r^+ \\ &\lambda_j, s_i, s_r \geq 0, \forall i, j, r \end{aligned} \quad (3)$$

If multiplier component is put into the model, CCR model transforms into BBC model. BBC model was named after Banker, Charnes and Cooper regarding to Variable to Return Scale (VRS) to estimate parameters. In the model, efficiency of each DMU varies from the scale of dataset.

$$\sum_{j=1}^{n} \lambda_j = 1 \quad (4)$$

Relating to SFA method, Aigner proposed the model of stochastic production function, took natural logarithm. It contains deterministic component, noise term and the inefficient term in the model.

$ln\ qi = x'i\beta + vi - ui$

$qi = exp\ (\beta 0 + \beta 1\ ln\ xi + vi - ui)$ (5)

$qi = exp\ (\beta 0 + \beta 1\ ln\ xi) \times exp(vi) \times exp(-ui)$

deterministic component noise term inefficient term

This model has type of Cobb-Douglas model with stochastic component. It only estimates the coefficient of input variable, does not have degrees of freedom.

Technical efficiency is measured by:

$$TEi = \frac{qi}{exp\,(xi'\beta + vi)} \frac{qi}{exp\,(xi'\beta + vi)} = exp(-ui) \quad (6)$$

To estimate the model, Aigner, Lovell and Schmidt applied log-likelihood function for half-normal distribution. Log-likelihood has type of:

$$\ln L(\mathbf{y} \mid \boldsymbol{\beta}, \sigma, \lambda) = -\frac{I}{2}\ln\left(\frac{\pi\sigma^2}{2}\right) + \sum_{i=1}^{I}\ln\Phi\left(-\frac{\varepsilon_i\lambda}{\sigma}\right) - \frac{1}{2\sigma^2}\sum_{i=1}^{I}\varepsilon_i^2 \quad (7)$$

The above function represents Trans-log model with degrees of freedom. Consecutively, the research applies MLE estimation by taking first derivative for log-likelihood function and setting equals 0. Specifically, the technical estimation of each firm can be predicted by the optimal predictor. This approach minimizes the means square predictor error:

$$\hat{TE}_i \equiv E\left\{\exp(-u_i)\middle|q_i\right\} = \left[\Phi\left(\frac{u_i^*}{\sigma_*} - \sigma_*\right)\middle/\Phi\left(\frac{u_i^*}{\sigma_*}\right)\right]\exp\left\{\frac{\sigma_*^2}{2} - u_i^*\right\}. \quad (8)$$

## 3. RESULTS AND DISCUSSION

### 3.1. SFA estimation method

Initially, in order to choose model with the most suitable efficiency frontier, it has type of Cobb-Douglas production function or Trans-Log function. The research tests hypothesis H0: $\lambda = 0$: Stochastic production function in Trans-Log type transforms into Cobb-Douglas production function. In that, there are 3 input variables: Asset, labor and owner equity. Based on Frontier 4.1 software and chi-square critical value table, Log-likelihood ratio = 2,8093 < chi-square value of 6 degrees in 1% and 5%

significant value. Therefore, we accept H0 hypothesis; production function with stochastic frontier has type of Cobb-Douglas function.

The second hypothesis H0: $\gamma = 0$ aims to test whether MLE estimation complies with stochastic production function or linear regression with OLS estimation. Based on the estimated program, t-statistic value of γ-vector coefficient describes factor of deficiency, equaling 7,717 > critical value of 1% significance level. Therefore, the paper rejects H0 hypothesis with 1% significance level. The random variables accounting for technical inefficiency component exist in the model; therefore, the model has type of stochastic production function. Model estimation also shows the deviation due to deficiency factor of agencies. Specifically, coefficient $\gamma = 0{,}912$ indicates that 91,2% deviation of the dataset is from the technical deficiency of agencies. All H0 hypotheses are summarized in the following table:

**Table 1. The Hypothesis Tests of Production Function Type and MLE Estimation Application**

| Hypothesis | Type of statistic value | Statistic value | Significant level | Result |
|---|---|---|---|---|
| H0: $\lambda = 0$ | Chi-squared | 2,8093 | 1% | Accept |
| H0: $\gamma = 0$ | t | 7,717 | 1% | Reject |

*Source: Estimated results from Frontier 4.1 program.*

All coefficients of the estimation are illustrated in the below table:

**Table 2. Coefficients in MLE Model Estimation for SFA Method**

| Input variables | Coefficient | Standard deviation | t-statistical value |
|---|---|---|---|
| Asset | 0,912 | 0,237 | 3,841 |
| Labor | 0,0704 | 0,152 | 0,464 |
| Owner equity | 0,0426 | 0,227 | 0,188 |
| Sigma-squared | 1,139 | 0,461 | 2,472 |
| Gamma value | 0,912 | 0,118 | 7,717 |
| Log-likelihood value | -30,05 | | |

*Source: Estimated results from Frontier 4.1 program.*

The paper then performs ranking of the technical efficiency scores of 30 enterprises. The mean efficiency of top ten enterprises scores at 0,753,

whereas the score of all 30 enterprises in the survey 0.52. Among that, there are 4 companies which has efficiency score over 0.8 and 3 companies with the score below 0.16. It shows the notable difference between DMUs measured by SFA method. The technical efficiency scores of 30 ICT companies are shown in the below table:

**Table 3. Efficiency Scores of 30 Vietnamese ICT Enterprises by SFA Method**

| No | Enterprises | Technical efficiency | No | Enterprises | Technical efficiency |
|---|---|---|---|---|---|
| 1 | MSER | 0.856 | 16 | CMC | 0.535 |
| 2 | SMT | 0.85 | 17 | MOBI | 0.525 |
| 3 | HPT | 0.805 | 18 | VCC | 0.488 |
| 4 | TGDD | 0.803 | 19 | YEAH | 0.465 |
| 5 | INFONET | 0.768 | 20 | VEC | 0.447 |
| 6 | VIETTEL | 0.753 | 21 | VNG | 0.413 |
| 7 | VNPT | 0.715 | 22 | VNPAY | 0.386 |
| 8 | ONECORP | 0.702 | 23 | VNTT | 0.367 |
| 9 | NAPAS | 0.662 | 24 | FPT | 0.364 |
| 10 | VTCTEL | 0.621 | 25 | ELC | 0.315 |
| 11 | VNP | 0.614 | 26 | BKAV | 0.269 |
| 12 | PIA | 0.611 | 27 | CTIN | 0.204 |
| 13 | HIPT | 0.599 | 28 | BEL | 0.161 |
| 14 | ITD | 0.545 | 29 | HNEL | 0.13 |
| 15 | AITS | 0.524 | 30 | MISA | 0.1 |
| Mean of efficiency | | 0.52 | | | |

*Source: Estimated results from Frontier 4.1 program.*

According to the results, MSER, SMT, HPT and TGDD are the four enterprises with highest ranking in term of technical efficiency; they are only midsize companies compared with big corporations in ICT field. By constrast, Viettel and VNPT are the big corporations, are only ranked at 6$^{th}$ and 7$^{th}$ positions, respectively. Meanwhile, other big corporations are CMC and FPT, only stand at 16$^{th}$ and 24$^{th}$. This result implies that some midsize Vietnamese ICT companies reach high efficiency in comparison with big corporations. Further, big corporations might lose their efficiency

in business due to their large size. In fact, almost corporations struggle to administrate their organization and resources effectively in the severe business condition during Covid-19 period. As a result, corporations that fail to manage this problem have to cut down their business scale.

Otherwise, MISA, HNEL and BEL are ranked at the lowest scores, below 0.2 efficiency score. These corporations show the poor performance due to their size compared to the operational efficiency output. The differences between low-scoring enterprises and higher ones are also remarkable, demonstrate that low-scoring group's data is far from efficient frontier of the model, urge firms to enhance their performance.

### 3.2. Measurement with DEA model

Initially, the paper ranks DMUs applying DEA estimation with CRS measure. The efficiency of each DMU does not depend on the scale. Also, the paper then applies VRS measure that ranking of technical efficiency depends on the scale of DMU. In this research, both CRS and VRS models apply input-oriented that minimizes the input varibles while satisfying the given output levels. The results of 30 ICT enterprises are shown in the following tables.

**Table 4. Efficiency Scores of 30 Vietnamese ICT Enterprises by DEA - CRS Method**

| No | Enterprises | CRS-based efficient score | No | Enterprises | CRS-based efficient score |
|---|---|---|---|---|---|
| 1 | HPT | 1.0 | 16 | CMC | 0.462 |
| 2 | INFONET | 1.0 | 17 | VEC | 0.455 |
| 3 | VNPAY | 1.0 | 18 | ITD | 0.442 |
| 4 | TGDD | 1.0 | 19 | PIA | 0.431 |
| 5 | SMT | 1.0 | 20 | VNG | 0.393 |
| 6 | MSER | 1.0 | 21 | VCC | 0.37 |
| 7 | ONECORP | 1.0 | 22 | YEAH | 0.322 |
| 8 | VNPT | 0.975 | 23 | FPT | 0.301 |
| 9 | VIETTEL | 0.974 | 24 | ELC | 0.278 |
| 10 | MOBI | 0.86 | 25 | VNTT | 0.254 |
| 11 | NAPAS | 0.722 | 26 | CTIN | 0.198 |
| 12 | VTCTEL | 0.678 | 27 | BKAV | 0.182 |

| | | | | | |
|---|---|---|---|---|---|
| 13 | HIPT | 0.608 | 28 | BEL | 0.092 |
| 14 | VNP | 0.474 | 29 | HNEL | 0.085 |
| 15 | AITS | 0.473 | 30 | MISA | 0.08 |
| Mean of efficiency | | 0.57 | | | |

*Source: Estimated results from DEAP 2.1 program.*

**Table 5: Efficiency Scores of 30 Vietnamese ICT Enterprises by DEA - VRS Method**

| No | Enterprises | VRS-based efficient score | No | Enterprises | VRS-based efficient score |
|---|---|---|---|---|---|
| 1 | VNPT | 1.0 | 16 | NAPAS | 0.731 |
| 2 | VIETTEL | 1.0 | 17 | HIPT | 0.641 |
| 3 | HPT | 1.0 | 18 | CMC | 0.494 |
| 4 | INFONET | 1.0 | 19 | VEC | 0.491 |
| 5 | VNPAY | 1.0 | 20 | ITD | 0.471 |
| 6 | TGDD | 1.0 | 21 | VNG | 0.4 |
| 7 | SMT | 1.0 | 22 | VCC | 0.377 |
| 8 | VNP | 1.0 | 23 | VNTT | 0.353 |
| 9 | MSER | 1.0 | 24 | FPT | 0.348 |
| 10 | ONECORP | 1.0 | 25 | YEAH | 0.324 |
| 11 | BEL | 1.0 | 26 | ELC | 0.285 |
| 12 | PIA | 1.0 | 27 | BKAV | 0.262 |
| 13 | AITS | 0.975 | 28 | CTIN | 0.204 |
| 14 | MOBI | 0.9 | 29 | HNEL | 0.088 |
| 15 | VTCTEL | 0.754 | 30 | MISA | 0.08 |
| Mean of efficiency | | 0.672 | | | |

*Source: Estimated results from DEAP 2.1 program*

According to the above list, DEA-CRS model reflects the efficiency score without concern about enterprise's scale. Similar to SFA method, MSER, HPT, SMT, TGDD are enterprises that achieve highest score, equivalent to 1.0. Besides, INFONET, ONECORP and VNPAY also reach the same level, reflect the absolute effectiveness in business. By contrast, there are 3 enterprises: MISA, HNEL, BEL with remarkably low efficiency score achieving score under 0.1. The mean score of 30 enterprises is 0.57, slightly higher than SFA method. When the paper applies VRS method to measure, the enterprises attaining 1.0 score in the list are even much

more. There are 12 enterprises that achieve this score, and the mean score of 30 enterprises is 0.672. In general, the efficiency score of VRS measure is higher than CRS measure because it was adjusted in accordance with business scale. Relating to big ICT corporations, VNPT and VIETTEL achieve score 1.0 in VRS measure but in CRS they cannot. The other big enterprises, FPT and CMC are only ranked at 0.301 and 0.462 in CRS measure, at 0.348 and 0.494 in VRS measure, respectively, demonstrate medium score level in both lists. Thus, the midsize enterprises coming with well-managed organization and brilliant business performance achieve the highest score in term of technical efficiency. They even earn higher score compared with other big corporations. This result is suitable in Covid-19 situation, big corporations without good management would lose their effectiveness of business, urging them to cut down their scale.

Relating to bad performance enterprises, MISA and HNEL still ranks at lowest points, at 0.08 and 0.085 in DEA-CRS, at 0.08 and 0.088 in DEA-VRS, respectively. BEL also stands at low point in CRS and SFA; however, in VRS measure, its score incredibly increases to 1.0 ranked in high-scoring group. Instead, CTIN ranked at low score in SFA and CRS measures, replaces BEL to the third lowest position in VRS measure, at 0.204.

In general, rankings of enterprises performance in CRS and VRS variants of DEA are mostly similar to SFA methods. However, in term of technical efficiency, the differences between low and high scoring-groups of CRS and VRS are larger compared to SFA method. Furthermore, there are many enterprises achieving maximal scores in CRS and VRS measures making their means of efficiency are higher than SFA method.

## 4. CONCLUSION AND POLICY IMPLICATIONS

### 4.1. Conclusion

The research applies 2 approaches to measure the operational efficiency score of ICT enterprises in Vietnam. These methods are SFA with data stochastic frontier and non-parametric DEA method. In DEA method, we continue to separate into CRS measure with constant return to scale and VRS measure with varied return to scale. With obtained results,

SFA method shows that 4 enterprises, including MSER, SMT, HPT, TGDD have score over 0.8, equivalent over 80% efficiency in their operation. There are also other 4 enterprises that reach 0.7-0.8 efficiency score. In term of DEA method, CRS measure shows 7 enterprises including MSER, SMT, HPT, TGDD, INFONET, VNPAY and ONECORP attain the highest efficiency score, at 1.0. By contrast, there are still 3 enterprises: MISA, HNEL, BEL with very low efficiency score, under 0.1. Regarding to VRS measures, it presents 12 enterprises with 1.0 score, and its efficiency scores are dramatically improved compared with CRS measure. Overall, ranking positions of enterprises in three efficiency measures are nearly unchanged, except the case of BEL. Furthermore, big corporations have efficiency score lower than midsize companies. Specifically, VIETTEL and VNPT are only big corporations which have remarkable efficiency score, whereas FPT and CMC perform medium score level. These results suggest that in the situation of Covid-19, midsize enterprises with optimal management reach the highest efficiency in business, above other big enterprises. Therefore, some of the big ICT corporations need to improve the management and increase business performance in order to enhance their operational efficiency.

### 4.2. Policy implications

The ICT industry encouragement for facilitating business is essential to support the enterprises to overcome negative impact of Covid-19 pandemic as well as to modernize the economy. In order to raise the enterprise's operational efficiency, the research proposes several relevant policies as follows.

*Firstly*, the authorities should decrease the taxes imposing on ICT business activities. The corporate tax in Vietnam is currently 20%; enterprises investing in cutting-edge and innovative ICT products should receive the tax cut by 5% or 10%. This policy should apply for ICT start-up enterprises in new technology field, such as: Artificial Intelligence, IT for public services, educational and health care IT solutions, digital government services…

*Secondly*, the governmental offices may cooperate with educational organization to provide short-term business administration courses and forums to discuss on business management for ICT enterprises. Through

this activity, the enterprises can comprehend actual management knowledge with diversified case study. Also, they can share experiences and knowledge each other to find the most effective business management techniques.

*Thirdly*, to grow business and capital flow, the government and public organizations may cooperate with financial institutions and banks to provide low-interest loans for cutting-edge ICT projects, prioritize for start-up and SMEs. Owing to these loans, the enterprises might decrease the cost of input to produce output with higher efficiency. Furthermore, the government can assess to provide incentives for these ICT projects through public funds. Specifically, the government can expend science and technology development funds or other budget resources to invest in ICT projects with new cutting-edge technology.

*Fourthly*, public organizations need support SMEs to find partners and potential investors through competitions and conferences. These events both help creditors to find good investment opportunity as well as provide ICT enterprises with necessary amount of capital. The obtained capital ensures the output performance, operational capability, and further development of brilliant SMEs.

In term of management work of enterprises, the paper proposes some relevant internal polices to improve the operational efficiency. These recommendations directly relate to minimize the input and maximize the output factors to improve the operational efficiency.

*Firstly*, the enterprise should manage the input tightly to struggle with severe business condition in the Covid-19 period. Based on the results of paper, big enterprises should consider to lessen number of workers, eliminate ineffective company's part and reduce the scale of department indirectly supporting for business. These solutions restrict firms to waste resources to improve their operational efficiency. Notwithstanding, they should maintain appropriate resources, capital and workers for key production activities.

*Secondly*, the enterprises have to reduce degree of output collapse, especially for the revenue. The shrinking market during the Covid-19 period heavily impacts on business result, so that enterprises need to

expand more business channels and customer network to keep their sales performance. One of the best solutions is to promote digital transformation for enterprises operating traditional business model.

*Finally*, ICT SMEs need to find the support from public organizations in term of finance and consultancy, tightly cooperate with them to overcome the difficulties in business. Likewise, the effort of participating in ICT event and competition helps to promote concepts of digital transformation to public, and to connect with the potential customers and partners. This solution improves the firm's output to raise operational efficiency.

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## ANNEX

List of Vietnamese ICT enterprises in the research:

| No | Enterprises | Abbreviation |
|---|---|---|
| 1 | CMC Corporation | CMC |
| 2 | FPT Corporation | FPT |
| 3 | Vietnam Posts and Telecommunications Group | VNPT |
| 4 | MISA Joint Stock Company | MISA |
| 5 | Military Telecommunications and Industry Corporation (VIETTEL) | VIETTEL |
| 6 | HIPT Corporation | HIPT |
| 7 | HPT Vietnam Corporation | HPT |
| 8 | Joint Stock Company for Telecom and Informatics | CTIN |
| 9 | Infonet Joint Stock Company | INFONET |
| 10 | Mobifone Telecommunications Corporation | MOBI |
| 11 | Vietnam Payment Solution Joint Stock Company | VNPAY |
| 12 | Mobile World Joint Stock Company | TGDD |
| 13 | Elcom Technology Telecommunications Corporation | ELC |
| 14 | National Payment Service Joint Stock Company | NAPAS |
| 15 | Hanel Joint Stock Company | HNEL |
| 16 | Vietnam Technology & Telecommunication Joint Stock Company | VNTT |
| 17 | VTC Telecommunication Joint Stock Company | VTCTEL |
| 18 | VNG Corporation | VNG |
| 19 | Sametel Corporation | SMT |
| 20 | BKAV Corporation | BKAV |
| 21 | VCCorp Corporation | VCC |
| 22 | Yeah1 Group | YEAH |
| 23 | Aviation Information and Telecommunications Joint Stock Company | AITS |
| 24 | Vietnam Price Joint Stock Company | VNP |
| 25 | M-Service Joint Stock Company | MSER |
| 26 | Innovative Technology Development Corporation | ITD |
| 27 | One Communication Corporation | ONECORP |
| 28 | Vietnam Electronics and Informatics Joint Stock Corporation | VEC |
| 29 | Viettronics Bien Hoa Joint Stock Company | BEL |
| 30 | Petrolimex Information Technology and Communication Joint Stock Company | PIA |

# PERSONALITY TRAITS AND INNOVATIVENESS: THE MODERATED MEDIATION OF KNOWLEDGE SHARING AND TRANSFORMATIONAL LEADERSHIP

**Vo Hoang Kim An[1], Nguyen Ha Lien Chi[1,*], Le Yen Nhi[2], Cao Ngoc Quynh Huong[2], Le Ngoc Thanh Van[2], Huynh Khanh Linh[2]**

***Abstract**: This study aims to investigate the correlation between personality traits and innovativeness with the moderated mediation effect of knowledge sharing and transformational leadership. The research model is based on the Big-Five traits, theories of person-environment interaction, and previous research literature. With the non-probability sampling method, a sample size of 318 Vietnamese employees was gathered. Data were analyzed by using Cronbach alpha scale reliability testing, partial least squares structural equation modeling (PLS-SEM), T-test, and ANOVA tests. The results indicate that some personality traits have relationships with innovativeness and those relationships become more apparent with the mediating effect of knowledge sharing. Furthermore, transformational leadership should be regulated to facilitate innovativeness due to its unfavorable impact on the process.*

***Keywords:** Innovativeness, knowledge sharing, organizational performance, personality traits, transformational leadership.*

## 1. INTRODUCTION

In the fiercely competitive and rapidly changing market, enterprises are required to develop and improve their competitive advantage continuously. Meanwhile, employee innovativeness lays a foundation for an organization's performance (Scott and Bruce, 1994) and has been studied to be related to personality traits (Som et al., 2019; Yesil et al., 2012). Besides, knowledge sharing (KS) is imperative for a company's success since it can improve decision-making abilities, encourage innovation and growth (Dalkir, 2017). More importantly, empirical

[1] Department of International Business and Trade, Foreign Trade University - Ho Chi Minh City Campus, Ho Chi Minh City, Vietnam

* Corresponding author. Email: nguyenhalienchi.cs2@ftu.edu.vn

[2] Foreign Trade University - Ho Chi Minh City Campus, Ho Chi Minh City, Vietnam

studies have argued that KS has a positive impact on innovativeness (Nguyen et al., 2019; Radaelli et al., 2014), therefore, it is predicted to be a mediating variable whose existence explains the relationship between Big-Five personality and innovativeness. On the other hand, the leader motivates organizational innovation and organizational performance by assisting the organization's members in discovering their mental models, reshaping their perspectives of reality to see beyond surface situations, and developing their systemic understanding (Senge et al., 1994). Noticeably, the theory of transformational leadership (TL) has been studied widely as it influences employee expectations and goals, as well as their perceptions and values. In fact, Howell and Avolio (1993) in their study argued that TL enhances innovativeness and KS among the employees in the firms (Mohammadi and Boroumand, 2016).

However, there are still some research gaps, firstly the mechanism of how Big-Five personality traits affect the individual's innovativeness and the influence of organizational environmental factors on that process. Secondly, the previous research was conducted in limited fields such as engineering, hotel, customer behavior, and the like. Finally, empirical studies have investigated either the relationship between personality and innovativeness (Yesil et al., 2012; Ali., 2019) or the correlation between TL and KS (Liu et al., 2018) or the relationship between TL and organizational innovation (García Morales et al., 2008). Nevertheless, none have empirically assessed the effects of personality traits on employee innovativeness with mediation effects of KS. Besides, moderating factors (TL) in the mentioned process have not been mentioned as well.

To fill this gap, this study examines the influence of Big-Five personality traits including extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience on innovativeness with the moderated mediation effect of KS and TL. Based on a survey of 318 employees from enterprises in various fields in Vietnam, the study applies PLS-SEM, T-test, and ANOVA tests to investigate the research model, examine the hypotheses, and provide solutions for enterprises and recruiters.

As a result, this study shows that different personalities create different impacts on innovativeness and it also proposes different results under the moderated mediation effects. The result contributes to a better understanding

of how different personality factors influence individual innovativeness, allowing businesses or recruiters to better choose and exploit employee potential. Moreover, TL has no impact or unfavorable impact on the relationship between personality traits and innovativeness. Therefore, different levels of TL are required to facilitate innovative behavior at work.

## 2. LITERATURE REVIEW

### 2.1. Theoretical background

#### *2.1.1. The Big-Five personality traits*

The Five-Factor Model is derived from the personality trait covariation and is identified as five broad trait dimensions, namely openness to experience, conscientiousness, extraversion, agreeableness and neuroticism (McCrae and Costa, 1985). This model is the most commonly used and recognized model to date (Rossberger, 2014). Therefore, the Five-Factor Model is applied to examine the influence of personality traits on individual innovativeness via the moderated mediation of KS and TL.

#### *2.1.2. Innovativeness*

Innovativeness is defined as an engagement in innovative behaviors, including behaviors related to the innovation process (Scott and Bruce 1994). This capacity to innovate is among the most important factors that impact business performance (Hurley et al., 1998; Porter, 1990). Therefore, several studies have attempted to determine the origins of innovativeness.

#### *2.1.3. Knowledge sharing*

KS is the act of making knowledge available to others within the organization, which can be understood and used by other individuals (Hendriks, 1999; Ipe, 2003). As knowledge is regarded as a potential source of competitive advantage to organizational success (Oyemomi et al., 2015), many studies have documented findings of factors affecting KS intention and behavior, which have been divided into three groups: individual, organizational and technological (Edwards, 2011). Different groups with different factors, such as employee trust (sources) or organizational culture (Lee et al., 2016), can either favor or obstruct KS activities.

#### *2.1.4. Transformational leadership*

TL has gained much attention from scholars and is considered one of the most powerful leadership theories (Le and Lei, 2019). TL describes the leaders' ability to motivate employees to achieve the highest degree of accomplishment, stimulate them to overcome self-interest to innovate and create change that will contribute to the growth and the future success of the company (Bass, 1985; Bass and Riggo, 2006). TL encompasses 4 dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized considerations.

### 2.2. Hypothesis development

#### *2.2.1. The Big-Five personality traits and individual innovativeness*

There is a growing amount of research indicating personality traits is one of the most important contributing factors of innovativeness (Hsieh et al., 2011; Rossberger, 2014; Weele, 2013).

Extraversion people are enthusiastic and active (Rossberger, 2014). These characteristics facilitate extraverts' exploration and experience, which is vital to innovativeness (Patterson et al., 2009). Moreover, innovative works seldom happen in isolation (Patterson et al., 2009), so employees need to actively interact with one another. It is strongly related to the extraverted as they frequently show a high need for personal interactions (Bakker et al., 2006). In fact, previous studies argued that high levels of extraversion lead to greater capability of innovativeness (Bartey and Furnham, 2006, Hsieh et al., 2011, Weele, 2013). Consequently, the first hypothesis is proposed:

H1: Extraversion positively affects the level of individual innovativeness.

Agreeableness refers to tolerance and compliance (McCrae and Terracciano, 2005), which may inhibit individuals' innovative tendencies as innovators are shown to have a high level of social rule independence. The negative relationship between innovation and agreeableness has been confirmed by empirical studies (Hall and MacKinnon, 1969; Dudek et al., 1991). These findings support Eysenck's focus on innovators' potentially unfavorable dispositional features, such as their tendency to be outspoken, unrestrained, quarrelsome, and asocial (Eysenck, 1993). In fact, some

research has indicated that agreeableness has a negligible (Hsieh et al., 2011) or even negative (Patterson, 2002) impact on innovativeness. The following hypothesis is thus proposed:

H2: Agreeableness negatively affects the level of individual innovativeness.

According to Goldberg (1990), conscientiousness is described to be organized, orderly, and practical. The research demonstrates that those who are conscientious are more resistant to change at work and more inclined to follow current organizational standards. Moreover, individuals with high conscientiousness are found to be more focused on completing a task in an ordered manner rather than disrupting the flow of the task by coming up with new ideas (George and Zhou, 2001). Therefore, they are less motivated to seek innovation or to try to implement new things due to being afraid of uncertainties and unexpected delays in their work. Hence, the third hypothesis is presented:

H3: Conscientiousness negatively affects the level of individual innovativeness.

Turning to neuroticism, it is described as anger, despair, anxiety, and hostility (Costa and McCrae, 1997). Low scores in this aspect indicate emotional stability, therefore people would be able to deal effectively with difficulties. Furthermore, highly neurotic individuals avoid circumstances where they are fearful of failing, and they lack the confidence required for the social and task-related risk-taking that is frequent in creative undertakings and (Zhao and Siebert, 2006). Innovation necessitates the capacity to quickly integrate knowledge and seek out new ways of thinking, which may be encouraged by a calm temperament and self-confidence. Accordingly, the fourth hypothesis is proposed:

H4: Neuroticism negatively affects the level of individual innovativeness.

Finally, openness to experience which is the greatest and most well-researched effect on innovativeness among the Big-Five personality traits relates to high levels of curiosity, intellect, inventiveness, unconventionality, and breadth of understanding (Batey and Furnham, 2006). All of these things encourage people who have a high level of openness to try new things and question their ideas (Rossberger, 2014). According to research by Madrid et al. (2014), open individuals are more likely to actively

investigate and adopt unique ideas, resulting in innovative work behavior. Moreover, people who are open to new experiences are more adaptable and prepared to embrace different viewpoints, even if the concepts are unfamiliar and appear fanciful/underdeveloped (Zhao and Seibert, 2006). In fact, prior research indicated that openness to experience significantly impacts innovative behavior (Marcati et al., 2008). Accordingly, the hypothesis is proposed:

H5: Openness to experience positively affects the level of individual innovativeness.

#### *2.2.2. The Big-Five personality traits and knowledge sharing*

Prior studies showed that differences in personality traits affect KS behavior because it revealed how a person tried to seek information and how to act in response (Matzler et al., 2008; Gupta, 2008). Therefore, understanding employee's personality trait is critical to facilitating KS process and thus enhance the company's growth.

Extraverts are sociable, expressive and talkative (Barrick et al., 2002), so they easily interact with others and express their opinions. Additionally, they are also self-efficacy when working in teams. In an investigation of the accomplishment of student group assignments depends on online resources available in the library, students with extravert traits always share information with team members to boost team productivity (Gupta, 2008). Furthermore, there is a relationship between extraversion and a desire to gain status so sharing knowledge frequently with other people is one of a way to increase individuals' status in an organization (Barrick et al., 2005). Thus, it can be hypothesized as follows:

H6: Extraversion is positively related to sharing knowledge with others.

Agreeableness relates to being compassionate and helpful, and they seek cooperation rather than competition (Liao and Chuang, 2004). These characteristics are strongly linked to KS behavior because KS is a type of workplace helpfulness and collaboration, and entails 'getting along with others' within interpersonal relationships with colleagues and supervisors (Organ and Lingl, 1995). Therefore, the next hypothesis is given:

H7: Agreeableness is positively related to sharing knowledge with others.

Conscientious people are regarded as the single best trait predictor of job performance, with consistent impacts across a variety of factors (Barrick et al., 2005) as they are dependable, achievement-oriented and perseverant. In addition, people scoring high on conscientiousness is more cooperative with others in organizations where interdependence and strong interpersonal relationships are essential success factors (Lepine and Dyne, 2001). Subsequently, they are expectedly more willing to involve in activities of documenting knowledge to share it with others and to make more contributions to organizational success (Matzler et al., 2011). In addition, highly conscientious people tend to engage in actions beyond formal role requirements (Organ and Ryan, 1995) and they are more inclined to share their knowledge without official request to do so (Farh et al., 2004). Therefore, the following hypothesis is postulated:

H8: Conscientiousness is positively related to sharing knowledge with others.

Neurotic individuals tend to have low self-esteem and feel worried with a lower level of trust towards others (Pour and Taheri, 2019). When highly neurotic people lack trust in people and a mutual trust foundation, they are more prone to keep information to themselves and unwilling to share knowledge with their peers (Lin et al., 2018). Previous studies have shown that neuroticism has no influence on KS behaviors due to its negative attributes, such as fear, anger or embarrassment (Gupta, 2008; Lofti et al., 2016). Neurotic individuals may suffer from fear and insecurities in any situation so it may be hard for them to get along with other people, which thereby hinders them from sharing knowledge. Thus, the following hypothesis is given:

H9: Neuroticism is negatively related to sharing knowledge with others.

Highly open people express intellectual curiosity, creativity, flexible thinking, and cultural awareness (Dingman, 1990) and thus are more likely to have more optimistic attitudes towards learning new things, seek other people's insights, and are more engaged in the learning experience (Cabrera et al., 2005). Additionally, some research has implied that openness to experience is the most influencing predictor of KS among the Five-Personality traits (Cabrera et al., 2005, Lofti et al., 2016) since individuals with high levels of openness to experience can quickly accept

knowledge from others and stimulate the process of sharing knowledge at a faster rate (Zhang et al., 2019). Hence, the next hypothesis is proposed:

H10: Openness to experience is positively related to sharing knowledge with others.

#### *2.2.3. Knowledge sharing and individual innovativeness*

Hargadon and Sutton (1997) note that when information is exchanged among groups within an organization, existing ideas from one group look innovative to another, resulting in possibly new goods or services. According to the theories of creativity (Kozbelt, 2011), the correlation between innovativeness and KS is partially contributed by knowledge, which stresses interpersonal interaction in the formation of new knowledge. In fact, various empirical studies have supported the positive relationship between innovativeness and KS. Research has also indicated that KS, in two dimensions: knowledge donating and knowledge collecting, significantly affects the employee's innovative behavior (Hassan et al., 2018, Nguyen et al., 2019). Thus, the hypothesis is suggested:

**H11**: KS has a positive impact on individual innovativeness.

#### *2.2.4. Personality traits, innovativeness and knowledge sharing*

Plenty of research has investigated the mediating effect of KS. Specifically, Afsar (2016) has found that the KS behavior is a partial mediator between person-organization fit and innovative work behavior when doing a questionnaire among the nurses in Thailand's government hospitals. As his research demonstrated that the presence of KS helped enhance employees' work behavior associated with innovativeness, besides the positive impacts of person-organization fit on innovative work behavior. Ahmed et al. (2018) try to explore the mediating role of KS in telecommunication sector companies of Pakistan. Their results exhibit that KS partially mediated the relationship between the high commitment work system and innovative work behavior. Because the study indicated that the high engagement work practices were not adequate to explain the impact on innovative work behavior, and employees' innovative behavior - high commitment work system relationship was increased under the mediating mechanism of employee's KS behaviors. Back to the current study, it has a different approach from the aforementioned studies when taking

personality traits as variables fostering individual innovativeness through the mechanism of KS among employees. Additionally, as mentioned above, Big-Five personality traits affect KS behaviors. Besides, KS and Big-Five traits both have an effect on individual innovativeness. Therefore, KS can be taken as a mediator in this research. It is consequently proposed that KS has a partial mediation on the relations between the Big-Five personality traits and individual innovativeness.

H12: KS has a partial mediating effect on the relations between the Big-Five personality traits and individual innovativeness.

H12-1: KS has a partial mediating effect on the relations between extraversion personality trait and individual innovativeness.

H12-2: KS has a partial mediating effect on the relations between agreeableness personality trait and individual innovativeness.

H12-3: KS has a partial mediating effect on the relations between conscientiousness personality trait and individual innovativeness.

H12-4: KS has a partial mediating effect on the relations between neuroticism personality trait and individual innovativeness.

H12-5: KS has a partial mediating effect on the relations between openness to experience personality trait and individual innovativeness.

#### *2.2.5. Personality traits, innovativeness, and transformational leadership*

Theories of person-environment interaction have been a popular topic in the management literature for the past few decades. Previous research literature has proposed that the better fit between individuals and organizations, the more likely individuals' positive behavior occurs (Brown et al., 2005; O'Reilly et al., 1991). In addition, the leaders of organizations are one of the key factors that help define and shape work contexts, which subsequently make contributions to organizational innovation (Amabile, 1998). Among many types of leadership styles, TL can contribute to the development of a positive environment for organizational innovation, and thus affect innovative behavior (Elenkov and Manev, 2005). For example, in the context of teachers' leadership behavior and students' personality traits, Lin et al., (2018) stated that different personality attributes on KS behavior are moderated by teachers' TL behavior. Specifically, if they can both keep a stable relation with person-organization fit, students will result

in more positive behavior, namely KS behavior. This principle can be applied in the context of TL and individual innovativeness. If the relation between TL behaviors and employees' personality traits is good and consistent, the employee will feel valued and trusted when being granted autonomy in decision making and implementation of ideas, which thereby stimulates their innovative behaviors and vice versa. Therefore, it can be hypothesized as follows:

H13: TL moderates the relationship between the Big-Five personality traits and individual innovativeness.

H13-1: TL behavior moderates the relationship between individuals with extraversion personality trait and their innovativeness.

H13-2: TL behavior moderates the relationship between individuals with agreeableness personality trait and their innovativeness.

H13-3: TL behavior moderates the relationship between individuals with conscientiousness personality trait and their innovativeness.

H13-4: TL behavior moderates the relationship between individuals with neuroticism personality trait and their innovativeness.

H13-5: TL behavior moderates the relationship between individuals with openness to experience personality trait and their innovativeness

Based on the hypotheses argued above, the following conceptual model is proposed:

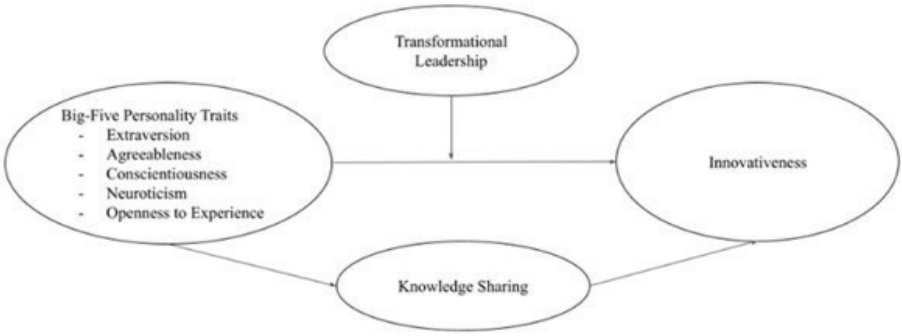


**Figure 1. Research conceptual model**

## 3. METHOD

### 3.1. Sample

Data was collected from employees working in various fields in Vietnam, mainly in Ho Chi Minh City within 1 month from February 2022. The convenience sampling method was used to obtain data for this study and to make it simpler for target respondents to reply. This survey was circulated across social media sites, majorly Facebook and Gmail. Within a month, a total of 337 responses were collected, of which 318 are usable.

The demographic characteristics of the respondents are described in Table 1. In addition, Table 2 presents the business sizes and industries that the respondents work at.

**Table 1. The Demographic Characteristics of the Respondents**

| | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| Male | 110 | 34.6 |
| Female | 208 | 65.4 |
| **Ethnicity** | | |
| Kinh | 296 | 93.1 |
| Hoa | 15 | 4.7 |
| Others | 7 | 2.2 |
| **Age** | | |
| 18-25 | 266 | 83.6 |
| 26-30 | 36 | 11.3 |
| 31-35 | 14 | 4.4 |
| 36-40 | 2 | 0.6 |
| Under 1 year | 214 | 67.3 |
| 1-3 years | 81 | 25.5 |
| 5-7 years | 13 | 4.1 |
| 7-10 years | 2 | 0.6 |
| Over 10 years | 2 | 0.6 |
| **Educational background** | | |
| High school | 13 | 4.1 |
| Intermediate degree | 23 | 7.2 |
| Master's degree | 276 | 86.8 |
| Others | 6 | 1.9 |
| **Position** | | |
| Intern/Trainee | 173 | 54.4 |
| Official employee | 107 | 33.6 |
| Team leader | 18 | 5.7 |
| Middle manager | 12 | 3.8 |
| Senior manager | 4 | 1.3 |
| Others | 4 | 1.3 |

**Table 2. Business Size and Industry**

| | Frequency | Percentage |
|---|---|---|
| **Business size** | | |
| Under 100 employees | 38 | 11.9 |
| 10 - 50 | 106 | 33.3 |
| 50 - 100 | 78 | 24.5 |
| 100 - 200 | 28 | 8.8 |
| 200 - 300 | 12 | 3.8 |
| Over 300 | 56 | 17.6 |
| **Industry** | | |
| Agriculture, forestry, fisheries, animal husbandry, mining | 8 | 2.5 |
| Financial and Insurance Services | 41 | 12.9 |
| Manufacturing | 19 | 6.0 |
| Wholesale and Retail Trade | 34 | 10.7 |
| Healthcare | 12 | 3.8 |
| Arts, Entertainment and Recreation | 27 | 8.5 |
| Services | 59 | 18.6 |
| IT | 52 | 16.4 |
| Others | 66 | 20.8 |

### 3.2. Measures

This study adopted the scales from previously published papers, which all were proved to be reliable and valid, to measure constructs in the proposed model. However, a pilot survey was conducted to retest the reliability and validity of the measures before the official survey.

Except for personality traits, all variables are measured by using 5-point Likert-type scales, ranging from 1 (strongly disagree) to 5 (strongly agree). As we conducted this study in Vietnam, the questionnaire was distributed in Vietnamese by using translation - back-translation by Brislin (1986).

Knowledge sharing: A 5-item scale developed by Bock et al. (2005) was used to evaluate a team member's KS behavior. The Five-point Likert scale ranged from "1 = very frequently" to "5 = very rarely". These items included the following: "I will share my work reports and official documents with members of my organization more frequently in the future."

Personality traits: The Big-Five personality traits, our main independent variable, including extraversion, agreeableness, conscientiousness, neuroticism, openness to experience was measured by the short Big-Five Inventory (BFI-S) model established by Gerlitz and Schupp (2005). Compared to the standard BFI, this shortened version will allow an easier implementation of the surveys when it comes to general political and social topics. The respondents were asked whether each statement applied to them using a seven-point scale, ranging from "1 = strongly disagree" to "7 = strongly agree".

Transformational leadership: TL was assessed using the eight-item scale developed by McColl-Kennedy et al. (2002). Respondents were asked to rate their supervisors' level of TL using a five-point Likert scale ranging from "1 = completely disagree" to "5 = completely agree". These items included the following: "My leader gives personal attention to each sales representative."

Innovativeness: innovativeness, the dependent variable of this study, was assessed by adopting a 6-item scale - Innovative Work Behavior, created by Scott et al. (1994). Each item was rated on a 5-point Likert scale, ranging from "1 = never" to "5 = always". A sample item for this scale is: "Generates creative ideas."

### 3.3. Data analysis method

This study performed descriptive statistics and the reliability of the measures by examining the Cronbach's alpha coefficients with the support of SPSS software. In assessing the validation and estimating the proposed research model, PLS-SEM was carried out by using SMARTPLS software. In addition, for the significance tests of the hypotheses in the structural model, the article also used a bootstrapping approach.

## 4. RESULTS AND DISCUSSION

### 4.1. Results

#### *4.1.1. Reliability and validity analysis*

Reliability analysis is performed through Cronbach's Alpha using the SPSS tool. To be considered acceptable, Cronbach's Alpha value is required to be greater than 0.6 (Nunally and Bernstein, 1978). The

values for all variables are: extraversion (0.704), agreeableness (0.815), conscientiousness (0.749), neuroticism (0.828), openness to experience (0.782), KS (0.810), innovativeness (0.812), TL (0.742). All of those values are well above 0.600, qualifying the reliability and validity of the data set and measurement variables for further analysis.

#### *4.1.2. Outer loadings*

Outer loadings values of all measurement variables in five models are larger than 0.7 with the P-value being 0.000. Therefore, the results indicate that these variables are considered highly satisfactory.

#### *4.1.3. AVE and R-squared*

According to Hair et al. (2011), the value of Average Variance Extracted (AVE) which is from 0.5 or higher shows that the latent variable will explain more than half the variance of its observed variables, indicating that the scale has good convergence.

The Composite Reliability (CR) value ranges from 0 to 1, with a value closer to 1 indicating a higher level of confidence. In particular, for exploratory research, a confidence value of 0.6 - 0.7 is accepted, but with many other studies, this value is required to be in the range of 0.7 - 0.9 to be accepted (Nunnally and Bernstein, 1994). If this value is greater than 0.95, it is considered problematic because there is a high probability of overlapping observed variables, that is, observed variables with the same content. In all five models, the scale of each concept has Composite Reliability CR > 0.7 and Average Variance Extracted AVE > 0.5, so it can be concluded that all scales in the model are reliable.

#### *4.1.4. Hypothesis testing*

For the purpose of this research, the Structural Equation Model technique (SEM) was used to examine the hypotheses. The results of hypothesis testing show positive and significant influence of extraversion and openness to experience on individual innovativeness, resulting in acceptance of hypotheses H1 and H5. On the other hand, agreeableness, conscientiousness, and neuroticism show no clear relationship with individual innovativeness as proposed in hypotheses H2, H3, and H4. Personality traits, except for neuroticism, also significantly influence KS,

as supported in hypotheses H6, H7, H8, and H10. In the same way, KS has a mediating effect on the relationship between personality traits (except for neuroticism) and innovativeness as in H12-1, H12-2, H12-3, H12-5. In the study, it was also discovered that KS influences individual innovativeness, as proposed in H11. Finally, the research found a moderating effect of TL on the relationship between innovativeness and agreeableness (H13-2) and openness to experience (H13-5).

**Table 3. Reliability and Validity Analysis**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| **Extraversion (Cronbach's Alpha = 0.704)** | | | | |
| **EX1** | 8.54 | 4.583 | 0.665 | 0.413 |
| **EX2** | 7.76 | 5.411 | 0.567 | 0.556 |
| **EX3** | 8.91 | 6.683 | 0.357 | 0.797 |
| **Agreeableness (Cronbach's Alpha = 0.815)** | | | | |
| **AG1** | 10.05 | 3.966 | 0.729 | 0.680 |
| **AG2** | 10.31 | 3.951 | 0.746 | 0.664 |
| **AG3** | 10.34 | 4.629 | 0.537 | 0.873 |
| **Conscientiousness (Cronbach's Alpha = 0.749)** | | | | |
| **CS1** | 9.19 | 3.203 | 0.651 | 0.576 |
| **CS2** | 9.57 | 3.098 | 0.653 | 0.571 |
| **CS3** | 9.69 | 3.980 | 0.439 | 0.811 |
| **Neuroticism (Cronbach's Alpha = 0.828)** | | | | |
| **NR1** | 8.80 | 4.245 | 0.779 | 0.662 |
| **NR2** | 8.89 | 4.284 | 0.794 | 0.646 |
| **NR3** | 9.08 | 6.059 | 0.512 | 0.914 |
| **Openness to Experience (Cronbach's Alpha = 0.782)** | | | | |
| **OP1** | 9.39 | 3.261 | 0.677 | 0.641 |
| **OP2** | 9.61 | 3.431 | 0.620 | 0.706 |
| **OP3** | 9.73 | 4.034 | 0.572 | 0.757 |
| **Knowledge sharing (Cronbach's Alpha = 0.810)** | | | | |
| **KS1** | 15.66 | 6.962 | 0.512 | 0.801 |
| **KS2** | 15.56 | 6.796 | 0.583 | 0.778 |
| **KS3** | 15.57 | 6.561 | 0.644 | 0.759 |
| **KS4** | 15.27 | 7.020 | 0.609 | 0.771 |
| **KS5** | 15.33 | 6.581 | 0.648 | 0.758 |
| **Innovativeness (Cronbach's Alpha = 0.812)** | | | | |
| **IN1** | 17.77 | 10.577 | 0.545 | 0.788 |
| **IN2** | 17.94 | 10.098 | 0.615 | 0.773 |
| **IN3** | 18.02 | 10.350 | 0.526 | 0.793 |
| **IN4** | 17.95 | 9.861 | 0.569 | 0.784 |
| **IN5** | 17.72 | 10.453 | 0.577 | 0.781 |
| **IN6** | 17.77 | 10.094 | 0.609 | 0.774 |
| **Transformational Leadership (Cronbach's Alpha = 0.742)** | | | | |
| **TL1** | 11.22 | 4.000 | 0.549 | 0.675 |
| **TL2** | 11.08 | 4.122 | 0.520 | 0.692 |
| **TL3** | 11.21 | 3.435 | 0.609 | 0.638 |
| **TL4** | 11.19 | 4.107 | 0.469 | 0.719 |

**Table 4. Outer Loadings**

| | Model: EX | Model: AG | Model: CS | Model: NR | Model: OP |
|---|---|---|---|---|---|
| EX1 | 0.873 | | | | |
| EX2 | 0.945 | | | | |
| AG1 | | 0.946 | | | |
| AG2 | | 0.938 | | | |
| CS1 | | | 0.937 | | |
| CS2 | | | 0.894 | | |
| NR1 | | | | 0.952 | |
| NR2 | | | | 0.967 | |
| OP1 | | | | | 0.880 |
| OP2 | | | | | 0.846 |
| OP3 | | | | | 0.774 |
| KS1 | 0.708 | 0.708 | 0.708 | 0.731 | 0.789 |
| KS2 | 0.723 | 0.723 | 0.734 | 0.733 | 0.709 |
| KS3 | 0.788 | 0.788 | 0.789 | 0.784 | 0.792 |
| KS4 | 0.744 | 0.744 | 0.737 | 0.714 | 0.760 |
| KS5 | 0.809 | 0.809 | 0.804 | 0.801 | 0.819 |
| IN1 | 0.797 | 0.797 | 0.712 | 0.708 | 0.702 |
| IN2 | 0.747 | 0.747 | 0.753 | 0.742 | 0.761 |
| IN3 | 0.780 | 0.780 | 0.769 | 0.775 | 0.776 |
| IN4 | 0.795 | 0.795 | 0.798 | 0.704 | 0.780 |
| IN5 | 0.722 | 0.722 | 0.719 | 0.720 | 0.723 |
| IN6 | 0.767 | 0.767 | 0.758 | 0.759 | 0.764 |
| TL1 | 0.763 | 0.763 | 0.765 | 0.764 | 0.764 |
| TL2 | 0.730 | 0.730 | 0.728 | 0.730 | 0.727 |
| TL3 | 0.790 | 0.790 | 0.790 | 0.790 | 0.789 |
| TL4 | 0.718 | 0.718 | 0.719 | 0.717 | 0.720 |

**Table 5. AVE and R-squared**

| Model | Concepts | Number of measurement variables | Composite Reliability (CR) | Average Variance Extracted (AVE) | P value |
|---|---|---|---|---|---|
| Extraversion | EX | 2 | 0.905 | 0.827 | Qualified |
| | IN | 6 | 0.865 | 0.516 | |
| | KS | 5 | 0.867 | 0.566 | |
| | TL | 4 | 0.838 | 0.564 | |
| Agreeableness | AG | 2 | 0.940 | 0.887 | |
| | IN | 6 | 0.865 | 0.516 | |
| | KS | 5 | 0.869 | 0.570 | |
| | TL | 4 | 0.838 | 0.564 | |
| Conscientiousness | CS | 2 | 0.912 | 0.839 | |
| | IN | 6 | 0.865 | 0.517 | |
| | KS | 5 | 0.869 | 0.570 | |
| | TL | 4 | 0.838 | 0.564 | |
| Neuroticism | NR | 2 | 0.959 | 0.921 | |
| | IN | 6 | 0.865 | 0.517 | |
| | KS | 5 | 0.868 | 0.568 | |
| | TL | 4 | 0.838 | 0.564 | |
| Openness to Experience | OP | 3 | 0.873 | 0.696 | |
| | IN | 6 | 0.865 | 0.516 | |
| | KS | 5 | 0.869 | 0.571 | |
| | TL | 4 | 0.838 | 0.564 | |

**Table 6. Hypothesis Testing Results**

| Hypothesis | Original Sample | Standard Deviation | P-value | Result |
|---|---|---|---|---|
| **Model: Extraversion** | | | | |
| H1: Extraversion → Innovativeness | 0.129 | 0.054 | 0.016 | Supported |
| H6: Extraversion → Knowledge sharing | 0.355 | 0.052 | 0.000 | Supported |
| H11: Knowledge sharing → Innovativeness | 0.134 | 0.058 | 0.022 | Supported |
| H12-1: Extraversion → Knowledge sharing → Innovativeness | 0.045 | 0.020 | 0.028 | Supported |
| H13-1: Extraversion*Transformational Leadership → Innovativeness | 0.193 | 0.131 | 0.140 | Not supported |
| **Model: Agreeableness** | | | | |
| H2: Agreeableness → Innovativeness | 0.093 | 0.059 | 0.117 | Not supported |
| H7: Agreeableness → Knowledge sharing | 0.285 | 0.063 | 0.000 | Supported |
| H11: Knowledge sharing → Innovativeness | 0.172 | 0.060 | 0.006 | Supported |
| H12-2: Agreeableness → Knowledge sharing → Innovativeness | 0.047 | 0.020 | 0.017 | Supported |
| H13-2: Agreeableness*Transformational leadership → Innovativeness | -0.129 | 0.056 | 0.022 | Supported |
| **Model: Conscientiousness** | | | | |
| H3: Conscientiousness → Innovativeness | 0.066 | 0.057 | 0.247 | Not supported |
| H8: Conscientiousness → Knowledge sharing | 0.264 | 0.059 | 0.000 | Supported |
| H11: Knowledge sharing → Innovativeness | 0.172 | 0.062 | 0.006 | Supported |
| H12-3: Conscientiousness → Knowledge sharing → Innovativeness | 0.045 | 0.020 | 0.021 | Supported |
| H13-3: Conscientiousness*Transformational leadership → Innovativeness | -0.037 | 0.095 | 0.700 | Not supported |
| **Model: Neroticism** | | | | |
| H4: Neuroticism → Innovativeness | 0.064 | 0.051 | 0.210 | Not supported |
| H9: Neuroticism → Knowledge sharing | 0.129 | 0.067 | 0.053 | Not supported |
| H11: Knowledge sharing → Innovativeness | 0.188 | 0.056 | 0.001 | Supported |
| H12-4: Neuroticism → Knowledge sharing → Innovativeness | 0.024 | 0.025 | 0.102 | Not supported |
| H13-4: Neuroticism*Transformational leadership → Innovativeness | -0.091 | 0.095 | 0.339 | Not supported |
| **Model: Openess to Experience** | | | | |
| H5: Openness → Innovativeness | 0.191 | 0.053 | 0.000 | Supported |
| H10: Openness → Knowledge sharing | 0.316 | 0.059 | 0.000 | Supported |
| H11: Knowledge sharing → Innovativeness | 0.130 | 0.060 | 0.030 | Supported |
| H12-5: Openness → Knowledge sharing → Innovativeness | 0.041 | 0.041 | 0.040 | Supported |
| H13-5: Openness*Transformational leadership → Innovativeness | -0.155 | 0.048 | 0.001 | Supported |

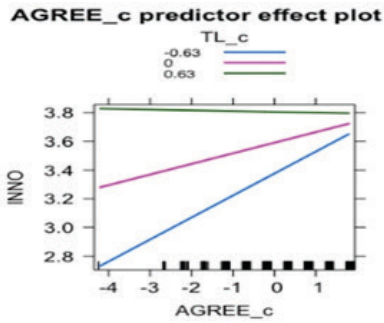


**Figure 2. The Interactive Influence of Transformational Leadership and Agreeableness on Innovativeness**

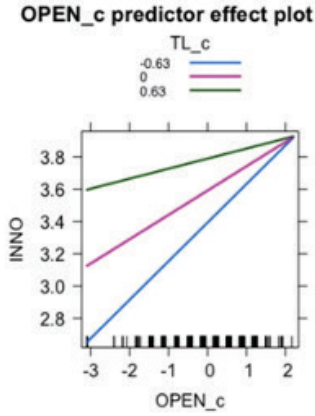


**Figure 3. The interactive influence of transformational leadership and agreeableness on innovativeness**

### 4.2. Discussion

#### *4.2.1. The Big-Five personality traits and individual innovativeness*

The positive impacts of openness to experience and extraversion on innovativeness in this study correspond to previous studies by Hsieh et al. (2011), Rossberger (2014), and Ali, (2019). However, agreeableness does not demonstrate a clear relationship with innovativeness for characteristics such as being tolerant and compliant may hinder an individual's innovativeness (McCrae and Terracciano, 2005). Those who comply with rules are less likely to come up with new ideas. This insignificant effect is consistent with the research by Hsieh et al. (2011) and the emphasis of Sung and Choi (2009) that a high tendency of agreeableness was not beneficial

for their creative performance. Similarly, conscientiousness may inhibit innovative activities due to conscientious individual's proclivity to plan, organize, and attain goals (Weele, 2013). Other studies have discovered a negligible link between conscientiousness and innovativeness (Kirton and De Ciantis, 1986; Steel et al., 2011). In the same way, neuroticism in employees does not lead to innovativeness and such employees display a low level of innovative behavior (Ali, 2019).

#### *4.2.2. The Big-Five personality traits and knowledge sharing*

Similar to findings in previous literature (Mooradian et al., 2006; Matzler et al., 2011), the Big-Five personality traits in this research, except for neuroticism, have positive impacts on KS. It implies that firms with individuals being extraverted, conscious, open, agreeable and less neurotic are more likely to share knowledge with others and thus contribute to organizational development. Whereas, neuroticism does not indicate a clear relationship with KS. It might be due to negative characteristics such as insecurities and having trust issues impeding them from engaging in social activities to share knowledge.

#### *4.2.3. Knowledge sharing and individual innovativeness*

The results indicate that KS has a positive impact on innovativeness, which is in line with empirical studies. This correlation can be explained by various reasons. Firstly, KS provides social interactions, which may give individuals resources inventions (Hansen, 1999). Secondly, Popadiuk et al., 2006 argued that idea generation is a process that involves merging internal and external information into new forms. Individuals coordinate and associate sets of knowledge with other people or teams during the process to routinize innovation (Tucker et al., 2007). Thirdly, the act of sharing knowledge triggers a 'cognitive elaboration' and 're-elaboration process' that gives people a new perspective on the knowledge they already have and helps them mobilize it for creativity (Radaelli et al., 2014).

#### *4.2.4. Personality traits, innovativeness, and knowledge sharing*

One of the most compelling findings in this research is that KS significantly mediated the positive relationship between extraversion, agreeableness, conscientiousness, openness to experience, and innovativeness. The study

illustrates the mediating effect of KS on the associations between personalities, including extraversion and openness to experience, and individual innovativeness besides showing that these personality traits significantly impact KS and thus, through sharing knowledge, enhance innovativeness. The result is relatively similar to prior studies (Afsar, 2016; Ahmed et al., 2018) in which KS serves as a mediator among different variables, related to innovative work behavior, in different contexts. Regarding the impact of agreeableness or openness to experience on innovativeness solely, the current study depicts a negative relationship. However, with the presence of KS, individuals scoring high on these traits positively affect innovativeness. On the contrary, KS does not have a mediating impact on neuroticism. It can be explained by the result that employees with high levels of neuroticism have no significant influence either directly or indirectly on individual innovativeness even when having KS as a mediator.

#### *4.2.5. Personality traits, innovativeness, and transformational leadership*

The result from the statistical analysis reveals that transformational leadership only has moderating effects on innovativeness for agreeableness and openness to experience but not extraversion, conscientiousness and neuroticism. For agreeable employees, supervisors displaying low transformational leadership behavior can significantly increase their innovativeness. Those employees being led by supervisors having high transformational leadership are generally more attached to their supervisors, thus they learn more from them, so they tend to accept their supervisor's instructions. At that point, employees' innovativeness will deteriorate since they frequently rely on the boss's opinions. For open employees, low transformational leadership significantly affects their innovativeness, but not high transformational leadership. They are open to new experiences and prepared to embrace different viewpoints (Zhao and Seibert, 2006), thus transformational leadership behavior will encourage their innovativeness. Therefore, TL should be adjusted appropriately to encourage employees' innovativeness. For extraverted employees, since they are full of energy and enjoy new experiences, they have great capability of innovative task performance (Steel et al., 2008; Ali, 2019). Because their creative ability is greatly influenced by their personality, TL does not affect that relationship much. For conscientious employees, while they are resistant to change at

work and avoid taking risks (Raja and Johns, 2004), supervisors exhibiting TL are inclined to stimulate innovation (Bass and Riggo, 2006). However, leaders with TL still pay special attention to each of their followers and serve their mentors or coaches (Bass, 1990). Hence, each employee will be treated based on his own characteristics and his personality will be respected given that the employee fulfills his responsibility. As a result, TL behavior does not significantly impact conscientious employees' innovativeness. For neurotic employees, they are vulnerable and emotionally unstable, both of which hinder them from innovativeness (Ali, 2019). They are not innovative by nature, regardless of TL.

## 5. CONCLUSION

This study aims to examine the moderating effects of TL on personality traits - innovativeness relationships via KS. Although there are many available studies on personality, these findings extend the literature of the influence of Big-Five personality trait dimensions which suggest different personalities have different impacts on innovativeness and it can strengthen or weaken via the mediation of KS and moderation of TL.

The result shows that people who have high levels of extraversion, openness to experience and agreeableness on individual innovativeness have positive impacts on innovativeness, which is consistent with previous studies (Hsieh et al., 2011; Rossberger, 2014; Ali, 2019). Otherwise, conscientiousness and neuroticism personalities do not significantly affect one's innovativeness. In addition, the empirical results of this research indicates that KS mediates the relationship of personality traits and individual innovativeness, excluding neuroticism. Regarding the moderating effects, TL behavior only influences individuals with agreeableness and openness to experience traits. To be more detailed, people with high openness to experience and agreeableness tend to be less innovative when exposed to TL. Therefore, individual differences in personality traits require different levels of TL to maximize innovative behavior at work.

In conclusion, the present research helps gain deeper insight into how different personality traits affect individual innovativeness, which thereby assists organizations or managers to select and exploit employee's potential in more effective ways, stimulating a strong competitive advantage for the

organizations. Besides, with the mediating effect of KS, the correlation between individual innovativeness and personality traits, especially agreeableness and conscientiousness, becomes more apparent. Thus, such characteristics shall be encouraged to share knowledge with others to be more innovative. The manager is suggested to create a communicative working environment and rewards. Last but not least, the results imply that TL has some unfavorable impact on individual innovativeness regarding personality traits. To be more detailed, people with high openness to experience and agreeableness tend to be less innovative when exposed to TL. Therefore, the authors propose that awareness of an employee's personality is significantly necessary to maximize innovative behavior at work.

However, this study could not be free of limitations, which is thereby open to improvement possibilities for future research. Firstly, because cross-sectional design is used in this study to examine the relationship among different variables, causal relationships may change in the long run. A longitudinal study is recommended to tackle this limitation. Secondly, the sample size is limited to employees from companies in Vietnam, so it may appear that the results may fluctuate in different geographical areas with cultural and economic differences. So, it is better to conduct more studies in different contexts to evaluate and compare the findings with this present research. Thirdly, due to the nature of the quantitative survey method and lack of prior research investigating the correlations among the constructs under the moderating mechanism of TL, a thorough understanding about the moderating effect of TL is not generated. Therefore, this paper strongly calls for future studies to provide better insight into relationships among variables of Big-Five personality traits, innovativeness, KS and TL.

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# STUDENTS' PERCEPTION OF INTERNATIONAL FINANCIAL REPORTING STANDARDS IN ECONOMIC TRAINING PROGRAMS AT HIGHER EDUCATION IN HANOI

**Van Anh Doan[1], Tuong Tran Manh[1,*]**

***Abstract:*** *The International Financial Reporting Standards (IFRS), which is a set of accounting standards developed by the IASB (International Accounting Standards Board), could make financial statements more comparable. On March 16, 2020, the Ministry of Finance officially issued Decision No. 345/QD-BTC approving the Scheme to apply Financial Reporting Standards in Vietnam. In the Vietnam Report 2035 with the theme "Towards Prosperity, Innovation, Equity and Democracy", the Ministry of Planning and Investment and the World Bank have proposed that Vietnam Accounting Standards (VAS) should be unified with the IFRS to develop capital markets in-depth and attract more foreign investors. Accordingly, the application of IFRS will help Vietnam stay on track with the Vietnam 2035 vision in line with ASEAN policies as well as keep up with the development momentum of other successful economies in the region and the world, especially in the current period when Vietnam is in the process of extensive international economic integration to participate in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the ASEAN Economic Community (AEC).*

*One of the necessary contents of promoting IFRS in learning is the self-awareness of students about IFRS in the training program. This study was conducted with 337 survey questionnaires for students majoring in accounting and auditing from universities in the economic sector in Hanoi and tested the SEM linear structure model. The research showed five factors affecting the intention to attend IFRS integrated training program including perceived behavioral control, attitude, motivation for personal development, pressure from understanding IFRS, and complexity of learning. Research results have shown that while the attitudinal factor has the strongest influence on the students' intention, the complexity factor has a negative influence on the intention to attend the IFRS integrated training program. Based on the analysis results, the research team proposed some recommendations based on the strong influencing factors in the model to improve the effectiveness of those factors in the intention to attend the IFRS integrated training program.*

***Keywords:*** *Student perception, International financial reporting standards, training program.*

[1] Department of Accounting and Auditing, Thuongmai University, Hanoi, Vietnam

* Corresponding author. Email: tuong.tm@tmu.edu.vn

## 1. INTRODUCTION

In recent years, the growth of globalization has erased the economic geographical boundaries between countries. Therefore, in the trend of innovation and integration, a similar and globally accepted accounting and financial reporting system is required in Vietnam. The IFRS was born as an attempt to harmonize the differences between the accounting standards of countries around the world.

In the trend of IFRS convergence, it is only a matter of time until the full application of IFRS in Vietnam. Hence, when applying IFRS, what benefits do Vietnamese companies in general and businesses operating in the Vietnamese territory benefit from? "IFRS creates transparency and helps improve accountability by reducing information gaps between inside and outside the business. IFRS also helps businesses and markets function operate more efficiently because of a whole set of trusted global standards which can apply to both developed and emerging economies. IFRS lowers the cost of capital and minimizes reporting costs" (Hoogervorst, 2012). In the current period of strong globalization, through the application of IFRS, the Vietnamese economy in general and Vietnamese enterprises in particular can benefit from economic integration, such as accessing to natural resources and capital, maintaining competitiveness and developing sustainably, or developing audit staff, etc.

Despite playing an important role in the future, the IFRS is still not taught in many universities in the economic sector or, if so, only integrated with some subjects. This situation leads to the fact that many students do not realize the essential role of IFRS. Therefore, the group of authors decided to study the topic: "Students' perception of international financial reporting standards in economic training programs at higher education in Hanoi". The authors want to find out the perception of economic students, i.e. students majoring in Accounting - Auditing, about integrating IFRS in the training program. Thereby, we might propose some solutions for universities and students.

## 2. THEORETICAL FRAMEWORK

### 2.1. Social cognitive theory (SCT) and cognitive appraisal theory (CA)

#### *2.1.1. Social cognitive theory (SCT) and cognitive appraisal theory (CA)*

Currently, there are not many studies on students' perception of IFRS, if any, mainly developed from the model of previous studies. Those researches are relied on the popular background theories in research or failed to combine models to thoroughly solve theoretical problems. In the field of accounting, regarding financial reporting standards, many theories can be applied in research with primary data as well as with secondary data. However, when studying students' perceptions of IFRS in the training program, the authors aim to study the IFRS integrated training program through cognitive research. The application of background theory is very important to solve the research problem well, especially with the studies that approach primary data. According to the authors' research, two main theories which play an important role in determining factors are the theory of the intended behavior (Ajzen, 1991) and the social cognitive theory of Bandura. In addition, the authors also mentioned the Cognitive - Appraisal theory of RS Lazarus (1991) to be able to explain the identification of factors.

According to behavioral intention theory (Ajzen, 1991), the intention to perform the behavior will be influenced by three factors including attitude towards the behavior, subjective standards, and perceived behavioral control.

The theory of planned behavior (TPB) was developed from the theory of rational behavior (Fishbein, 1975) due to the limitation of the previous theory when human behavior is completely affected by mind control.

Similar to the TRA theory, a central element in the TPB is the individual's intention to perform a certain behavior. The basic model of this theory is presented (Ajzen, 1991) as follows:

### *2.1.2. Theory of Planned Behavior (TPB)*

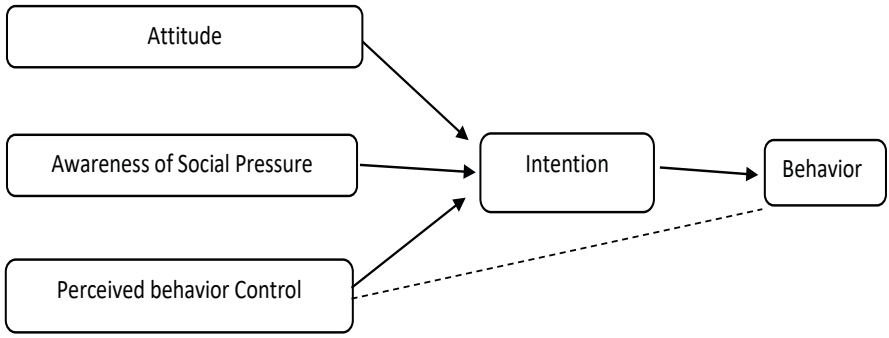


**Figure 1. Theory of Planned Behavior (TPB)**

*Source: Ajzen, 1991.*

In some studies, in many other fields in Vietnam, this term is translated as Cognitive Control, or Perceived Control. However, according to Ajzen (1991), the term is considered as "Perceived control over the behavior" or "Perceptions of behavioral control", so the author proposed the most optimal term should be used in Vietnam as 'Perceptions of behavioral control'.

Attitude: According to Ajzen (1991), a person's attitude towards a particular behavior is measured by the belief that performing that behavior is beneficial.

Perception of social pressure: According to Ajzen (1991), this is a community factor, i.e. the pressure from people around (also can be understood as expectation) or the community pressure which may influence the person performing the behavior.

Perceived control: According to Ajzen (1991), this is the perception of available resources and the ability to seize opportunities when performing a particular behavior. When behaviorists consider that they have more resources and ability to seize opportunities with fewer obstacles, their perceived control over the behavior is greater. Resources and the ability to seize opportunities can be understood as financial resources, human resources, and physical facilities.

In addition, TPB theory also emphasizes that the intention to perform a behavior reflects a person's willingness to perform the behavior.

Consequently, the intention is a direct indicator of the behavior. According to Ajzen (1991), the impact of the three factors in the TPB model on predicting behavior will vary according to specific situations, but not the same in all cases. It can be understood that there will be situations where the attitudinal factor has a strong influence on the behaviour. On the contrary, there are also cases where the remaining factors exert their influence.

TPB theory is included in the study because it correctly explains the factors affecting the intention and behavior that the authors want to target - the intention to attend the IFRS integrated training program that comes from students' awareness.

#### *2.1.3. Social cognitive theory (SCT)*

Bandura's social cognitive theory explains behavior based on the mutual interaction between the triad of personal, environmental, and behavioral factors. Personal factor includes cognitive, emotional, biological, whereas environmental factor consists of physical environment (natural environment) and social environment. These three factors are closely related to each other.

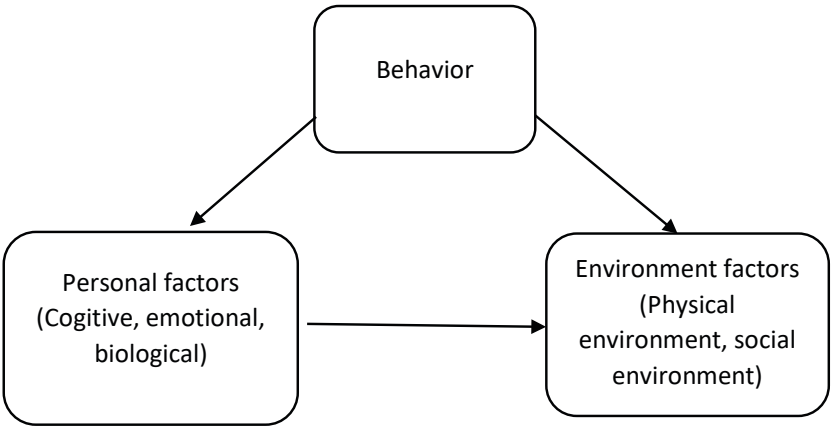


**Figure 2. Correlation Between Behavior, Personal Factor, and Environmental Factor**

*Source: Bandura, 1986.*

The relationship between behavior and environment in the triad system is reciprocal in two directions. In daily life, when people change their behavior, it will create changes in the characteristics of the

environment. When the environment is always fluctuating and changing, it will act to change behavior. The relationship between environmental factor and personal one is considered as the mutual interaction between individual characteristics and environmental influences. People's desires, beliefs, emotional dispositions, and cognitive capacities are developed and regulated by social influences. Everyone has different reactions to their environments and they manifest themselves in what they say and do because each person has unique physical characteristics such as age, gender, race, height, weight, physical attraction, and also different roles and positions in society.

The personal factor represents the intervention which is divided into two parts: the operational process (including attitudes, emotions, and motivations) and the cognitive process (recognizing, remembering information, and learning process). The psychological process in an individual can only be indirectly measured in terms of psychological constructs such as attitudes, feelings, and motivations toward the product. Based on attitudes, motivations, and feelings towards the product, consumers will like or dislike the products. In addition, the psychological process is also a process of recognition, memory, and learning, so it will be associated with the cognitive process. This factor leads to the reactive element in product selection, purchase, use, or disposal through the consumer decision-making process.

In this study, the authors applied a model of social cognitive theory to students' perception of IFRS. Because students' perception is also in the group of personal factor, affecting environmental factor, thereby affecting the behaviors and intentions to attend the IFRS integrated training program.

#### *2.1.4. Cognitive-appraisal theory (CAT)*

The cognitive evaluation theory of emotions, which is also known as Appraisal theory or Lazarus theory, is a theory of cognitive psychology. Richard Lazarus was the first psychologist to combine cognition and emotion in the same theory to account for the phenomena and emotional changes people experience with their perception when they encounter a situation. From the perspective of psychology, cognition means thinking, seeking, and using knowledge; perception begins with focusing on something and

then defining what it is (Kalat, 2008). Perception is more or less related to thought processes, which include activities such as perceiving, expressing opinions or ideas, and remembering (Kellerman, 1980).

Lazarus (1982) argues that perception and emotion are naturally linked. The cognitive appraisal is how people interpret when they are in a certain situation at a certain time and this assessment determines their emotional response. Lazarus (1982, p. 1020) concludes that "cognitive evaluation is a necessary and sufficient condition for emotion". This conclusion refutes the previously published results of psychologists who had studies that confirmed the existence of emotional responses without the presence of cognitive systems. RS Lazarus (1991) assumes that when a situation/event occurs, people evaluate that situation/event (cognitive evaluation process). These assessments will positively/negatively affect different emotional states such as happiness, joy, hope or anger, frustration, and anxiety. The emotion will influence the intention and behavior of the person afterward. These different emotional responses lead to different intentions and behaviors.

The cognitive - appraisal theory of Richard Lazarus is further mentioned by the authors in the research paper to explain the impact of emotional factors on people's behavior and intentions. This aims at studying the intention to study the IFRS integrated training program.

### 2.2. Proposing a research model students' perception of IFRS in economic training programs at higher education in Hanoi

After synthesizing and inheriting from the research papers mentioned in the research overview, the group has synthesized and proposed a research model that demonstrates students' awareness of IFRS in the chapter. The economic training program at universities in Hanoi is shown below:

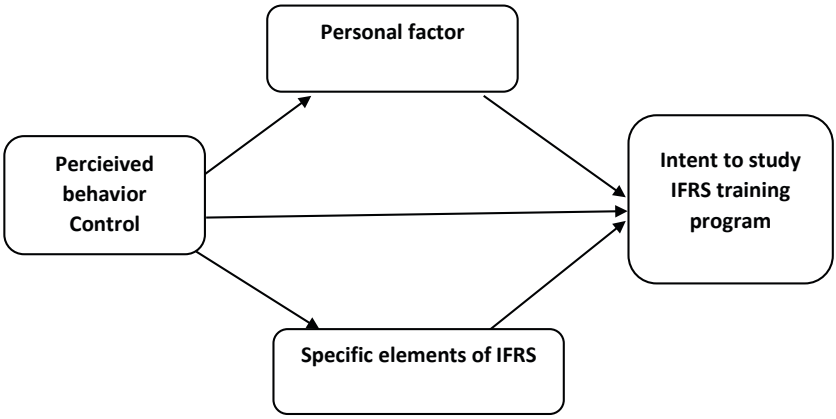


**Figure 3. Research Model**

*Source: Author's compilation based on previous studies and adjustments.*

## Research hypothesis

### Cognitive behavioral control

According to Bandura (1986), self-perception affects people's choices and beliefs about themselves, including the goals they choose to pursue and the efforts they put in. They are willing to face with setbacks and failures. Therefore, students' self-perception about IFRS greatly affects their factors, such as their attitude towards self-development or motivation for self-development.

Bandura (1986) argues that people's desires, beliefs, emotional dispositions, and cognitive capacities are developed and regulated by social influences, which are specific factors for IFRS such as difficulty, complexity, etc.

United (2014) emphasises students' awareness of learning is the students' understanding of issues related to learning activities, including: school-related issues (vision, mission, core values, training programs, etc.) and individual learning outcomes (learning motivation, learning methods, etc.). Accordingly, students' perception of behavioral control about the importance of IFRS makes them increases their intention to attend an IFRS integrated training program.

Therefore, according to the group's understanding, students' perception has a positive influence on personal factors, social factors, and their intention to study the training programs.

H1: "Perceived behavioral control has a positive effect on attitude".

H2: "Perceived behavioral control has a positive impact on motivation for personal development".

H3: "Perceived behavioral control has a positive effect on pressure from understanding IFRS".

H4: "Perceived behavioral control has a positive effect on the complexity of IFRS learning".

H5: "Perceived behavioral control has a positive effect on the intention to attend IFRS integrated training program".

**Personal factors**

Personal factors are understood as factors related to each person's characteristics such as gender, age, interests, foreign language ability, each person's strengths, personal perception, etc. Personal factors in this study include attitudes and motivations for self-development.

The attitudes mentioned here are specifically the students' positive or negative feelings about attending the IFRS integrated training program. According to Ajzen (1991), attitude is the most important factor in the TPB model and this is also the central factor in TAM's model (Davis, 1986) and TPB theory (Taylor & Todd, 1995). Besides, studies on IFRS that apply to TPB such as the researches of Djatej et al. (2012) or Simegn (2015) also show that if respondents are aware of the importance of IFRS, their positivity may influence their intention to attend the course.

Personal motivation is an important factor affecting the behavior in choosing a training program. This is the internal factor that encourages, determines, and sustains behavior (Awan, Noureen, & Naz, 2011). Zimmerman (1998) suggests that self-motivation is required in individual initiative, resourcefulness, perseverance, and it is a sense of responsibility to become a self-directed learner to improve oneself.

Therefore, in this study, the authors propose the hypothesis:

H6: "Attitude mediates the relationship between perceived behavioral control and intention to attend IFRS integrated training program".

H7: "Personal development motivation mediates the relationship between perceived behavioral control and intention to attend IFRS integrated training program".

**Specific elements of IFRS**

IFRS-specific factors in this study included pressure from understanding IFRS and the complexity of learning IFRS.

Pressure from understanding IFRS acts as an external factor and is affected by respondents' perception of social pressure, thereby affecting learners' intention to study.

Regarding the complexity of learning IFRS, the group wants to refer to the perception of difficulty/complexity when students acquire knowledge about IFRS. According to Taylor & Todd (1995), perceived difficulty has an impact on the intention or behavior of the respondents. Related to the study, student's perception of the difficulty of IFRS can also have an impact on their intention to attend an IFRS-integrated training program.

Therefore, in this study, the authors propose the hypothesis:

H8: "Pressure from understanding IFRS mediates the relationship between perceived behavioral control and intention to attend an IFRS integrated training program".

H9: "Pressure from understanding IFRS mediates the relationship between perceived behavioral control and intention to attend an IFRS integrated training program".

## 3. RESEARCH METHOD

**Qualitative research methods**

The qualitative research method is carried out through the study of documents, books, and related topics on concepts as well as issues related to the research topic. The study then built a theoretical basis, research model, and observed variables.

**Quantitative research methods**

The research team conducted a quantitative survey by sending a survey via email and the internet to students due to the complicated Covid-19

epidemic situation. The number of valid questionnaires is 337 and analysis is done through the software SPSS 20.0 and AMOS to consider the independent and dependent variables to study the perception of students controlling the intention to attend the training program IFRS integration.

**Research sample**

- Sampling method: This paper uses the convenience non-probability sampling method. This is a non-random sampling technique where the sample elements are chosen largely because they are easily accessible to researchers. Anyone who is accessible to the researcher and who is willing to participate in the survey is satisfied to be the sample element. Because of the convenience of this sampling method, it also allows the researcher to obtain a large number of elements in a short time. Specifically, a Google form board has been designed and sent to online classes in the second semester of the academic year 2021-2022 at universities in the economic sector in Hanoi. This sampling method is appropriate during the context of the Covid-19 pandemic. The convenience sampling combined with the author's control group for the demographic characteristics of the students could ensure that the research sample is representative.

- Sample size: Several methods of determining sample size have been proposed by researchers. According to Hair et al. (1998), the minimum sample size must be from 100 - 150, and to conduct EFA factor analysis, the sample size proportional to the observed variable is 5:1. Nguyen Dinh Tho (2011, quoted in Bollen, 1989) states that the minimum sample size is five samples for a parameter to be estimated, ie $N \geq 5*n$, where n is the observed variable. The minimum sample size in this study was 120 (5*24), however, the larger the sample size required, the higher the reliability of the study (reducing sampling errors). From the above arguments, the research paper issued 337 questionnaires.

## 4. RESEARCH RESULTS AND DISCUSSION

### 4.1. Descriptive statistics of the study sample

The results of the descriptive statistics survey of students' perception of IFRS in training programs at universities in the economic sector in Hanoi are shown as follows:

Regarding gender, the results from 337 survey questionnaires showed that a large number of students participating in the survey were female and accounted for 64.53%, while male students accounted for 35.47%.

Regarding the survey of students in their third year of study, the results showed that most of the survey respondents were third-year students, accounting for 46.4%. This is also understandable because, from year 3 onwards, students begin to delve into their majors and gain access to financial reporting standards.

Regarding the survey of participating schools, the authors sent a survey to students of 16 economic universities in Hanoi. In which, the largest number of votes were collected from students of Thuong Mai University (accounting for 40.5%), National Economics University (accounted for 11.9%), Foreign Trade University (accounted for 14.9%), and Academy of Finance (accounted for 14.9%), Banking Academy (accounted for 11.3%) and some other colleges accounted for a negligible number of votes.

Regarding the descriptive statistics of the area, the results show that the percentage of votes received the most from the second rural region (45.7%), whereas the least from the third region accounted for only 8.9%.

With regard to the statistics on the high school exam scores, the results show that the national high school exam scores are generally high with the percentage of groups over 22 points or more accounting for more than 50% of the students responding to the survey, followed by the spectrum of scores from 20 to 22 points with 13.38% and the lowest group from 18 to 20 points accounted for only 1.49%.

Regarding the question "Are you currently a member of any accounting clubs?" the results showed that more than half of the surveyed students did not join any accounting clubs, 34.5% of students are members of the accounting faculty club, while other schools' accounting faculty members are only 10.1%. This shows that students have not fully taken the initiative in learning and absorbing knowledge from the school's clubs.

Regarding the question "Do you currently have a part-time job at an accounting company?", most students have not worked part-time. This is understandable because most of the surveyed students are only in 2nd or

3rd year and are still studying, so they do not have enough knowledge and time to work part-time.

### 4.2. Estimated model analysis results

#### *4.2.1. Result of confirmatory factor analysis CFA*

The purpose of CFA analysis is to evaluate the reliability and validity of the scale to confirm the factors used in the model. A scale is considered good when it meets the following criteria: heterogeneity, validity, and reliability.

**Heterogeneity**

According to Vương and Giao (2020), the heterogeneity is achieved when the questions have an acceptable load factor for the respective latent structure to ensure the heterogeneity of the measurement model. Any questions with low factor loading will be deleted. For a question that has been inherited from previous studies, the load factor for a question should be 0.6 or higher. Looking at the table below, all observed variables have coefficients higher than 0.6. Thus, the underlying concepts are guaranteed to be heterogeneous.

**Table 1. Factor Loading, Composite Reliability and Cronbach's Alpha**

| Observed variables | Observable variable symbol | Normalized regression coefficient | Variance quoted AVE | Composite reliability CR |
|---|---|---|---|---|
| Personal development engine | DC1 | .840 | 0.744 | 0.935 |
| | DC4 | .911 | | |
| | DC2 | .885 | | |
| | DC3 | .843 | | |
| | DC5 | .830 | | |
| The complexity of IFRS | SPT3 | .878 | 0.766 | 0.929 |
| | SPT4 | .868 | | |
| | SPT1 | .867 | | |
| | SPT2 | .887 | | |
| Attitude | TD3 | .888 | 0.729 | 0.915 |
| | TD1 | .932 | | |
| | TD2 | .838 | | |
| | TD4 | .746 | | |

| | | | | |
|---|---|---|---|---|
| Cognitive behavioral control | NT2 | .745 | 0.631 | 0.871 |
| | NT1 | .687 | | |
| | NT3 | .836 | | |
| | NT4 | .893 | | |
| Intent to study IFRS | CTĐT1 | .836 | 0.643 | 0.843 |
| | CTĐT2 | .856 | | |
| | CTĐT3 | .705 | | |

*Source: Processed from the author's data.*

## Validity

Validity is the instrument's ability to measure exactly what it is for a structure. There are 3 types of values needed for each measurement model, which are:

+ Convergent value: This value is achieved when all questions in the measurement model are statistically significant. Calculation of the convergent value can also be confirmed by calculating the average extracted variance AVE for each structure which must be greater than or equal to 0.5. Looking at Table 1 above, it is easy to see that the AVE values of the 5 concepts are all higher than 0.5 (the lowest is 0.631). Thus, the scales of the latent concepts are satisfactory in terms of convergent value.

+ Structure value: This value is achieved when the fitness index for a structure reaches the required level as follows:

**Table 2. Statistics of Goodness of Fit of the Measurement Model**

| | Model fit index | Recommended value | Actual value of the model |
|---|---|---|---|
| Absolute fit index | RMSEA | < 0.08 | 0.041 |
| | GFI | > 0.90 | 0.935 |
| Increased suitability | AGFI | > 0.90 | 0.911 |
| | CFI | > 0.90 | 0.984 |
| | TLI | > 0.90 | 0.981 |
| | NFI | > 0.90 | 0.958 |
| Minimalist relevancy | Chi-square/df | < 5 | 1.559 |

*Source: Li, Humphreys, Yeung, & Cheng, 2007, Albright & Park, 2009.*

The metrics of this Measurement Model are consistent with market data, and there is no correlation between measurement errors so it achieves structural validity.

+ Discriminant value: The easiest way is that the correlation coefficient between the component concepts of a large concept must be <0.85 to achieve the discriminant value. The results of Table 3 shows that the value of the correlation coefficient between the research concepts of the model ranges from the lowest 0.547 to the highest 0.800, all lower than 0.85. This confirms that research concepts have acquired discriminatory value

**Table 3. Correlation Coefficient**

| | | | Estimate |
|---|---|---|---|
| DC | <--> | SPT | .615 |
| DC | <--> | TD | .549 |
| DC | <--> | NT | .627 |
| SPT | <--> | TD | .735 |
| SPT | <--> | NT | .609 |
| TD | <--> | NT | .586 |
| DC | <--> | CTĐT | .547 |
| SPT | <--> | CTĐT | .697 |
| TD | <--> | CTĐT | .800 |
| NT | <--> | CTĐT | .648 |

*Source: Processed from the author's data.*

#### *4.2.2. Estimation results of the linear structural equation model*

The purpose of the analysis of the linear structural model is to test the research hypotheses, and at the same time to answer the initial research questions and objectives. The dependent variable in this model is the intention to attend the IFRS applied for a training program.

The results of the SEM model presented to show that the model has a Chi-square statistical value of 446,463 with P-value = 0.000 < 0.005. However, according to Hulland and Bentler (1999), if the model receives the SRMR value less than 0.1, it is considered to be in agreement with the actual data. Thus, the research model is concluded to be compatible with the data.

Thus, the factors Cognitive behavioral control, attitude, and complexity of IFRS all have a very positive and statistically significant influence on the intention to attend the IFRS training program (the P-values are all very small

- all are less than 0.05). Only the relationship between personal development motivation and intention to attend IFRS integrated training program is not statistically significant. At the same time, the coefficients of regression weight estimation are all positive → so 6 out of 7 hypotheses are accepted.

+ The Cognitive behavioral control has a positive and significant impact on motivation for personal development (P-value is 0.000 < 0.05) when the individual's awareness increases by 1 unit. Keeping all other factors constant, this will increase an individual's attitude by 0.702 units

+ The Cognitive behavioral control has a positive and significant impact on an individual's attitude (P-value is 0.000 < 0.05), when the individual's awareness increases by 1 unit. If other factors remain constant, it will increase the individual's attitude by 0.741 units

+ The Cognitive behavioral control has a positive and significant impact on the perceived complexity of IFRS learning (P-value is 0.000 < 0.05) when the individual's awareness increases 1 unit. When other things constant, this increases the individual's perception of the complexity of learning IFRS by 0.86 units.

+ The Cognitive behavioral control has a positive and significant impact on the intention to attend the IFRS e-learning program (P-value is 0.010 < 0.05), when the individual's awareness increases by 1 unit. Keeping other factors constant, it will increase an individual's intention to attend an IFRS integrated training program by 0.253 units.

+ Attitude and complexity of IFRS also have a positive and statistically significant impact on the intention to attend the IFRS curriculum (P-values are both 0.000 and 0.004 < 0.05, respectively). When Attitude and complexity increase by 1 unit during other factors unchanged, it will increase an individual's intention to attend a training program by 0.522 and 0.144 units, respectively.

**Table 4. Normalized Regression Weights of Structural Models**

| | | | Estimate |
|---|---|---|---|
| DC | ← | NT | .666 |
| TD | ← | NT | .651 |
| SPT | ← | NT | .670 |
| CTĐT | ← | NT | .232 |

| | | | Estimate |
|---|---|---|---|
| CTĐT | ← | DC | .011 |
| CTĐT | ← | TD | .545 |
| CTĐT | ← | SPT | .170 |

*Source: Processed from the author's data.*

The results of the standardized regression weight table show that the attitudinal factor has the strongest influence on the intention to attend the IFRS curriculum with an estimated coefficient of 0.545, followed by the cognitive-behavioral control factor with a coefficient estimated at 0.232. Finally, the complexity factor of IFRS has the lowest influence with an estimated coefficient of 0.170.

**Table 5. Determination Coefficient of the Model**

| | Estimate |
|---|---|
| TD | .424 |
| SPT | .449 |
| DC | .443 |
| CTĐT | .687 |

*Source: Processed from the author's data.*

Table 5 shows that 3 motivational factors for self-development, individual's attitude, and perception of the complexity of IFRS explain up to 68.7% variation of intention to study IFRS curriculum. This confirmed that the factors selected by the research team are very good when the proposed model fits nearly 70% (greater than 50% is considered a good model). The remaining 31.3% is due to other factors that have not been detected to include in the model. Besides, the cognitive behavioral control factor was also explained quite well and relatively high the attitude, perceived complexity of IFRS, and motivation for personal development with the appropriate rate of 42.4%, 44.9% and 44.3% respectively.

Finally, the results of normalized residual covariance are checked as a criterion to check the goodness of fit of the structural model. A model is considered correct if most of the absolute values of the normalized residuals are < 3. The results show that the absolute values of all cells are satisfied < 5. This shows that the sentences in the question explained their respective latent variables quite well. Therefore, the model has a good fit.

## 5. SOME SUGGESTED IMPLICATIONS

Based on the analysis results, the research team proposes some recommendations based on the strong influencing factors in the model in order to improve the effectiveness of those factors in the intention to attend the IFRS integrated training program. To contribute to the development of this training program, the authors would like to propose some managerial implications and recommendations as follows:

Firstly, the study shows that the attitudinal factor has the strongest influence on the intention to attend the IFRS integrated training program.

Based on the study of attitudes, the authors found that students with a positive attitude towards the IFRS integrated training program will have a higher intention to attend the IFRS integrated training program. In order to improve students' attitudes towards studying IFRS in the training program, the Faculty of Science and the universities of the economic sector need to promote measures to attract students and help students understand the program better. What are the benefits of the IFRS training program, and what are the career opportunities for students through the organization of exchange and career orientation session. In addition, economic universities can supplement communication through the press, mass media, and especially social networking sites about information related to the IFRS training program to help students have a more positive attitude towards the IFRS integrated training program.

Furthermore, the cognitive behavioral control factor is the second most influential factor in the intention to attend the IFRS integrated training program. Students understand that learning IFRS takes a lot of time, but that is not a factor that hinders their intention to attend an IFRS integrated training program because the great benefits of learning IFRS such as opportunities career working for foreign enterprises are wide open, students have high income after graduation. However, in reality, through surveying students about the level of IFRS understanding, many students still have not had the opportunity to learn in-depth about IFRS. Therefore, in order to stimulate the intention to study the IFRS training program in the future, universities should equip more documents, and train knowledgeable and good teaching staff about IFRS, etc. Currently, many prestigious universities in the field of economics have been implementing advanced, high-quality

associate degree programs in accounting and auditing on IFRS integrated training programs with major universities in the world and organizations such as ACCA, ICAEW. Therefore, towards the expansion of the industry, international linkages with organizations and universities in countries with developed education, teaching, and certification of ACCA and CPA, CFAB, etc. should be also taken into consideration. In order to improve students' perception of accounting and auditing majors, universities may consider increasing international student exchange activities, thereby motivating students and igniting interest in the study.

Thirdly, the study shows that the complexity factor has a negative effect on the intention to attend the IFRS integrated training program. In the current period, when Vietnam joins the CPTPP and the AEC, the application of IFRS is extremely necessary. The first implementation of IFRS will certainly face many difficulties, in which the integration of IFRS is an urgent matter of concern. Research results show that the perception of the complexity of learning IFRS has a great influence on the intention to attend the IFRS integrated training program. The complexity in the learning of IFRS can be mentioned as IFRS has a lot of complicated knowledge, and there are many differences compared to current VAS, etc. To help students follow the IFRS training program, the research team makes the following recommendations: Universities need to conduct a review of their accounting training programs and supplement IFRS training content, according to the different ways. With the number of hours in class unchanged, but the amount of knowledge when training under IFRS is quite large, it is required to promote students' self-research ability. Universities need to apply a learner-centered approach to develop students' independent and creative thinking.

Besides, building and developing IFRS teaching staff, through specialized IFRS training and other necessary skills to master active teaching methods in IFRS training, create favorable conditions for teaching and learning, encourage lecturers to participate in training courses on IFRS from leading domestic and foreign experts; encourage tutors to participate in IFRS seminars and participate in IFRS research projects; require lecturers to participate in practice and learn the practical experience of accounting under IFRS at enterprises that have applied IFRS, etc.

Universities need to be aware that current IFRS training is not only a choice but a direction to take. It is necessary to invest costs to develop a system of IFRS learning materials, including equipping more books, foreign textbooks, and ebooks as reference materials for students.

## 6. CONCLUSION

In order to prepare a reliable resource for the developing economy, education plays an important role in developing students' abilities from awareness to knowledge and professional capacity about IFRS. Higher education in accounting in particular has a strategic role in enhancing the capabilities and professionalism of accounting students so that they can produce future accountants. Therefore, the integration of IFRS in the curricula is necessary to produce graduates who are able to prepare and audit financial statements according to international standards.

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# THE EFFECT OF GREEN SUPPLY CHAIN MANAGEMENT ON THE SMES' PERFORMANCE: A SURVEY OF THE LITERATURE

**Le Thanh Binh**[1]

**Abstract:** *A high level of global competition has pushed companies to pay attention to cost-cutting, green development, and environmental sustainability (Krstíc et al., 2020). Various firms have investigated environmentally friendly supply chain operations while focusing on environmental problems (Borazon et al., 2022). Firms develop an approach to implementing environmental factors to decrease environmental effects while increasing competitive advantage to fulfill stakeholder demands. Nowadays, people are increasingly interested in sustainable goods and consume them because they believe those items are genuinely beneficial for the planet (Biondi et al., 2002; cited by Aldaas et al., 2022). The study of organizational sustainability and sustainable asset utilization tends to focus on large enterprises rather than small and medium-sized firms. Small and medium-sized enterprises (SMEs) account for a considerable proportion of the environmental consequences of economic activity, although they receive little attention in academic study (Anwar et al., 2020). Thus, this study aims to summarize the previous results about the effects of green supply chain management deployment on business performance and other related parameters. In short, its findings provide novel insights to SMEs that have used GSCM methods to improve production and operational performance.*

***Keywords****: Business performance, green supply chain management, SMEs, sustainable.*

## 1. INTRODUCTION

Consumers are highly conscious of all operational and production procedures that harm the environment. Scholars are passionate about discovering the impact of incorporating green practices into firms' operations. Studies have improved supply chain management (SCM) theory to make it more efficient and ecologically conscientious (Touboulic & Walker, 2015). SCM has been destructive to our environment over the last 40 years since it requires more strategic development to harmonize business. In order to meet end-user needs, it is critical to combine core

[1] Banking Faculty, Banking Academy of Vietnam, Vietnam. Email: binhlethanh@hvnh.edu.vn

business with green policies (Green et al., 2012; cited by Jassim et al., 2020). This requirement necessitates green initiatives such as green purchasing, green production, green design, green packaging, and green marketing (Islam et al., 2017). Each green process is distinct, with various methods of implementation to enhance operational efficiency. Green purchasing is defined as the collaboration of companies and suppliers to create and develop sustainable products or services (Zhu et al., 2008). Green manufacturing is associated with production systems and the management of environmental waste flows. Green packaging refers to recycling and reusing materials to save resources and reduce waste. Green design is described as a production method that decreases resource and energy usage (Green et al., 2012). Green marketing is the promotion of a product based on its environmental aspects and is separated into four categories: market analysis, coordinated communication techniques, distributing, and pricing (Zampese et al., 2016; cited by Jassim et al., 2020).

Small and medium enterprises are the engines of economic growth, but they also are the causes of a considerable amount of the emissions generated by supply chain activities (Lewis et al., 2015; cited by Silva et al., 2021). SMEs are regarded to lag behind significant firms in implementing green business activities (Roxas, 2021). Several studies have linked the lack of implementation to a variety of reasons, including SMEs' low level of awareness of their pollution footprint, their inability to regard environmental performance as a competitive edge, and their inadequate ability to comprehend and respond to regulatory requirements (Ljungkvist & Andersén, 2021). Studies of green supply chain management (GSCM) approaches reveal a low degree of green practices in SMEs (Zhu et al., 2008) due to several reasons, such as the absence of SMEs' workforce and financial stability to commit to sustainability practices (Pinto, 2020), a lack of understanding about the economic benefits of environmental programs (Brammer et al., 2012), and a lack of bargaining power with suppliers (Zhu et al., 2008).

The study sheds light on how SMEs cope with ecological practices and their impact on performance. The goal is to raise awareness among SMEs about the relevance of GSCM practices in optimizing performance by improving the existing environmentally-friendly system, which strives

to safeguard the environment and resources while also increasing the firm's performance level.

## 2. BACKGROUND

Due to increased competition, and regulatory and social demands, enterprises must achieve the right balance between economic and environmental performance. Under mounting pressures, businesses must execute a strategic plan to limit the environmental effect of their products and services. To apply legislative standards to the ecosystem, firms must successfully define and reevaluate their business objective (Perotti et al., 2012; cited by Jassim et al., 2020). When market demand is determined through GSCM strategies, the firm's performance will be enhanced. According to the analysts, integrating green initiatives into strategic planning would strengthen operational capabilities and gain a competitive edge (Khan & Qianli, 2017). Promoting green design techniques results in more efficient use of energy and water. Firms prioritize environmental concerns and adopt green practices in their procedures to remain competitive and efficient in the marketplace (Sarkar, 2012; cited by Jassim et al., 2020).

Supply networks are growing more complicated and fragmented (Touboulic & Walker, 2015). At the same time, public attention to environmental concerns was experiencing exponential growth, which supported the formation of GSCM in the late 1980s. The significance of GSCM comes from its ability to manage numerous green tasks connected to SCM. Although GSCM addresses various elements of corporate activities such as competitiveness, sustainability, and logistics, the primary challenges in GSCM are environmental, financial, and economic performance (Islam et al., 2017).

GSCM originated from the theory of green marketing, which focused on improving ecological responsibility and growth (Seuring & Gold, 2013; cited by Mafini & Muposhi, 2017). In its framework, GSCM is a multidimensional process recognized by terminology, including sustainable SCM, closed-loop supply chains, environmental SCM, reverse logistics, and green operation. GSCM expanded on classic value chain theory and ecologically sustainable activities, which include eco-design

and production, waste minimization, resource supervising, reprocessing, and recycling (Ahi & Searcy, 2015).

According to Ahi & Searcy (2015), GSCM was described as the collaboration of enterprises in the supply chain to deal with the integration of economic, environmental, and social operational decisions to boost the organizations' substantial growth. GSCM has developed from a compliance standpoint to an integrative inter-organizational approach to improve ecosystem balance and corporate success (Zhu et al., 2012). GSCM advantages include higher operational and interpersonal effectiveness, positive business reputation, environmental sustainability, and financial achievement (Lee et al., 2012; cited by Mafini & Muposhi, 2017). According to Zhu et al. (2008), GSCM improves system performance by lowering costs, improving existing products, and shortening manufacturing lead times. GSCM strengthens supply chain linkages by fostering trust, practical discussions, and collaboration among value chain participants (Zacharia et al., 2009; cited by Mafini & Muposhi, 2017). Furthermore, Urban and Naidoo (2012) suggested that the primary SMEs' benefits of GSCM adoption are lower manufacturing costs, faster order cycles and lead times, market share expansion, enhanced product quality, and positive company identity. As a result, GSCM has grown into a critical practice that benefits enterprises in various ways.

## 3. GREEN SUPPLY CHAIN MANAGEMENT PRACTICES

According to research on the environmental element of SCM, environmental considerations have been included in supply chain operations and resources, such as sourcing, procurement strategy, supplier evaluation, product and service development, and logistics (Sarkis et al., 2011). Meanwhile, to decrease the detrimental effect, there is considerable pressure for a fresher and healthier ecosystem (Fraj et al., 2011; cited by Jassim et al., 2020). The European Union (EU), the United States, and other advanced economies had implemented strict environmental legislation in the second half of the 2000s. As a result, firms should engage in green business, including using GSCM to reduce the environmental effect of manufacturing and increase company competitiveness (Lee, 2009; cited by Kim et al, 2021).

GSCM generally means reducing the environmental effect of a company's supply chain. It is a revolutionary technique for organizations to reduce environmental consequences and improve ecological health to achieve higher profitability and market growth goals. Furthermore, GSCM integrates environmental considerations into typical closed-loop SCM (Lau, 2011, cited by Kim et al, 2021). It contributes to the incorporation of environmental philosophy into management and the achievement of long-term growth for enterprises (Mangla et al., 2014). Likewise, incorporating sustainable processes and functions for resource reform necessitates the appropriate decision-making mechanism. Most notably, firms started to investigate environmental concerns across the whole supply chain to improve their environmental performance (Lee, 2009; cited by Kim et al, 2021).

Numerous publications have tried to explore what GSCM comprises. According to Mafini & Muposhi (2017), GSCM practices encompass green logistics, green production, and green procurement. GSCM practices were classified into four aspects by Zhu and Sarkis (2004), including internal environmental control, external GSCM procedures, investment recovery, and eco-design. Afterward, their subsequent research classified the external GSCM practice category into two groups: green purchasing and customer collaboration. Green purchasing is concerned with environmental management in the firm's supply chain. In contrast, customer collaboration is associated with cooperation between vendors and purchasing businesses on eco-friendly product planning, manufacture, and packaging. They suggested that their analysis is a "self-diagnostic tool" for identifying areas for development and a suitable supervision approach for preserving the manufacturer's GSCM processes' quality. Internal environmental monitoring is the most frequently utilized set of GSCM operations by industrial companies (Zhu et al, 2008). Furthermore, the top manager's responsibility for GSCM and environment-friendly procedures are the two most identifiable aspects of internal environmental management, and they are increasingly being adopted in organizations. Aich & Tripathy (2014) discovered that (1) green logistics, (2) green design, and (3) green procurement are elements that relate short-term sustainability measures with business performance.

Adopting GSCM methods, in practice, may alters the strategic aspects of the firms, as shown in Table 1.

**Table 1. The Implications of Green Supply Chain Management on Business Functions**

| Green Supply Chain Management Practice | Impact |
|---|---|
| Green procurement | Identify suppliers who use green products and are devoted to environmental conservation to lower carbon footprints. |
| | Utilize environmental requirements on input resources to help create a business image, lower emissions, and save expenses. |
| | Prioritize green materials that are non-toxic, non-radioactive, reusable, superior efficiency, and decompose quickly. |
| | Establish applicable environmental criteria in raw material procurement for suppliers to recognize and comply with their processes, as well as enable firms to supervise their suppliers' operations. |
| | Integrate control systems across firms and suppliers to promote environmentally friendly methods, product innovation, and greener processes. |
| Green design | Reduce adverse environmental consequences of products during manufacture, transport, and consumption. |
| | Develop products that utilize less energy and allow for more effective and ecologically friendly recycling and reuse of resources. |
| Green manufacturing or operations function | Prioritize the firm's profitability through ecologically sustainable activities. |
| | Minimize ecological impacts with the production of eco-friendly products. |
| | Reduce input costs by taking regulations, energy consumption, and disposal into account. |
| | Reduce emissions by using environmentally friendly products, techniques, and processes. |
| | Apply lean production to combine environmental objectives into economic outputs. |
| | Production processes, equipment, and technologies can satisfy environmental and consumer requirements. |
| | Research and development can develop innovative sustainable techniques of utilizing raw materials and innovative solutions to minimize energy consumed. |
| Green marketing or sales function | Help to improve customer recognition of eco-friendly products. |
| | Fulfill the customer demand for green products in an environmentally friendly process to facilitate the company's reputation. |
| | Environmental concerns are given adequate consideration and will not be overshadowed by commercial objectives. |
| | Growing competitive leverage via environmental-oriented business activities. |
| | Green marketing communications may help to generate an ecologically responsible company identity. |

| | |
|---|---|
| Green packaging | Green packaging facilitates the establishment of sustainable packaging, thus protecting environmental quality.<br>Recycling raw materials is key to green packaging.<br>Green packaging takes into account material costs, transportation costs, performance, efficiency, compatibility, and environmental impact. |
| Green logistics | Reduce pollution arising from the transportation of goods.<br>Use green fuel and greener technologies. |
| General management or Human resources function | Internal training on green business strategies for staff.<br>Encourage environmental behavior by implementing a green workplace, business culture, and reward systems.<br>Employ ecological sustainability professionals to put sustainable green processes in place.<br>Develop company plans to manage environmental impacts that fulfill the stakeholders' requirements. |
| Finance or information technology function | Implement green accounting policies and employ an integrative eco-information system.<br>Make the shift to a digital administrative system by accommodating cutting-edge technologies.<br>Know and understand modern eco-friendly technology. |

*Sources: Zhow (2014);Molina-Besch & Pålsson (2015); Ramakrishnan (2015); Mafini & Muposhi (2017); Kim et al (2021).*

## 4. GREEN SUPPLY CHAIN MANAGEMENT AND SMES' PERFORMANCE

### *The pressure on SMEs to apply the green supply chain management*

NGOs, authorities, clients, and other stakeholders are putting pressure on firms to implement an environmental sustainability approach in the current market environment (Amankwah-Amoah et al., 2019, cited by Silva et al., 2021). Large enterprises seem to be under tremendous pressure regarding society's requirements for ecologically sustainable goods and operations. Schmidt et al. (2017) used BP (a global oil and gas firm) and Waitrose & Partner (a food retailer) as illustrations of enormous corporations that operated green supply chain efforts in response to stakeholder concerns. For SMEs, this pressure causes having to comply with complicated and expensive standards and laws, which may weaken their competitiveness. SMEs have several obstacles, including limited financial and human resources, insufficient creativeness, and low operational know-how (Abbasi & Nilsson, 2012; cited by Mafini & Muposhi, 2017). According to Chin et

al. (2012), a large number of SMEs are financially challenged and lack sufficient frameworks to perform GSCM objectives. Preuss (2011), for example, indicated that some SMEs believe that a structured organizational structure hinders decision-making flexibility. Moreover, adopting GSCM necessitates new technology capacities in sustainable innovation and managerial competence in supplier evaluation and negotiating skills, which are intrinsically rare in most SMEs (Mohanty & Prakash, 2014). Furthermore, staff training and development must instill the green business culture required to implement and sustain GSCM practices (Diabat & Govindan, 2011; cited by Mafini & Muposhi, 2017). According to Zhu et al. (2008), organizational scale influences the firm's resource allocation and ability to implement environmental policies within the supply chain framework. SMEs have an inadequate workforce and financial stability for efforts (such as establishing and qualifying suppliers) and negotiating leverage in supplier agreements. They also confront less pressure to enhance environmental awareness, lack a network infrastructure that promotes environmental practices, and low customer demand for environmental changes. These reasons illustrate why certain SMEs, particularly in emerging nations, are reluctant about GSCM (Preuss, 2011). Leonidou et al. (2017) suggested that SMEs seem to hesitate toward environmental problems due to various factors, such as the significant uncertainty when applying entirely new approaches to business operations and significant capital costs in sustainability practices with more extended payback periods. Besides, the difficulties in coordinating operations across the supply chain, the lack of technical skills in adopting green technology, and the absence of an organizational climate that encourages environmental efforts are also several reasons preventing SMEs from accessing GSCM.

Despite these obstacles, GSCM appears to be a promising approach in the long run due to cost reductions and product innovation (Mohanty & Prakash, 2014). On the other hand, adopting GSCM methods by smaller enterprises may utilize the skills and resources of their more significant supply chain partners.

***Green supply chain management and operational performance***

Enterprises are dealing with rapidly changing market conditions, and the effectiveness of SMEs is becoming increasingly dependent on

the early identification of market demands and the assessment of new market segments (Gurahoo & Salisbury, 2018). In a community that relies significantly on global commercial transactions, sustainability has become a vital issue for businesses. SMEs are considered crucial factors of global value chains that must fulfill the environmental criteria of their multinational clients (Jorgensen & Knudsen, 2006; cited by Kim et al, 2021). Large multinational enterprises tend to improve their environmental performance when governments of developed economies enact increasingly stringent environmental rules to meet the demands of various social organizations. Similarly, SMEs should try to reduce the environmental effect of their activities (Mathiyazhagan et al., 2014). The increased awareness about environmental concerns has prompted manufacturers to actively examine incorporating green procurement techniques into their supply chain procedures. In this context, SCM is frequently highlighted as a critical component of a company's competitive advantage (Côté et al., 2008, cited by Kim et al, 2021).

The importance of SMEs in global SCM cannot be overstated, both economically and environmentally. Global supply networks may also verify that suppliers are following environmental rules. If purchasing corporations specify environmental requirements during the procurement process, SMEs must also produce goods that match these parameters to compete (De et al., 2020). Furthermore, in order to effectively manage its green supply chain, the focal business must supervise the activities of its supply chain members from many countries, and the SMEs in the supply chain may face difficulty from this collaborative effort (Liu et al., 2018). Nevertheless, the supply chain's greening should be considered a challenge and an opportunity for small local companies in their national and worldwide markets (Frey et al., 2013; cited by Kim et al, 2021).

The concept of GSCM has garnered considerable attention from academics and business people because of its close association with environmental advantages (Zhu et al., 2013). The study of the correlation between GSCM implementation and company success has been more prevalent in both scientific theory development and firms' manufacturing (Linton et al., cited by Kim et al, 2021). The majority of research has found a positive association between the implementation of GSCM

techniques and organizational performance. This association, however, is contradicted by several other studies that underline the fact that the adoption of GSCM methods might raise the company's costs, which has a detrimental influence on the organization's success in the market. Several moderating variables have been adopted by various research in order to evaluate the relationship between GSCM practices and organizational success (Mughal, 2019). According to Carnevale et al. (1990), GSCM procedures can have a negative impact on the company's performance. As a result, businesses must emphasize sustainable practices that may support improving and enhancing the advantages mentioned in SCM.

In contrast, implementing GSCM procedures can boost customer engagement with the brand because consumer knowledge of environmental sustainability has improved. According to Forbes et al., 2009 (cited by Mughal, 2019), customers' desire for ecological production has grown as their understanding of environmental sustainability has improved since customers can only support the mission of firms' social responsibility by purchasing items made using sustainable techniques. This necessitates the adoption of GSCM methods by enterprises in order to reach more market segments. Kuei et al. (2015) revealed that firms' environmental management capabilities are favorably related to their growth in the economy. According to Madsen and Ulhi (2003), once companies have to pay attention to environmental issues, they are forced to sacrifice resources for other strategic issues, such as their long-term goals and product positioning. As a result, an increase in production costs and a weakening of the company's competitiveness may occur. However, they proposed that in the long run, the outcomes of a proactive pollutant prevention scheme may assist enterprises in saving money on manufacturing and increase product value and brand image, implying that the company can become more competitive in the market (Porter et al., 1995, cited by Kim et al, 2021). A study by Seman et al. (2019) suggested that the application of GSCM would help enterprises improve their green innovation capacity, increase green procurement, and improve their market position. Therefore, these improvements will have a positive impact on the firm's performance. According to Feng et al. (2018), both internal and external GSCM techniques strengthen firms' effectiveness, including environmental and operational efficiencies, which leads to enhanced financial performance. Chavez et al.

(2016) found that operational performance, including quality and delivery, is essential in achieving greater loyalty of customers, adaptability, and cost reduction. Li et al. (2019) supposed that successful green supply chain strategies improved a firm's profitability and public image.

GSCM has been proven in analyses to boost performance in terms of product features, adaptability, pricing, and distribution. Zailani et al., 2012 (cited by Kim et al., 2021) examined that the implementation of GSCM practices (e.g., environmental buying) resulted in enhanced operational performance, particularly in terms of product quality and cost savings. Technologies that cut emissions in the manufacturing process, indicating a company with a robust internal environmental management system, can have long-term benefits. This is because they can consume fewer resources and energy, enhancing efficiency and productivity while lowering operating expenses. Empirical evidence shows that environmental integration improves an organization's bottom line (Zhu et al., 2012). Environmental integration in the supply chain promotes financial performance through cooperative partnerships that foster trust, partnership, and commitment while lowering operational risks (Lai, 2009; cited by Mafini & Muposhi, 2017). However, as Zhu et al. (2012) imply, when operational synergies across supply chain members are better integrated, financial performance advantages are more visible in the long run than in the near term.

GSCM covers a variety of practices, including "green purchasing", "eco-design", and "investment recovery". Each practice includes a series of activities and behaviors that have an optimistic impact on company performance (Tsai et al., 2019; cited by Silva et al., 2021). Green purchasing is a purchasing strategy that ensures waste reduction by involving procurement activities such as supplier evaluation, procedures assessment, raw material acquisition, reuse, and recycling that comply with environmental safety regulations (Younis et al., 2016; cited by Rasit et al., 2019). The methodology is also acknowledged as compatible with the firm's sustainable performance goals (Hassan et al., 2016). Green purchasing strategies contribute significantly to business performance in the long term (Nderitu & Ngugi, 2014) since the purchasing process ensures that all acquired materials are suitable for the buying enterprises and satisfy environmental standards. Green purchasing techniques may promote

a positive "green" reputation in the market, contributing to maintaining corporate success (Zhu et al., 2008). This strategy entails several efforts that may be useful to the performance of businesses, such as developing a cleaner technology to attain sustainable performance (Muma et al., 2014, cited by Rasit et al., 2019). These practices are expected to significantly impact sustainable performance (Nderitu & Ngugi, 2014). Additionally, the traceability approach in GSCM has enabled firms to expand supplier integration while decreasing the threat of misleading suppliers (Suryanto et al., 2018, cited by Mughal, 2019). According to Galvez et al. (2018), traceability is a novel idea that guarantees the transparency of activities between the firm and its suppliers. Jabbour and de Sousa Jabbour (2016) have stated that traceability in the supply chain benefits businesses by boosting connections with customers and suppliers. Establishing and maintaining a solid collaborative partnership is significantly important from the suppliers' standpoint. They believe it is critical to satisfying purchasing firms' environmental interests while building environmentally friendly processes. According to Lamming & Hampson, 1996 (cited by Kim et al., 2021), this partnership would provide more excellent market prospects for suppliers to integrate their organizations into the customer's value chain. Furthermore, several studies show that a long-term, sustainable partnership between the firms and suppliers helps to enhance suppliers' performance (Prajogo et al., 2020).

Eco-design is a greener design that can reduce harmful consequences over the whole manufacturing process (Alshura & Awawdeh, 2016; cited by Rasit et al., 2019). Eco-design processes typically involve resource efficiency, minimization, or avoidance of the presence of hazardous materials in product development, reuse, and recycling (Asif et al., 2018). These practices facilitate the effective use of cleaner sources of energy in the manufacturing phase, which increases organizational productivity (Amemba, Nyaboke, Osoro, and Mburu, 2013; Asli, 2018; cited by Rasit et al., 2019). Zhu et al. (2008) demonstrate that eco-design schemes may assist companies by providing access to green markets, remanufacturing opportunities, recycling improvement, and a created eco-efficiency, which contribute to the organization's achievement in terms of sustainable performance. According to Büyüközkan & Çifçi (2012), implementing eco-design approaches may greatly enhance goods and processes. Green

design items have a beneficial influence on company performance since buyers are prepared to pay for environmentally friendly products (Lin et al., 2013). The introduction of sustainable product innovation through eco-design expands manufacturing capacities (Kleindorfer et al., 2005; cited by Jassim et al., 2020). A substantial number of businesses employ green design approaches in their systems to differentiate themselves from their rivals in the market (Lin et al., 2013).

When green packaging was adopted, the effectiveness of the packaging process may be better improved since it reduced materials and increased consumer loyalty (Tomar & Oza, 2015). Green packaging increases productivity and has a beneficial impact on business performance (Islam et al., 2017). Adopting the most significant resources in green manufacturing results in a long-term competitive edge and high-quality goods at the lowest possible price. Green manufacturing methods decrease waste, shorten production stages, generate more efficient items, and lower prices (Narasimhan & Schoenherr, 2012; cited by Jassim et al., 2020). It enhances the firm's image and reputation (Khan & Qianli, 2017). Suppliers' competitive advantages are influenced by green manufacturing (Subramanian & Gunasekaran, 2014; cited by Jassim et al., 2020). Green manufacturing significantly influences the adoption of GSCM techniques since it reduces hazardous manufacturing activities with less waste in the whole process and enhances efficiency and performance (Baines et al., 2012; cited by Jassim et al., 2020). As a result, green manufacturing practices boost organizational performance (Tomar & Oza, 2015; Khan & Qianli, 2017; Islam et al., 2017). A sustainable product has a low environmental effect across its whole life cycle. Green marketing is a new administrative phrase that can impact a company's success (Zampese et al., 2016). According to Fraj et al. (2011), green marketing methods improve business performance. Baker & Sinkula (2005) also discovered a clear link between green marketing and the success of new products, which increases brand recognition.

Reverse logistics refers to actions that take place after items have been received for further production or recycling. Product return, material reuse, recycling, trash disposal, and reproducing are examples of reverse logistics sub-practices (Muma, Nyaoga, Matwere & Nyambega, 2014;

cited by Rasit et al., 2019). Reverse logistics strategies need firms to collect discarded items for reuse, collect spent packaging from buyers, and return products to suppliers for remanufacturing (Bachev, 2018). This method produces outstanding outcomes since reverse logistics has been favorably associated with environmental performance (Chin et al., 2015; cited by Rasit et al., 2019). Reverse logistics is a component of GSCM innovation that has been shown to provide optimal service to the green supply chain (Rogers & Tibben-Lembke, 2001). Sustainable development in the supply chain could not be reached without effective management in reversing logistics procedures as part of a green logistics strategy to fulfill sustainability performance (Chin et al., 2015; cited by Rasit et al., 2019).

***Green supply chain management and employee job satisfaction***

In order to cope with environmental challenges, a firm's units should cooperate effectively (Younis et al., 2016). The dedication of top management is crucial in ensuring sustainable performance through GSCM procedures (Chin et al., 2015; cited by Rasit et al., 2019). Collaboration with external stakeholders, such as suppliers, is also critical in accomplishing corporate goals for increasing awareness of environmental issues (Paulraj, 2011; cited by Rasit et al., 2019). Cooperation practices serve as a collaborative tool to help GSCM practices be applied successfully to attain sustainable performance. Collaboration has been found as a good predictor of sustainability performance (Dubey et al., 2014) since environmental sustainability cannot be accomplished without the participation of its suppliers. As a result, it is critical for managers to motivate all parties engaged in the chain to guarantee that GSCM processes are adequately implemented to achieve long-term performance (Neramballi et al., 2017; cited by Rasit et al., 2019).

Empirical studies discovered that the support of top and middle executives is the crucial element for GSCM practice implementation because communicating effectively with upper-level management assists environmental specialists in identifying and resolving ecological threats (Zhu et al., 2008). Top management decisions have an innate impact on administrative staff. When an activity is predicted to result in a creative and unique shift in business culture, employees are more willing to

engage with a positive view of their job and the organization. Several previous research has found that one enterprise's social responsibility outcomes are increased employee enthusiasm and career satisfaction (Valentine et al., 2007, cited by Kim et al., 2021). Environmental auditing or relevant regulations for sustainable development, such as ISO 14001 qualification, might be considered green innovation that makes staff feel more secure (Zhu et al., 2008). Furthermore, according to Lee & Chang (2008), the creative spirit and group-oriented collaboration in the firm have a beneficial influence on work engagement. Innovative eco-friendly manufacturing procedures and working practices may provide employees with safety and happiness by reducing harmful amounts of toxic elements from the supply chain.

Quality of work-life denotes the enjoyment derived from working under existing employment conditions. Due to their voluntary engagement, pleased workers tend to work more effectively and provide greater productivity and economic performance, according to organizational psychology research (Melián-González et al., 2015; cited by Kim et al., 2021). Thus, employee work satisfaction is also an indicator of how satisfied workers are, which results in effective performance. In support of this argument, Harrison et al. (2006) indicated that employee behavior and organizational effectiveness are reflected by the job attitudes of staff, such as job satisfaction and work engagement. In addition, Patterson et al. (2004) proposed an indirect correlation between organizational environment and a firm's performance. They discovered that job satisfaction plays a mediating role between company environment and productivity by evaluating workers' opinions of the relationship between a firm's efficiency and organizational policies and practices.

***Green supply chain management practices and collaboration performance***

Businesses cannot consider their operations green until they properly integrate their environmental aims with the other members of their supply chains (Hollos et al., 2012; cited by Kim et al., 2021). Firms are facing rising institutional demands on their day-to-day SCM as tighter environmental rules on production and packaging have been extensively implemented in most global economies (Alziady & Alziady, 2019). The ever-changing

nature of environmental responsibility and regulations complicates eco-design even more. In this regard, focal businesses monitor suppliers' environmental performance for eco-friendly items and frequently give resources to help suppliers enhance their green operations and skills (Lee et al., 2021; cited by Kim et al., 2021).

The logic for environmental cooperation is that all stakeholders rely on one another; hence, they must collaborate for mutual benefit and achievement. Another basic foundation of partnerships is finding new solutions to corporate difficulties rather than compromise. In other words, the present success of a farm operation is determined by how well it is interconnected to other organizations that impact and are influenced by its actions. As a result, environmental collaborations have arisen as a vital activity for the long-term success of businesses (Mafini & Muposhi, 2017)

The long-term effects of GSCM in supply chain management depend on the dedication and collaboration of supply chain stakeholders such as suppliers, manufacturers, wholesalers, retailers, and customers (Sarkis et al., 2011). Because of the extent of interconnection between supply chain partners, the output of one partner is a vital input of another; collaboration is critical to GSCM (Shang et al., 2010). Supply chain collaboration includes business operations such as new product design, product innovation, procurement cooperative planning, distribution standardization, offering product features to suppliers, implementing best practices, environmental sustainability, lower costs, and sharing input in business strategy. As a result, the flawless integration of supply chain operations is regarded as the hallmark of GSCM implementation (Zhu, Geng & Lai 2010; cited by Mafini & Muposhi, 2017). According to Sarkis et al. (2011), the quality of the cooperative process, loyalty, fairness in negotiating, and the collective commitment of supply chain partners all contribute to the effective implementation of GSCM. A green supply chain's continuous flow of information generates operational capabilities and connections that decrease the perception of risk and uncertainty in the operating environment (Ruan et al., 2012; cited by Mafini & Muposhi, 2017).

**Table 2. Green Supply Chain Management and SMEs' Performance**

| | Findings | Main references |
|---|---|---|
| Green supply chain management and operational performance | A positive association between the implementation of GSCM techniques and organizational performance.<br>The adoption of GSCM methods might raise the company's costs | Zhu et al., 2013, Mughal, 2019 |
| | Each GSCM practice includes a series of activities and behaviors that have an optimistic impact on company performance | Tsai et al., 2019; cited by Silva et al., 2021, |
| Green supply chain management and employee job satisfaction | The support of top and middle executives is the crucial element for GSCM practice implementation | Zhu et al., 2008, Kim et al., 2021 |
| | Environmental auditing or relevant regulations for sustainable development, such as ISO 14001 qualification, might be considered green innovation that makes staff feel more secure | Zhu et al., 2008 |
| Green supply chain management practices and collaboration performance | The long-term effects of GSCM in supply chain management depend on the dedication and collaboration of supply chain stakeholders such as suppliers, manufacturers, wholesalers, retailers, and customers | Sarkis et al., 2011, Mafini & Muposhi, 2017. |

*Source: Author's reviews*

## 5. CONCLUSION

This paper reviews the literature about green supply chain management (GSCM) and SME's performance. We introduce the implement of GSCM to the business activities, providing the general knowledge about GSCM and business functions. Moreover, this research summarizes the principal results about the impact of GSCM to operational performance, employee job satisfaction, and collaboration performance in SME's activities. In general, the GSCM adoption leads to a positive impact to SME's performance. However, we need to consider numerous issues in the process of applying GSCM in SME's production.

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# THE EFFECT OF WORKING REMOTELY ON WORKER'S PRODUCTIVITY AND SATISFACTION DURING THE COVID-19 PANDEMIC

**Truong Hoang Diep Huong[1,*], Quach Thu Trang[1]**

***Abstract:*** *The coronavirus infection outbreak has disrupted life and working conditions throughout the world. There are rising worries that working remotely might have a negative impact on people's mental stability and physical condition, which in turn affects work performance. To examine the impacts of remote work on remote employees' productivity and satisfaction, we carry out an research based on survey of employees in a specific firms, FPT, affected by the Covid-19 outbreak. Research results show that working remotely during the Covid-19 period increases work pressure, and thereby has a negative impact on efficiency and job satisfaction.*

***Keywords:*** *Working remotely, productivity, satisfaction.*

## 1. INTRODUCTION

The process of restructuring flexible workplaces to accommodate changing types of work, staff, and technology is known as workplace transformation. The workplace has been rapidly changing to accommodate these continuous developments, which have been driven by new technologies and growing globalization. Companies, particularly in the context of Covid-19, have been required in recent years to use online working forms to protect employee safety and health. As a result, the digitization process in society is accelerated.

This adjustment has affected all work practices and daily activities. Remote work is a consequence of such modifications. There is growing worry that working remotely may have a negative influence on the mental and physical health of individuals. Prior to the Covid-19 pandemic, only 5% of employed individuals experienced work-from-home stress; during the pandemic, that number jumped to 18% (Reynolds, 2020). The short

[1] Banking Academy of Vietnam

* Corresponding author. Email: huongthd@hvnh.edu.vn

of support at work which is on the top of the demanding conditions, may influence significantly on employees' mental health. Anxiety and company expectations might have a negative impact on employees who are working remotely for the first time. It could also increase job-related stress and decrease productivity. Employees who worked remotely had to contend with family members staying at home and rising levels of job, healthcare, and economic instability. The association between remote work and observed work stress shifted.

The purpose of this paper is to investigate the impacts of remote work on remote employees' productivity and satisfaction in FPT firms affected by the Covid-19 outbreak. Beginning in March of 2020, individuals across the globe began working remotely, while maintaining their objectives and responsibilities. Likewise, FPT's employees, Vietnam's largest private-sector ICT company with over 30,000 employees and 48 offices throughout the world, also experience the change in work's place. To give further insight on workplace transformation study, the following components will be identified in this study report as influencing job productivity and work satisfaction when teleworking in two areas: (1) Remote work; (2) Work stress when working at home. Secondly, the relationship of the above factors on employee productivity, and job satisfaction in FPT companies will be investigated. Lastly, the recommendation based on the result will be given to the company to adjust more efficiency on the remote working demand. As a result, this study will give insight into how this adjustment affects work productivity and satisfaction for remote workers in an FPT organization during the Covid-19 epidemic.

## 2. LITERATURE REVIEW

### *Remote work and work stress*

Following the release of Covid-19, there was a greater demand for remote employment. Prior to the pandemic, research on the link between distant labor and stress yielded mixed results. On the one hand, several researches have indicated that telework reduces work role stress, although the benefit appears to be minor (Duxbury, 2014). Enhanced workplace autonomy mediated stress reduction, the more autonomy the teleworker had, the less stress he or she experienced (Song and Gao, 2018). Others, on

the other hand, have shown a link between telework and increased stress, particularly when it causes work-life conflict or destroys work-life balance.

Working remotely during an epidemic, on the other hand, is fundamentally different than prior remote work arrangements. First and foremost, neither the employer nor the employee chose to participate. Second, it did not take into account individual characteristics or organizational culture-all work that could be done remotely was to be done so, regardless of the employee's capacity to cope with social isolation or the culture of the business. Finally, it was intensive in that it did not allow for intervals of not working remotely because all of the work had to be done that way, and it coincided with other family members remaining at home. All of these factors emphasize the drawbacks of working remotely rather than the advantages (Juan Sandoval, 2021).

*Hypothesis 1 (H1). Remote work will positively affect the work stress.*

***Remote work and work productivity***

Organizations have cited increased productivity as a compelling incentive to employ remote working as a work arrangement. According to research, working from home helps people to work during their most productive hours, avoid interruptions or distractions from coworkers, and so enhance productivity. Teleworking, on the other hand, has a negative impact on productivity when there is insufficient space to work from or when interruptions are frequent due to children or others who want assistance, such as at home (Nakroien, A, 2019). As a consequence, we suggest:

*Hypothesis 2 (H2). Remote work will negatively affect the work productivity.*

***Remote work and work satisfaction***

According to Golden (2005), evidence demonstrating that teleworkers have higher job satisfaction is sparse and appears to be linked. Teleworkers who worked more than 15 hours per week had a negative perception of the connection, whereas those who worked less had a good perception. The rise in social isolation that faraway employees may face is one factor for this decline in job satisfaction. Employees feel less connected and supported as a result of telework since it diminishes interpersonal encounters and

weakens colleague relationships (Green,2020). Because telework became the working norm (over 15 hours per week) in Covid-19and was applied to the majority of colleagues and superiors, this need for relatedness is essential for a sense of professional satisfaction. As a result, we propose the following:

*Hypothesis 3 (H3). RW is negatively affected the work satisfaction.*

***Work stress and work productivity***

The link between remote work, stress, productivity, and job happiness has been discussed as above. However, as the research demonstrates, there are mediator components that operate as channels via which remote working affects productivity and job satisfaction. Previous study has demonstrated that pandemics, such as the Covid-19 pandemic, have an impact not only on physical and mental health, but also on work performance. In the present setting of the Covid-19 pandemic, where teleworking has become required, this situation has become a source of stress for employees and has undoubtedly impacted employee performance.

The multiple mediations demonstrate how complex the links between remote working and diverse outcomes are. As previously noted, remote work during the pandemic is defined by circumstances that vary from past remote work arrangements. This situation causes stress among the now-remote workers, which originates from employment expectations that may hinder or undermine their work productivity (Juan Sandoval, 2021). As a result, we proposed that:

*Hypothesis 4 (H4). Stress mediates the relationship between remote work and work productivity.*

***Work stress and work satisfaction***

The multiple mediations demonstrate that the relationships between distant functioning and various outcomes are very complicated, implying that further mediations may be discovered. As previously noted, tele working in pandemic is defined by circumstances that vary from past remote work arrangements. This position produces stress for now-remote workers, since job expectations may damage their work performance and satisfaction. Summary, we proposed that work stress may act as a mediator

in all of the associations between distant employment and various outcomes (Juan Sandoval, 2021).

The relationship between remote working stress and job satisfaction has been studied in the past. This study, according to Bentley et al., confirmed both the negative impact of remote work on job satisfaction and the role of stress as a moderating factor in this relationship. Furthermore, the researchers observed a negative link between social isolation and happiness, which was stronger for those who worked remotely for eight hours or more per week than for those who just worked remotely for a few hours per week. Working from home for up to seven hours a week is possible. We focused on remote work satisfaction as a subset of job satisfaction in this study, which is defined as happiness with remote work. We predicted a negative relationship between social isolation and remote job satisfaction because social isolation is associated with a loss of social relationships. As a result, we hypothesized that work stress may function as a buffer between remote work and job satisfaction:

*Hypothesis 5 (H5). Stress mediates the relationship between remote work and work satisfaction.*

## 3. Methodology

### *3.1. Research model*

Through all the theoretical background and hypothesizes development above and the research model (Juan Sandoval, 2021), we will have the final conceptual model looks as below:

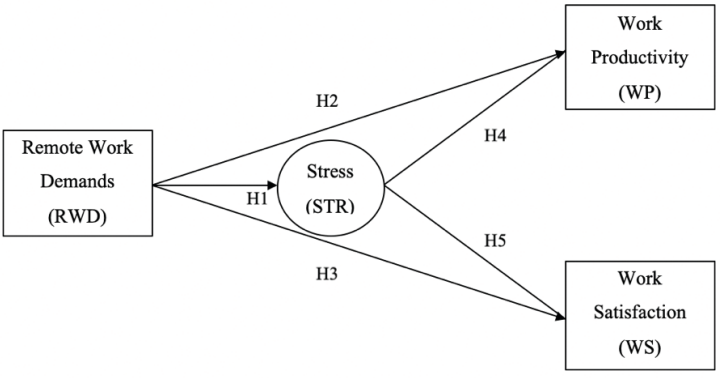


**Figure 1. Research Model**

### 3.2. Data collection method

This research uses a **quantitative survey** along with the deductive technique. This is a common strategy in business research since it allows you to reach out to a huge number of people. According to the development of technologies, this study will use Google Form as an online survey method to distribute the questionnaires in order to collect data from the participants. In the time of Covid-19, this is a very suitable strategy for researchers to easily collect necessary data via email, Facebook, messenger. In addition, the questionnaire in this research is commercially available and has been thoroughly validated by previous research papers. In order to maximize the percentage of respondence, convenience sampling method is applied. The researcher collects data from the participants which are employees in FPT located in Hanoi. A confidence level of 95% and a margin of error of 5% were used to calculate the minimum sample size necessary for testing the conceptual model. The research suggests a minimum size of 100 for a population of 265 employees in Hanoi.

### 3.3. Variable measurement

There are 1 independent variable (Remote work), 1 mediating variable (Stress) and 2 dependent variables (work productivity and work satisfaction). In which, remote work is defined as "arrange work that workers do their regular duties in location that not in their typical workplace, aided by appropriate technology" (Smith et al., 2015). Workplace stresses are role overload, uncertainty, and disagreements impair the flow of work. Work productivity in this study, will be mentioned as knowledge worker productivity. These workers are more suitable to work in remote places, which is fundamentally and similar with the work-from-home concept (Martinez-Amador, 2016). The phrase "work satisfaction" is characterized as an emotional commitment to one's employment that is impacted by situations outside of one's control (Smith et al., 2015).

**Table 1. The Measurement of Study Variables**

| Variables | Measurement | Sources |
|---|---|---|
| Remote Work | Poor telecommunications environment at home relative to the workplace | Morikawa, 2021 |
| | Difficult to concentrate on work for the presence of family members | |
| | Some types of jobs are not completed at home regardless of rules and regulations | |
| | Lack of private rooms specially designed at work | |
| | Lack of pressure from bosses, colleagues at the workplace | |
| Stress | Since working remotely, I felt angry | Sandoval-Reyes et al., 2021 |
| | Since working remotely, I felt scared | |
| | Since working remotely, I felt sad | |
| | Since working remotely, I felt terrible | |
| | Since working remotely, I felt unhappy | |
| Work productivity | My productivity is improved | Sandoval-Reyes et al., 2021 |
| | I have increased my work results | |
| | My work has become more effective | |
| Work satisfaction | I feel encouraged to find new and better ways | Alpern et al., 2013 |
| | My tasks are always clearly explained | |
| | I have learned many new work skills | |
| | I am satisfied with my promotion opportunity | |
| | The amount of work I anticipate completing each week is reasonable | |

## 4. RESULTS

### 4.1. Descriptive statistics

After discarding those that were incomplete, we have a sample of 100 respondents, 49% were men and 51% were women. Most of the age of respondents were from 20 to 30 year old (79%). Of those, 44% were worked more than 4 years, 28% were worked for 2-3 years, 24% were worked for 1-2 years and 4% were worked less than 1 year. The statistics from Table 3 show that the mean of the variables fluctuates around 3.3. Whereas all the min and max are the same value at 1 and 5. In addition, the standard deviation which indicate of the spread out of data fluctuates around 0.96 and 1.24.

**Table 2. Descriptive Statistics**

| | Mean | Min | Max | Std. Dev. | | | Mean | Min | Max | Std. Dev. |
|---|---|---|---|---|---|---|---|---|---|---|
| Remote work (RW) | | | | | | Work productivity (WP) | | | | |
| RW1 | 3.27 | 1 | 5 | 1.24 | | WP1 | 3.31 | 11 | 5 | 1.13 |
| RW2 | 3.3 | 1 | 5 | 1.12 | | WP2 | 3.34 | 1 | 5 | 1.21 |
| RW3 | 3.34 | 1 | 5 | 1.11 | | WP3 | 3.26 | 1 | 5 | 1.24 |
| RW4 | 3.38 | 1 | 5 | 1.11 | | | | | | |
| RW5 | 3.47 | 1 | 5 | 0.96 | | | | | | |
| Work Stress (STR) | | | | | | Work Satisfaction (WS) | | | | |
| STR1 | 3.28 | 1 | 5 | 1.11 | | WS1 | 3.37 | 1 | 5 | 1.17 |
| STR2 | 3.31 | 1 | 5 | 1.03 | | WS2 | 3.49 | 1 | 5 | 1.07 |
| STR3 | 3.27 | 1 | 5 | 1.00 | | WS3 | 3.43 | 1 | 5 | 1.06 |
| STR4 | 3.29 | 1 | 5 | 1.13 | | WS4 | 3.41 | 1 | 5 | 1.12 |
| STR5 | 3.26 | 1 | 5 | 1.12 | | WS5 | 4.49 | 1 | 5 | 1.08 |

*Source: Authors' calculation.*

### 4.2. Realiability and validity test

To verify the reliability of the latent variables, Cronbach alpha, composite reliability is aplied. Most of outer loading variable items are smaller than 0.708 which is acceptable and satisfactory when assessing reliability (Hair et. al, 2016). Except WS3 and WS5 are removed because they can't satisfy the condition.

**Table 3. Cronbach's Alpha and Composite Reliability Results**

| Latent Variables | Cronbach's Alpha | Composite Reliability | AVE |
|---|---|---|---|
| Remote Work | 0.847 | 0.891 | 0.622 |
| Work Stress | 0.757 | 0.860 | 0.672 |
| Work Productivity | 0.776 | 0.779 | 0.691 |
| Work Satisfaction | 0.855 | 0.859 | 0.633 |

*Source: Authors' calculation.*

To check the convergent validity, the Average variance Extracted (AVE) indices and item loading are considering. AVE value according to the table above is higher than 0.50 indicates that on the average, the

construct has convergent validity and be acceptable. In addition, to check discriminant validity, cross loadings (HTMT criterion) is considering. The value is smaller than 0.9 show that this research does not have collinearity problems among the latent constructs. As a result, the data are valid.

**Table 4. HTMT Criterion Results**

| Latent Variables | Remote Work | Work Stress | Work Productivity | Work Satisfaction |
|---|---|---|---|---|
| Remote Work | - | | | |
| Work Stress | 0.794 | - | | |
| Work Productivity | 0.851 | 0.855 | - | |
| Work Satisfaction | 0.722 | 0.802 | 0.863 | - |

*Source: Authors' calculation.*

### 4.2. Structural model

Path coefficient values below are standardized on a range from -1 to +1, it representing strong positive relationships because the coefficients are closer to +1 (Hair et al., 2014). According to the table below, Remote Work has a significant relationship with Work Stress, Work Satisfaction but not the Work Productivity. At the same time, Work Stress also has a significant relationship with Work Productivity and Satisfaction.

**Table 5. Path Coefficient Values**

| Latent Variables | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (\|O/STERR\|) | P Value |
|---|---|---|---|---|---|
| Remote Work → Work Productivity | 0.387 | 0.381 | 0.128 | 0.265 | 0.061 |
| Remote Work → Work Satisfaction | 0.265 | 0.265 | 0.144 | 1.847 | 0.000 |
| Remote Work → Work Stress | 0.678 | 0.681 | 0.071 | 9.555 | 0.001 |
| Work Stress → Work Productivity | 0.441 | 0.454 | 0.130 | 3.387 | 0.001 |
| Work Stress → Work Satisfaction | 0.477 | 0.484 | 0.144 | 3.303 | 0.001 |
| t (0.05) = 1.96 | | | | | |

*Source: Authors' calculation.*

$F^2$ evaluate whether exogenous constructs (independent variables) have a substantive impact on endogenous constructs (dependent variables). According to the table below, Remote Work has a small effect size on Work Productivity, medium effect size on Work Stress and large effect size on Work Satisfaction. Whereas Work Stress has both medium effect size on Work Productivity and Satisfaction.

**Table 6. Effect Size Values**

| Latent Variables | Remote Work | Work Stress | Work Productivity | Work Satisfaction |
|---|---|---|---|---|
| Remote Work | - | 0.190 | 0.072 | 0.852 |
| Work Stress | - | - | 0.247 | 0.232 |

*Source: Authors' calculation.*

## 5. DISCUSSION

This part indicates on analyzing the results and discussing the meanings of the above information. The hypotheses' corresponding variables will be supported by explanation and other research.

**Table 7. Hypothesis Results**

| Hypothesis | Relationships | Path coefficient | P Value | Result |
|---|---|---|---|---|
| H1 | Remote Work → Work Stress | 0.678 | 0.001 | Supported |
| H2 | Remote Work → Work Productivity | 0.387 | 0.061 | Not Supported |
| H3 | Remote Work →Work Satisfaction | 0.265 | 0.000 | Supported |
| H4 | Remote Work → Work Stress → Work Productivity | 0.299 | 0.001 | Supported |
| H5 | Remote Work → Work Stress → Work Satisfaction | 0.324 | 0.003 | Supported |

*Source: Authors' calculation.*

*Hypothesis 1 (H1): Remote work will positively affect the work stress*

This hypothesis is to examine the relationship between remote work and work stress in the organization. According to the table above, P value is 0.001, which is smaller than 0.05. Thereby, it enhances the significant

relationship between 2 variables. In addition, the path coefficient also representing strong positive relationships with 0.678. Specifically, the employees that work from home in FPT tends to have work stress. This can consider as a challenge for the employees as well as the company. In this relationship, the stress can be occurred by many factors from remote work such as poor telecommunication, difficult to concentrate. Especially in the context of Covid-19, employees must work from home not by voluntary. This is similar with several previous research. For example, the research which was conducted by Sandoval-Reyes et al (2021) indicated that in Covid-19 people working remotely perceive higher levels of stress as a consequence of the higher demands they face when working from home. Previous papers all show a statistically significant hypothesis, which helps to strengthen the relationship of these two variables in this research.

*Hypothesis 2 (H2): Remote work will negatively affect the work productivity*

This hypothesis is to examine the relationship between remote work and work productivity in the organization. The P value of this hypothesis is 0.061 which is higher than the 0.05. As a result, the hypothesis will not be supported, the statistical significance is rejected. The fact that the P value is not statistically significant will make the path coefficient no longer valid. This finding suggests that remote work does not negatively impact workplace productivity. Although the hypothesis is rejected, it shows a good sign that working at home has no adverse effect on employee performance in FPT. Thereby, although telecommuting is mandatory for companies, it can also be a good opportunity for growth in the future. Different from this, other researches show that there was a significantly and negatively relationship between these variables. According to Galanti et al (2021), the both family-work conflict and social isolation when work from home were significantly and negatively associated to productivity. Therefore, we can see that depending on the circumstances of each employee, good or bad, their work is affected.

*Hypothesis 3 (H3): Remote work is negatively affected the work satisfaction*

This hypothesis is to examine the negative relationship between remote work and work satisfaction in the organization. According to the table above, P value is 0.000, which is smaller than 0.05. Thereby, it enhances

the significant relationship between 2 variables. In addition, the path coefficient also representing strong positive relationships with 0.265. The results of our survey clarify the origin of this relationship. FPT employees feel that their work efficiency is not as good as before Covid-19. This can be affected by many reasons such as the working environment, work, and telecommunications. FPT should notice this significant relationship and imply an appropriate strategy for employees. Different to this result, according to Bellmann (2020), they determined that there was a positively significant influence of working at home on Job Satisfaction. Reasons might include increased time flexibility, more time sovereignty, more autonomy and reduced stress. However, other studies find the opposite result, namely that JS is lower, that working from home increases stress (Song and Gao, 2018).

*Hypothesis 4 (H4): Stress mediates the relationship between remote work and work productivity*

The purpose of this hypothesis is to investigate the mediate association between work stress and job satisfaction in the workplace. As a result, the substantial association between two variables seem to be strengthen. Furthermore, the path coefficient represents a significant positive association ($\beta = 0.299$, $p = 0.001 < 0.05$). Therefore, it's clear that stress mediates the relationship between remote work and work productivity in FPT. It is important that stress is meaningful in this relationship. Because through that, we can see the obvious involvement and influence of stress which can help the company concerns and focus on this issue. Because mental health at work should be a priority for every company since it can directly affect the work performance. According to Galanti et al. (2021), both family-work conflict and social isolation were positively related to stress and negatively related to work from home productivity. This result of previous research has strengthened the hypothesis more convincingly and have high confidence

*Hypothesis 5 (H5): Stress mediates the relationship between remote work and work satisfaction*

The goal of this hypothesis is to look at the mediating relationship between work stress and job satisfaction in the workplace. As a result, there is a significant relationship between two variables. Furthermore, the

path coefficient indicates a considerable positive relationship ($\beta = 0.324$, $p = 0.003 < 0.05$). Therefore, it's clear that stress mediates the relationship between remote work and work satisfaction in FPT. This can be considered a challenge for the company, because work stress is a problem that affects job satisfaction. Thereby it reduces the quality of the employees' performance. According to Sandoval-Reyes et al. (2021), they found that stress lessens the positive effect of working remotely on productivity and engagement, and stress is an element that, under the actual circumstances, is increasing and would steadily affect those working outcomes. This prior study outcome has strengthened the notion more strongly and with high confidence.

## 6. CONCLUSION

From the result conducted in research, it can be seen that remote work is related with work stress and job productivity and satisfaction. Specifically, remote work will positively affect the work stress that also means the company should re-consider their workplace transformation during Covid-19. The company may hold a meeting or announce a post about reducing stress when working at home. Or create some interesting events, funny trends for relaxing the employees after stressful hours. The company should also re-look at their tasks for employees because it may not be suitable for remote work. Stress mediates the relationship between remote work and work productivity, satisfaction. That means the company should focus more on this problem, proceeding strategy to reduce stress, increasing job satisfaction and productivity.

There are some gaps in our understanding regarding public engagement in research that result from our results and might benefit from more investigation. As a result, it would be beneficial to capture qualitatively the experiences and opinions of research partners who have had mixed or unpleasant experiences, as they may be less likely to volunteer to engage in studies of involvement in research than enthusiasts. Similarly, future study might look at the perspectives of disadvantaged and underrepresented groups engaging in research.

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# THE INFLUENCE OF PERCEIVED SUPERVISOR SUPPORT, ECONOMIC VALUE, JOB CHARACTERISTICS, REWARDS AND RECOGNITION, AND WORK-LIFE BALANCE ON JOB AND ORGANISATION ENGAGEMENT

**Viet Quoc Cao[1,*], Hai Phuoc To[2], Uyen Phuong Le Nguyen[1], Phat Thuan Doan[1]**

***Abstract:*** *This study aims to identify factors affecting job and organisation engagement in the public hospital in Ho Chi Minh City. Quantitative research was conducted through a survey questionnaire with 262 full-time health workers who come from the eight public hospitals in Ho Chi Minh City. The study results confirm the relationship between economic value, job characteristics, rewards and recognition with job engagement and organisation engagement. The work-life balance influences organisation engagement significantly. Based on the research results, we have proposed some specific management implications related to the influencing factors to increase employee engagement in public hospitals.*

***Keywords:*** *Public hospital, perceived supervisor support, employee engagement, job engagement, organisation engagement, economic value, job characteristics, rewards and recognition, work-life balance.*

## 1. INTRODUCTION

According to the Vietnam Health Union, as of June 30, 2022, there were 3,756 health workers to quit their jobs. Among them are 1,190 doctors, 1,177 nurses, 267 medical technicians and 1,126 other health workers. Some provinces and cities have a high number of officials leaving and leaving jobs, such as Ho Chi Minh City (874), Hanoi (360), Dong Nai (360), Binh Duong (166), An Giang (146), Da Nang (127), Can Tho (111).

[1] School of Management, College of Business, University of Economics Ho Chi Minh City, Vietnam

* Corresponding author. Email: vietcq@ueh.edu.vn

[2] School of Management, College of Business, University of Economics Ho Chi Minh City; An Binh Hospital, Ho Chi Minh City, Vietnam

According to the Department of Health of Ho Chi Minh City, in 2021, in the city, 1,154 health workers are leaving, including 274 doctors and 610 nurses. Only in the first 6 months of 2022, 874 medical staff quit, including 199 doctors and 391 nurses. In 2 years, 2,028 health workers quit their jobs, including 473 doctors and 1,001 nurses, accounting for about 5% of the total health workforce of the whole city.

Low salaries and allowances for health workers in the public health system, especially at preventive and grassroots health facilities. Because at these public health service units, the state budget guarantees the main source of operating funding, and the non-business revenue is low. The Vietnam Health Union has suggested reasons medical staff have recently quit their jobs.

According to the current salary and allowance regime regulations (with a base salary of 1,490,000 VND), a doctor, after studying for 6 years and after 18 months of practice to be granted a practising certificate, if recruited and employed in public non-business units, the salary is 3,486,000 VND. With a career incentive allowance of 40%, the income level is 4,881,240 VND (not yet deducted from the payment of social insurance and health insurance). This salary only ensures a part of life's needs, so it is difficult to retain health workers and employees working in public health facilities, while the income level at non-public medical facilities is very difficult.

The price of medical services for holders of the Health Insurance card is low, and the factors constituting the medical service price have not been considered. As a result, the non-business revenue of the units is low. Some non-business units are assigned to be self-sufficient in recurrent expenses (the source of salary and allowance payment for health workers is deducted from the non-business revenue of the unit through the price of medical services).

Medical staff decreased sharply. On the other hand, in recent years, due to the impact of the Covid-19 epidemic and social distancing, the number of patients coming for medical examination and treatment has decreased, leading to a decrease in the revenue of the medical non-business units, the income of the medical staff has also decreased. Even many units were slow to pay salaries for medical staff. This is may also a big reason for medical staff resigning or quitting their jobs and looking for job opportunities with higher incomes.

Health workers and other workers have concerns about ensuring family life and minimum living conditions in daily activities, so with low income while work is too difficult, intensity and labour time increase; With limited or no attractiveness and remuneration regimes, the number of medical staff resigning and quitting will increase.

Due to high work pressure, since the outbreak of the Covid-19 epidemic until now, the working intensity of medical staff has been very large. There are almost no days off, working with high intensity, especially for health workers in localities with large populations such as Ho Chi Minh City and some southern provinces. On the other hand, working in a dangerous environment creates a high risk of disease, which can even affect their life and family. This also profoundly affects the psychology and work motivation of employees.

The specific working environment of the health sector also has some issues. Health workers must often witness the illness and pain of patients, especially patients who die that they cannot cure. Moreover, at the same time, under great pressure from the patient's family, even some medical staff are subjected to threatening and violent physical and mental actions by the patient's family, causing psychological confusion. All of the above may be the key reason for the lack of engagement of health workers.

The topic of employee engagement has been studied worldwide for many years with the background of the studies of Kahn (1990), May et al. (2004) and Saks (2006). In the health care field, based on empirical evidence from 329 employees working in four large public hospitals in Egypt, a study by Abdelmotaleb (2020) indicated a direct positive impact of organizations' social responsibility on organisational engagement. Further, the study revealed that public service motivation positively correlated with employee engagement. The study also confirmed the mediating role of public service motivation in the relationship between employee perceptions of organisations' social responsibility and engagement.

Our research aims to identify factors affecting job and organisation engagement in public hospitals in Ho Chi Minh City. Thus, we have chosen to study the factors affecting employee engagement in the hospital context in both job and organisational aspects. In more detail, we identify the

influence of economic value, job characteristics, rewards and recognition, work-life balance, and work and organisation engagement.

## 2. LITERATURE REVIEW

### Employee engagement (EE), Job engagement (JE), Organisation engagement (OE)

Employee engagement is either a positive state of mind or the opposite of burnout. Many definitions of "employee engagement" have been researched and formed. The concept of employee engagement was first proposed by Kahn (1990), as the harnessing of organisation members' selves to their work roles; self-employment and self-expression of people physically, cognitively, and emotionally in their work lives. Participation is "the simultaneous employment and expression of one's 'self-preferred' task behaviours that promote connections with work and with others, personal presence (physical, cognitive and emotional) and active, full role performances" (Kahn, 1990, p.700).

Personal disengagement refers to the "separation of oneself from work roles; in disengagement, people withdraw and defend themselves physically, cognitively, or emotionally while performing the role" (Kahn, 1990, p.694). Since Kahn proposed this concept, researchers have proposed different definitions in various approaches, reflecting different understandings of employee involvement in each study. Among them, the four most prominent approaches are employee engagement as a multifaceted construct; employee engagement is understood as willingness to commit.

Within the scope of this study, we decided to proceed with the approach that "Employee engagement acts as a multifaceted construct." Because the object of this study is the employee's attachment to the organisation and the job, this is reflected in behaviour, emotion, and perception, as May et al. (2004) stated. Besides, Wellins and Concelman (2005) explain in their research that engagement combines commitment, loyalty, productivity, and ownership. Meanwhile, Saks (2006) defined employee engagement as "a distinct and unique construct comprising the cognitive, emotional and behavioural components related to the performance of the employee's role personally". The definition is quite similar to Kahn's (1990) as it also focuses on role performance in the job. The creative aspect is that Saks

(2006) distinguishes between "Job Engagement" (performing a job role) and "organisation engagement" (performing a role as an organisation member). Cha (2007) defined employee engagement as an employee's active participation in work and the complete psychophysiological, cognitive, and emotional state that accompanies work engagement, including three dimensions: job engagement, organisational recognition, and a sense of work value. Macey and Schneider (2008) have suggested that employee engagement should be considered as a broad term encompassing different types of engagement (characteristic participation, psychosocial participation, behavioural participation), and each type requires different concepts, such as proactive personality (characteristic participation), enjoyment (psychological participation) and organisational citizenship behaviour. Bakker (2011) summarised that attachment is a perceived and positive emotional state with two characteristics: energy and engagement. Soane et al. (2012) developed an employee engagement model with three requirements: focus on job role, trigger, and positive influence. In addition, Xu et al. (2013) divided employee engagement into four dimensions: organisational identity, work attitude, mental state, and responsibility effectiveness. On the other hand, Xiao and Duan (2014) said that employee engagement is a conceptualisation that includes five dimensions: initiative, loyalty, effectiveness, identity, and commitment. Liu (2016) states that knowledge worker engagement includes five aspects: identity, dedication, absorption, vigour, and pleasant harmony.

Kahn (1990) suggested that job engagement is determined by three preconditions: psychological significance, safety, and readiness. Then, Rich et al. (2010) built on Kahn's point of view and argued that job engagement is a multi-dimensional motivational concept that reflects the simultaneous investment of physical energy, receiving an individual's perceptions and feelings into positive, adequate job performance.

Saks's (2006) study shows that job engagement and organisation engagement are significant predictors of job satisfaction, organisational commitment, organisational citizenship behaviour directed to the organisation and intention to leave.

Work-related emotions can have important implications for both individuals and organisations. Mowday et al. (1979) conceptualise the

strength of the psychological relationship between the individual and the organisation regarding the individual's commitment to the organisation. Allen and Meyer (1990) distinguished organisational commitment into three components: affective engagement, ongoing engagement, and normative engagement (Iverson & Buttigieg, 1999). Organisation engagement emphasises individual identification and involvement in the organisation. It reflects the process by which individuals associate themselves with an organisation and focus on the actions of individuals (Gautam, Van Dick, & Wagner, 2004; van Knippenberg & Sleebos, 2006).

Organisation engagement differs from engagement because it refers to a person's attitude and attachment to their organisation. Furthermore, organisational commitment is a psychological state that includes job satisfaction, organisational commitment, psychological empowerment, and job engagement (Macey & Schneider, 2008).

**Perceived supervisor support (PSS)**

Perceived supervisor support is the extent to which employees perceive supervisors provide support, encouragement, and concern for employees (Babin & Boles, 1996). When employees perceive more supervisory support, they feel more secure, and the company cares about their welfare (DeConinck, 2010).

Therefore, according to Menguc et al. (2013), in the absence of supervisors' support, employees will question their value and contribution to the organisation and feel detached, frustrated, and impotent.

**Job characteristics (JC)**

Kahn (1990) suggested that the job engagement level comes from many factors, including Job Characteristics; it offers diverse, challenging jobs that allow individuals to use various skills, personal perceptions and opportunities to contribute to the organisation. Kahn's findings are based on the model of Hackman and Oldham (1980) and the job characteristics theory (JCT), in which job characteristics are defined as including five factors: skill variety, task identity, task significance, autonomy, feedback. Every job has these characteristics to a greater or lesser extent. There is no single combination of characteristics that make up the ideal job; rather, the purpose of job design is to adjust the levels of each characteristic to

match the overall job with the workers performing it. This association is important because workers carry psychological states at work, affecting work results with core characteristics.

**Distributive justice (DJ)**

The safety dimension identified by Kahn (1990) involves predictable and consistent social situations. For organisations, it is crucial to be predictable and consistent about the distribution of rewards and the procedures used to allocate them. While Distributive Justice deals with one's perception of the fairness of decision outcomes, Procedural Justice deals with the perceived fairness of the means and processes used to quantify and distribute resources (Colquitt, Wesson, Porter, Conlon, & Ng, 2001; Rhoades, Eisenberger, & Armeli, 2001).

**Reward and recognition (RR)**

Kahn (1990) reported that people differ in their participation due to their perception of the benefits they receive from a role. Furthermore, a sense of return on investment can come from external rewards and recognition in addition to meaningful work. Therefore, one can expect that employees will be so likely to engage in work that they receive more rewards and recognition for performing their roles.

**Work-life balance (WB)**

Work-Life Balance means an employee balancing work, family, and other life roles (Jaharuddin & Zainol, 2019). Work-Life Balance is essential in achieving employees' psychological, emotional, and cognitive stability, helping to promote organisational effectiveness. Many organisations in recent history have developed a reward strategy over time and organisational commitment, thereby leading to work-life conflict (the inability to divide time between personal life and work-life), leading to burnout and stress among employees.

**Economic value (EV)**

Economic value includes workers' job security and competitive remuneration (Bhasin, Mushtaq, & Gupta, 2019). When discussing economic value, it is important to consider whether employees believe their companies provide above-average pay, benefits, job stability, compensation

packages, and advancement chances (Berthon, Ewing, & Hah, 2005). This value positively influences employees' perceptions regarding their desire to stay long-term in an organisation (Chew & Chan, 2008). Further, Ash and Bendapudi (1996) argued that when employers provide high salaries and perquisites, the number of potential applicants increases and employee retention is also improved. According to Shore and Coyle-Shapiro (2003), economic value is significant in sustaining the rapport between employers and employees. Originally, the factor of economic value was retrieved from the development of the employer attractiveness scale, whereby Berthon et al. (2005) proposed how the desired employer stands apart from other employers. Another approach having considered the economic aspect was the dimension of "economic benefit" belonging to "employer branding" measurement; which was first coined by Ambler and Barrow (1996) and defined as "the package of functional, economic and psychological benefits provided by employment, and identified with the employing company" (p. 187). As argued by Berthon et al. (2005), the employer attractiveness construct (represented by five unique value dimensions of social, development, application, interest and economic) was "essentially a refinement and extension of the three dimensions proposed by Ambler and Barrow (1996)" (p.162). Above all, both of these approaches did confirm the important role of 'employer brand' or 'employ attractiveness' in contributing substantially to the enterprise's success in terms of the organisation's personnel (Ambler & Barrow, 1996; Berthon et al., 2005); especially, both notions have mentioned economic dimension which is significantly beneficial for employees of an organisation.

## 3. HYPOTHESES AND RESEARCH MODEL

### The relationship between perceived supervisor support (PSS) and job, organisation engagement

Kahn (1990) found that interpersonal relationships of support and trust and manager support promote psychological reassurance for employees. Organisation members feel safe in a work environment characterised by openness and support. To test the results of Kahn's study, May et al. (2004) conducted a study and found similar results that supervisor support affects psychological safety, affecting employee engagement. Since employees tend to view supervisor orientation toward them as an indication of

organisational support (Rhoades & Eisenberger, 2002), perceived supervisor support is also likely an important predictor of employee participation. In addition, lack of supervisor support is also considered a special factor affecting employee burnout (Maslach, 2001). Moreover, conversely, frontline supervisors are essential for building engagement and a root cause of employee turnover (Bates, 2004; Frank, Finnegan, & Taylor, 2004). An authentic and supportive supervisor is theorised to influence employee follow-up and increase engagement, satisfaction, and enthusiasm for work (Schneider, Macey, Barbera, & Martin, 2009).

The results are similar to Menguc et al. (2013) study. However, Saks (2006) showed that perceived supervisor support does not impact job or organisation engagement. In 2019, Saks repeated his 13 years study ago with the name "Antecedents and consequences of employee engagement revisited", and the results remained unchanged when perceived supervisor support had no impact on job engagement or organisation engagement. Moreover, Ojo et al. (2021) found that supervisor support has no impact on employee engagement even though Mohanty and P (2021) showed that supervisor trust would have a positive impact. In the healthcare sector, Torabi et al. (2019) pointed out a significant positive relationship between perceived supervisor support and organisation engagement of nurses from a hospital in Shiraz.

Because of the inconsistencies in the research findings on the relationship between perceived supervisory support and job engagement, the research team decided to hypothesise the following:

*H1a: Perceived supervisor support (PSS) is positively related to job engagement (JE)*

*H1b: Perceived supervisor support (PSS) is positively related to organisation engagement (OE)*

**The relationship between job characteristics (JC) and job, organisation engagement**

Kahn (1990) states that jobs with high levels of job characteristics give individuals space and encouragement to help them become more engaged in their work. May et al. (2004) proposed that job richness strongly impacts meaningfulness, while meaningfulness moderates its relationship with employee engagement.

Contrary to employee engagement, the relationship between job characteristics and organisation engagement is not favourable. There is not much research on this relationship; if it does, it goes in the opposite direction. As Saks (2006) pointed out, the relationship between job characteristics and employee engagement with work is positive. However, the relationship does not exist for organisation engagement. Akingbola and van den Berg (2019) showed a positive relationship between these two factors.

In a nutshell, inconsistencies in the relationship were found among the research papers that the team explored. Therefore, hypotheses H2a and H2b are stated as follows:

*H2a: Job characteristics(JC) are positively related to job engagement (JE)*

*H2b: Job characteristics(JC) are positively related to organisation engagement (OE)*

**The relationship between distributive justice (DJ) and job, organisation engagement**

Studies on distributive justice show that distributive justice is related to organisational outcomes such as job satisfaction, organisational commitment, organisational citizenship behaviour, and intentions to leave and performance (Colquitt et al. 2001). When employees have a high perception of equity in their organisations, they are more likely to feel obligated to be fair in performing their roles through a higher level of involvement. On the other hand, low perception of fairness will likely cause employees to withdraw and leave their job roles. Ram and Prabhakar (2011) also showed a positive impact of distributive justice on the organisation's support (POS), which is determined to have a positive relationship with employee engagement.

On the other hand, the studies of Saks (2006, 2019) concluded that there is no influence of the distributive justice factor on job engagement and organisation engagement. Thus, we proposed H3a and H3b:

*H3a: Distributive justice(DC) is positively related to job engagement (JE)*

*H3b: Distributive justice(DC) is positively related to organisation engagement (OE)*

**The relationship between reward and recognition (RR) and job, organisation engagement**

Maslach and Leiter (2008) showed that insufficient rewards (whether financial, institutional, or social) increase the risk of burnout for everyone; appropriate rewards and recognition are important to engagement. Regarding social exchange theory, when employees receive rewards and recognition from their organisation, they should feel obligated to respond with a higher level of commitment. Furthermore, the lack of recognition from customers, colleagues, managers and external stakeholders reduces the value of both work and employees, which is even strongly linked to feelings of ineffectiveness (Maslach, 2001). Rewards and recognition can also be seen as outputs versus inputs (i.e. time, effort, and expertise) that employees devote to their work. Having remuneration and benefits at par with the market and a sense of fair reward (Koyuncu, Burke, & Fiksenbaum, 2006), and being treated fairly and valued highly will help employees stay engaged with the company. Employees are likely to engage at work to the extent that they receive more rewards and recognition for performing their roles (Saks, 2006). Employees often base their commitment to an organisation depending on how much they perceive their commitment to the organisation (Stajkovic & Luthans, 1997). Thus, we developed H4a and H4b:

*H4a: Rewards and recognition(RR) is positively related to job engagement(JE)*

*H4b: Rewards and recognition(RR) is positively related to organisation engagement (OE)*

**The relationship between work-life balance (WB), job and organisation engagement**

Almost all theories and research results support the hypothesis that work-life balance positively affects employee engagement performance. Previous studies have concluded that work-life balance positively impacts an employee's enthusiasm and performance. Typically, Jaharuddin and Zainol (2019) demonstrated that work-life balance positively impacts job engagement. However, a few authors do not find a positive impact of work-life balance on employee engagement such as De Silva and Iddagoda (2021). Thus, two hypotheses are stated:

*H5a: Work-life balance (WB) is positively related to job engagement (JE)*

*H5b: Work-life balance (WB) is positively related to organisation engagement (OE)*

**The relationship between economic value (EV) and job, organisation engagement**

Perspectives from the previous studies on the antecedents of employee engagement were taken as the theoretical foundation for Bhasin et al. (2019) to propose hypothesised relationships in their research, which was the first study to investigate economic value that was put in correlation with both job and organisation engagement. These statements align with social exchange theory (SET), which states that the employee's engagement level increases when they believe that they are being appropriately rewarded (Kahn, 1990; Saks, 2006). From the study of Bhasin et al. (2019), empirical evidence indicated that economic value had a significant positive influence on both job engagement and organisation engagement. The manner that underpins the relevance of economic benefits is that individuals provide their skills and knowledge to the business to acquire economic rewards from their employers (Shore & Coyle-Shapiro, 2003). To further analyse, economic benefits are determined by the efficiency and competence of workers in contributing to the organisation. If employees recognise a rise in their economic benefits from the companies, they will, in turn, put their best effort forth.

However, the previous research studying the impact of economic value as a dimension of employer brand on employee engagement has not differentiated between job and organisation engagement. These earlier studies have solely considered one aspect of engagement: job engagement, ignoring organisation engagement. Interestingly, the impact or relevance of economic value was considerably different for job and organisation engagement (Bhasin et al., 2019). The results noted that economic value was the most significant factor influencing job engagement. Still, the impact of economic value on organisation engagement was far weaker than that on job engagement. In the healthcare sector, the research review of a recent study shows no empirical evidence for the influence of economic value on job engagement as well as organisation engagement of doctors, nurses or other types of employees in the medical field. Thus, putting them into the context of the healthcare industry, we proposed two following hypotheses:

*H6a: Economic Value (EV) is positively related to job engagement (JE)*

*H6b: Economic Value (EV) is positively related to organisation engagement (OE)*

## 4. METHODS

### Sampling and procedure

The study was carried out using the convenience sampling method. Eight Ho Chi Minh City public hospitals health workers distributed the paper questionnaire survey.

The number of health worker women participating in the survey is 132 people (50.9%), and 130 men (49.1%).

Overall, the survey was attended by many people from different professions. Among 262 survey participants, 173 people are nurses (accounting for 66.4%); 39 people are nurse assistant (15.1%); 50 people are doctors (accounting for 18.5%).

The proportion of survey participants aged 20-25 accounted for the highest with 61% (160 people), followed by the proportion of people aged 26-40 who accounted for 28% (74 people). The proportion of people aged 41-55 accounts for 7.6% (20 people), and the remaining 3.4% is the proportion of people over 55 years old.

### Measurement items

In this study, the job engagement scale is measured based on the scale from Saks's study (2006, 2019). The scale includes 5 observed variables marked from JE1 to JE5. Along with job engagement, Organisation Engagement is also measured in Saks' study (2006, 2019), including 6 observed variables from OE1 to OE6. Based on Saks' study (2006, 2019), the perceived supervisor support scale is measured with 4 observed variables from PSS1 to PSS6. According to Morris and Venkatesh (2010), the job characteristics scale is measured by 10 observed variables, from JC1 to JC10. In this study, the scale of Distributive Justice is inherited from the study of Saks (2006, 2019). This scale includes 4 observed variables, denoted from DJ1 to DJ4. The scale of Rewards and Recognition used is based on Siegrist et al. (2004). This scale includes 5 observed variables,

denoted from RR1 to RR5. This study uses the scale of Cain et al. (2018) with 6 observed variables, denoted from WB1 to WB6. We use the economic value scale inherited from the scale of Berthon et al. (2005), which includes 5 observed variables denoted from EV1 to EV5.

Regarding the sampling formula, based on Cohen's (1988) study, the number of independent variables in the model is 3, with a significance level of 5%, and the smallest $R^2$ is 0.1, the minimum sample needed is 147 samples. The number of samples collected for the formal quantitative study was 262, so it was sufficient to take the next steps. The characteristics of the above model will be discussed in more detail in the next part.

## 5. DATA ANALYSIS AND RESULTS

### Testing the Measurement Model

When considering the Consistency Reliability index at Cronbach's Alpha, a scale with a value between 0.7 and 0.8 is considered the acceptable scale. These test results show that all scales have an Alpha value greater than 0.7, which indicates good scales.

**Table 1. Cronbach's Alpha of Observed Variables**

| | Cronbach's Alpha | Composite Reliability | Average Variance Extracted (AVE) |
|---|---|---|---|
| Distributive Justice (DJ) | 0.877 | 0.915 | 0.729 |
| Job Characteristics (JC) | 0.781 | 0.850 | 0.532 |
| Job Engagement (JE) | 0.852 | 0.910 | 0.772 |
| Organisation Engagement (OE) | 0.908 | 0.932 | 0.733 |
| Perceived Supervisor Support (PSS) | 0.859 | 0.914 | 0.780 |
| Economic Value (EV) | 0.884 | 0.915 | 0.683 |
| Rewards and Recognition (RR) | 0.829 | 0.885 | 0.659 |
| Work-Life Balance (WB) | 0.922 | 0.939 | 0.720 |

### Composite reliability

Because when testing the scale, Cronbach's alpha coefficient is relatively sensitive to the number of variables in each scale, the composite reliability coefficient is used to limit this (Hair et al., 2017). According

to Bagozzi et al. (1998), this coefficient needs to be greater than or equal to 0.7 to be appropriate. The results of testing the reliability coefficients in this study show that all scales achieve the required intrinsic reliability, with values ranging from 0.850 for Job Characteristics (JC) to 0.939 for Work-Life Balance (WB).

### Convergent validity

The researcher has tested it through the outer loading coefficient and variance to evaluate the convergence value of the research concepts or whether the concepts positively correlate with other concepts on the same scale (Hair, Celsi, Money, Samouel, & Page, 2016).

**Table 2. Outer Loadings of the Observed Variables**

| | DJ | EV | JC | JE | OE | PSS | RR | WB |
|---|---|---|---|---|---|---|---|---|
| **DJ1** | 0.817 | | | | | | | |
| **DJ2** | 0.869 | | | | | | | |
| **DJ3** | 0.879 | | | | | | | |
| **DJ4** | 0.850 | | | | | | | |
| **EV1** | | 0.842 | | | | | | |
| **EV2** | | 0.843 | | | | | | |
| **EV3** | | 0.792 | | | | | | |
| **EV4** | | 0.819 | | | | | | |
| **EV5** | | 0.835 | | | | | | |
| **JC3** | | | 0.750 | | | | | |
| **JC4** | | | 0.699 | | | | | |
| **JC5** | | | 0.712 | | | | | |
| **JC7** | | | 0.732 | | | | | |
| **JC8** | | | 0.751 | | | | | |
| **JE1** | | | | 0.894 | | | | |
| **JE2** | | | | 0.855 | | | | |
| **JE5** | | | | 0.886 | | | | |
| **OE1** | | | | | 0.901 | | | |
| **OE2** | | | | | 0.839 | | | |
| **OE4** | | | | | 0.847 | | | |
| **OE5** | | | | | 0.904 | | | |
| **OE6** | | | | | 0.783 | | | |
| **PSS1** | | | | | | 0.887 | | |
| **PSS2** | | | | | | 0.860 | | |
| **PSS3** | | | | | | 0.902 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **RR1** | | | | | | | 0.840 | |
| **RR2** | | | | | | | 0.778 | |
| **RR3** | | | | | | | 0.819 | |
| **RR5** | | | | | | | 0.809 | |
| **WB1** | | | | | | | | 0.751 |
| **WB2** | | | | | | | | 0.847 |
| **WB3** | | | | | | | | 0.894 |
| **WB4** | | | | | | | | 0.876 |
| **WB5** | | | | | | | | 0.841 |
| **WB6** | | | | | | | | 0.873 |

The higher the outer loading factor is, the more correct the concept is. Usually, when the factor loading is found in the range of 0.4 to 0.7, some observed variable will be removed from the scale after considering the content value if removing this variable will increase the value of the Composite reliability or the value of the variance extracted is above the recommended threshold value. In this study, the research team uses the cut-off point in the following argument of 0.5 to ensure that the observed variables measure better than the concept. The results show that close variables are satisfactory, with the indexes ranging from 0.699 on the JC4 scale to 0.904 on the OE5 scale.

At the same time, this study also uses the Average Variance Extracted test (AVE) to measure the convergence value. AVE is defined as the square of the averaged factor loading. Usually, with a value higher than 0.5, the research concept should explain more than 50% of the variability of the observed variables that form it. Here, the study also uses a 50% cut-off to determine the scale's validity. The results show that all the variables meet the requirements, ranging from 0.532 (the JC scale) to 0.780 for the PSS scale.

**Discriminant Validity**

Discriminant validity refers to whether there exists a difference between the concepts in the study. The Heterotrait-Monotrait Ratio (HTMT) is the mean HTMT as the average of all the correlations of the important observed variables of each concept with another (Hair, Hult, Ringle, & Sarstedt, 2017). When considering HTMT, the correlation between concepts represented in numbers is 1, which means that the concepts lack discriminant value. The cut-off point for this test uses the study results from Henseler et al. (2015); the authors show that the acceptance threshold

will fall below 0.85. The test results show that the scales have discriminant values within the acceptable range. The correlation between the variable OE and JE is still quite high (HTMT = 0.884). On the contrary, the correlation between the WB and PSS scales is low (HTMT = 0.316), showing a clear difference between the two scales. The remaining relationships are shown in the following table:

**Table 4. HTMT of the Observed Variables**

| | DJ | EV | JC | JE | OE | PSS | RR | WB |
|---|---|---|---|---|---|---|---|---|
| **DJ** | | | | | | | | |
| **EV** | 0.689 | | | | | | | |
| **JC** | 0.680 | 0.713 | | | | | | |
| **JE** | 0.516 | 0.652 | 0.711 | | | | | |
| **OE** | 0.503 | 0.761 | 0.653 | 0.884 | | | | |
| **PSS** | 0.568 | 0.802 | 0.625 | 0.550 | 0.641 | | | |
| **RR** | 0.728 | 0.833 | 0.718 | 0.645 | 0.733 | 0.744 | | |
| **WB** | 0.441 | 0.432 | 0.445 | 0.360 | 0.441 | 0.316 | 0.473 | |

## Testing the research model

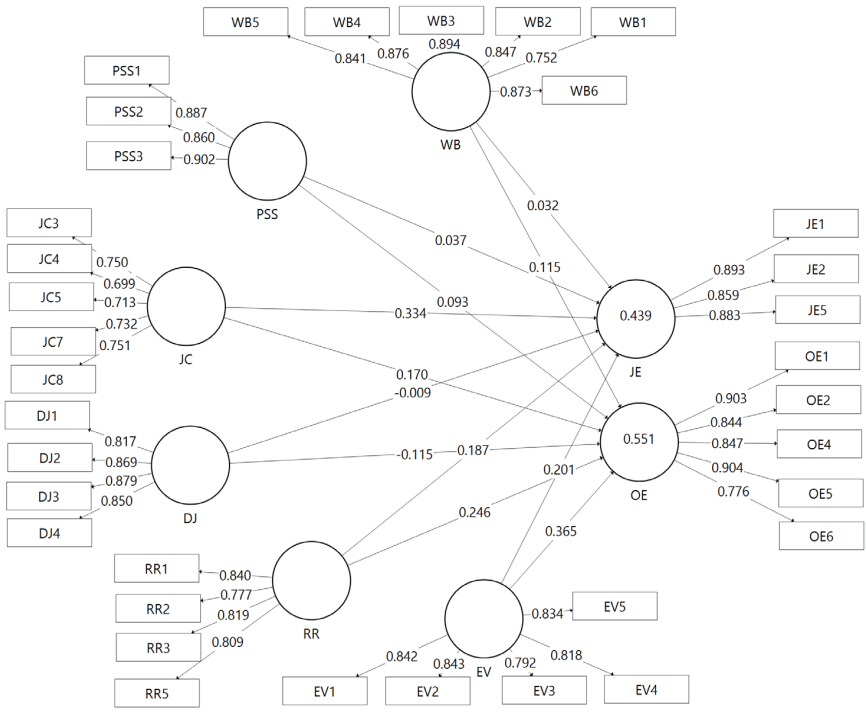


**Figure 2. Research Model after Testing by SmaratPLS 3.2.8**

## Hypotheses Testing

In the analysis technique PLS-SEM, Hair et al. (2017) proposed a sample magnification method that can replace up to 5000 samples to find out the standard error of the observed path coefficient, from which it can be concluded about the p-value of the hypothesis. Typically, the 95% confidence interval (equivalent to the 5%) cut-off point for management and marketing studies is used for the two-tailed test (Hair et al., 2017). Similar to previous studies, the results of hypothesis testing in this study also use the 5% significance level to evaluate.

**Table 5. Hypotheses Testing Results**

| Hypothesis | Relationship | Beta | Standard Error | P-values | R2 | Conclusions |
|---|---|---|---|---|---|---|
| H1a | Perceived Supervisor Support (PSS) Job Engagement (JE) | 0.037 | 0.076 | 0.631 | 0.439 | Rejected |
| H1b | Perceived Supervisor Support (PSS) Organization Engagement (OE) | 0.093 | 0.067 | 0.169 | 0.551 | Rejected |
| H2a | Job Characteristics (JC) Job Engagement (JE) | 0.334 | 0.073 | 0.000*** | 0.439 | Accepted |
| H2b | Job Characteristics (JC) Organisation Engagement(OE) | 0.170 | 0.065 | 0.009** | 0.551 | Accepted |
| H3a | Distributive Justice (DJ) Job Engagement (JE) | -0.009 | 0.081 | 0.909 | 0.439 | Rejected |
| H3b | Distributive Justice (DJ) Organisation Engagement | -0.115 | 0.081 | 0.156 | 0.551 | Rejected |
| H4a | Rewards and Recognition (RR) Job Engagement (JE) | 0.187 | 0.083 | 0.024* | 0.439 | Accepted |
| H4b | Rewards and Recognition (RR) Organisation Engagement (OE) | 0.246 | 0.085 | 0.004** | 0.551 | Accepted |
| H5a | Work-Life Balance (WB) Job Engagement (JE) | 0.032 | 0.077 | 0.681 | 0.439 | Rejected |
| H5b | Work-Life Balance (WB) Organisation Engagement (OE) | 0.115 | 0.055 | 0.035* | 0.551 | Accepted |
| H6a | Economic Value (EV) à Job Engagement (JE) | 0.201 | 0.097 | 0.038* | 0.439 | Accepted |
| H6b | Economic Value (EV) à Organization Engagement (OE) | 0.365 | 0.083 | 0.000*** | 0.551 | Accepted |
| Note:*p < 0.05; **p < 0.01; ***p < 0.001 | | | | | | |

The results in the table above show that out of 12 proposed hypotheses, there are 7 supported hypotheses, including H2a, H2b, H4a, H4b, H5b, H6a, and H6b.

**Discussion**

The relationship between JC and JE is accepted with beta = 0.334, which is equivalent to the antecedent studies of Saks (2006) and Rai (2019). The hypothesis of the relationship between JC and OE in the study for beta = 0.170 and p = 0.009 supports Akingbola and van den Berg (2019) but contradicts Saks (2006). The next factor affecting OE and JE is that DJ has the same results as the study of Saks (2006) and Colquitt et al. (2001) when they are not statistically significant. The RR factor affects both JE and OE with beta coefficients of 0.187 and 0.246, respectively. Research results on this variable are different from that of Saks (2006) but similar to Akingbola and van den Berg (2019).

Regarding WB, our study shows that they do not affect JE, in contrast to the study of Cain et al. (2018) when they found an impact at 99% significance level with the coefficient $\beta = 0.217$. Regarding the impact of the WB on OE, the results support the study of Iddagoda and Opatha (2020). But the result contrast with the study of De Silva and Iddagoda (2021). The result is aligned with that of the study of Bhasin et al. (2019), wherein they stated that the relevance of economic value was, interestingly, considerably different for job and organization engagement. However, this research shows that, conversely, the impact of economic value on organisation engagement was slightly stronger than job engagement with beta coefficients of 0.365 and 0.201, respectively. The results between these previous studies and this study are shown in the Table 5.

## 6. CONCLUSION

This study contributes both theoretically and practically. Theoretically, the study uncovers factors that influence employee engagement in Covid-19. In practical terms, the topic provides information and scientific arguments about factors affecting employee engagement. That is useful information so that administrators and human resources departments at organisations can understand and capture the needs and desires of employees, thereby making effective management policies to increase employee engagement

and improve employee performance. This can also be a stepping stone, a reference for future research when more pandemics have a large impact on society, similar to Covid-19. The research results also serve as a reference for further researchers and enrich and diversify research papers on employee engagement in Vietnam.

**Managerial implications**

Job characteristics is also a factor affecting JE and OE. It includes job variety, importance, required skill level, and opportunities for creativity and responsiveness. Healthcare organisations and managers consider empowering employees when they work to create opportunities to promote their ability to work and create. Allocating the right jobs to the right people is also essential to achieving productivity at work.

Recognitions work because they focus on the positives, giving health care employees a clear message that what they do is important. Rewarding employees for their hard work with what they want will keep them focused and motivated to do better. In other words, RR encourages employees to set and achieve goals, whether daily, weekly, quarterly, or annually. The existence of rewards and recognitions in the organisation helps employees in the health care sector feel that they are not left behind, feel that they are a member of the organisation, are cared for, and appreciated in any situation. In a nutshell, rewards and recognitions can positively affect motivation and thus lead to higher levels of job performance. Thus, the question arises, what can the organisation do to raise rewards and recognition? The organisation should have a plan to develop a reward program to support employees continuously. The organisation may award cash, or other incentives, such as travel, health services, activities, or family entertainment. Regularly monitoring and caring for them is also a measure of timely help and having an intuitive view of the work they complete. Sometimes little things like that are seen as recognition.

The results show that work-life balance (WB) predicts organisational engagement regarding individual employees. Work and life pressure will make health care workers unbalanced and exhausted when the epidemic situation is still complicated. Therefore, they need to arrange and allocate time appropriately to complete their tasks well at work and responsibilities towards family. One way to raise work-life balance is requesting time off

for certain life events. It is a successful practice to manage home life's demands, which affect workplace productivity (Greenhaus & Powell, 2006). Public hospitals and managers should foster a culture that promotes work-life balance, benefiting both parties. Allowing employees time for personal growth and family events can ultimately prevent burnout and promote a healthier work environment for the organisation and its employees.

Finally, economic value (EV) has a simultaneous impact on job engagement and organisational engagement. That means salary and income are important factors that lead workers in public hospitals to dedicate themselves to their work while working for their hospitals. Public hospitals must consider issuing salary and living income policies for employees to care for their families and contribute and engage with their hospitals with a peace of mind.

**Limitations and directions for further research**

This study still has some unavoidable limitations. Firstly, the regression results show that the independent variable of the dependent variables is still not high. It proves that other factors still affect job and organisational engagement, such as training and development, communication, psychological climate, and work environment. The context of the study is Vietnam, while the theories and scales are viewed from the perspective of foreign cultures. Although their validity has been tested, cultural differences still impact the results. The organisational culture of Vietnam, in particular and Eastern countries, in general, creates a rather different distance from the homeland of these theories. Moreover, the number of survey samples is relatively small (262 samples), so the representativeness is not high; most of the respondents are office workers, so the goal of career diversity is not guaranteed.

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# THE INFLUENCE OF USER-GENERATED CONTENT (UGC) ON THE PURCHASE INTENTION OF GENERATION Z

**Chung Tu Bao Nhu[1], Le Minh Anh[1], Nguyen Ngoc Hoang[1], Hoang Ngoc Mai[1], Huynh Nhu Ngoc[1], Phung Hieu Minh[1]**

***Abstract:*** *This paper aims to explore the impact of User-Generated Content (UGC) On the Purchase Intention of Generation Z Customers, based on the theory of planned behavior (TPB) and the technology acceptance model (TAM). The study's sample consisted of 389 Generation Z customers in Ho Chi Minh City. The main analytical method used in this study is Confirmatory factor analysis and the Partial least square-structural equation model (PLS-SEM). This paper shows that the factor "Purchase intention" is influenced by "UGC's information, social interaction, and tendency", mediating by "Attitude towards UGC", and 2 factors "Perceived usefulness" and "Perceived credibility". In that, Tendency of UGC has a positive effect on both the "Perceived usefulness" and "Perceived credibility" of UGC. This research develops a new framework to explain User-Generated Content - Purchase Intention relationship using the theory of planned behavior (TPB) and the technology acceptance model (TAM). Moreover, the focus on the effect of Tendency of UGC helps explain the sensitivity in consumption intention, especially for Generation Z customers.*

***Keywords:*** *User-generated content (UGC), Generation Z, Purchase intention, Technology Acceptance Model.*

[1] University of Economics and Law, Vietnam National University HCMC

* Corresponding author. Address. Email: nhuctb@uel.edu.vn

# RESEARCH ON FACTORS AFFECTING THE START-UP INTENTION OF UNIVERSITY STUDENTS IN VIETNAM

**Thi Huong Dinh**[1]

***Abstract:*** *The research aims to analyze the factors affecting to start-up intention of university students in Vietnam. The data was collected through pre-designed questionnaires from 728 students with the intention to startup a business. Furthermore, the collected data was processed using research methods including descriptive statistics, confirmatory factor analysis, SEM analysis, Bootstrapping. According to the results, there are several factors affecting to start-up intentions of students in universities in Vietnam including: entrepreneurship spirit, entrepreneurship knowledge, start-up environment, business education, financial support and student's age. Of which, entrepreneurship spirit is the factor with the strongest impact. At the same time, the research also suggests a number of solutions and recommendations to related students, universities, ministries and branches in order to develop the start-up activities of university students in Vietnamese students.*

***Keywords:*** *Start-up, students, universities, Vietnam.*

[1] Department of Human Resource Management, Thuongmai University, Hanoi, Vietnam. Email: dinhhuongtm@gmail.com

# THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON STRATEGIC OBJECTIVES: EVIDENCE FROM VIETNAM

**Tran Nguyen Hop Chau[1], Tran Ngoc Mai[1,*], Vu Thi Kim Chi[1], Nguyen Duc Dung[1], Nguyen Thi Thanh Tan[1]**

***Abstract:*** *Carrying out corporate social responsibility (CSR) not only brings benefits to the community, but also benefits the business itself. There are many studies on the application of CSR in business strategies to create competitive advantages and sustainable development. However, CSR is still a new term in Vietnam, and the concept has various definitions and most studies are mainly theory-based with limited research on the real situation of CSR practices, especially in the case of FDI firms. Therefore, this study aims to investigate the impact of CSR implementation on corporate strategic goals including, reputation, innovation and differentiation of FDI firms in Vietnam. This study uses a regression model to analyze survey data of 224 FDI enterprises in Hanoi, the capital of Vietnam. The empirical results indicated that the implementation of CSR has a significant impact on improving the efficiency of the deployment of three business strategic goals: enhancing reputation, enhancing innovation, and creating a horizontal competitive advantage. The findings of this study suggest that FDI enterprises in Vietnam need to renew their perspectives and approaches to integrate and implement CSR, not only seeing CSR as a costly obligation or merely charitable activities, but truly an opportunity to create competitive advantages and sustainable development.*

***Keywords:*** *Corporate Social Responsibility, Business Strategy, Innovation, Reputation, Horizontal Differentiation*

***JEL Classification Code:*** *M14, D22, L21, M10*

[1] Banking Academy of Vietnam

* Corresponding author. Email: maitn@hvnh.edu.vn

# CUSTOMER CHOICE BEHAVIOUR IN EDUCATION SECTOR: AN APPROACH USING INFORMATION PROCESSING CHOICE MODEL

**Tong Viet Bao Hoang [1,*], Hoang Viet Hanh Nguyen [1], Le Thi Phuong Thanh [1], Le Thi Phuong Thao [1], Bui Thi Thanh Nga [1]**

***Abstract:*** *Based on 400 survey samples including 12th grade students in Binh Tri Thien area and the covariance-based SEM (CB-SEM) estimation technique with second-order constructs, the study points out three factors, in descending order of impact, on students' choice of a university are as follows: student characteristics; external influences and general expectation of college life. The research demonstrates that general expectation of college life is an influential factor that is often overlooked by previous studies. Based on the findings, the authors suggest certain recommendations that universities should pay attention to when conquering learners such as focusing on personalized marketing, applying customer value-oriented marketing strategies to the education sector, and focusing on linking with businesses in the training process…*

***Keywords****: External influences, general expectation of college life, information processing choice models, student characteristics, university choice decision.*

[1] Hue College of Economics - Hue University

* Corresponding author. Email: tongbaohoang@hce.edu.vn

# EFFECTS OF NETWORKING BEHAVIORS ON SUBJECTIVE CAREER SUCCESS OF MANAGERS IN HANOI

**Nguyen Thi Lien Huong[1,*], Nguyen Van Toan[2]**

***Abstract:*** *The study examines the effects of networking behaviors on managers' subjective career success in Hanoi. Networking behaviors were evaluated using four subscales: socializing, maintaining contacts, engaging in professional activities, and increasing internal visibility. The research was conducted on working managers in Hanoi with at least three years of management experience. Furthermore, only managers who were not self-employed and not engaged in a family business were included. There are 303 questionnaires qualified for analysis. The findings indicate that only Maintaining Contacts and a part of Socializing have a beneficial impact on subjective career success (SCS). There is no statistical evidence to prove the impact of Engaging in Professional Networking, Increasing Internal Visibility on SCS. From an individual's perspective, the study findings implicate that a large amount of investment in networking activities is required from managers to feel successful in their careers. From an organizational standpoint, we propose that Human Resource Development specialists consider proactively pushing managers to focus on developing networking abilities.*

***Keywords:*** *Career development, career success, networking behaviors.*

[1] Faculty of Business Management, National Economics University, Hanoi, Vietnam

* Corresponding author. Email: lienhuong@neu.edu.vn

[2] School of Banking and Finance, National Economics University, Hanoi, Vietnam

# Theme 2
# Economics

# ANALYZING THE RELATIONSHIP BETWEEN FDI, FISCAL POLICY DEVELOPMENT AND GREEN ECONOMIC GROWTH IN SOUTHEAST ASIAN REGION

**Phung Thanh Quang[1,*], Luong Thi Thu Hang[1]**

***Abstract:*** *The climate change problem raised chiefly by greenhouse gases has been the front runner among all the existence challenges of the globe. The concept of green growth under the context of climate change threat has been addressed as an important key to achieve the sustainable development goals (SDGs) defined by the United Nations in 2015. The objective of this study is to explore how FDI and green economic growth are related in Southeast Asian economies (Brunei, Cambodia, East Timor, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam). To this end, a dynamic panel threshold model for the data over the period of 2000-2018 is employed. The major results proved that FDI positively impacts on green growth progress of these economies, while the magnitude of impact is stronger for the case of high fiscal policy development group of Southeast Asian economies. This result proves the pollution halo hypothesis that claims that FDI may enhance green growth progress in a country. In addition, the empirical results depicted an evidence of fiscal policy development threshold beyond FDI- green growth linkage in Southeast Asian countries. As major practical policy implications, orienting the economic priorities to improve green fiscal policies, reforming the fiscal integration programs, planning of green job creation and implementation of policies to attract FDI under the Covid-19 are recommended.*

***Keywords:*** *Green economic growth, fiscal policy development, FDI, the pollution halo hypothesis, Southeast Asia.*

## 1. INTRODUCTION

Foreign direct investment is one of the tools of economic development using the principle of capital fluidity in the world economy. Many developing countries use this financial tool to take advantage of the potential of other countries' investors to develop infrastructure, improve trade flows and globalize their economies. If we consider all the dimensions of development

[1] School of Banking and Finance, National Economics University, Hanoi, Vietnam

* Corresponding author. Address. Email: pt_quang@neu.edu.vn

of an economy in the form of sustainable development (SDGs) as defined by the United Nations in 2015, foreign direct investment tool helps a lot of developing countries in achieving sustainable development indicators like green economic growth which is considered as an acceptable strategy to deal with climate change threat. Based on OECD (2011), green economic growth can be defined as "fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies".

Many earlier studies (Nistor 2014; Iamsiraroj and Ulubasoglu 2015; Makiela and Ouattara 2018; Osei and Kim 2020; Zamani and Tayebi 2021) have proved that FDI is an essential factor to enhance economic growth due to the abilities of capital inflows, job creation, technology transfer and labor mobility under the FDI inflows. According to World Bank database, economic growth has experienced a negative movement since 2017 in regions like East Asia & Pacific, South Asia, North America and Europe & Central Asia. The main reasons to this continued economic growth reduction were the US-China trade war (Bown 2021), the divergence in the EU (Brexit challenge) (Bibao-Ubillos and Camino-Beldarrain 2021) and global oil market fluctuations (Alamgir and Amin 2021).

Despite neoclassical and endogenous economic growth models show that FDI can be considered as an accelerator of economic growth in a country, empirical studies have not provided similar evidences of the impact of FDI on green economic growth. On the one side, some scholars consider FDI as a way for transferring pollution-intensive operations from countries to the host country of investment meaning that FDI cannot help nations to deal with climate change threat. Haug and Ucal (2019) and Salahuddin et al. (2019) showed that FDI inflows positively impact on CO2 emissions which are against green economic growth, while a group of scholars highlight the important role of FDI to technology improvement and financing green projects which ensure the existence of green economic growth leading to reduce the risk of climate change.

The paradox in relationship between FDI and green economic growth becomes more essential for Asian nations, particularly Southeastern economies where different policies to enhance FDI inflows have been issued in last decade to promote the investment flows from abroad as the main

origin of capital and technology (Diaconu 2014). Among these policies, the Local Industry Upgrading Programme (LIUP) in Singapore, Malaysia's export-oriented growth strategy, USAID/CAMBODIA CDCS 2020-2025, and Indonesian five-year plan (2020-24) can be highlighted more due to their clear plans to attract foreign investment. Based on UNCTAD (2020)'s report, the FDI inflows to this region have increased by 5% in 2020 and reached to 156 billion US $ depicting that the region is growth engine of FDI in Asia.

However, the challenge of environmental pollution and green economic growth in the region as the volume of carbon dioxide emissions have increased over the last decade. Figure 1 demonstrates the $CO_2$ emissions at economies of Southeast Asia. It can be seen that the $CO_2$ emissions in almost all economies in this region have increased over 2010-2020 which reveals the importance of studying green economic growth in this region.

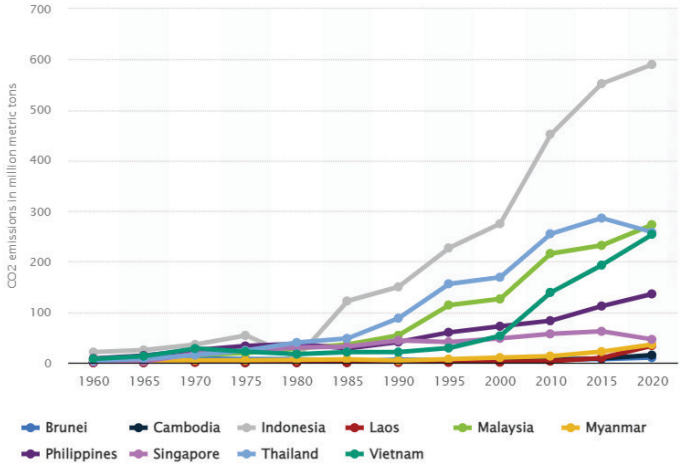


**Figure 1. $CO_2$ emissions in Southeast Asian economies, 1960-2020 (unit: mil. tons)**

*Source: Statista 2022.*

Regarding the contribution of FDI to mitigate $CO_2$ and promote green growth, two different hypotheses of the pollution halo hypothesis and the pollution haven hypothesis can be addressed. Based on the pollution halo hypothesis, FDI inflows to a country from abroad lead to various opportunities of promoting green technologies of production in the host country of FDI which decrease emissions and improve green growth

progress. Vice versa, the pollution haven hypothesis states that FDI accelerates emissions in the host country based on this claim that developed countries are trying to set up factories abroad through FDI flows which leads to more emissions and environmental pollution.

In this paper, the authors try to study how FDI can change green economic growth in the region of Southeast Asia. In other words, the existence of the pollution haven and halo hypotheses is checked in this paper. To this end, we cluster the countries in Southeast Asia based on the levels of fiscal policy development and then using the GMM approach to find out the coefficients of variables. However, to check the threshold effect, a dynamic panel threshold method proposed by Kremer et al. (2013) which help us to analyze the presence of a maximum fiscal policy development threshold in the field of FDI-green economic growth relationship.

## 2. LITERATURE REVIEW

To find out the literature gap, the existing studies can be spilt into two different strands. The first strand of literature concentrates on the issue of green economic growth and investment as a general case of countries, while the second strand focuses only on Southeast Asian region.

The first stream of literature includes the studies about the green economic growth and investment as a general issue for countries. Gao and Zhang (2013) studied the impact of FDI on environmental efficiency of China. The main empirical results showed that FDI can lead to a better environmental quality and also to a higher local innovation capacity. Kardos (2014) concentrated on the role of FDI on sustainable development of European Union. They concluded that it is better to increase the contributions of green investment to total FDI inflows. It may help the countries to promote their infrastructures and mechanisms of green economic progress. Doval and Negulescu (2014) tried to model green investments for Romania. The major results proved that enhancing green investments need a more cooperation of private sector. Using a panel data approach for 17 MENA economies, Abdouli and Hammami (2021) investigated the role of FDI and other explanatory variables to mitigate $CO_2$. The concluding remark is that FDI accelerates environmental degradation and also their results showed the existence oof pollution haven

hypothesis. Pisani et al. (2019) investigated whether FDI impacts on cities' environmental sustainability. They found out that FDI can help the cities to become green and have a better air quality. Capasso et al. (2019) identified different drivers of green growth development. Using foreign investments to have greener technologies was addressed as one of the main important drivers in this study. In other study, Estevao (2020) proposed climate-smart fiscal policy (e.g. green investment and environmental taxes) as a potential tool to foster economic recovery under the crisis of Covid-19.

Tawiah et al. (2021) investigated various aspects of green growth. They concluded that developing economies should pay attention more to FDI and trade to handle the progress of green growth. Alsubiri et al. (2021) carried out an academic study to find out how FDI can affect green and fossil fuel energy consumption. Their results for case of OPEC members depicted a positive relationship between FDI and $CO_2$ emissions and negative linkage between FDI and green power generation. Zhou and Zhao (2021) provided an empirical evidence of increase of green economic growth by enhancement of FDI (pollution halo). In a similar study, Khan et al. (2021) found out that FDI inflows may lead to acceleration of green economic growth however it depends on transparent and relevant policies and regulations about FDI and green growth progress. Demiral and Demiral (2021) employed a multidimensional approach to explore the stimulators of green growth progress. One of the main important results of their study is that inward FDI can be addressed as a motivator to green growth. In other fresh study, Vo and Ho (2021) tried to discover the interconnections among FDI, economic growth and environmental degradation for the case of Vietnam. The major results proved that FDI decreases environmental quality in the long run. Nawaz et al. (2021) focused on the relationship between green finance and environmental mitigation in the N11 economies. They found out significant impact of FDI on promoting green finance as a main part of green economy. Opoku et al. (2021) sought to explore the linkage between FDI and environmental pollution in African countries. The empirical result of this study depicted the negative impact of FDI on emissions.

The second strand of literature contains all the studies of the relationship between investment, fiscal policy and green economy in Southeast Asian economies. In general, the issue of FDI and green economy in Southeast Asian

countries has not drawn attention by many scholars. In a fresh study, Kang et al. (2021) investigated the impact of FDI on green energy consumption in South Asian economies using the panel co-integration estimation technique and annual data over the period of 1990-2019. According to the major results, policymakers in South Asian economies should view GDP and FDI as fundamental policy instruments for environmental sustainability. Murshed (2021) found out that greater FDI inflows may reduce the overall use of renewable energy while higher levels of economic growth and $CO_2$ emissions may lead to catalyze renewable energy use in South Asia. Caglar (2020) studied the importance of green energy consumption and FDI inflows in reducing environmental pollution in 9 countries. The main findings identified significant long-term relationships between foreign direct investment, renewable energy consumption and economic growth. Mahbub and Jongwanich (2019) investigated which factors influence on the FDI volume in energy sector of Bangladesh. The findings indicate that regulatory aspects are the most influential for firms when engaging in FDI in the power sector. Doytech and Narayan (2016) analyzed the FDI pattern - green energy relationship in 74 countries over the period of 1985-2012. They found out that sectoral FDI has significant and positive impact on development of green energy infrastructure. In other study, Sbia et al. (2014) tried to explore the impact of FDI on carbon emissions for the case of the UAE. They concluded that foreign direct investment declines energy demand and energy intensity. Diaconu (2014) identified the characteristics of FDI in Southeast Asian region. The author found out that the economies in the region have many unique competitive advantages which lead to attract foreign investors to the region. In a pioneer study, Lucas (1993) argued on FDI in seven East and Southeast Asia. The major estimation results depicted that foreign direct investment inflows are estimated to be less elastic with respect to the costs of capital (including taxes) than to wages, and to be more elastic with respect to aggregate demand in export markets than domestic demand.

Considering the brief aforementioned studies, a clear literature gap can be addressed as the evaluation of FDI and green economic growth in Southeast Asian economies through an econometric technique. Hence, our research will try to fill in this gap in existing literature.

## 3. RESEARCH METHODOLOGY AND DATA DESCRIPTION

### 3.1. Variables' specifications

In this paper, to evaluate how FDI and green economic recovery are related, a panel of 11 Southeast Asian economies over the period of 2000-2018 is analyzed. The dependent variable is inclusive green growth index including three different aspects of economic growth, social equality and environmental sustainability. The variables in each aspect can be found in Jha et al. (2018). We gathered the raw data from the World Bank, British Petroleum, and UNCTAD, and calculated the index for all 11 Southeast Asian economies. In regards to explanatory variables, FDI inflows as % of GDP is gathered from World Bank, fiscal policy development (with three proxies of tax revenue (% of GDP), expense (% of GDP) and CPIA fiscal policy rating 1 = low to 6 = high) is collected from World Bank's database. Besides, some control variables (Inflation rate, renewable energy consumption, $CO_2$ emissions per capita, and labor force participation rate) are added to the empirical model based on the earlier literature about their impacts on economic growth. Table 1 reports the description of all variables included in our empirical model.

**Table 1. Data Description**

| Role in empirical models | Variables | Symbols | Units | Sources |
|---|---|---|---|---|
| Dependent variable | Inclusive green growth indicator | GGRO | - | Calculation based on Jha et al. (2018) |
| Explanatory variable | Inwards FDI | FDI | % of GDP | World Bank's World Development Indicators database |
| Interfering variable (fiscal policy development) | Tax revenue | Tax | % of GDP | World Bank's database |
| | Expense | EXP | % of GDP | |
| | Fiscal policy rating | FP | 1 = low to 6 = high | |

| | | | | |
|---|---|---|---|---|
| Control variables | Inflation rate | INF | % | World Bank's World Development Indicators database |
| | Renewable energy consumption | REN | % of total energy consumption | World Bank's World Development Indicators database |
| | $CO_2$ emissions | $CO_2$ | Metric tones per capita | World Bank's World Development Indicators database |
| | Labor force participation rate | LFO | % of total population ages +15 | World Bank's World Development Indicators database |

### 3.2. Estimation strategy

In order to explore a better result of FDI green growth relationship, we consider all 11 Southeast Asian economies as a panel and also divide them into two groups based on the fiscal policy development level and re-estimate coefficients for each group of Southeast Asian economies. A general economic growth equation (Eq. 1) can be considered as our base estimation econometric model:

$$gG_{i,t} - gG_{i,t-1} = (\beta - 1).gG_{i,t-1} + \alpha.Z_{i,t} + \theta_t + \mu_t + \varepsilon_{i,t} \quad (1)$$

Where gG stands for inclusive green growth indicator, $\theta_t\theta_t$ and $\mu_t\mu_t$ are time-fixed effects and time invariant country-specific effect. Z denotes all explanatory variables and $\varepsilon_{i,t}\varepsilon_{i,t}$ represents the idiosyncratic shocks. Furthermore, following the economic growth literature on the problem of endogeneity, the estimation is done through the Generalized Method of Moments (GMM) proposed by Blundell and Bond (1998) which solves the problems of unobserved heterogeneity and simultaneity in empirical model. This estimator employs the lagged dependent variables and explanatory variables to instrument for solving the aforementioned problems.

Following Osei and Kim (2020), a linear interaction model for FDI-fiscal policy development level's interaction is employed. Next, the estimated interaction can be added as a variable to the empirical estimation model to explore whether FDI has any dependency on the level of fiscal policy development. To this end, Eq (1) can be re-arranged as Eq. (2):

$$gG_{i,t} - gG_{i,t-1} = (\beta - 1).gG_{i,t-1} + \delta FDI_{i,t} + \alpha.Z_{i,t} + \theta_t + \mu_t + \varepsilon_{i,t} \quad (2)$$

There is a significant interaction between the level of fiscal policy development (FDEV) and the coefficient of FDI in Eq (2):

$$\delta = \gamma_1 + \gamma_2 . FDEV_{i,t} \quad (3)$$

Considering Eq.(3) and Eq (2), the green growth equation (Eq.4) can be obtained as bellows:

$$gG_{i,t} - gG_{i,t-1} = (\beta - 1).gG_{i,t-1} + \gamma_1 FDI_{i,t} + \left(\gamma_2 FDI_{i,t} * FDEV_{i,t}\right) + \gamma_3 FDEV_{i,t} + \alpha . Z_{i,t} + \theta_t + \mu_t + \varepsilon_{i,t} \quad (4)$$

Through estimation of coefficients of variables in Eq. 4, we can explore whether the level of fiscal policy development of Southeast Asian economies is an important role on FDI-green growth in this region. To handle the GMM estimation, the variables are lagged for the level equation and second for the difference equation.

In continue a dynamic panel threshold model (Hansen, 1999; Caner and Hansen, 2004) which allows endogengeity among regressors carried out to discover whether there is any threshold level of fiscal policy development in the FDI- green economic growth nexus in Southeast Asian economies. The dynamic panel threshold equation is as shown in Eq. (5):

$$\Delta gG_{i,t} = \mu_i + \alpha_1 FDI_{i,t} I(FDEV_{i,t} \leq \gamma) + \delta_1 I(FDEV_{i,t} \leq \gamma) + \alpha_3 FDI_{i,t} I(FDEV_{i,t} > \gamma) + \omega . Z_{i,t} + \varepsilon_{i,t} \quad (5)$$

In Eq. (6), $\gamma\gamma$ shows the threshold level. In order to estimate the threshold level, Arellano and Bover (1995)'s method is employed. The method called the forward orthogonal deviations approach is recommended by earlier studies such as Aydin et al. (2016) and Zhang et al. (2019) as a way to ensure the error terms are not correlated.

## 4. EMPIRICAL FINDINGS AND DISCUSSIONS

First of all, the 11 examined countries in Southeast Asia are divided into two groups (high and low fiscal development levels). The fiscal policy development level is calculated based on three variables of tax revenues, expense and fiscal policy rating (we transformed the measurement of this variable (range of 1-6). Table 2 reports the two sub-sample groups of Southeast Asian economies.

**Table 2. Classification of Southeast Asian Economies Based on Fiscal Policy Development Level**

| High level of fiscal policy development (HFDEV) (higher than the average) | Low level of fiscal policy development (LFDEV) (lower than the average) |
|---|---|
| Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam | Brunei, Cambodia, East Timor, Laos, Myanmar |

*Source: Calculated from World Bank's World Development Indicators database.*

Next, we can estimate the coefficients for full sample (11 economies in the region) and sub-sample groups (6 economies with high level of fiscal policy development and 5 economies with low level of fiscal policy development). Table 3 reports the results of the estimation based on the system dynamic panel GMM as follows:

**Table 3. Results of System Dynamic Panel GMM**

| Variable | Panel of 11 economies | Sub-sample groups of countries | | Interactions | | |
|---|---|---|---|---|---|---|
| | | LFDEV | HFDEV | Tax | EX | FP |
| FDI | 0.10* | 0.04** | 0.24** | 0.09** | 0.09** | 0.14* |
| INF | -0.32** | -0.48* | -0.17* | -0.11* | -0.27** | -0.19** |
| REN | 0.05* | 0.01** | 0.19* | 0.07** | 0.01 | 0.05 |
| CO2 | -0.31** | -0.11* | -0.26* | -0.15 | -0.18* | -0.06** |
| LFO | 0.05 | 0.06 | 0.11** | 0.01* | 0.04** | 0.09** |
| Tax | - | - | - | -0.07* | - | - |
| FDI*Tax | - | - | - | -0.27** | - | - |
| EX | - | - | - | - | -0.01** | - |
| FDI*EX | - | - | - | - | -0.26* | - |
| FP | - | - | - | - | - | -0.22 |
| FDI*FP | - | - | - | - | - | -0.43 |
| F-stat for FDI | - | - | - | 4.57* | 4.79* | 3.54* |
| Countries | 11 | 6 | 5 | 11 | 11 | 11 |
| Hansen's J test | 0.313 | 0.515 | 0.301 | 0.253 | 0.267 | 0.189 |
| AR(2) test | 0.904 | 0.260 | 0.664 | 0.489 | 0.664 | 0.493 |

*Note 1: LFDEV and HFDEV indicate low fiscal policy development and high fiscal policy development, respectively. In addition, FDI, INF, REN, $CO_2$, LFO, Tax, EX, and FP are foreign direct investment, inflation rate, renewable energy consumption, carbon dioxide emissions, labor force participation rate, tax revenue, expense, and CPIA fiscal policy rating, respectively.*

*Source: Calculated by Stata 16.*

According to Table 3, foreign direct investment (FDI) has positive impact on inclusive green growth indicator for the case of full sample, and two groups of economies with low and high fiscal policy development levels. However, the variable's coefficient for the high fiscal policy development group of Southeast Asian economies is bigger than that of the low fiscal policy development group of economies in the region. This finding is line with Rioja and Valev (2004) that proved that in order to make FDI more efficient to economic growth; countries should have a higher level of financial and fiscal policy development.

To have more in-depth results, the linear interaction analysis was employed to check whether the coefficient of FDI has any linkage with the fiscal policy development level. According to Table 3, when tax revenue (Tax) and expense (EX), the interaction term has negative sign and also is statistically significant, expressing that the growth effect of foreign direct investment is lowered by any increase in fiscal policy development level. However, by considering FP (fiscal policy rating) as the representative of development level of fiscal policy in a country, the interaction term is statistically insignificant. Moreover, for the panel of all Southeast Asian economies, inflation rate has negative impact on inclusive green growth indicator, meaning that any increase in general price level of commodities and services in this region may decelerate the progress of green growth. This finding is in line with the earlier studies (e.g. Sahnoun and Abdennadher, 2019; Hasseb et al., 2019) who declare the negative impact of inflation on supply chain activities and consequently on growth of an economy, while this finding is in contrast to Benhabib and Spiegel (2009), Adaramola and Dada (2020) and Dabbous and Tarhini (2021) who found positive impact and neutrality off inflation rate to growth of an economy. The sign of coefficient of renewable energy consumption found positive and statistically significant highlighting the important contribution of promoting green energy consumption to green growth progress. The finding supports the conclusions of Rahmeher et al. (2021) who depicted the positive impact of renewable energy consumption on mitigating carbon dioxide which means development of green growth. Furthermore, we found out the negative impact of $CO_2$ on inclusive green growth of Southeast Asian economies which is in line with Hao et al. (2021) who found out negative relationship between green growth and $CO_2$ emissions in the case

of G7 economies. Interestingly, the empirical estimations did not find an evidence of influence of labor participation ratio on inclusive economic growth in the region meaning that still green growth in the region has not any dependency on participation of labor force in labor market, meaning that labor force is not a significant input for green growth in Southeast Asian region. The finding highlights the importance of green employment (expressed by Bowen et al., 2018) in the region to increase the role of input of labor capital on green growth progress of economies in this region. However, when we consider the groups of economies based on their fiscal policy development level, the estimation results revealed the positive and statistically significant impact of labor force participation ratio to inclusive green growth of HFDEV group meaning that in countries with higher fiscal policy development, employment in the green economy may be higher and consequently the impact of labor input would be more rather than in low fiscal policy development group countries in the region of Southeast Asia. Moreover, the magnitude of negative impact of inflation rate on green growth is lower in high fiscal policy development group countries compared with the impact in low fiscal policy development countries. This finding is supported by Hung (2003) who argued that a country with a better fiscal policy development may provide a more efficient control on inflation rate.

According to the shortcoming of linear interaction analysis and also the spilt-sample regressions, a dynamic panel threshold model to estimate Eq. (5) is employed to capture the threshold level of fiscal policy development (with the measurement of tax revenue (Tax)) in the linkage between FDI and inclusive green growth indicator for Southeast Asian economies. The estimation results of this model are represented in Table 4.

**Table 4. Results of Dynamic Panel Threshold Model**

| | **Tax** |
|---|---|
| Threshold | 94.51 |
| Confidence intervals | [88.59,96.19] |
| FDI impact | |
| $\alpha_1(FDEV > \gamma)$ | -0.035 (0.045) |
| $\alpha_2(FDEV \leq \gamma)$ | 0.150* (0.053) |
| INF | -0.094** (0.014) |
| REN | 0.231* (0.014) |

| | |
|---|---|
| CO2 | -0.095 (0.065) |
| LFO | 0.007 (0.011) |
| $\delta_1$ | 0.006 * (0.005) |
| Observations | 209 |
| Time period | 2000-2018 |
| Countries | 11 |

*Note: Numbers in () show standard errors, *and ** report significance at the 10% and 5% level, respectively. Tax stands for tax revenue.*

*Source: Calculated by Stata 16.*

According to Table 4, the threshold value is 94.51 which can be considered as 94.51% of green growth indicator. Approximately 20% of the observations in our sample are above the threshold level of 94.51. Based on the regime-dependent marginal effects ($\alpha_1$ *and* $\alpha_2 \alpha_1$ *and* $\alpha_2$), FDI inflows have positive and statistically significant impact on inclusive green growth indicator if Tax (tax revenue) stands below the threshold level, whereas the impact of FDI becomes insignificant when Tax is above the threshold level. In addition, the signs of explanatory variables of inflation rate, renewable energy consumption are plausible and significant. According to the results reported in Table 4, we can conclude that a potential fiscal policy development threshold exists in FDI-green growth relationship.

## 5. ROBUSTNESS CHECK

To ensure the validation of empirical results, the robustness check is employed. We consider the growth model used by Rahman and Alam (2021) where economic growth is a function of per capita energy use, per capita trade, per capita capital, FDI inflows and human capital index gathered from the World Development Indicators, World Bank database, BP and Feenstra et al., (2015). In order to find a proper estimation technique, the cross-sectional dependence test, Pesaran's (2007) cross-sectionally augmented Dickey Fuller (CADF), panel co-integration tests of Kao (1999) are carried out. Based on the results of preliminary tests, the long-run and short-run estimations are done through the panel pooled mean group (PMG) technique. Table 5 represents the results of PMG estimations:

**Table 5. Results of PMG Estimations (robustness check)**

| Independent variables | Coefficients | Standard errors | P-values |
|---|---|---|---|
| Long-run: | | | |
| FDI | 0.245 | 0.038 | 0.004 |
| Short-run: | | | |
| ΔFDI | 0.009 | 0.224 | 0.024 |

*Source: Calculated by Stata 16.*

According to Table 5, the coefficients of FDI are positive and significant in long-run and short-run, proving the positive impact of this variable on inclusive green growth indicator of 11 Southeast Asian economies which is similar to the findings reported in Table 3.

## 6. CONCLUSIONS AND POLICY IMPLICATIONS

This paper attempts to probe the relationship between FDI inflows and green economic growth for the case of 11 economies in Southeast Asia. In addition, the role of fiscal policy development on the direction and magnitudes of FDI-green growth of these economies is analyzed by utilizing data of 19 years (2000-2018) and employing GMM estimation approach. To this end, firstly, we divided the total sample into two groups of countries based on fiscal policy development level and carried out a linear system GMM. Then, to evaluate the threshold value, the dynamic panel threshold method was applied to explore whether a maximum fiscal policy development threshold is present in FDI-green growth relationship in the region.

### 6.1. Concluding remarks

According to the empirical findings, the paper concludes that on the one side, FDI positively impacts on green growth progress of these economies, while the magnitude of impact is stronger for the case of high fiscal policy development group of Southeast Asian economies. This result is in contrast to the pollution haven hypothesis that states FDI increases emissions, while it is in line with the pollution halo hypothesis that claims that FDI may enhance green growth progress in a country.

Moreover, there is a fiscal policy development threshold which motivates positive relationship between foreign direct investment and green

growth for Southeast Asian countries. In regards to explanatory variables, inflation rate has negative impact on inclusive green growth indicator, while renewable energy consumption has positive contribution to green growth progress. Furthermore, the negative impact of $CO_2$ on inclusive green growth of Southeast Asian economies was proved which highlights the importance of policies to mitigate carbon dioxide emissions in the region. The empirical estimations did not find an evidence of influence of labor participation ratio on inclusive economic growth in the region meaning that still green growth in the region has not any dependency on participation of labor force in labor market, indicating that labor force is not a significant input for green growth in Southeast Asian region. When we consider the groups of economies based on their fiscal policy development level, we can conclude that labor force participation is an accelerating factor to inclusive green growth of HFDEV group meaning. Moreover, the magnitude of negative impact of inflation rate on green growth is lower in high fiscal policy development group countries compared with the impact in low fiscal policy development countries.

### 6.2. Policy implications

According to the concluding remarks, it can be argued that:

i. To have a larger impact of FDI on green growth progress, the Southeast Asian economies should orient their economic priorities and policies to improve their fiscal policy development, particularly their green fiscal policies (Yang et al., 2019; Chang et al., 2020; and Dongyang, 2021) which can be fruitful to positive impacts of FDI on green recovery of the countries in Southeast Asia.

ii. As a practical policy implication, planning of green job creation is recommended to countries, especially the economies in Southeast Asia where there is not any significant relationship between labor force participation and green growth indicator. To this end, using successful experiences such as The Green Action Plan (GAP) for SMEs issued in 204 for the EU, the "Green Jobs Initiative" by UNEP, ILO, IOE, and ITUC, can be an appropriate policy for developing countries like the ones in the region of Southeast Asia.

iii. Since the existence of the pollution halo hypothesis has been approved in Southeast Asian economies, implementation of green tax incentives, development of green financial instruments like green bonds, establishment of green economic zones can be applied to attract more FDI from abroad. These policies are more important in the era of Covid-19 which negatively affected capital flows and globalization among countries.

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# CONTRIBUTION OF LABOR RESTRUCTURING TO ECONOMIC GROWTH: A CASE STUDY OF THE MANUFACTURING INDUSTRY IN VIETNAM

**Pham Thi Du**[1]

***Abstract:*** *The article uses data of gross domestic product (GDP), total number of labors in the economy, data of economic sectors (GDP, labor) collected from the General Statistics Office (GSO) in the period 2011-2020. Using the Lilien index to measure the rate of labor restructuring across economic sectors, it is found that the manufacturing industry has the highest rate of labor restructuring in the research period. By the shift - share analysis (SSA) method, the article analyzes the contribution of labor restructuring in the manufacturing industry to economic growth in Vietnam. Specifically: analyzing the contribution to economic growth of 9/21 first - level economic sectors according to three effects: static shift effect, dynamic shift effect and intra shift effect, to know that the contribution to economic growth of the manufacturing industry compared to other industries; analyzing the contribution of labor restructuring in the manufacturing industry (including: static shift effect and dynamic shift effect) and compare with intra shift effect, from which part has the main contribution to the economic growth of this industry. Based on the research results, the article proposes policy directions in labor restructuring to make a positive contribution to Vietnam's economic growth.*

***Keywords:*** *Labor restructuring, economic growth, manufacturing, Vietnam.*

## 1. INTRODUCTION

Economic restructuring and labor restructuring are not an automatic process, but it is affected by many factors, including the important role of the Government through supporting, management, and regulatory policies. To labor restructuring contributes positively to economic growth and development, and at the same time control the process of labor restructuring for the purpose of economic growth and development, it is always a matter

[1] Faculty of Economics of Law, Thuongmai University, Hanoi, Vietnam. Email: dupham@tmu.edu.vn

of concern of the managers and policy makers. In recent years, Vietnam's economy has had many remarkable achievements with an effective economic restructuring model. Accompanying the change in economic structure is the change in the structure of the labor force. Especially, the positive contribution of the labor restructuring from agriculture to industries and services; from state-owned enterprises to private enterprises. Vietnam has over 99 million people (GSO, 2022), with a high proportion of the population of working age, in the period of the golden population structure, which is a great advantage in the process of construction and development the economy. Reasonable reallocation of labor resources will contribute positively to economic growth. Especially, in the context of globalization and international economic integration, reasonable labor restructuring also needs to consider the comparative advantages of industries to be able to participate more deeply in the global value chain. However, the reality shows that the labor restructuring of sectors is not entirely proportional to their contribution to GDP. The question is: Has the labor restructuring of economic sectors in Vietnam in recent years contributed positively to economic growth? What is the contribution of labor restructuring in the manufacturing industry to economic growth? The article uses the SSA method to assess the contribution of labor restructuring to economic growth by sector, focusing on research on the manufacturing industry, specifically the contribution due to three parts: static shift effect, dynamic shift effect and intra shift effect.

## 2. LITERATURE REVIEW, THEORETICAL FRAMEWORK, AND METHODS

### 2.1. Literature review

*a. Theoretical basis of the relationship between labor restructuring and economic growth*

A number of economists attempted to analyse development in the context of a 'labour-surplus economy'. These theories owe their origin to the celebrated work of Nobel Laureate Sir W. Arthur Lewis in 1954. An elaborate discussion of the labour - surplus economy is given by G. Ranis and John Fei in 1961.

In 1954 Sir W. Arthur Lewis published a paper, "Economic Development with Unlimited Supplies of Labour" which has since become one of the

most frequently cited publications by any modern economist: its focus was a 'dual economics'- small, urban, industrialised sectors of economic activity surrounded by a large, rural, traditional sector, like minute is largely in a vast ocean. A central theme of that article was that, labour in dual economies is available to the urban, industrialised sector at a constant wage determined by minimum levels of existence in traditional family farming because of 'disguised unemployment in agriculture, there is practically unlimited supply of labour and available of industrialisation, at least in the early stages of development. At some later point in the history of dual economics, the supply of labour is exhausted then only a rising wage rate will draw more labour out of agriculture.

A less developed country is conceived to operate in two sectors: (1) A traditional agricultural sector, and (2) A much smaller and also more modern industrial sector.

Labor supply: there is no limit on the supply of simple labor. The traditional agricultural sector has always had a surplus of labor due to the lack of employment. This number of employees switch to work for modern industry without reducing the added value of agricultural industry. Labor demand and wages: modern industrial sector has high wages more, more productive and there is an increased demand for labor. Agricultural workers have lower levels of income and productivity are willing to move to work in modern industrial sector. Profitable and reinvested industry expands production leading to increased demand for labor motion. That explains the labor movement from low-productivity agriculture to a more productive industry. This process leads to the labor restructuring in the direction of increase productivity and contribute to economic growth.

Rainis - Fei (1961) pointed out two basic defects of the Lewis model: (1) The restructuring process has a stop when there is no surplus labor in the agricultural sector, (2) Ignore the commodity market and develop a commodity price index across industries. To overcome the above limitations, the authors have built a three-stage development model Stage: The first stage: There is labor mobility and structural transformation in the direction of increasing productivity due to labor surplus in agriculture. Second stage: in process industry restructuring, commodity market changes, agricultural product prices increase relative to prices of industrial

goods, surplus agricultural labor is exhausted, the ability to maintain the gap in wages is getting harder and harder, the industry wants to recruit more workers, it must increase wages, therefore must reduce accumulation, investment, leading to a decrease in productivity. Third stage: The transfer of surplus labor will stop when the wages of agricultural workers increase (not necessarily equal to the average wage of industrial workers).

Research on Structural Transformation in the Three Sector Economy of Kuznet. S (1966) based on several hypotheses: (a) The share of labor in agriculture has decreased in the development process; (b) The share of industrial labor remains unchanged in the development process; (c) The proportion of workers in the service sector increases during the development process. However, in the long run, some other studies show that: the proportion of industrial workers grows by "camel hump" (Ngai, Pissarides, 2007; Maddison, 1980). This result is consistent with the Fisher's "three-industry hypothesis" (1939), Furastié (1969) includes: (a) The proportion of industrial workers agriculture decreased in the process of development; (b) The share of industrial workers increases in the early stages of development (industrialization stage) and gradually decreased in the later stage; (c) The proportion of workers in the service sector increases during the development process.

*b. Empirical studies on the relationship between labor restructuring and economic growth*

McMillan, Margaret and Dani Rodrik (2011) argue that increasing labor productivity in an economy is achieved in one of two ways. First, productivity can increase in economic sectors through accumulate capital, technological change or reduce unreasonable movement of machines, labor tools. Second, labor can move between industries, from low-productivity industries to high-productivity industries, increasing the overall labor productivity of the entire economy. Using the SSA method with cross-sectional data of 38 countries on different continents, the author has researched and made some conclusions: (1) There is a big gap between labor productivity in traditional and modern industries. Labor flow moves from productivity industry from low to more productive industries is the key to driving growth. (2) The impact of labor restructuring and productivity growth vary across continents. In Asia, labor movement from

low-productivity industries to higher-productivity industries increases overall productivity, while in Africa and Latin America, the labor migration slows growth of labor productivity due to a part of labor that does not meet professional requirements should occur labor movement from high-productivity industries to lower-productivity industries. (3) Economic restructuring is not an automatic process. It needs effects, oriented control of managers and policymakers to stay on track to increase overall productivity, contribute to economic growth and development.

Using the SSA method, Singh. Lakhwinder (2004) explained the role of restructuring the industry to increase labor productivity and total factor productivity in Korea's industrial sector based on enterprise-level data for the period 1970-2000.

Nguyen Thi Tue Anh (2007), clarify the theoretical basis of industry restructuring in the process of industrialization, provide an analytical framework on the contribution of sectors and industry restructuring to labor productivity growth. Using the SSA method to assess the contribution of sectors and economic restructuring to labor productivity growth of 20 industries level 2 with the data set of the GSO for the period 1991-2006. Nguyen Thi Tue Anh (2018), using SSA method to analyze industry restructuring (Agriculture, forestry, and fishing, Industry - construction; Services) in the period 2006-2016 and its contributions to growth quality. This paper proposes some solutions that Vietnam needs to better take advantage of the opportunities brought by integration to carry out the restructuring of the industry, taking advantage of the trend of capital movement, technology, and management skills in the regionally and globally to create a breakthrough in industry restructuring, especially attracting new industries associated with technology and the digital economy.

Vũ Thị Thu Hương (2017), using the SSA method to assess the contribution of labor restructuring to labor productivity growth and Vietnam's economic growth in the period 1995-2014. Analyze how labor restructuring by industry in Vietnam has an impact on economic growth in terms of the overall space and the space of provinces/cities. Proposing policy recommendations to help the labor restructuring process be more effective and contribute better to economic growth.

Đinh Hong Linh, Nguyen Thi Thanh Huyen, Nguyen Thị Lan Anh (2021), analyze labor productivity characteristics and quantify the impact of labor restructuring on labor productivity growth in Ha Giang province in the period 2015-2019. Using the density shift analysis method, the research results show that the labor productivity growth in Ha Giang province is due to the static shift effect and the increase in intra-industry labor productivity, causing labor to shift to other industries. industry - construction and services have higher labor productivity. Meanwhile, the displacement effect has the opposite effect, reflecting that the change in the proportion of labor has not been commensurate with the increase in labor productivity of the province. Based on the research results, several recommendations have been proposed to improve the quality of labor productivity in Ha Giang province.

Pham Huy Tu (2016), using the SSA method to analyze the change in labor productivity of the whole economy through the change in productivity in industries and the transformation of labor structure. The data used for calculation is GDP in the years 2005-2014 at comparative prices with 2010, employed laborers in 2005-2014 divided by sectors, the proportion of employed laborers in industries compared to the whole economy. The study focuses on analyzing the contributions of the following components: changes in labor productivity within the industry, labor restructuring (static shift effects, dynamic shift effects), the industry's contribution rate to productivity growth of 11/21 first - level economic sectors of Vietnam.

## 2.2. Theoretical framework

### *2.2.1. The concept of labor restructuring and economic growth*

*a. The concept of labor restructuring*

Labor structure is an economic category, showing the proportion of each factor of labor according to different criteria in the whole or the ratio of each factor compared to another factor, expressed as a percentage (Pham Quy Tho, 2006).

Labor restructuring is the change over time in the proportion of each part of the total number of labors in a certain space and time and taking place in a certain trend (increasing, decreasing... ). Thus, labor restructuring

is a concept in a certain space and time, which changes the quantity and quality of labor (Pham Quy Tho, 2006).

Labor restructuring by industry is a type of labor restructuring. Labor restructuring by industry is the process of changing the proportion and quality of labor in different industries, taking place in a space, time and following a certain trend (Phi Thi Hang, 2014).

Labor restructuring by industry is associated with the trend of sectoral economic restructuring (ie, the economic structure and labor structure by sector are shifting from agriculture to industry and services). This is the most important trend of labor restructuring, an objective necessity of almost all countries in the world in the process of industrialization and modernization. The theory that reflects this trend of labor restructuring is based on: Arthur Lewis's two-area model theory and Harry T.Oshima 's two-area model theory.

*b. The concept of economic growth*

Economic growth is an increase of the national income per capita, and it involves the analysis, especially in quantitative terms, of this process, with a focus on the functional relations between the endogenous variables; in a wider sense, it involves the increase of the GDP, GNP and NI, therefore of the national wealth, including the production capacity, expressed in both absolute and relative size, per capita, encompassing also the structural modifications of economy (Alina - Petronela Haller, 2012). We could therefore estimate that economic growth is the process of increasing the sizes of national economies, the macro-economic indications, especially the GDP per capita, in an ascendant but not necessarily linear direction, with positive effects on the economic-social sector, while development shows us how growth impacts on the society by increasing the standard of life. Typologically, in one sense and in the other, economic growth can be: positive, zero, negative. Positive economic growth is recorded when the annual average rhythms of the macro-indicators are higher than the average rhythms of growth of the population. When the annual average rhythms of growth of the macro-economic indicators, particularly GDP, are equal to those of the population growth, we can speak of zero economic growth. Negative economic growth appears when the rhythms of population growth are higher than those of the macro-economic indicators.

Economic growth is a complex, long-run phenomenon, subjected to constraints such as: excessive rise of population, limited resources, inadequate infrastructure, inefficient utilization of resources, excessive governmental intervention, institutional and cultural models that make the increase difficult. Economic growth is obtained by an efficient use of the available resources and by increasing the capacity of production of a country. It facilitates the redistribution of incomes between population and society. The cumulative effects, the small differences of the increase rates, become big for periods of one decade or more. It is easier to redistribute the income in a dynamic, growing society, than in a static one. There are situations when economic growth is confounded with economic fluctuations. The application of expansionist monetary and tax policies could lead to the elimination of recessionary gaps and to increasing the GDP beyond its potential level. Economic growth supposes the modification of the potential output, due to the modification of the offer of factors (labor and capital) or of the increase of the productivity of factors (output per input unit). When the rate of economic growth is big, the production of goods, services rises and consequently, unemployment rate decreases, the number of job opportunities rises, as well as the population's standard of life.

### *2.2.2. Measuring labor restructuring*

To measure labor restructuring, there are three main methods (Vu Thi Thu Huong, 2017):

*(1) Vector method:*

The vector method (or Cos coefficient) proposed by the World Bank experts is used to assess the degree of structural change between periods. (Cong Van Di, 2008). To quantify the degree of transition between two times $t_0$ and $t_1$, use the coefficient cos F.

$$\cos\Phi = \frac{\sum_{i=1}^{n} S_i(t_0) \times S_i(t_1)}{\sqrt{\sum_{i=1}^{n} S_i^2(t_0) \times \sum_{i=1}^{n} S_i^2(t_1)}}$$

Where:

$s_i(t)$ - is the proportion of labor in industry i at time t.

F - is the angle between two structure vectors $s(t_0)$ and $s(t_1)$, the larger the cos F, the closer the structures are to each other and vice versa.

When cos F = 1: the angle between these two vectors is 0, it means that the labor structure at those two times is the same, there is no change in the labor structure. When cos F = 0: the angle between these two vectors is 90o and the labor structure vectors are orthogonal to each other, showing the largest change in the labor structure).

*(2) Lilien index*

The Lilien index (LI) is an important measure of structural change in several fields of economic research. One field, which garners special attention here, is the common use of the LI as a measure of structural change in the employment composition on the determinants of structural unemployment in the research literature. Indirectly, it measures the degree to which labor demand is affected by sectoral shifts in the composition of output. Lilien (1982) developed an index that measures the standard deviation of the sectoral growth rates of employment from time t − 1 to time t. For each region (or geographical area) of the country, the LI measures the variance in industry employment growth. The LI is bounded from below at 0; that is, it takes the value 0 if there are no structural changes within one period. This index is a dispersion measure, and it considers the size (or share) of the sectors. The LI is also considered a useful measure of the speed of structural changes. The higher the value of this indicator, the faster the structural changes and the bigger the reallocations of employment between branches (sectors or industries). It also indicates the ability of an economy to flexibly react and quickly adapt to changes in aggregate demand.

For each region (or geographical area) of the country, the LI measures the variance in industry employment growth as follows:

$$LI = \sqrt{\sum_{i=1}^{n}(s_{irt}) \times \{\ln(x_{irt}/x_{irt-1}) - \ln(X_{rt}/X_{rt-1})\}^2}$$

Where: $s_{irt} = x_{irt}x_{irt}/X_{irt}$ is the sector i share in total regional employment in time t, $x_{irt}x_{irt}$ is the employment in sector i in region r, $X_{rt}$ is the employment in the entire region, $\ln(x_{irt}/x_{irt-1}x_{irt}/x_{irt-1})$ is the employment growth in sector i in time t, and $\ln(X_{rt}/X_{rt-1})$ is the employment growth in the entire region in time t.

*(3) The change in the proportion of labor*

The most common in the studies, the labor restructuring over time is calculated by comparing the proportion of labor of each division in the

overall period with that of the previous period. Labor restructuring by space is calculated by comparing the proportion of labor between parts in the whole to see how much percentage has increased (or decreased). Wacziarg (2004) used a formula to measure labor restructuring by the absolute value of the difference between the proportion of labor in sector i and the total number of labors in the country/region over τ years.

$$CH_{it}(\tau) = | s_{it} - s_{it-\tau} |$$

Where: $s_{it}$ is the proportion of labor in industry i in the total number of labors of a country/region, year t.

Based on the collected data, this article selects the Lilien index to measure the labor restructuring of industries.

***2.2.3. Measuring the contribution of labor restructuring to economic growth***

The most used measure of structural transformation's contribution to growth is growth disaggregation. The method is called Shift Share Analysis (SSA), derived from research by Daniel Creamer in the 1940s, Fabricant 1942, and later developed by Edgar Dunn in 1960. The method was originally named as static comparative analysis model. And SSA is developed and can be applied in a quite convenient way mentioned in Havlik (2008). The SSA method is widely used to measure the contribution of economic and labor restructuring to economic growth in both developed and developing countries. Empirical studies can be found in reviews by Havlik (2008) or Timmer and de Vries (2008). According to this method, economic growth is decomposed into the following effects:

$$g = \frac{Y_1 - Y_0}{Y_0} = \frac{\sum_1^n Y_{i,0}(S_{i,1} - S_{i,0}) + \sum_1^n (Y_{i,1} - Y_{i,0})(S_{i,1} - S_{i,0}) + \sum_1^n (Y_{i,1} - Y_{i,0})S_{i,0}}{Y_0}$$

Where:

g: is the growth rate between the study period and the base period

n: is the total number of sectors in the economy

$Y_1$ and $Y_0$ are the output value (GDP) of the economy in the study period and the base period, respectively

$Y_{i1}$ and $Y_{i0}$ are the output value of industry i at the study period and the base period, respectively

$S_{i1}$ and $S_{i0}$ are the proportion of labor in industry i in the total labor force of the economy in the research period and the base period, respectively

The first part $\frac{\sum_1^n Y_{i,0}(S_{i,1}-S_{i,0})}{Y_0}$ is the contribution to growth due to changes in labor structure - static shift effect. This effect is positive if industries (which were initially high output) attract more workers relative to others and there has been a movement from low productivity to high productivity industries (sector i).

The second part $\frac{\sum_1^n(Y_{i,1}-Y_{i,0})(S_{i,1}-S_{i,0})}{Y_0}$ measures the contribution to growth due to the impact of both changes in the labor structure and the output structure of sectors in the economy - dynamic shift effect. If industries grow larger and attract more workers (increasing the share of industry workers in the economy), the combined effect of these two changes will be positive on growth. This effect will be negative if the industry has a high growth rate but cannot maintain the share of the industry's labor in the overall (industry using low - skilled or labor - substituting technology).

The third part $\frac{\sum_1^n(Y_{i,1}-Y_{i,0})S_{i,0}}{Y_0}$ measures growth assuming that there is no labor mobility between sectors in the economy between the study year and the base year. This effect is called intra shift effect (Tran Tho Đat, Le Quang Canh, 2015).

### 2.3. Methods

*a. Data collection methods*

- Data to calculate the Lilien index to measure labor restructuring of economic sectors includes Total number of labors, labor of sectors.

- Data to measure the contribution of labor restructuring to economic growth includes Total GDP of the country, GDP of sectors, total number of labors of the whole country, labor of sectors.

These data are collected from the GSO in the period 2011-2020. The selected economic sectors for research are 9/21 of Vietnam's first-level economic sectors, in which focus is on the manufacturing industry.

*b. Data analysis methods*

Based on the collected data, the author uses statistical and comparative methods to analyze and process data. To measure the labor restructuring of economic sectors, the article uses the Lilien index (mentioned in section 2.2.2). To measure the contribution of labor restructuring to economic growth, the author uses the SSA method (mentioned in section 2.2.3). The software that supports the calculation of the above criteria is excel software.

## 3. RESULTS AND DISCUSSION

### 3.1. Situation of labor restructuring in the manufacturing industry in Vietnam

#### *3.1.1. The change in the number and proportion of labor*

Studying the change in the proportion of labor working in economic sectors is the basic content to evaluate the process of labor restructuring by industry in Vietnam. The manufacturing industry is an industry with abundant labor resources, the annual additional labor force is quite high, which can ensure to meet the demand for labor resources for the development of the industry in recent years.

**Table 1. Number and Proportion of Labor Manufacturing Industry 2011-2020**

*Unit: Thousand persons*

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Total** | 50547.2 | 51422.4 | 52507.8 | 52744.5 | 53110.5 | 53345.5 | 53708.6 | 54282.5 | 54659.2 | 53609.6 |
| **Labor manufacturing** | 7006.5 | 7102.2 | 7363.2 | 7414.7 | 8457.5 | 9049.2 | 9537.6 | 9999.8 | 11287.6 | 11302.2 |
| **Proportion (%)** | 13.86 | 13.84 | 14.02 | 14.55 | 15.92 | 16.96 | 17.78 | 18.42 | 20.65 | 21.08 |
| **Growth rate (%)** | -0.64 | 2.15 | 2.88 | 4.79 | 9.61 | 6.99 | 5.4 | 4.85 | 12.88 | 0.13 |

*Source: GSO and the author's calculations.*

The proportion of labor in the manufacturing industry tends to increase gradually in the period 2011-2020 (except in 2012 which decreased by 0.02% compared to 2011). If in 2011, the number of labors in this industry reached more than 7 million persons, accounting for 13.86% of the total

number of labors, by 2020, this has increased to 11.3 million persons, accounting for 21.08%, increased by 7.14 percentage points compared to 2011 and achieved the highest increase compared to other economic sectors. In terms of the growth rate of the number of labors in this industry, in 2011 the number of labors decreased slightly by 0.64%, equivalent to 44.8 thousand persons; the remaining years all had a single-digit growth rate, except in 2019, the labor growth rate in the industry was the highest at 12.88%. In 2020, due to the impact of the Covid-19 epidemic, the number of labors in this industry insignificantly increased, only 0.13%, equivalent to 14.65 thousand persons.

#### *3.1.2. Labor restructuring rate*

Using data on labor aged 15 and over working in first -level economic sectors in the period 2011-2020 from the data of the GSO. The author selects 9/21 first -level economic sectors that account for large number of labors to calculate the Lilien index. Using the names of the industries based on the table of sectors in Vietnam: A- Agriculture, forestry, and fishing; B- Mining and quarrying; C- Manufacturing; D- Electricity, gas, steam, and air conditioning supply; F- Construction; G- Wholesale and retail trade; repair of motor vehicles and motorcycles; H- Transportation and storage; I- Accommodation and food service activities; K- Financial, banking and insurance activities.

**Table 2. Lilien Index of Economic Sectors in Vietnam**

| Industry | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 0.027 | 0.134 | 0.105 | 0.091 | 0.384 | 0.299 | 0.253 | 0.37 | 0.516 | 0.237 |
| B | 0.004 | 0.0009 | 0.06 | 0.083 | 0.038 | 0.0424 | 0.01 | 0.053 | 0.007 | 0.062 |
| C | 0.13 | 0.004 | 0.048 | 0.14 | 0.36 | 0.026 | 0.193 | 0.157 | 0.519 | 0.095 |
| D | 0.014 | 0.05 | 0.002 | 0.074 | 0.021 | 0.042 | 0.029 | 0.044 | 0.081 | 0.054 |
| F | 0.06 | 0.01 | 0.05 | 0.075 | 0.043 | 0.424 | 0.123 | 0.11 | 0.204 | 0,108 |
| G | 0.003 | 0.199 | 0.086 | 0.026 | 0.079 | 0.005 | 0.036 | 0.169 | 0.028 | 0.077 |
| H | 0.075 | 0.057 | 0.017 | 0.032 | 0.102 | 0.04 | 0.125 | 0.0008 | 0.197 | 0.034 |
| I | 0.121 | 0.085 | 0.048 | 0.075 | 0.135 | 0.011 | 0.018 | 0.193 | 0.013 | 0.042 |
| K | 0.098 | 0.006 | 0.049 | 0.043 | 0.029 | 0.056 | 0.054 | 0.066 | 0.15 | 0.036 |

*Source: GSO and the author's calculations.*

Among the above industries, the three sectors with a higher rate of labor restructuring are agriculture, forestry and fishing, mining, and manufacturing. The labor force in manufacturing industry changed the most (in 2019 the highest Lilien index reached 0.519), the agriculture, forestry and fishing industry ranked second, the mining industry ranked third. This is consistent with the process of economic restructuring in Vietnam to realize the goal of industrialization and modernization of the country. 2019 is the year that both agriculture, forestry and fishing, and manufacturing have the highest rate of labor restructuring. However, in 2020, this rate sharply decreased in both due to the impact affected by the Covid-19 epidemic (the mining industry increased the rate of labor restructuring). Labor in service industries such as wholesale and retail; transportation, warehousing; accommodation services, catering and financial services, banking and insurance, the labor structure has changed but the Lilien index is still low.

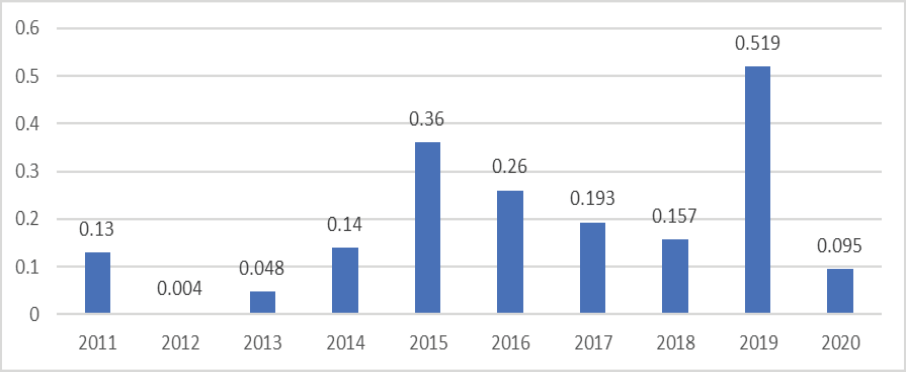


**Figure 1. Lilien Index of Manufacturing Industry Period 2011 - 2020**

*Source: GSO and the author's calculations.*

For the manufacturing industry, the labor restructuring rate also significantly changed in the period 2011-2020. In 2019, the highest Lilien index reached 0.519 because of the difference between the labor growth rate of this industry compared to the general labor growth rate was the highest at 12.18%. Then, in 2015 and 2016 this index was the second and third highest because this industry's labor growth rate compared to the general labor growth rate in two years was 9.6%, 7,0%, respectively. In 2012, this industry's Lilien index was the lowest at 0.004 because the labor growth rate compared to the general labor growth rate was -0.1%.

### 3.2. Contribution of labor restructuring to economic growth of the manufacturing industry in Vietnam

Using the SSA method to measure the contribution of labor restructuring to economic growth, where: g is the growth rate constituted by three shift effects: static shift effect, dyanamic shift effect, intra shift effect; with Labor restructuring effect = Static shift effect + dyanamic shift effect. The contribution of labor restructuring to economic growth is calculated according to the following formula:

$$\text{Contribution of labor restructuring} = \frac{labor\ restructuring\ effect}{g}\ x\ 100$$

The data for calculation is the data of 9 first -level economic sectors of Vietnam in the period 2011 - 2020, the results obtained are as follows:

**Table 3. Labor Restructuring Effect of Economic Sectors in Vietnam**

*Unit: Percent point*

| Industry | Shift effects | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | Static | -0.034 | -0.1681 | -0.127 | -0.107 | -0.437 | -0.318 | -0.251 | -0.345 | -0.454 | -0.19 |
| | Dynamic | -0.001 | -0.0049 | -0.003 | -0.004 | -0.01 | -0.004 | -0.007 | -0.013 | -0.009 | -0.005 |
| | Intra | 0.378 | 0.2552 | 0.22 | 0.276 | 0.186 | 0.095 | 0.185 | 0.222 | 0.108 | 0.126 |
| | **g** | **0.343** | **0.0822** | **0.09** | **0.165** | **-0.261** | **-0.227** | **-0.07** | **-0.136** | **-0.355** | **-0.069** |
| B | Static | -0.0003 | 0.00006 | -0.0041 | -0.0052 | -0.0022 | -0.002 | -0.00047 | -0.00222 | -0.0002 | -0.0021 |
| | Dynamic | -0.000009 | 0.000003 | 0.00001 | -0.0001 | -0.0001 | 0.00009 | 0.00003 | 0.00007 | -0.000003 | 0.0001 |
| | Intra | 0.00156 | 0.002662 | -0.00012 | 0.001 | 0.0025 | -0.0015 | -0.0022 | -0.0008 | 0.00028 | -0.0011 |
| | ***g*** | ***0.00125*** | ***0.002725*** | ***-0.0042*** | ***-0.0047*** | ***0.0002*** | ***-0.0034*** | ***-0.0026*** | ***-0.00296*** | ***0.00005*** | ***-0.0031*** |
| C | Static | -0.064 | -0.0022 | 0.0256 | 0.077 | 0.204 | 0.16 | 0.129 | 0.115 | 0.408 | 0.082 |
| | Dynamic | -0.009 | -0.0002 | 0.0018 | 0.006 | 0.022 | 0.019 | 0.019 | 0.015 | 0.046 | 0.005 |
| | Intra | 0.262 | 0.17434 | 0.1439 | 0.152 | 0.229 | 0.292 | 0.396 | 0.4 | 0.381 | 0.229 |
| | **g** | **0.189** | **0.17194** | **0.1713** | **0.235** | **0.455** | **0.471** | **0.544** | **0.53** | **0.835** | **0.316** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **D** | Static | 0.0002 | -0.0008 | 0.00004 | 0.0013 | -0.0004 | 0.0008 | -0.0006 | 0.001 | 0.0019 | -0.0014 |
| | Dynamic | 0.00002 | -0.0001 | 0.000003 | 0.0002 | -0.00005 | 0.0002 | -0.00006 | 0.0001 | 0.0002 | -0.00006 |
| | Intra | 0.00084 | 0.0012 | 0.000724 | 0.001 | 0.0012 | 0.001 | 0.00114 | 0.0012 | 0.0012 | 0.0006 |
| | **g** | **0.00106** | **0.0003** | **0.000763** | **0.0025** | **0.0007** | **0.002** | **0.00048** | **0.0023** | **0.0033** | **-0.0009** |
| **F** | Static | 0.0092 | -0.00146 | -0.0073 | -0.0107 | 0.006 | 0.063 | 0.02 | 0.019 | 0.037 | 0.0206 |
| | Dynamic | -0.00002 | -0.00005 | -0.0004 | -0.0007 | 0.0006 | 0.006 | 0.002 | 0.002 | 0.003 | 0.0014 |
| | Intra | -0.001 | 0.01356 | 0.0212 | 0.0248 | 0.0378 | 0.037 | 0.039 | 0.044 | 0.046 | 0.0374 |
| | **g** | **0.0082** | **0.01205** | **0.0135** | **0.0134** | **0.0444** | **0.106** | **0.061** | **0.065** | **0.086** | **0.0594** |
| **G** | Static | 0.0009 | 0.0563 | 0.0262 | -0.0081 | 0.025 | -0.0017 | 0.012 | 0.058 | -0.01 | 0.0277 |
| | Dynamic | 0.0001 | 0.0058 | 0.0019 | -0.0007 | 0.002 | -0.0001 | 0.001 | 0.005 | -0.0009 | 0.0015 |
| | Intra | 0.0977 | 0.0992 | 0.0768 | 0.09 | 0.102 | 0.0974 | 0.1 | 0.104 | 0.115 | 0.073 |
| | **g** | **0.0987** | **0.1613** | **0.1049** | **0.0812** | **0.129** | **0.0956** | **0.113** | **0.167** | **0.104** | **0.1019** |
| **H** | Static | -0.0037 | 0.0028 | -0.0009 | 0.00159 | 0.005 | -0.002 | 0.006 | 0.00004 | 0.0104 | 0.0019 |
| | Dynamic | -0.0003 | 0.0002 | -0.00005 | 0.00008 | 0.0003 | -0.0001 | 0.0005 | 0.000003 | 0.0009 | -0.00003 |
| | Intra | 0.0064 | 0.005 | 0.0047 | 0.00446 | 0.0043 | 0.0056 | 0.007 | 0.0074 | 0.008 | -0.002 |
| | **g** | **0.0024** | **0.008** | **0.0038** | **0.00613** | **0.0096** | **0.0035** | **0.0135** | **0.00744** | **0.019** | **-0.00013** |
| **I** | Static | 0.0084 | 0.0062 | 0.0036 | 0.006 | 0.011 | -0.0009 | -0.0014 | 0.016 | 0.001 | 0.0036 |
| | Dynamic | 0.0007 | 0.0005 | 0.0004 | 0.0003 | 0.0002 | -0.00006 | -0.0001 | 0.001 | 0.00007 | -0.0005 |
| | Intra | 0.0104 | 0.0105 | 0.0151 | 0.0075 | 0.0038 | 0.0114 | 0.0153 | 0.011 | 0.0126 | -0.0276 |
| | **g** | **0.0195** | **0.0172** | **0.0191** | **0.0138** | **0.015** | **0.01047** | **0.0138** | **0.028** | **0.0137** | **-0.025** |
| **K** | Static | 0.0038 | 0.00027 | 0.0021 | 0.002 | 0.0013 | 0.0026 | -0.0025 | 0.003 | 0.0075 | -0.002 |
| | Dynamic | 0.0003 | 0.00002 | 0.0001 | 0.0001 | 0.0001 | 0.0002 | -0.0003 | 0.0002 | 0.0007 | -0.0001 |
| | Intra | 0.0021 | 0.00181 | 0.0022 | 0.002 | 0.0028 | 0.003 | 0.0034 | 0.003286 | 0.0038 | 0.0036 |
| | **g** | **0.0062** | **0.0021** | **0.0045** | **0.0041** | **0.0042** | **0.0058** | **0.0006** | **0.006693** | **0.012** | **0.0015** |

*Source: GSO and the author's calculations.*

The manufacturing industry has the highest growth rate in the period 2011-2020. The agriculture, forestry and fishing industry had the second

highest growth rate in the period 2011-2014, but in the period 2015-2020 it had a negative growth rate. The G-Wholesale and retail trade; repair of motor vehicles and motorcycles has the third highest growth rate in the period 2011-2020. The D- Electricity, gas, steam, and air conditioning supply has the lowest growth rate in this period. Both the agriculture, forestry and fishing, and the mining industry had negative effects on static shift effect and dynamic shift effect during period 2011-2020. It shows that these industries have high growth rates but cannot maintain the labor share of the industry in the overall, attract few workers (because these industries switch to using labor-saving technologies or labor substitution).

The manufacturing industry has an increasing growth rate in the period 2011-2020, reaching the highest growth rate in 2019 (0.835), except in 2020, the growth rate decreased to 0.316. In 2011 and 2012, the contribution to economic growth was mainly from intra shift effect, but in the 2013-2020 period, the contribution from labor restructuring effect to increase gradually, reaching the highest level of 54.37% in 2019. The static shift effect in the period 2012-2020 is positive, showing that the manufacturing industry has attracted more workers than other industries and has moved labor from the low productivity to high productivity industry (manufacturing industry). In 2011 and 2012, this effect was negative, indicating labor movement from the manufacturing industry to other sectors. The dynamic shift effect in the period 2012-2020 is positive, showing that the manufacturing industry has high growth but still maintains the proportion of the industry's labor in the overall (in 2011 and 2012 in contrast to this trend). The labor restructuring effect tends to increase, which will have a positive impact on economic growth, which proves that manufacturing industry is the industry with larger growth and attracting more labors.

Research results in table 3 show that, in the period 2011-2014, the labor restructuring effect (static shift and dynamic shift effects) and the intra shift effect of the manufacturing industry are similar with the research results of Vu Thi Thu Huong (2017) and Pham Huy Tu (2016). However, in this article, the author focuses on analyzing the contribution of industrial labor restructuring to Vietnam's economic growth, while the above two authors' article focuses on analyzing the contribution of labor restructuring to Vietnam's overall labor productivity growth. This confirms the difference,

the non-duplication of this study compared with other previously published studies.

**Table 4. Contribution of Labor Restructuring to Economic Growth in Manufacturing**

*Unit: Percent point*

| Shift effects | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| Static | -0.064 | -0.0022 | 0.0256 | 0.077 | 0.204 | 0.16 | 0.129 | 0.115 | 0.408 | 0.082 |
| Dynamic | -0.009 | -0.0002 | 0.0018 | 0.006 | 0.022 | 0.019 | 0.019 | 0.015 | 0.046 | 0.005 |
| Labor structuring | -0.073 | -0.0024 | 0.0274 | 0.083 | 0.226 | 0.179 | 0.148 | 0.13 | 0.454 | 0.087 |
| Intra | 0.262 | 0.17434 | 0.1439 | 0.152 | 0.229 | 0.292 | 0.396 | 0.4 | 0.381 | 0.229 |
| **g** | **0.189** | **0.17194** | **0.1713** | **0.235** | **0.455** | **0.471** | **0.544** | **0.53** | **0.835** | **0.316** |
| Contribution from labor restructuring (%) | -38.62 | -1.39 | 16 | 35.32 | 49.67 | 38 | 27.2 | 24.53 | 54.37 | 27.53 |
| Contribution from intra (%) | 138.62 | 101.39 | 84 | 64.68 | 50.33 | 62 | 72.8 | 75.47 | 45.63 | 72.47 |

*Source: GSO and the author's calculations.*

In the period 2011-2015, the contribution of intra shift effect to economic growth gradually decreased from 138% to 50.33%, corresponding to the increased contribution of labor restructuring. In the period 2016-2018, the contribution of intra shift effect to economic growth tends to increase, corresponding to a decrease in the contribution of labor restructuring. In 2019, the contribution of labor restructuring increased sharply compared to 2018; but by 2020 it will be nearly halved. Such a change is due to the impact of the Covid-19 epidemic, workers temporarily quit or move to other jobs with lower labor productivity.

The contribution of intra shift effect to economic growth tends to increase and the contribution of labor restructuring tends to decrease over the years, which is explained by the fact that when the labor structure is more stable, if the economy cannot take advantage of the impact of labor restructuring, the industry must change itself in management, technology, etc. to increase labor productivity. This can be clearly seen in 2020, due to being heavily affected by the Covid-19 epidemic, the processing and manufacturing industry mainly contributed from intra shift effect (72.47%). When the effect of labor restructuring has little contribution, it requires industries to improve their own productivity to be more competitive.

In the period of 2013 - 2020, the manufacturing industry is a dynamic industry because there are intra shift effect contributions, and the contributions of labor restructuring (static and dynamic effects) are positive. This shows that this industry has both greater growth and attracts more workers than other sectors in the economy and has a positive impact on economic growth. Therefore, to improve the resilience and recovery of the economy, it is necessary to focus on creating conditions for industries that have a positive impact on economic growth (such as the manufacturing industry) to develop; thereby creating a basis for leading other sectors in the economic recovery and growth.

Thus, the manufacturing industry is the only industry that continuously grows both the economy and the proportion of labor. The analysis results show that this is the most dynamic industry in the Vietnam economy. During the whole research period, manufacturing industry always the most positive contribution to overall economic growth. The contribution of this industry to economic growth is summed up from the positive contributions of all three components parts: static shift effect, dynamic shift effect and intra shift effect. That shows, there is qualitative change in manufacturing industry, and is one of the leading growth sectors in Vietnam.

## 4. POLICY IMPLICATIONS

From the research results, the article proposes some policy directions as follows:

(1) It is necessary to develop policies towards the goal of encouraging the reallocation of resources (capital, labor) in an efficient manner and enhancing the contribution of labor restructuring to the growth of the whole country.

Having reasonable policies to create dynamic industries/groups of industries that contribute positively to economic growth. These dynamic industries have increased both in growth and in their share of employment, i.e., in both scale and operational efficiency. Specifically, the manufacturing industry (leading), other industries such as: G- Wholesale and retail trade; repair of motor vehicles and motorcycles; F- Construction; I- Accommodation and food service activities.

(2) Formulate policies on industry development to achieve the goals of the industry structure and take advantage of the positive contributions from the restructuring of the industry.

Labor restructuring that has a positive contribution to economic growth is different between industries, so relevant policies should be designed in accordance with the characteristics of each first - level industry, and in line with the characteristics of each second - level industry to bring the best effect.

(3) The State should have policies to actively support the labor force moving from other industries (A- Agriculture, forestry, and fishing; B- Mining and quarrying) to the manufacturing industries such as policies on loans for investment, policies on vocational training, policies on migration...

Continue to implement, evaluate, and perfect the support policies of the State such as: developing the manufacturing industry in the direction of industrialization and modernization; develop key economic zones, develop supporting industries, etc.

(4) It is necessary to focus on training and developing high-quality human resources to meet the development requirements of this industry, and the requirements of globalization and international economic integration.

Providing services for general education and vocational training to improve the quality of human resources, while focusing on developing the labor market, helping workers and employers to find jobs, exchange information, select talented people.

Thus, labor restructuring in the manufacturing industry makes the most positive contribution to economic growth. This is also the most dynamic industry in the economy because it both increases labor productivity in the industry, creates many new jobs, and increases both in size and proportion of employees. Labor restructuring in Vietnam in general and labor restructuring in the manufacturing industry in particular should be oriented appropriately according to each stage of development and in the direction of innovating the growth model: building a reasonable economic and labor structure, promoting comparative advantages, having high labor productivity and competitiveness, deeply participating in the global production network and value chain; industrial civilization prevails in production and social life; develop rapidly and sustainably in accordance with the conditions of each period.

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# DETERMINANTS INFLUENCING VIETNAM'S FRESH FRUIT EXPORT COMPETITIVENESS

**Doan Nguyen Minh[1,*], Nguyen Thi Minh Nguyet[1], Pham Thi Lua[1], Vu Le Cong[1]**

***Abstract:*** *This paper attempts to analyze the determinants influencing Vietnam competitiveness in fresh fruit export. Using Revealed Competitiveness Advantage (RCA) as a proxy for export competitiveness, the paper also utilizes an Autoregressive Distributed Lag (ARDL) model which includes variables representing macro-economic indicies of Vietnam to explore the net-effect of these variables on Vietnam's fresh fruit competitiveness in the global market. The model results shows long-term and short-term effect of the total production, real GDP of Vietnam, and the per capita GDP on Vietnam's competitiveness in fresh fruit export. However, real estate exchange rates only show significant effect in long-term estimation. The findings of this study reveal the vital role of the government in providing a stable and suitable macro-economic environment to boost competitiveness of Vietnam's export in fresh fruit products.*

***Keywords:*** *ARDL model, RCA, fresh fruits, export competitiveness, Vietnam.*

## 1. INTRODUCTION

With tropical monsoon climate and industriousness workers, Vietnam has overwhelming advantages in the production of fresh fruits. Along with development in technology and agricultural techniques, fresh fruit products export has taken a salient role in promoting Vietnam economy. Up to 2021, the area of fruit production in Vietnam was about 1.14 million hectares, the total fruit output was about 12.6 million tons/year. Vietnamese fruits are being exported to 60 countries, accounting for nearly 1% of the total import value of this item in the world. The global market demand for fruit is forecasted to grow by 8.2% annually from 2019 to 2025 and reach US$585.25 billion by 2025. (Ministry of Agriculture and Rural Development, 2021). The importance of fresh fruit export is also amplified due to the expansion of worldwide demand. WHO statistics shows

[1] Thuong Mai University, Hanoi, Vietnam

* Corresponding author. Email: minhdn@tmu.edu.vn

approximately 3.9 million deaths worldwide due to insufficient intake of fruits and vegetables which mainly the direct result of gastrointestinal cancer, ischemic heart disease, and stroke. The awareness of these risks boosts global demand of fresh fruits by 40% in the last 50 years, with an annual expected growth of 5.79%.

The importance and benefits of Vietnam fresh fruit export has driven the demand for research dedicated to analyzing aspects influencing fresh fruit production, and trade volume. A deciding factor that heavily affected trade is the relative competitive power of Vietnam products to others on the global market. This sparks research specializing in locating the determinants influencing export competitiveness, as well as quantifying the effect that these determinants might impose on trade volume. Well-conducted research in the mentioned field lay solid foundation for government policies aiming at promoting export competitiveness.

This paper focuses mainly on the competitiveness of Vietnam fresh fruit products and the factors that directly alter the competitive power of these products on the global market. The main goal of this paper is to reveal the macro-economic factors that affect competitiveness as well as quantifying the magnitude of these factors in both long and short term, using ARDL model and a time series data set.

## 2. LITERATURE REVIEW

Globalization has exposed products to increasing competition in the global market which boost the concern both theoretically and empirically on international competitive power of products. Firstly, from the perspective of using economic theoretical bases to study competitiveness.

Attila Chikán (2008) has shown the connection between the macro and micro levels of national and business competitiveness associated with the diamond model. The results of the three studies have shown that a meaningful connection between the micro and macro levels of the economy can be made, which is very useful for connecting recent research results. and serve as a basis for further studies.

Tomasz Siudek, Aldona Zawojska (2014) point out the influence and most prominently it is based on Adam Smith's concept of the invisible

hand along with David Ricardo's concept of comparative advantage, Schumpeter's theory of entrepreneurship and innovation, Michael E. Porter's theory of competitiveness and Krugman's (criticism) concept of competitiveness. Of particular note is the four-factor model for competitive advantage between countries, also known as the diamond model.

*However, certain research dedicated to analyzing export competitiveness of specific country*

Önsel et al (2008) study a new perspective on the competitiveness of countries. The authors assert that measuring competitiveness and developing strategy is an important issue for policy makers.

Research by Cho et al. (2008*)* shows that the general double diamond (GDD) and nine factor (NF) models have better explanatory power than Porter's diamond when assessing the CSAs of countries. has high international connectivity and high human factor dependence, and the DDD model is more comprehensive than the GDD and NF models in explaining the CSAs of countries with heterogeneous provinces.

*A wide range of literature research competitiveness of certain products, industry*

Research by Rifin, A (2013) analyzed the export competitiveness of cocoa beans of Indonesia. Using the revealed comparative advantage (RCA) and the Almost Ideal Demand System (AIDS), the results indicate that Indonesia has a comparative advantage in cocoa bean production despite the remaining three producing countries with a higher RCA. Meanwhile, Indonesia and Ghana's cocoa beans supplementing and increasing the world's cocoa demand for beans will benefit Indonesia the most.

Research by Nguyen Thi Phuong Mai & Nguyen Thi Oanh (2017) analyzed the competitiveness of a commodity for Vietnam to export to Russia. With the diamond model of M. Porter and the comparative method, the competitiveness of a cover export to Russia has been clearly clarified and Vietnam's position with other countries.

Dinh Cao Khue & associates (2020) studied the potential and solutions to promote Vietnamese fruit and vegetable exports to the Japanese market. By analyzing the existing competitive assessment index (RCA) in recent

years, Vietnam's fruit and vegetable exports have a competitive advantage. On that basis, a number of solutions are proposed to promote vegetable exports to the Japanese market in the coming time.

It can be said that there have been many foreign studies studying the factors affecting energy consumption competitiveness by qualitative, quantitative or a combination of the two methods above. The factors affecting competitiveness have been pointed out from certain angles, but research close to this topic is still limited.

*Factors influencing export competitieveness are also a field of concern*

Dube et al (2018) analyzed a series of ARDL trials to examine the factors that affected Ethiopia's agricultural exports between 1985-2016. The results show that the exchange rate, Ethiopia's real GDP, foreign direct investment (FDI), prices, and structural disruption all have a positive effect on Ethiopia's export competitiveness in the short-term and long term. Bhattacharya, Poulomi (2019) was based on the ARDL model that found a long-term relationship.

Bhattacharya, Poulomi (2019) based on the ARDL model found a long-term relationship between the export competitiveness of Indian fresh fruit along with the determinants of its main. The results of the long-run elasticity show that the GDP per capita of the main fruit importing countries, investment in the agricultural sector, the effective real exchange rate have a positive effect, while the domestic fake has a positive effect. have a negative impact on the export competitiveness of fresh fruit in India in both the short and long term.

Along with the above approach, research by AMG Salmerón (2020) highlighted and clarified the influence of GDP per capita in the competitive advantage of fruit and vegetables of Almeria. A linear regression analysis that crosses two variables to assess the degree of coincidence that exists between the growth of Almeria's horticultural industry and the quality of life of its citizens.

Realizing the intrinsic characteristics that can alter estimation results, research also dedicate to analyzing competitiveness in product level data, especially freshfruit.

Dube et al (2018) analyzed a series of ARDL trials to examine the factors that affected Ethiopia's agricultural exports between 1985-2016. The results show that the exchange rate, Ethiopia's real GDP, foreign direct investment (FDI), prices and structural disruption all have a positive effect on Ethiopia's export competitiveness in the short-term and long-term. However, foreign GDP has only a positive effect and real interest rates have a negative effect in the long run. Finally, key policy measures considered to improve Ethiopia's agricultural exports were proposed.

Bhattacharya, Poulomi (2019) based on the ARDL model found a long-term relationship between the export competitiveness of Indian fresh fruit along with its key determinants. The results of the long-run elasticity show that GDP per capita of the main fruit importing countries, investment in the agricultural sector, the effective real exchange rate has a positive effect; while domestic prices have a negative impact on the export competitiveness of fresh fruit in India in both the short and long term.

The study by Wattanakul et al (2021) analyzed the effects on the competitiveness of Thailand's processed pineapple exports as well as the size of these factors by focusing on canned pineapples and canned pineapples. pineapple juice. Panel data from 2013 to 2017 of 10 partners were used in a panel regression model with pooled OLS, fixed effect, and random effects models showing negative effect price significantly to the market share of both products. Furthermore, there is a positive effect from GDP per capita on pineapple market share, exchange rate positively affects canned pineapple market share and Thailand's pineapple juice market share is less price sensitive than the market. canned pineapple. From that, a number of proposals have been drawn to improve the export competitiveness of processed pineapple products in today's fierce competition.

## 3. ESTIMATION METHODOLOGY AND DATA

### 3.1. Unit root test

Due to the intrinsic characteristics of time-series data, selected variables are testes for potential unit roots, appropriate estimation strategy is derived based on the result of the unit roots test. A combination of Augmented

Dickey- Fuller test (ADF) and Phillips-Peron test is implemented inorder to investigate potential unit root within in variables.

Phillip-Peron and ADF test are different in specification and ultimately hypothesis testing. PP test allows normal: T test for coefficient significance, however, ADF test will have to follow a special critical value:

$$CV\,(T) = \beta + \beta_1 T^1 + \beta_2 T^2$$

### 3.2. Autoregressive distributed lag model

The unit root test reveals different integrated order in variables, hence a distributed lag model is implemented in order to analyze the short-run and long run dynamic between fresh fruit competitiveness and the selected independent variables. The procedure to conduct ARDL model is as follow:

*Step 1:* Unit root tests are conducted to determine the order of integration in variables.

*Step 2:* A Bound test is implemented to obtain evidence of long-run effect between the variables following the below hypothesis:

$H_0$:$H_0$: No long run dynamic $(\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0)$

$H_1$:$H_1$: Existing long-run dynamic $(\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5)$

*Step 3:* Estimation the long run-effect through a "level model" given as:

$$\ln RCA_t = \alpha_0 + \beta_1 \ln REER_t + \beta_2 \ln TFG_t + \beta_3 \ln PPI_t + \beta_4 \ln GDPVN_t + \beta_5 \ln PCGDP_t + v_t$$

*Step 4:* An Unrestricted Error Correction model is estimated to analyze the short run dynamic between variables. The ECM model is specified as follow:

$$\Delta \ln RCA_t = \alpha_0 + \beta_1 \ln REER_{t-1} + \beta_2 \ln TFG_{t-1} + \beta_3 \ln PPI_{t-1} + \beta_4 \ln GDPVN_{t-1} + \beta_5 \ln PCGDP_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta \ln RCA_{t-i} + \sum_{j=0}^{q} \delta_j \Delta \ln REER_{t-j} + \sum_{j=0}^{q} \theta_j \Delta \ln TFG_{t-j} + + \sum_{j=0}^{q} \rho_j \Delta \ln PPI_{t-j} + \sum_{j=0}^{q} \mu_j \Delta \ln GDPVN_{t-j} + \sum_{j=0}^{q} \vartheta_j \Delta \ln PCGDP_{t-j} + \tau ECM_{t-1} + \varepsilon_t$$

With $RCA_t$ represent the revealed competitiveness advantage index of Vietnam fresh fruit at time t, $REER_t$ is the calculated Real Effective Exchange Rate between Vietnam and trading partners at time t, TFG is the total fruit production of Vietnam at time t, PPI is the domestic price index of Vietnam's fresh fruit at time t, GDPVN and PCGDP are gross domestic production of Vietnam and Per capital domestic production of importing countries respectively. The above selection of variables and estimation specification follow the procedure suggested by Bhattacharya, Poulomi (2019).

## 4. ESTIMATION DATA

### 4.1. Data collection and calculation methods

For the purpose of the study, the dependent variable proxying through RCA index (Balassa, 1965) is calculated and used to measure the competitiveness of Vietnam's fruit exports compared to other countries in the world. However, this index has been criticized for its asymmetric value: the RCA ranges from 0 to 1 if a country has a disadvantage, and from 1 to ∞ if a country has a comparative advantage (Laursen), 2015). And to overcome the above problem, Vollrath (1991) suggested using that logarithm of RCA to centralize and eliminate asymmetry in the index. On that basis, this paper will follow the procedure suggested by Vollrath, 1991 and calculate the natural logarithm of RCA. The authors have calculated the RCA index showing the competitiveness related to fruit export activities of Vietnam and some other countries in Asia in the period 1996-2020 according to the formula of Balassa (1965) built on the formula of Liesner (1958).

$$RCA = \frac{X_{ij} / X_i}{X_{wj} / X_w}$$

The effective real exchange rate of Vietnam (REER) for the period 1996-2020 is calculated following the formula suggested by Tran Thi Thu Ha (2020) based on the OECD data. Bilateral exchange rate with 28 currencies of Vietnam's 46 main trading partners (n = 46) is selected; including 19 partners using the same euro and China, USA, Japan, Korea,

Singapore, Thailand, Malaysia, Australia, Hong Kong, Indonesia, India, UK, Cambodia, Philippines, Russia, Switzerland, Canada, Brazil, Saudi Arabia, Turkey, Sweden, Laos, Mexico, New Zealand, Israel, Denmark, Chile with time data from 1996 to 2020 (t=20). Data on trade shares have been collected from the IMF's Direction of Trade Statistics (DOT) database. Bilateral exchange rate denoted in USD, consumer price index of Vietnam and partner countries are collected from International Financial Statistics (IFS) database of IMF.

Data on domestic fruit prices (PPI) (such as oranges, bananas, watermelons, etc.) (producer prices in USD/ton) are collected from the Food and Agriculture Organization's FAOSTAT database (FAO). Data on total fruit production in Vietnam (TFG) (commodities such as oranges, bananas, watermelons, etc.) are collected from the FAOSTAT database of the Food and Agriculture Organization (FAO). The GDPVN and PCGDP data are collected from the World Bank's World Development Indicators (WDI) database.

## 5. EMPERICAL RESULTS AND DISCUSSION

### 5.1. Stationarity Tests

The values of all economic variables are converted to natural logarithmic values (ln) and the stability of the data series is checked through the enhanced Dickey-Fuller model (ADF) and Phillips model. Perron (PP).

**Table 2. Summary of Unit Root Tests**

| Variables | ADF | | PP | |
|---|---|---|---|---|
| | No trend | With trend | No trend | With trend |
| ln(RCA) | -3.97***(0.00) | -3.91**(0.01) | -3.93***(0.00) | -3.85**(0.01) |
| DD ln(RCA) | -6.58***(0.00) | -6.49***(0.00) | -7.12***(0.00) | -7.11***(0.00) |
| ln(REER) | 1.02 (0.99) | -0.71 (0.97) | 0.92 (0.99) | -1.09 (0.93) |
| DD ln(REER) | -3.08**(0.02) | -3.31 (0.06) | -3.07**(0.02) | -3.31 (0.06) |
| ln(TFG) | 1.18 (0.99) | -3.03 (0.12) | 0.99 (0.99) | -3.20 (0.08) |
| DD ln(TFG) | -3.91***(0.00) | -3.84**(0.01) | -3.92***(0.00) | -3.83**(0.02) |
| ln(PCGDP) | -5.76***(0.00) | -4.79***(0.00) | -5.92***(0.00) | -4.93***(0.00) |
| DD ln(PCGDP) | -6.24***(0.00) | -6.20***(0.00) | -6.53***(0.00) | -6.62***(0.00) |

| | | | | |
|---|---|---|---|---|
| ln(GDPVN) | -0.44 (0.90) | -0.87 (0.95) | -0.43 (0.91) | -1.36 (0.87) |
| DD ln(GDPVN) | -2.71*** (0.07) | -2.66 (0.25) | -2.61*** (0.09) | -2.52 (0.32) |
| ln(PPI) | -0.09 (0.95) | -2.30 (0.43) | 0.06 (0.96) | -2.25 (0.46) |
| DD ln(PPI) | -5.72***(0.00) | -5.68**(0.00) | -5.71***(0.00) | -5.68***(0.00) |

*Notes: The figures in parentheses are p values: ***, **, * denote the level of significance at 1%, 5% and 10%, respectively.*

*Source: Author's own calculation.*

The test results of the enhanced Dickey-Fuller (ADF) and Phillips Perron (PP) models presented in Table 2 show a mixture of integrated order among selected variable. While RCA, PCGDP show no sign of unit root or I(0), the other are integrated in the order of 1 or I(1). Fortunately, no variables is I(2), hence the method of ARDL is relevant for the available data.

### 5.2. Bound test

After the original unit root tests results are available, in the next step, the optimal delay for the ARDL model is selected, while also checking for the presence of variable variance and serial correlation in the model (Table 3).

**Table 3. Robustness Checks**

| RCA | |
|---|---|
| Heteroscedasticity (chi-sq.-statistic) | Serial correlation (LM-statistic) |
| 23.00 (0.40) | 2.07 (0.36) |
| H0: no heteroscedasticity-accept | H0: no serial correlation-accept |

*Source: Author's own calculation.*

**Table 4. Bound F-test Results**

| F-statistic (dependent variable: lnRCA) | Significance level | Bound critical values (Pesaran et al., 2001) | |
|---|---|---|---|
| | | I(0) | I(1) |
| 5.506*** | 1% | 3.41 | 4.68 |
| | 5% | 2.62 | 3.79 |
| | 10% | 2.26 | 3.35 |

*Notes: The figures in parentheses are p values: ***, **, * denote the level of significance at 1%, 5% and 10%, respectively.*

*Source: Author's own calculation.*

The presence of cointegration (long-term dynamic) between the variables is tested using the binding test method. Accordingly, the results presented in Table 4 show that the estimated F-statistic value (5,506) is larger than the critical values of 1%, 5% and 10%, respectively. Therefore, the results of the bound F test supported the rejection of the null hypothesis H0 about no co-integration, and at the same time indicated the existence of a long-term relationship between the variables. This implies that there is cointegration between Vietnam's fruit export competitiveness and other key determinants in the model. The existence of co-links between chains supports the analysis of short-term and long-term relationships of factors affecting the competitiveness of Vietnamese fruit exports.

### 5.3. Estimate the long-run and short-run coefficients of the associated ARDL and Error Correction Models (ECM)

**Table 5. Results of Long-Run Elasticities Estimated by ARDL Model**

| Variables | ln(RCA) | Std. Error | t-Statistic |
|---|---|---|---|
| ln(REER) | 3.58 * (0.06) | 1.61 | 2.21 |
| ln(TFG) | -1.73 ** (0.04) | 0.72 | -2.40 |
| ln(PCGDP) | -0.14 ** (0.00) | 0.02 | -6.05 |
| ln(GDPVN) | 0.41 * (0.06) | 0.19 | 2.18 |
| ln(PPI) | 0.01 (0.91) | 0.08 | -0.12 |
| Constant | 25.63 (0.09) | 13.25 | 1.93 |
| $R^2$ | 0.87 | | |
| Adjusted $R^2$ | 0.65 | | |
| DW | 2.19 | | |

*Notes: The figures in parentheses are p values: ***, **, * denote the level of significance at 1%, 5% and 10%, respectively.*

*Source: Author's own calculation*

The results of the long-run elasticity are shown in Table 5, showing that for ln(REER), ln(TFG), ln(PCGDP), ln(GDPVN) all have statistically larger values than the values. is critical, which means that the effective real exchange rate, total fruit production, GDP per capita of the importing country and real GDP of Vietnam all have an impact on the competitiveness of fruit exports of the importing country. Vietnam in the long run. Meanwhile, the remaining independent factors such as the domestic fruit producer price index have no impact in this model.

For REER, the long-run elasticity of ln(REER) is 3.58 and the significance level is 10%, which means that, in the long run, on average, when the effective real exchange rate increases by 1%, competitiveness Vietnam's fruit export competition also increased by 3.58%. This is completely consistent with the previous expectation theory. The effective real exchange rate positively affects exports through price volatility. Depreciating the value of the local currency makes Vietnam's exports cheaper in the world market, so revenue will outperform. In other words, competitiveness also increases.

The long-run elasticity of ln(TFG) is -1.73. This suggests that, in the long run, on average, a 1% increase in Vietnam's total output will reduce Vietnam's fruit exports by 1.73%, contrary to theoretically expected. It can be explained that the increasing domestic demand for Vietnamese fruit leads to an increase in total domestic consumption and will become larger than Vietnam's total export volume in the long run.

Similarly, the GDP per capita of the importing country has a negative effect on the RCA, contrary to the model's hypothesis. In fact, when a country's PCGDP increases, that country's income increases. Vietnam's fruit import markets will become more demanding, stricter requirements for the quality of imported goods in general and fruit products in particular.

At the 10% significance level, the long-run elasticity of ln(GDPVN) is 0.41. This is completely consistent with the model's hypothesis. In fact, when Vietnam's gross domestic product grows, the production of goods in general and fruit in particular will also be promoted, contributing to increasing the ability to export fruit to the market. international.

**Table 6. Results of Short-Run Elasticities Estimated by ARDL Model**

| Variables | ln(RCA) | | |
|---|---|---|---|
| | Coefficients | Std. Error | t-statistic |
| ln(REER) | -5.36 | 3.86 | -1.39 |
| ln(TFG) | 5.95 ** | 1.92 | 3.11 |
| ln(PCGDP) | -0.29 ** | 0.10 | -2.82 |
| ln(PPI) | -0.38 | 0.39 | -0.99 |
| ln(GDPVN) | 1.49 * | 0.68 | 2.17 |
| ECM(t-1) | -0.65 *** (0.00) | 0.71 | -5.17 |
| CUSUM | Stability | | |
| CUSUMSQ | Stability | | |

*Notes: The figures in parentheses are p values: ***, **, * denote the level of significance at 1%, 5% and 10%, respectively.*

*Source: Author's own calculation*

Table 6 shows the short-term effects of factors affecting the competitiveness of Vietnam's fruit exports. The error correction estimator $ECM_{t-1}ECM_{t-1}$ was found to be statistically significant with a negative sign, implying the speed of adjustment from short-run deviation to long-run equilibrium. The estimated coefficient value of -0.65 suggests that about 65% of the deviation from the equilibrium will be eliminated in one year and therefore it will take 1.54 years to return to the equilibrium in the long run.

Although the effective real exchange rate has a significant effect in the long run, the short-run model does not have a significant effect. This can be explained by the supply constraints faced by Vietnam's fruit as well as agriculture. In the long run, an increase in the effective real exchange rate (depreciation) can lead to an increase in exports. But in the short term, the prevalence of supply constraints is increasing and world demand is also increasing, making it difficult for Vietnam to secure a cheaper price advantage compared to other countries. other countries, resulting in no significant short-term impact.

Although the total fruit production of Vietnam has a negative effect in the long run (Table 5), it has a positive effect on the competitiveness of fruit exports in the short term with a short-run coefficient of 5.95. This shows that on average, when TFG increases by 1%, Vietnam's fruit export competitiveness will increase to 5.95% in the short term. The reason for this change is that when total output increases, both domestic and foreign demand increases, then the total domestic consumption as well as the total export volume increase. This is a positive sign for Vietnam's fruit export competitiveness in the short term. But in the long run, when domestic demand exceeds world demand, it will become an obstacle for export activities, leading to a negative impact on Vietnam's fruit export competitiveness.

For the remaining independent factors such as ln(PCGDP), ln(GDPVN) still keep the same short-term impact in the long-term with short-run coefficients of -0.29 and 1.49, respectively. In other words, GDP per capita of importing countries still has a negative impact and Vietnam's real GDP still has a positive impact on Vietnam's fruit export competitiveness in the short term. In addition, the domestic fruit producer price index continues

to have no significant impact in this model both in the long run and the short term.

## 6. CONCLUDING REMARKS

This study has empirically examined the factors affecting the competitiveness of Vietnamese fruit exports, using data for the period 1996-2020. Although a few studies in Vietnam have emphasized the export competitiveness of agricultural products in general and fruit in particular, to measure the competitiveness of fruits using RCA and Influencing factors can also be considered as a new step, adding to the existing literature on agricultural exports in Vietnam.

Based on the theoretical background of factors affecting competitiveness, previous studies on fruit export competitiveness as well as fruit export status, a research model was built including: including qualitative factors affecting micro-economic competitiveness as well as quantitative factors affecting macroeconomic competitiveness; and estimation methods are used throughout the study.

The autoregressive distributional delay (ARDL) model proposed by Pesaran et al (2001) was chosen to analyze the cointegration between fruit export capacity and hypothesized variables. The results of the model show that total fruit production, Vietnam's real GDP and GDP per capita of importing countries all have a significant impact on the competitiveness of Vietnam's fruit exports in the whole country long term and short term. Meanwhile, the real effective exchange rate is also only significantly revealed in the long run.

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# FACTORS AFFECTING ELECTRICITY-SAVING INTENTION AND BEHAVIOR OF VIETNAMESE HOUSEHOLDS: AN EMPIRICAL STUDY USING NORM ACTIVATION MODEL

**Nguyen Thi Phuong Linh**[1]

***Abstract:*** *Saving electricity in households plays an important role in conserving national resources and energy. This study uses norm activation model (NAM) to find out the factors affecting the intention and behavior to save electricity of Vietnamese households. By quantitative research method with a large-scale survey of 538 households throughout the territory of Vietnam, the research results show that awareness of consequences has a positive influence on personal norm and behavior towards electricity-saving. At the same time, two consensus relationships also confirmed by research data are the relationship between personal norm and intention towards electricity-saving; intention and behavior towards electricity-saving of Vietnamese households. Based on the research results, the author makes a number of recommendations for state management agencies to promote intention and behavior towards electricity-saving of Vietnamese households.*

***Keywords:*** *Electricity-saving, households, norm activation model, Vietnamese*

## 1. INTRODUCTION

Energy saving and emission reduction are important issues in formulating a long-term energy strategy (Yu et al., 2016). Environmental policymakers increasingly emphasize consumer responsibility for the environmental impacts of their behaviour, and many environmental claims are expressed in terms of related to households such as recycling, purchasing green-labelled products, reducing household electricity use (Ek & Söderholm, 2010). The potential for energy savings for residential electricity consumption is considered very important (Gardner & Stern, 2008). Households are the basis for changing energy-saving

[1] Business Administration Faculty, National Economics University. Email: linhnp@neu.edu.vn

behavior in urban areas because this is the area with the largest number of electricity users, so if the electricity consumption of households is reduced, national electricity consumption will decrease significantly (Fithri et al., 2015).

Vietnam is one of the countries with the highest energy consumption intensity in the region and in the world (Hien & Chi, 2020). According to Decision No. 428/QD-TTg dated 18/2016 approving the adjustment of the National Power Development Plan for the period 2011-2020 with a vision to 2030, electricity demand in Vietnam will continue to grow at a rapid rate 8.4%/year from 2021 to 2030. According to statistics of the electricity industry, electricity consumed by households accounts for about 35-40% of the total electricity consumed in the country. Therefore, the economical, safe and efficient use of electricity by each household plays a very important role, not only contributing to reducing electricity consumption, saving costs for the family but also protecting the environment and saving national resources.

To date, there are many studies on energy saving behavior based on psychological and behavioral perspectives (Hong et al., 2019; Shi et al., 2017; Van de Broek et al., 2019). Psychological and behavioral orientation emphasizes psychological factors including attitudes, social norms, and environmental awareness (Fornara et al., 2016; Zhou & Yang, 2016) to promote electricity-saving behavior of households. Currently, when investigating the factors affecting the intention and behavior towards electricity-saving, several theories have been included including the theory of rational behavior (TRB), norm activation model (NAM) and the theory of planned behavior (TPB). TRB pays attention to conditionally controlled factors while ignoring non-controlling factors such as time and chance (Lam & Hsu, 2004). TPB considers both uncontrolled and extrinsic factors to understand environment-related behavior (Rivis et al., 2009). However, both theories just mentioned ignore the ethical aspect of a pro-social behavior such as electricity-saving. Therefore, this study will use NAM to study the factors affecting the intention and behavior towards electricity-saving of Vietnamese households.

## 2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

Electricity-saving behavior encompasses the full range of consumer choices and actions to reduce electricity consumption. These include everyday electricity-saving behaviors when heating, cooking, turning lights on/off, and choosing to install household appliances, insulation, and heating that use renewable energy (Abrahamse et al. 2007; Urban & Ščasný, 2016).

NAM is widely applied to the study of various types of social behavior of individuals (De Groot & Steg, 2009; Schwartz, 1977). Pro-social behavior refers to actions that can benefit others, such as helping, sharing, and environmental behavior (De Groot & Steg, 2009). Households' electricity-saving behavior can be considered as a kind of pro-social behavior, as such behavior can benefit the family and society. Therefore, NAM is a suitable theory to study electricity-saving intention and behavior of households.

NAM is a theory used in the study of different types of socially beneficial behaviors of individuals such as reuse of old phones (Nnorom et al., 2009), energy conservation behavior (Rasool et al., 2019), garbage sorting behavior (Wang et al., 2019), sustainable transport behavior (Liu et al., 2017), energy-saving behavior (Zhang et al., 2013), recycling behavior (Park and Ha, 2014).

NAM consists of three main factors: personal norm, awareness of consequences and ascription of responsibility.

Personal norm (PN) refers to an individual's moral responsibility or obligation to perform certain actions and is a core element of NAM (Lanzini & Khan, 2017). This is an important factor to influence an individual's behavioral intentions and it stems from the individual's own responsibility or obligation. High personal moral norms will motivate an individual to engage in pro-social behavior, while low personal norms will prevent an individual from engaging in pro-social behavior (Fornara et al., 2016). Bagheri et al. (2019) confirmed that there is a significant positive correlation between personal norm and different pro-social intentions. Personal norm was found to be the most prominent and influential factor in promoting citizens' intention to complain about the environment in the study of Zhang et al. (2018). In the context of energy-saving behavior, it can be expected

that individuals with high norms will have more ethical obligations and responsibilities to conserve energy. Wasting energy would not conform to the individual's moral norms and obligations, which can lead to guilt and discomfort. Abrahamse & Steg (2009) found a positive relationship between households' personal norms and their total energy-savings. In a study of household environmental behaviors, Harland et al. (2007) found that personal ethical standards have a positive effect on public transport use and behavior. energy saving. Fornara et al. (2016) found that personal norm positively influences households' energy consumption behavior. In the study Guo et al. (2018), personal norm was also concluded to have a significant positive impact on the intention and behavior of residents to consume electricity. Therefore, the author proposes the hypothesis:

***Hypothesis 1 (H1): Personal norm is positively correlated with intention towards electricity-saving of Vietnamese households.***

According to Schwartz (2014), awareness of consequences (AC) refers to the ability to perceive the potential harm that comes from one's behavior to the benefit of others in the decision-making process. Electricity consumption can lead to a number of negative long-term consequences such as power depletion, ecological damage and even global warming. If households are aware of these negative consequences, they are likely to develop ethical obligations and electricity-saving behavious. Conversely, if households are not aware of the negative consequences of electricity use, they will not form personal norms and behavior to save electricity. De Groot & Steg (2009) found that personal norm was stronger when respondents were aware of the negative effects of energy use. Harland et al. (2007) found that the awareness of consequences positively affects the personal norm related to environmental behavior (using public transport and saving water) of households. Therefore, the author hypothesizes:

***Hypothesis 2a (H2a): Awareness of consequences are positively correlated with personal norm of Vietnamese households.***

***Hypothesis 2b (H2b): Awareness of consequences are positively correlated with electricity-saving behavior of Vietnamese households.***

Ascription of responsibility (AR) refers to the feeling of self-responsibility for the negative consequences of not acting in the common good of society (De Groot & Steg, 2009). When households perceive

responsibility regarding electricity use (i.e., feel responsible for the consequences), they are more likely to develop personal norm for electricity-saving. Several previous studies have found that ascription of responsibility positively influences personal norm. De Groot & Steg (2009) found that ascription of responsibility contributes significantly to the interpretation of personal norm in the context of reduced car use. Klöckner & Ohms (2009) found a positive relationship between ascription of responsibility and personal norm when studying the purchase of organic milk. Guagnano (2001) concluded the positive influence of awareness of responsibility in research on the behavior of using recycled paper products to protect the environment. In addition, ascription of responsibility has a positive impact on the energy-saving behavior of households. If households feel that excessive electricity consumption can lead to some negative consequences, they will increase their intention and behavior to save electricity. Therefore, the author proposes the following hypotheses:

***Hypothesis 3a (H3a): Ascription of responsibility is positively correlated with personal norm of Vietnamese households.***

***Hypothesis 3b (H3b): Ascription of responsibility is positively correlated with electricity-saving behavior of Vietnamese households.***

Based on the TRA theory put forward by Ajzen & Fishbein (1975), the intention to perform a given behavior precedes the actual behavior. This intention is called behavioral intention and is the result of the belief that performing the behavior will lead to a particular outcome. The TRA theory also suggests that the greater the intention to perform a particular behavior, the more likely it is that the behavior will be performed. Thus, when households have the intention to save electricity, they are likely to move towards the behavior of saving electricity. Therefore, the author hypothesizes:

***Hypothesis 4 (H4): Intention is positively correlated with electricity-saving behavior of Vietnamese households.***

## 3. METHOD

### 3.1. Data collection

The author used quantitative research method in this study. To collect quantitative data, an online survey was conducted using a structured

questionnaire. The variables used in this study were measured using validated items and then collected and analyzed. The demographic characteristics of the respondents were also collected using a questionnaire. Through a network of friends and colleagues, the questionnaire was sent to a total of 600 households living in Vietnam via e-mail. Respondents are Internet users over 18 year-olds who are interested in saving natural resources and energy. This ensures that the participants have a certain level of knowledge and interest in the energy problem. Respondents were asked to volunteer to complete the questionnaire in the email. Respondents were assured that their anonymity and privacy would be respected and there were no right or wrong answers. Data was collected within 2 months from January to March, 2022. The total number of questionnaires collected was 557, the number of valid questionnaires for processing was 538.

### 3.2. Measures

The author used a scale of 4 items of Hien and Chi (2020) to measure electricity-saving behavior (BE); 3 items of Hien and Chi (2020) to measure electricity-saving intention (IN); 3 items of Shanyong Wang et al. (2018) to measure personal norms; 4 items of Wang et al. (2018) to measure awareness of consequences (AC) and 4 items of Wang et al. (2018) to measure ascription of responsibility (AR). Each item was measured using a Likert scale from 1 (Strongly disagree) to 5 (Strongly agree).

### 3.3. Sample profile

**Table 1. Respondents' Characteristics (N = 538)**

| Characteristics | Frequency | Percent (%) |
|---|---|---|
| **Gender** | | |
| Male | 259 | 48.1 |
| Female | 279 | 51.9 |
| **Age** | | |
| 18-28 | 136 | 25.3 |
| 29 - 38 | 172 | 32.0 |
| 39 - 48 | 124 | 23.0 |

| | | |
|---|---|---|
| 49 above | 106 | 19.7 |
| **Educational background** | | |
| High School Graduate | 78 | 14.5 |
| University Graduate | 387 | 71.9 |
| Post Graduate | 73 | 13.6 |
| **Monthly Income (USD)** | | |
| Less than 500 USD | 126 | 23.4 |
| 500 - 1000 USD | 216 | 40.1 |
| 1000 - 2000 USD | 118 | 21.9 |
| **More than 2000 USD** | 78 | 14.5 |
| Marital Status | | |
| Married | 298 | 55.4 |
| Single | 240 | 44.6 |
| **Living area in Vietnam** | | |
| North | 189 | 35.1 |
| Central | 112 | 20.8 |
| South | 237 | 44.1 |

Table 1 shows the demographic characteristics of the respondents. Of the 538 household representatives surveyed, 48.1% of respondents are male and 51.9% of respondents are female. 32% of respondents are between the ages of 29 and 38, followed by those aged 18 to 28. The majority of respondents (71.9%) have a University Graduate education. The average monthly income is less than 500 USD, accounting for 23.4% of the survey sample, over 40% of respondents have an income of 500 - 1000 USD. The number of married people (55.4%) is higher than the number of single people (44.6%). A larger proportion (44.1%) of respondents live in the South, followed by 35.1% of those living in the North, with the remaining 20.8% living in the Central region.

## 4. RESULTS

### 4.1. Convergent Validity and Reliability of the Scale

**Table 2. Convergent Validity and Reliability of the Scale**

| | Outer loading | Cronbach's Alpha | Composite Reliability (CR) | Average Variance Extracted (AVE) |
|---|---|---|---|---|
| **BE** | | 0.877 | 0.916 | 0.731 |
| **BE1** | 0.833 | | | |
| **BE2** | 0.870 | | | |
| **BE3** | 0.861 | | | |
| **BE4** | 0.855 | | | |
| **IN** | | 0.873 | 0.922 | 0.798 |
| **IN1** | 0.915 | | | |
| **IN2** | 0.863 | | | |
| **IN3** | 0.901 | | | |
| **PN** | | 0.865 | 0.917 | 0.787 |
| **PN1** | 0.900 | | | |
| **PN2** | 0.906 | | | |
| **PN3** | 0.854 | | | |
| **AC** | | 0.911 | 0.938 | 0.790 |
| **AC1** | 0.895 | | | |
| **AC2** | 0.884 | | | |
| **AC3** | 0.879 | | | |
| **AC4** | 0.898 | | | |
| **AR** | | 0.841 | 0.883 | 0.654 |
| **AR1** | 0.915 | | | |
| **AR2** | 0.769 | | | |
| **AR3** | 0.807 | | | |
| **AR4** | 0.733 | | | |

Firstly, about the convergent validity, the author considers the outer loading coefficient of the items and the average extracted variance (AVE) (Fornell & Larcker, 1981). If the outer loading is higher, it means that the items will measure the same factor. Hair et al. (2016) argue that the outer loading needs to be greater than or equal to 0.7 for that item to be quality. At the same time, Fornell & Larcker (1981) suggested that for the factor

to achieve convergence, the AVE should be about 0.5 or more. In Table 2, the statistical results show that all outer loading coefficients of the items of the research model are greater than 0.7; AVEs are all greater than 0.5 and range from 0.654 to 0.798.

Secondly, the reliability of the scale is assessed through Cronbach's Alpha coefficient and composite reliability (CR). According to Giao & Vuong (2019), Cronbach's Alpha coefficient and composite reliability (CR) should be greater than or equal to 0.7 to ensure the reliability of the scales in the research model. The results of the reliability test of the scale shown in Table 2 show that the Cronbach's Alpha coefficient and the composite reliability (CR) are both greater than 0.7.

### 4.2. Discriminant validity

The discriminant validity is the consideration of whether a concept is actually different from other research concepts by empirical criteria. Fornell & Larcker (1981) recommend that discriminability is guaranteed when the square root of the AVE for each latent variable is higher than all correlations between the latent variables. The discriminant value was assessed using the following criteria: (1) Cross loading and (2) Fornell and Larcker criteria. The analysis results show that the cross loading coefficients of the measurement variable (in bold) are larger than all the cross-loading coefficients of other research concepts (Table 3). In addition, the Fornell and Larcker coefficients - square root of the AVE value of one structure (in bold) are greater than the correlation with all other structures (Table 4).

**Table 3. Cross Loading**

| | AR | BE | AC | IN | PN |
|---|---|---|---|---|---|
| **AR1** | 0.915 | 0.129 | 0.070 | 0.122 | 0.089 |
| **AR2** | 0.769 | 0.048 | 0.028 | 0.079 | 0.058 |
| **AR3** | 0.807 | 0.054 | 0.053 | 0.058 | 0.056 |
| **AR4** | 0.733 | 0.033 | 0.011 | 0.101 | 0.004 |
| **BE1** | 0.065 | 0.833 | 0.412 | 0.537 | 0.390 |
| **BE2** | 0.105 | 0.870 | 0.425 | 0.528 | 0.377 |
| **BE3** | 0.083 | 0.861 | 0.397 | 0.456 | 0.319 |

| | | | | | |
|---|---|---|---|---|---|
| **BE4** | 0.094 | 0.855 | 0.394 | 0.483 | 0.355 |
| **AC1** | 0.049 | 0.427 | 0.895 | 0.325 | 0.238 |
| **AC2** | 0.036 | 0.419 | 0.884 | 0.364 | 0.272 |
| **AC3** | 0.041 | 0.409 | 0.879 | 0.379 | 0.325 |
| **AC4** | 0.092 | 0.439 | 0.898 | 0.387 | 0.270 |
| **IN1** | 0.102 | 0.518 | 0.353 | 0.915 | 0.351 |
| **IN2** | 0.112 | 0.506 | 0.374 | 0.863 | 0.329 |
| **IN3** | 0.093 | 0.548 | 0.372 | 0.901 | 0.400 |
| **PN1** | 0.045 | 0.363 | 0.278 | 0.335 | 0.900 |
| **PN2** | 0.054 | 0.402 | 0.299 | 0.403 | 0.906 |
| **PN3** | 0.118 | 0.354 | 0.249 | 0.329 | 0.854 |

**Table 4. Fornell and Larcker Criterion**

| | **AR** | **BE** | **AC** | **IN** | **PN** |
|---|---|---|---|---|---|
| **AR** | 0.809 | | | | |
| **BE** | 0.102 | 0.855 | | | |
| **AC** | 0.062 | 0.477 | 0.889 | | |
| **IN** | 0.114 | 0.587 | 0.410 | 0.893 | |
| **PN** | 0.080 | 0.422 | 0.312 | 0.404 | 0.887 |

### 4.3. Multicollinearity test

Table 5 shows the variance inflation factors (VIF) values, which were smaller than 5, which confirmed that there are no issues of multicollinearity in the research model.

**Table 5. Collinearity Assessment (VIF) - Inner VIF**

| | **AR** | **BE** | **AC** | **IN** | **PN** |
|---|---|---|---|---|---|
| **AR** | | 1.021 | | | 1.004 |
| **BE** | | | | | |
| **AC** | | 1.360 | | | 1.004 |
| **IN** | | 1.937 | | | |
| **PN** | | | | 1.295 | |

### 4.4. Hypotheses testing

**Table 6. Hypotheses Testing Results**

| | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (\|O/STDEV\|) | P Values |
|---|---|---|---|---|---|
| AC -> BE | 0.283 | 0.283 | 0.036 | 7.768 | 0.000 |
| AC -> PN | 0.308 | 0.308 | 0.044 | 7.058 | 0.000 |
| AR -> BE | 0.030 | 0.037 | 0.038 | 0.800 | 0.424 |
| AR -> PN | 0.061 | 0.068 | 0.045 | 1.338 | 0.181 |
| IN -> BE | 0.469 | 0.468 | 0.044 | 10.555 | 0.000 |
| PN -> IN | 0.404 | 0.404 | 0.045 | 8.962 | 0.000 |

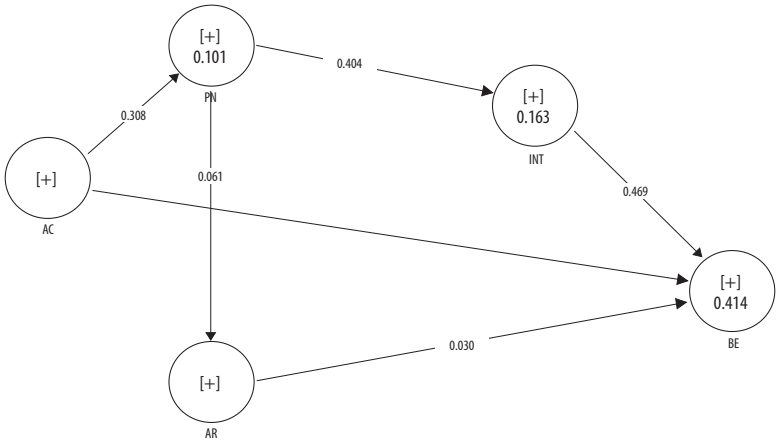


**Figure 1. Results of Model Testing**

In the analysis of Table 6 and Figure 1, four hypotheses are accepted, two hypotheses are rejected about the relationship between AR and BE, PN due to the satisfactory index of P values ($p > 0.05$). In which, AC has a positive relationship with BE and PN ($\beta = 0.283$ and 0.308 respectively). PN has a positive correlation with IN ($\beta = 0.404$). Finally, IN has a positive effect on BE ($\beta = 0.469$).

## 5. DISCUSSION AND CONCLUSION

### 5.1. Discussion

Based on NAM, this study explores the factors that influence the intention and behavior towards electricity-saving of Vietnamese

households. Research results show that awareness of consequences has a positive impact on personal norm (PN). This shows that the more knowledgeable households are about environmental issues such as the consequences of wasting electricity on the environment, the more personal norm for electricity-saving behavior will increase. In addition, personal norm has a positive effect on households' electricity-saving intention, and households' electricity-saving intention has a relative influence on their electricity-saving behavior. This result is in agreement with the research results of Zhang et al. (2013), Song et al. (2019) when studying the intention and behavior towards electricity-saving.

Meanwhile, in the research context of households in Vietnam, two hypotheses were rejected about the relationship between ascription of responsibility and personal norm, ascription of responsibility and behavior towards electricity-saving. After receiving this result, the author continued to conduct in-depth interviews with some households to find out why these hypotheses were rejected in the context of Vietnam. Although they are aware of the consequences of wasteful use of electricity, households in Vietnam have not considered it as their own responsibility to save electricity in particular and protect the environment in general. When not aware of responsibility, households have not formed personal norm and behavior to save energy.

### 5.2. Conclusions

Based on the research results, the author makes some suggestions for state management agencies to promote the intention and behavior towards electricity-saving of Vietnamese households.

Firstly, raising awareness about the consequences of wasteful use of electricity in households. Currently, the media has focused on conveying messages about saving electricity such as Earth Hour and some of the consequences for the environment due to the wasteful use of electricity. However, communication of the serious consequences of excessive electricity use in households should be included in the educational program from the primary level and included in the daily news on television and newspapers to households gradually become aware of serious consequences such as affecting energy sources for future generations, depletion of

national resources, climate change, environmental pollution... Thereby, it not only affects awareness of consequences, but also affects households' personal norm of intention and behavior to save electricity.

Secondly, there should be specific guidelines for households on measures to save electricity. In addition to propagating that electrical appliances should be turned off when there is no need to use them, the orientation towards installing and experiencing electricity-saving appliances or using renewable energy such as solar energy should be paid attention to. State management agencies should provide support on production costs for energy-saving appliances to reduce the selling prices of these products, leading to households easily put into consideration when needing to replace household appliances every day at home.

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# MENTAL HEALTH AND ACADEMIC PERFORMANCE OF UNIVERSITY STUDENTS IN THE CONTEXT OF COVID-19

**Nguyen Thi Phuong Linh**[1]

**Abstract:** *Using a combination of qualitative research methods - in-depth interviews and quantitative research methods with a large-scale survey of 727 university students, the paper explores the relationship between Covid-19, mental health and academic performance. The results show that Covid-19 has a positive relationship with academic performance and mental health (β = -0.207 and -0.216 respectively) and academic performance has a positive correlation with mental health (β = 0.379). Based on the research results, the author makes a few implications for universities and students to enhance academic performance of university students in the context that Covid-19.*

***Keywords:*** *Academic performance, Covid-19, mental health, Vietnam.*

## 1. INTRODUCTION

Covid-19 broke out in China and became a worldwide threat in just a few months. In addition to the impact on people's health, Covid-19 also puts a huge strain on public mental health. In the past, numerous studies have demonstrated that individuals have strong stress responses during disasters or crises. According to research by Bruffaerts et al. (2018), university students are a vulnerable population to mental health. Son et al. (2020), Khan et al. (2020) showed the negative impact of Covid-19 on the mental health of students, the majority of university students significantly increased their stress and anxiety levels. This is similar to recent findings of worsening mental health among Chinese students (Zhang et al., 2020) and increasing internet searches for negative thoughts among university students in the United States (Jacobson et al., 2020). Therefore, in the context of the Covid-19 epidemic, the mental health of students needs special attention.

[1] Business Administration Faculty, National Economics University. Email: linhnp@neu.edu.vn

Poor mental health in students is clearly an important issue that has a negative impact on academic performance of university students (Deroma et al., 2009; Richardson et al., 2012). Poor mental health has been found to have a negative impact on achievement and progress (Hughes & Spanner, 2019; Thorley, 2017a) and whether students complete each module individually (Mojtabai et al., 2015); as well as their qualifications (Thorley, 2017b). Due to the impact of the Covid-19 pandemic, the shift to online teaching for university students has become common. This form of learning provides an alternative to minimize contact between students and lecturers (Pragholapati, 2020). In a recent study, Giusti et al. (2021) warned about the negative impact of distance (online) teaching on students' mental health, and they identified mental health as the strongest predictor of academic performance.

In Vietnam in recent years, researchers have also approached the topic of mental health with its positive aspects as the foundation for physical health and helping each individual function effectively (Le Thu Hien and Ngo Thu Tra My, 2020). In particular, some studies have focused on the mental health of university students (Le Thu Hien and Ngo Thu Tra My, 2020; Nguyen Thanh Truc and Nguyen Thi Bich Tuyen, 2020). However, research on mental health of university students in Vietnam has only stopped at normal life circumstances. Despite the Covid-19 pandemic having a significant negative impact on university students' lives, but the full scope and nature of its effects on academic performance and mental health remains unclear (Prowse et al., 2021). Therefore, this study was conducted to understand the relationship between Covid-19, mental health and academic performance of university students.

## 2. LITERATURE REVIEW

University students are a particularly vulnerable group at risk for mental health disorders (Liu et al., 2020). Even before the Covid-19 pandemic, the frequency of mental health disorders among university students was increasing at an alarming rate. As the Covid-19 pandemic unfolds, social distancing and the shift from face-to-face classes to online learning also mean that college students are receiving little social and emotional support from friends, family, colleagues, and professors (Elmer et al., 2020; Sharma et al., 2020) may increase mental health problems.

In the wake of the Covid-19 pandemic, studies have found that the proportion of students experiencing mental health problems is increasing. Chrikov et al. (2020) showed that 35% of university students suffered from major depressive disorder and 39% had generalized anxiety disorder due to the impact of the Covid-19 pandemic. Another study found that 71% of student participants indicated they had increased levels of stress, depressive thinking and anxiety due to the pandemic (Eysenbach et al., 2020). Most of these symptoms are based on health concerns for self and family, difficulty concentrating, sleep disturbances, social isolation, and academic anxiety (Eysenbach et al., 2020).

The extent of the impact of Covid-19 on students' mental health was mentioned in the study of Zhai & Du (2020). The pandemic creates fear and leads to a range of psychological consequences (Liu et al., 2020) ranging from distressing responses such as anxiety, stress and substance abuse, to behavioral changes such as difficulty sleeping and eating stress. The authors suggest that college students experience overwhelming negative emotions during times of social isolation such as frustration, anxiety, feelings of betrayal, and struggling with loneliness due to disconnection from friends and lecturers. Students who once received on-campus counseling are now inaccessible, worsening psychological symptoms, increasing the risk of self-harm and substance abuse. Along with that, with the rapid spread of the pandemic, students are also afraid of infecting family members when they return home. They assume they may be asymptomatic carriers (Pal et al., 2020), so worry about putting older family members at higher risk of infection with serious complications. Zhai & Du (2020) assert that Covid-19 and its accompanying effects will continue to affect mental health profoundly, while mental health itself plays an important role in fighting disease. Therefore, it is extremely important and urgent to study the impact of Covid-19 on mental health and find reasonable solutions.

Patwary et al. (2020) conducted a study on the impact of Covid-19 on the mental health of students in Bangladesh, and concluded that about 78.1% of the students studied had mental health effects due to the pandemic, about 47% of students had moderate and severe anxiety. The cause of such anxiety may be related to the disruption of learning (Agnew et al., 2019) as well as loss of future career orientation (Sahu, 2020). Covid-19 also causes

stress for students due to financial hardship, concerns about the health of family members, and exposure to social media.

Therefore, the proposed research hypothesis is:

*H1: Covid-19 has a negative impact on the mental health of university students.*

In the context of the increasingly complex Covid-19 pandemic, there is a growing consensus that the spread of the pandemic and the decision to close universities can have a negative impact on student learning. Research by the authors Soland et al. (2020) has shown that Covid-19 can have a profound effect on students' academic achievement. Mahdy's (2020) study found that the Covid-19 pandemic affected the academic performance of most participants to varying degrees. Online education helps keep students active and gives students the opportunity to learn on their own. However, the main challenge facing online education is how to deliver real-world lessons. Students think that it is difficult to access practical lessons if they only learn through online platforms. This has a negative impact on the learning outcomes of students.

Thus, the authors propose the hypothesis:

*H2: Covid-19 negatively affects students' academic performance.*

The inverse relationship between mental health and academic performance is a well-known phenomenon in the scientific literature in sociology, epidemiology, and social psychiatry. Despite nearly a century of research on the issue, there is no consensus on how this relationship develops and persists. Several studies have demonstrated the influence of academic performance on mental health such as Ritsher et al. (2001), Esch et al. (2014). Miech et al. (1999) found the effect of adolescent school performance on anxiety. Studies on the impact of academic performance on mental health in young populations predominantly include adolescents. Early school dropout was found to be associated with substance abuse, depression, and appearance problems (Esch et al., 2014). Furthermore, poor and unexpected school performance in adolescence is associated with suicidal ideation in men, but not in women (Gunnell et al., 2011).

From the above arguments, the proposed hypothesis is:

*H3: Academic performance has a positive impact on students' mental health.*

## 3. RESEARCH METHODS

### 3.1. Collect samples and data

The study used a combination of qualitative methods - in-depth interviews and quantitative methods with a large-scale survey. For the qualitative research, in-depth interviews were conducted with 30 students at 7 different universities in Hanoi namely National Economics University, Hanoi University of Science and Technology, Hanoi Pedagogical University, University of Architecture, Hanoi Medical University, Foreign Trade University, and Hanoi University in order to draw factors suitable for conditions in Vietnam. For quantitative research, an online survey using the Google Forms tool was sent to students of some universities by random sampling in November 2021. The number of questionnaires collected was 750, the number of valid questionnaires included in the study was 727 survey votes (accounting for 96.9%).

### 3.2. The scale

The author used a scale of 21 items by Lovibond & Lovibond (1995) to measure mental health (MH); 6 items of Singh et al. (2020) to measure academic performance (AP). Covid-19 is determined based on having never/ever lived in a quarantine area with 4 levels: (1) Never lived in a quarantine area; (2) Have lived in a social distancing area for less than 1 month; (3) Have lived in a social distancing area for less than 3 months; (4) Have lived in a social distancing area for more than 3 months from April 27, 2021.

**Table 1. Respondents' Characteristics (N = 727)**

| Characteristics | Frequency | Percent (%) |
|---|---|---|
| **Gender** | | |
| Male | 293 | 40.3 |
| Female | 434 | 59.7 |
| **Student of the year** | | |
| First year | 243 | 33.4 |

| | | |
|---|---|---|
| Second year | 264 | 36.3 |
| Third year | 166 | 22.8 |
| Fourth year | 42 | 5.8 |
| Other | 12 | 1.7 |
| **Covid-19 - Time spent in quarantine** | | |
| Never lived in a quarantine area | 105 | 14.4 |
| Have lived in a social distancing area for less than 1 month | 290 | 39.9 |
| Have lived in a social distancing area for less than 3 months | 256 | 35.2 |
| Have lived in a social distancing area for more than 3 months | 76 | 10.5 |

Table 1 shows the demographic characteristics of the respondents. Of the 727 students, 59.7% of respondents are female and 40.3% of respondents are male. 36.3% of respondents are second-year students, followed by first-year students (33.4%). 39.9% of respondents lived in a social distancing area for less than 1 month, 35.2% of respondents lived in a social distancing area for less than 3 months.

## 4. RESULTS

### 4.1. Qualitative research results

All students interviewed agreed that Covid-19 has affected many aspects of their lives to varying degrees. Among them, some typical comments are as follows:

"*Covid-19 has changed quite a bit about my life in both positive and negative ways. On the positive side, I have more time with my family as well as some time to slow down, to love and care about myself and the people around me more. On the negative side, my life was almost turned upside down, I couldn't go to school and it was quite difficult for me to study online because I couldn't absorb knowledge as effectively as in class, interact through Social media is key*" (Male, Hanoi University, 3rd year).

"*When there was no epidemic, my life was really happy. However, it has completely changed since Covid-19 appeared, online learning has become difficult, health has been stagnant, family finances have been*

*affected to some extent that makes me more hesitant with expenses*" (Male, Hanoi University of Science and Technology, 2nd year).

"*Before Covid-19 appeared, my state was completely normal, with very little anxiety or stress. The epidemic made me feel very pressured because my family members had to go to quarantine, I was very worried about the health of myself and everyone. Covid-19 also forced me to study from home, which prevented me from fully experiencing student life. My outdoor activities were also interrupted, making me more anxious than before the epidemic, stressed because of weight gain, in addition, the disease also affected me in many other aspects...*" (Male, Hanoi University of Science and Technology, 2nd year).

"*Covid-19 has impacted my life quite a bit, from school, part-time work and mental health. As a medical student, some subjects required clinical practice at the hospital, so it was delayed for a long time. Some other subjects have switched to online learning. Since the day of the epidemic, the clinic that I worked for was also closed, so I lost my part-time job for a long time. Normally, I'm rarely stressed, but recently due to about to graduate, I often worry about the problem of graduation thesis and future job opportunities. I clearly affirm that Covid-19 has greatly affected my studies and activities*" (Female, Hanoi Medical University, 5th year).

Academic performance are learners' expectations of what they will be able to achieve or accomplish at the end of their studies. And all the students interviewed agreed that when the academic results are not good, it creates pressure leading to the pathologies of mental disorders. The ongoing Covid-19 has had a negative impact on student academic performance.

"*Learning online makes it more difficult for me to absorb knowledge compared to face-to-face learning. I could hardly buy textbooks and interact with lecturers and friends ineffectively. This leads to some negative effects and I worry that I won't do well in the exam*" (Male, Hanoi National University of Education, 2nd year).

"*While studying online at home, it is harder for me to focus on studying, studying alone is quite boring, but my learning results when studying online are higher because I feel the test is lighter. In addition, when learning online, having to turn on the camera, turn on the mic and*

*submit the paper on the online platform is quite complicated*" (Male, National Economics University, 2nd year).

"*My academic performance is still normal, but for me, the acquisition of knowledge is really not as effective as when I study directly at the university. Many external factors affect my concentration*" (Male, Hanoi University, 3rd year).

"*Due to the specifics of my specialty, most of my knowledge has to be self-taught and creative, so there isn't much difference between online and face-to-face learning. The results of this period are higher than those of university, so I don't worry much about my academic performance*" (Female, Hanoi University of Architecture, 3rd year).

Interviewees shared that their mental health was affected by the Covid-19 pandemic. The epidemic has left university students at home for a long time, which has turned their lives upside down, causing negative effects on mental health. Some of the highlights include:

"*The pandemic has had a huge impact on my mental health. Not being outside makes it difficult to apply knowledge in practice, limited physical and recreational activities make the body weaker, easy to feel stressed and unmotivated in life. living*" (Female, National Economics University, 2nd year).

"*In the past time, when the distance was so long that I couldn't go out, I used to fall into a state of stress, easily short-tempered. Also because of too much time indoors, my outdoor activities seem to be absent, since then my biological clock is disturbed and often has insomnia or sleeps late, sometimes even fall into a lonely state*" (Male, Hanoi University of Science and Technology, 2nd year).

"*I think the mental health of university students is influenced by factors such as: students who are about to graduate have many difficulties in the process of internships and job search, have not yet adapted to online learning and exams, with little contact with friends and lecturers... I think Covid-19 is the direct cause of these difficulties*" (Male, Hanoi University, 3rd year).

"*The epidemic forced me to stay at home for a long time, along with the complicated and dangerous developments of the epidemic, which made*

*my mentality change erratically. I feel more frustrated, more anxious, more stressed*" (Female, Hanoi University of Architecture, 3rd year).

### 4.2. Quantitative research results

#### *4.2.1. Convergent validity and reliability of the scale*

**Table 2. Convergent Validity and Reliability of the Scale**

| | Outer loading | Cronbach's Alpha | Composite Reliability (CR) | Average Variance Extracted (AVE) |
|---|---|---|---|---|
| MH | | 0.965 | 0.968 | 0.589 |
| MH1 | 0.798 | | | |
| MH2 | 0.716 | | | |
| MH3 | 0.726 | | | |
| MH4 | 0.727 | | | |
| MH5 | 0.774 | | | |
| MH6 | 0.771 | | | |
| MH7 | 0.708 | | | |
| MH8 | 0.853 | | | |
| MH9 | 0.754 | | | |
| MH10 | 0.758 | | | |
| MH11 | 0.794 | | | |
| MH12 | 0.779 | | | |
| MH13 | 0.820 | | | |
| MH14 | 0.706 | | | |
| MH15 | 0.827 | | | |
| MH16 | 0.765 | | | |
| MH17 | 0.844 | | | |
| MH18 | 0.742 | | | |
| MH19 | 0.721 | | | |
| MH20 | 0.764 | | | |
| MH21 | 0.836 | | | |

| | | | | |
|---|---|---|---|---|
| AP | | 0.908 | 0.928 | 0.682 |
| AP1 | 0.806 | | | |
| AP2 | 0.858 | | | |
| AP3 | 0.857 | | | |
| AP4 | 0.831 | | | |
| AP5 | 0.836 | | | |
| AP6 | 0.762 | | | |

Firstly, about the convergent validity, the author considers the outer loading coefficient of the items and the average extracted variance (AVE) (Fornell & Larcker, 1981). If the outer loading is higher, it means that the items will measure the same factor. Hair et al. (2016) argue that the outer loading needs to be greater than or equal to 0.7 for that item to be quality. At the same time, Fornell & Larcker (1981) suggested that for the factor to achieve convergence, the AVE should be about 0.5 or more. In Table 2, the statistical results show that all outer loading coefficients of the items of the research model are greater than 0.708; AVEs are all greater than 0.5 (0.589 and 0.682).

Secondly, the reliability of the scale is assessed through Cronbach's Alpha coefficient and composite reliability (CR). According to Giao & Vuong (2019), Cronbach's Alpha coefficient and composite reliability (CR) should be greater than or equal to 0.7 to ensure the reliability of the scales in the research model. The results of the reliability test of the scale shown in Table 2 show that the Cronbach's Alpha coefficient and the composite reliability (CR) are both greater than 0.7.

#### *4.2.2. Discriminant validity*

The discriminant validity is the consideration of whether a concept is actually different from other research concepts by empirical criteria. Fornell & Larcker (1981) recommend that discriminability is guaranteed when the square root of the AVE for each latent variable is higher than all correlations between the latent variables. The discriminant value was assessed using the following criteria: (1) Cross loading and (2) Fornell and Larcker criteria. The analysis results show that the cross loading coefficients of the measurement variable (in bold) are larger than all the

cross-loading coefficients of other research concepts (Table 3). In addition, the Fornell and Larcker coefficients - square root of the AVE value of one structure (in bold) are greater than the correlation with all other structures (Table 4).

**Table 3. Cross Loading**

| | AP | Covid | MH |
|---|---|---|---|
| AP1 | 0.806 | -0.126 | 0.316 |
| AP2 | 0.858 | -0.169 | 0.273 |
| AP3 | 0.857 | -0.195 | 0.292 |
| AP4 | 0.831 | -0.193 | 0.337 |
| AP5 | 0.836 | -0.196 | 0.496 |
| AP6 | 0.762 | -0.127 | 0.300 |
| MH1 | 0.287 | -0.173 | 0.698 |
| MH10 | 0.353 | -0.229 | 0.758 |
| MH11 | 0.379 | -0.272 | 0.794 |
| MH12 | 0.355 | -0.229 | 0.779 |
| MH13 | 0.392 | -0.219 | 0.820 |
| MH14 | 0.318 | -0.233 | 0.706 |
| MH15 | 0.261 | -0.267 | 0.827 |
| MH16 | 0.350 | -0.234 | 0.765 |
| MH17 | 0.275 | -0.254 | 0.844 |
| MH18 | 0.321 | -0.195 | 0.742 |
| MH19 | 0.195 | -0.203 | 0.721 |
| MH2 | 0.297 | -0.235 | 0.716 |
| MH20 | 0.326 | -0.216 | 0.764 |
| MH21 | 0.320 | -0.205 | 0.836 |
| MH3 | 0.266 | -0.171 | 0.726 |
| MH4 | 0.222 | -0.179 | 0.727 |
| MH5 | 0.382 | -0.211 | 0.774 |

| | | | |
|---|---|---|---|
| MH6 | 0.315 | -0.264 | 0.771 |
| MH7 | 0.259 | -0.216 | 0.708 |
| MH8 | 0.394 | -0.225 | 0.853 |
| MH9 | 0.404 | -0.264 | 0.754 |

**Table 4. Fornell and Larcker Criterion**

| | AP | Covid | MH |
|---|---|---|---|
| AP | 0.826 | | |
| Covid | -0.207 | 1.000 | |
| MH | 0.423 | -0.294 | 0.767 |

### *4.2.3 Multicollinearity test*

Table 5 shows the variance inflation factors (VIF) values, which were smaller than 5, which confirmed that there are no issues of multicollinearity in the research model.

**Table 5. Collinearity Assessment (VIF) - Inner VIF**

| | **AP** | **Covid** | **MH** |
|---|---|---|---|
| **AP** | | | 1.045 |
| **Covid** | 1.000 | | 1.045 |
| **MH** | | | |

### *4.2.4. Hypotheses testing*

**Table 6. Hypotheses Testing Results**

| | **Original Sample (O)** | **Sample Mean (M)** | **Standard Deviation (STDEV)** | **T Statistics (\|O/STDEV\|)** | **P Values** |
|---|---|---|---|---|---|
| AP -> MH | 0.379 | 0.381 | 0.031 | 12.400 | 0.000 |
| Covid -> AP | -0.207 | -0.207 | 0.033 | 6.257 | 0.000 |
| Covid -> MH | -0.216 | -0.216 | 0.032 | 6.822 | 0.000 |

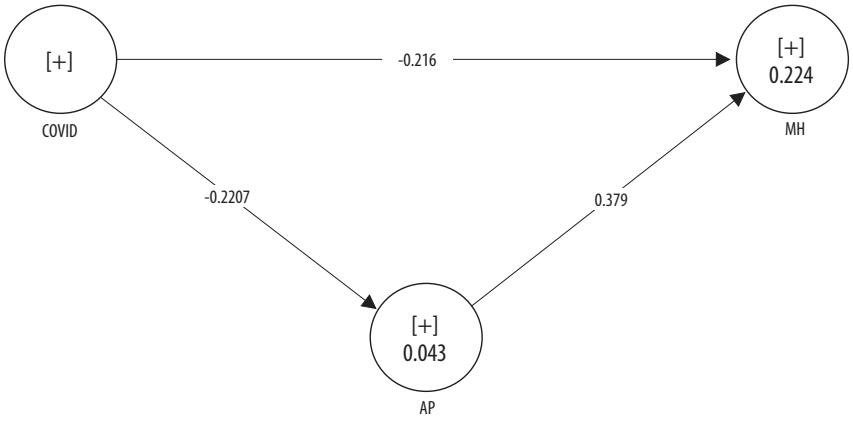


**Figure 1. Results of Model Testing**

In the analysis of Table 6 and Figure 1, three hypotheses are accepted due to the satisfactory index of P values ($p > 0.05$). In which, Covid has a positive relationship with AP and MH ($\beta = -0.207$ and -0.216 respectively). AP has a positive correlation with MH ($\beta = 0.379$).

## 5. DISCUSSION AND IMPLICATIONS

### 5.1. Discussion

Direct relationship between Covid-19 and mental health of university students ($\beta = -0.216$; $p = 0.000 < 5\%$) has statistical significance. Therefore, we accept hypothesis H1. This conclusion is also supported by the studies of Talevi et al. (2020); Zhai and Du (2020). This shows that the spread of the Covid-19 pandemic has a negative impact on the mental health of students. The relationship between Covid-19 and students' academic performance ($\beta = -0.207$; $p = 0.000 < 5\%$) is statistically significant. Thus, hypothesis H2 is supported. This result is almost similar to previous studies of UNESCO (2020); Mahdy (2020). This confirms that Covid-19 has a negative impact on students' academic performance. The relationship between academic performance and students' mental health ($\beta = 0.379$; $p = 0.000 < 5\%$) is statistically significant, so hypothesis H3 is supported. This result has been confirmed in the study of Gunnell et al. (2011); Jonsson et al. (2012).

### 5.2. Implications

The paper is conducted with the goal of analyzing the impact of Covid-19 on mental health and academic performance of university students. The author makes some implications for universities and students as follows:

For the universities, it is necessary to have an appropriate plan to improve the mental health of students: (1) the universities should actively participate in helping students in learning, internship, and extra-curricular activities. online lock; (2) university counseling centers should provide university students with remote counseling services (such as telehealth); (3) Universities and educational administrators should pay attention to the development and implementation of programs to train students' skills in taking care of their mental health.

For students, it is necessary to take measures to improve mental health to improve academic performance: (1) determine the learning goals that you pursue, then find methods and ways to improve the mental health to achieve the desired academic performance; (2) self-managing and maintaining individual learning outcomes through measuring, monitoring, and evaluating personal achievement; (3) make specific plans, improve self-study ability; develop skills in debating, creative thinking, problem solving, teamwork, leadership skills.

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# POLICIES TO ATTRACT FOREIGN ENTERPRISES TO INVEST IN VIETNAM TOWARDS IMPROVING THE QUALITY OF HUMAN RESOURCES IN THE NEW CONTEXT

**Tran Thi Kim Lien[1], Hoang Thi Minh Chau[2], Vu Thi Mai[2]**

***Abstract:*** *After extensive integration into the world economy through investment and trade, Vietnam has quickly received investment in the scale and quantity of foreign enterprises. These investments also directly affect the quality and quantity of human resources in Vietnam. In general, this study has shown that the operation of foreign enterprises in Vietnam does not stimulate the development of high-quality human resources in Vietnam but also reduces the size of these human resources. However, This research also shows that having appropriate policies to attract investment from foreign enterprises will bring Vietnam a large amount of investment capital, contributing to improving the quality of Vietnam's human resources. These policies should give the selection of affiliated enterprises, thereby developing the domestic market and prioritizing the use of domestic materials. In addition, it is necessary to issue several priority policies that support FDI enterprises to invest in: non-commercial service industries, support industries that connect to the domestic raw production sector in Vietnam, encourage enterprises to invest in non-commercial services in Vietnam, and share the governance standards that domestic enterprises need; so that improve quality of Vietnamese human resources.*

***Keywords:*** *foreign enterprises, foreign direct investment in Vietnam (FDI), quality of human resources, highly qualified labor.*

## 1. INTRODUCTION

Different economic theories suggest diverse effects of the activities of multinational corporations (MNCs) in the name of foreign direct investment (FDI) to the host country. In 2010, Sornarajah summarized in his research that there are two main theories about the activities of MNCs affecting economic development and particularly in human resources in developing

[1] Trade Union University. Corresponding Author. Email: lienttk@dhcd.edu.vn

[2] Banking Academy.

countries. The classical theory, developed by Adam Smith and David Ricardo, holds that FDI is always beneficial to the host economy (Morgan & Katsikeas, 1997): MNCs help improve capital shortages and generate many positive benefits; FDI helps to improve the quality of resources through technological advancement and management level. However, dependency theory, which developed in Latin American countries, is in stark contrast to classical theory (Peet, 1991): MNCs operate in developing countries with the main aim of benefiting themselves abroad as a result, the quality of human resources in the host country is underestimated and causes inequality between workers and employers. Therefore, developing countries need reasonable policies to reconcile these two views, ensure positive benefits as mentioned in the classical theory, and limit the excessive extraction of MNCs as in the dependency theory.

Vietnam began to integrate deeply into the world economy through investment and trade. Accordingly, the amount of FDI inflows into Vietnam has rapid growth from $19 billion in realized capital in 2007 to $31.15 billion in 2021. Vietnam began to integrate deeply into the world economy through investment and trade. Accordingly, the amount of FDI inflows into Vietnam has rapid growth from $19 billion in realized capital in 2007 to $31.15 billion in 2021. FDI plays an important role in expanding capital for economic development and improving information technology in Vietnam. Besides, The impact of MNCs'activities on the quality of human resources in the recent period needs to be fully studied and analyzed, so that Vietnam can choose appropriate policies to attract FDI and support MNCs to improve human resources in the country.

After the introduction, the study will (i) review the literature related to the human resource effect by FDI, (ii) summarize the current situation of FDI in Vietnam, (iii) Research methodology; (iv) present the findings of the study (v) discuss some policy implications and conclusions.

## 2. LITERATURE REVIEW

In 1994, UNCTAD (United Nations Conference on Trade and Development) summarized the detailed theoretical evidence of MNCs' effect on human resource quality. The way foreign investors enter the market as a new investment (Greenfield - GF) or merger and acquisition

(M&A) is a crucial factor in the short term. According to this report, new investment often has a positive impact on many aspects of employment including the quality of human resources. In contrast, M&A can cause a decrease in the labor size, but increase the quality of jobs, because this is essentially a change in ownership from domestic to foreign. The effect of MNCs on human resources also depends on the quality of the product they create, whether it is a substitute for domestic production or a higher quality product with higher technical requirements.

It can be seen from the report (UNCTAD, 1994) that the activities of MNCs create both direct and indirect effects on human resource quality, both positively and negatively at the same time . Some empirical studies also showed these effects, in terms of the quantity and quality of human resources (Abor & Harvey, 2008; Bailey & Driffield, 2007; Jenkins, 2006; Wong & Tang, 2011). This article will summarize some empirical studies about the effect of FDI on human resource quality.

Studying highly skilled labor in industry and services in Singapore, Wong & Tang (2011) used the self-regressive lagged method (ARDL) to test the causal relationship between FDI and human resource issues in Singapore. The study found that the quality of human resources available in Singapore is a decisive factor in the long-term causality relationship of employment-FDI in the direction from FDI and the size of human resources for the service industry to the manufacturing industry. Specifically, high-quality human resources in these two industries attract FDI to Singapore. In the short term, the activity of MNCs and service sector employment help to increase employment in the manufacturing sector. This is due to the large scale of investment of MNCs in the manufacturing industry and the very developed logistics service industry in Singapore, leading to an increase in the quality of jobs in the manufacturing industry. FDI in Singapore helps increase the number and quality of careers in the manufacturing sector, thereby pulling the supporting service industry to develop.

Contrary to this trend, Bailey & Driffield (2007) compared the impact of MNCs and technology development on demand for high-quality human resources in the UK. In their research, they are using the sector data for SMEs, and its result showed the effects of foreign capital versus domestic investment. In this period, the UK is carrying out a shift in industrial

policy from a regional to horizontal investment with a focus on supporting the development of small and medium enterprises (SMEs) and industrial clusters. However, the results of this policy did not achieve the ultimate goal of reducing unemployment and improving human resources at the regional level.

During this period, the policies implemented by the UK were incompatible with MNCs, so MNCs did not stimulate the development of high-quality human resources but also reduced the scale of human resources in general.

In a skeptical study on the impact of FDI on the quality of human resources, Abor & Harvey (2008) argued that MNCs entering Ghana's manufacturing sector only helped to improve the scale of employment but not helped to increase the number of jobs. Additionally, the study did not find the impact of MNCs on highly skilled workers.

Regarding this research direction in Vietnam, the article by Jenkins (2006) is a rare research work on the period 1995-1999. In this study, although foreign enterprises accounted for a large proportion of output value by industry and export, the quality of human resources they spread were limited by weak links with the domestic market. The indirect effect of stimulating human resource development in domestic enterprises were quite small, even negative to the limited connectivity that foreign enterprises create and the risk of crowding out effect on the domestic enterprises. With domestic investment, domestic enterprises cut down their personnel, including highly qualified personnel

Not only was the direct effect of stimulating job quality of FDI in Vietnam not high, the indirect effects were quite small, even in a negative direction. The final impact of the indirect effect depends on the synergistic effect of MNCs when helping domestic investors to attract highly skilled workers from new markets and the crowding out effect when foreign firms replace domestic companies. Foreign enterprises in Vietnam create weak industry links because they mainly import input materials from abroad. Research showed that 69.3% of the inputs for the production of MNCs were imported, while that of state-owned enterprises (SOEs) is 36.6%, private enterprises and the rest are 18. 2%. This number also varies widely across industries in which MNCs are involved. While domestic industry linkages

are weak, empirical evidence shows negative signs of the crowding-out effect on domestic firms and the reorganization of SOEs in response to foreign competitors leading to a decline in high-skilled employment.

Most economists do not draw a specific conclusion about the net effect of FDI in stimulating the development of high-quality human resources. A general theory suggested that a positive or negative impact was not possible since the labor effects of different FDI flows were different (Baldwin, 1995).

## 3. FOREIGN DIRECT INVESTMENT IN VIETNAM

Since joining the WTO in 2007, Vietnam has welcomed a large amount of FDI in 2008 with a registered capital of up to 64 billion USD, more than three times higher than in 2007. However, the economic crisis of The global financial economy in 2008 and the public debt crisis in Europe in 2010 caused FDI in Vietnam in the period of 2009 - 2012 to significantly decrease before recovering and stabilizing in the period of 2013 - 2019.

From 2020, due to the impact of the Covid-19 Pandemic, the world economy and Vietnam were severely affected. Accordingly, outward investment capital flows sharply decreased, especially FDI investment. The amount of FDI in 2020 into Vietnam reached 21 billion USD, down 6.7% compared to 2019 (Figure 1). The newly registered FDI capital in this period was about 2-3 times higher than the adjusted registered capital. In 2021, although the Covid-19 pandemic is still complicated, FDI into Vietnam will reach 31.15 billion USD, up to 9.2% compared to 2020. New and adjusted registered investment capital both increased. Compared to 2020, this capital increased sharply to 40.5%. This result demonstrates Vietnam's significant efforts in the FDI attraction policy, with the desire to improve productivity and economic growth.

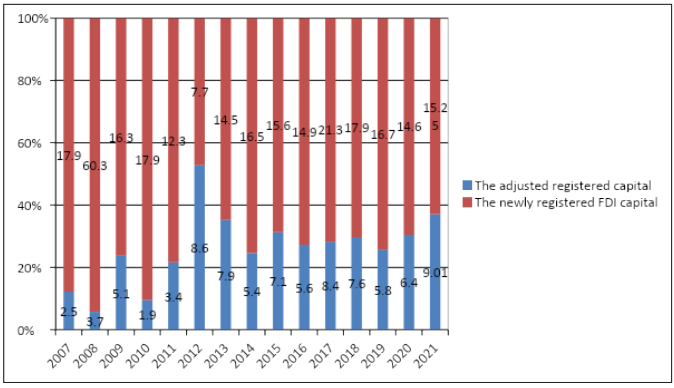


**Figure 1. FDI into Vietnam in the Period 2007-2021 (billion USD)**

*Source: Foreign Investment Agency - Ministry of Planning and Investment (2021)*

Regarding the structure of FDI, up to now, foreign direct investment has been present in 19/21 industries in Vietnam's national economic sub-sector system. However, FDI has a significant difference between economic sectors. Accordingly, the processing and manufacturing industry is always the industry that attracts the most foreign investment. Accumulated until the end of 2021, this industry accounted for more than half of the capital with 240.2 billion USD (equivalent to 58% of total investment capital) and nearly half of registered projects with 15,558 projects (equivalent to 45 % of total investment capital, 2% of total projects) (Figure 2). One of the reasons for this industry to absorb a large amount of FDI is that in the early stages of economic opening, Vietnam encouraged foreign investment in the industry and processing to realize the goal of industrialization and modernization the country

In addition, these are also industries with strengths of traditional partners investment in Vietnam such as Korea, Japan, and Singapore because of the advantages of labor and natural resources in Vietnam. Beside the rise of FDI investment in processing and manufacturing industries, FDI investment in service industries has had an upward trend in recent years. Agriculture, forestry and fishery are strong sectors of Vietnam, but foreign investment in these sectors is still quite limited. By the end of 2021, the amount of FDI in these industries only reached 3.7 USD with 516 investment projects (accounting for less than 1% of total FDI capital into Vietnam). One of the main reasons is that the local policies to attract

and encourage foreign investors are not really attractive. However, in recent years, Vietnam has focused on attracting high-tech projects in the agricultural sector towards green agriculture.

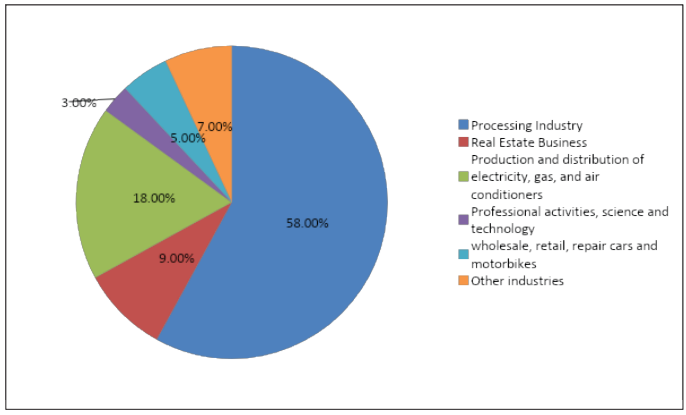


**Figure 2. Structure of FDI Registered Capital by Economic Sector**

*Source: General Statistics Office (2021).*

Considering the total investment capital of the whole society, FDI capital has become an essential source of capital in Vietnam. FDI investment capital increases from VND 616.5 trillion in 2017 to VND 713.6 trillion in 2021 (accounting for 15-18% of total social investment) (Figure 3), adding to the investment capital in the state economic sector, while this capital source falls below 30%

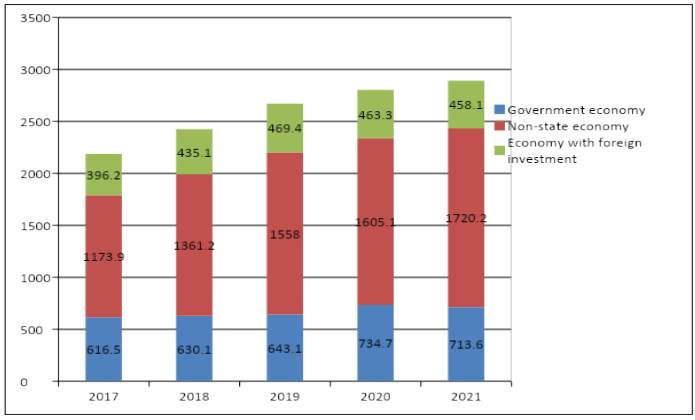


**Figure 3. Structure of Social Investment Capital for the Period 2017-2021 (trillion VND)**

*Source: General Statistics Office (2021).*

MNCs also contribute positively to economic growth in Vietnam, from 18.6% in 2016 to 20.13% in 2020 (Figure 4).

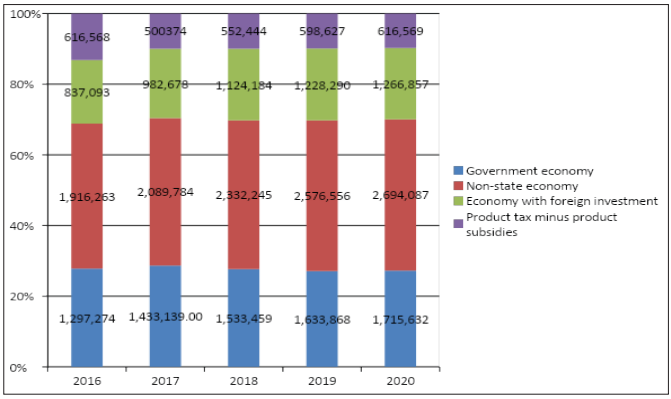


**Figure 4. Real GDP by Economic Sectors 2016-2020 (billion VND)**

*Source: General Statistics Office (2020).*

Although accounting for a small proportion of the total capital of the whole society, FDI enterprises have always led in terms of import and export value in Vietnam. Data from the General Statistics Office (2021) also shows that in the period 2016-2020, the total export value of MNCs is twice that of domestic enterprises; meanwhile, with an import value of about 1.25 times.

This showed that the majority of FDI inflows into Vietnam are to import input goods and export them to the world market. It illustrated the possibility of a weak linkage between domestic enterprises and foreign enterprises. This is also the phenomenon that Jenkins (2006) recognized in the 1990s. And it will create negative labor effects on FDI inflows.

In terms of statistics, it can be seen that the impact of FDI inflows on jobs is not high in Vietnam. Large capital scale, however, FDI enterprises only absorb less than 10.5% of the average number of employees, including high-quality workers, in the economy (Figure 5). This is a very modest number.

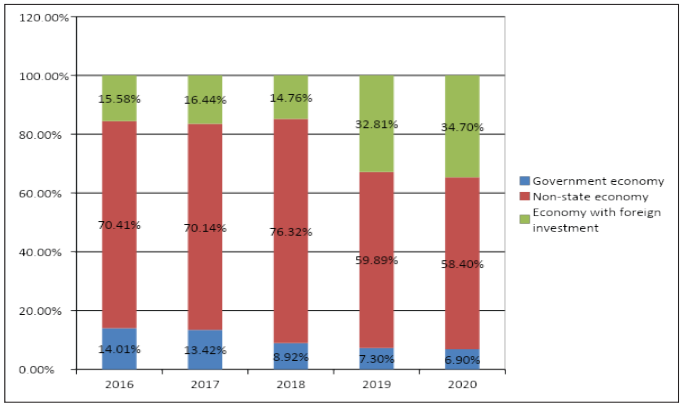


**Figure 5: Contribution of FDI to Jobs in Vietnam in the Period 2016-2020**

*Source: General Statistics Office (2020).*

Increasing FDI inflows into Vietnam theoretically will directly stimulate the development of high-quality human resources if this capital has invested in the right direction. Otherwise, it will create negative effects while M&A (direct impact), as well as cut off the number of high-skilled labor in the domestic sector to increase competitiveness. competition (indirect impact) (UNCTAD, 1994).

It can be seen from the labor market that the labor productivity of FDI enterprises in Vietnam is much higher than domestic enterprises, creating an imbalance in the level of labor qualifications. If Vietnam does not have appropriate policies to connect these two regions, the positive effects of labor quality, technology transfer, etc. will be difficult to spread.

## 4. RESEARCH METHODOLOGY

The article is trying to build a quantitative model to assess the influence of FDI enterprises on the quality of human resources in Vietnam, using the array of data from 63 provinces in the period 2017-2021 through a quantitative model:

$$ln(ldkn_{ijt}) = \alpha_1 + \alpha_2 ln(quymoMNCs_{ijt}) + \alpha_3 ln\ (luong_{ijt}) + \alpha_4 ln(xk_{ijt}) + \alpha_5 ln(nk_{ijt}) + \alpha_6 ln(dnnd_{ijt}) + \omega_t + u_{ijt} \quad (1)$$

*In there:*

+ i, j, t : industry, province and year index respectively.Areas of study include: agriculture, industry-construction and services.

+ *ldknijt* : the dependent variable representing the size of qualified labor in Vietnam.

+ $quymoMNCs_{ijt}$: the main independent variable, calculated by the total assets of MNCs with 100% foreign direct investment in province i, industry j year t.

+ $luong_{ijt}$ i: the nominal average salary of highly skilled workers working in industry i, province j in year t.

+ $xk_{ijt}$: the total export value of industry i in province j in year t

+ $nk_{ijt}$: the total import value of industry i in province j in year t

+ $dnnd_{ijt}$ : the total assets of domestic enterprises in industry i province j year t.

Besides the total assets of MNCs in Vietnam, the control variables are selected based on empirical research models (Bailey & Driffield, 2007; Craigwell, 2006). Study the logarithm of the variables to calculate the relative impact as a percentage.

With the analysis of Jenkins (2006), the research hypothesis tested that increasing the activity of MNCs in Vietnam will harm the scale of high-quality jobs.

The characteristics of different provinces make the process of absorbing FDI different, so the impact of FDI on employment in each industry may be different. Therefore, the study chooses a fixed effect (FE) method with a corrected standard error. Wooldridge (2002) suggested that contains all the provincial unobservable factors that affect the dependent variable, called unobserved effects, and should be separated from randomness through an efficient method. The study also corrects the standard error (heteroskedasticity-robust standard error) to overcome the defects of the model's possible variable variance.

The study also provides a model to explore the stimulating effect of high-quality human resources in the agricultural, industrial, and service sectors in Vietnam. This research is a significant basis to be wise more about the investment motivation of MNCs. The research model was designed as follows:

$$ln(ldkn_{ijt}) = \alpha_1 + (\alpha_2 + \beta_1 NN + \beta_2 CN) ln(quymoMNCs_{ijt}) + \alpha_3 ln\ (luong_{ijt}) + \alpha_4 ln(xk_{ijt}) + \alpha_5 ln(nk_{ijt}) + \alpha_6 ln(dnnd_{ijt}) + \omega_t + u_{ijt} \quad (2)$$

*In there:*

+ NN is a dummy variable equal to 1 if MNCs invest in agriculture, 0 for industries and services

+ CN is a dummy variable equal to 1 if MNCs invest in industry-construction, 0 for agriculture and services

Thus, the value $a_2$ reflects the impact of MNCs on the service industry. Coefficients $b_1$ and $b_2$ indicate the relative difference between the agriculture and industry-construction sectors, respectively, from the service sector. Equation (2) is rewritten as follows:

$$ln(ldkn_{ijt}) = \alpha_1 + \alpha_2 ln(quymoMNCs_{ijt}) + \beta_1 NN * ln(quymoMNCs_{ijt}) + \beta_2 CN * ln(quymoMNCs_{ijt}) + \alpha_3 ln\ (luong_{ijt}) + \alpha_4 ln(xk_{ijt}) + \alpha_5 ln(nk_{ijt}) + \alpha_6 ln(dnnd_{ijt}) + \omega_t + u_{ijt} \quad (3)$$

In which, $NN * ln(quymoMNCs_{ijt})$ and $CN * ln(quymoMNCs_{ijt})$ are the product of the dummy variable of the agriculture sector and the industry-construction industry with the variable $ln(quymoMNCs_{iit})$.

Similarly, the study assesses the impact of enterprises interacting with export and import values, as the actual situation above, these two variables can influence the linkage between the domestic and foreign sectors in Vietnam.

**Table 1. Research Data**

| Variables | Number of samples | Averages | Standard deviations | Units |
|---|---|---|---|---|
| ldkn | 754 | 33.668 | 82.851 | person |
| luong | 754 | 3.542 | 2.588 | Thousand VND |

| | | | | |
|---|---|---|---|---|
| quymoMNCs | 754 | 11.700.000 | 54.000.000 | Million VND |
| xk | 754 | 360.000 | 1.810.000 | Million USD |
| nk | 754 | 340.000 | 1.840.000 | Million USD |
| dnnd | 754 | 65.100.000 | 34.000.000 | Million VND |

*Source: Author's own calculation.*

How to divide occupations according to the above three fields through VSIC 2007 National Economic Sector System; accordingly, agriculture includes A-grade industry; industry-construction includes the B, C, D, E, and F grades, service includes the rest. The data is extracted from two data sets, the Enterprise Survey (VEC) and the Labor Employment Survey (LFS), which are conducted annually by the General Statistics Office. The study calculates an intermediate quantity that is the average assets of an enterprise equal to the average assets at the beginning and the end of the period in a year of the enterprise. Hence, dnnd is the average total assets of wholly domestic-owned enterprises. Meanwhile, the regular independent variable MNCs is the average total assets of wholly foreign-invested enterprises. The variable ldkn is calculated as the total number of weighted workers with high qualifications from the diploma level and above.

## 5. RESEARCH RESULTS

Table 2 shows the results of estimating the impact of MNCs in Vietnam on the development of high-quality human resources by occupations in provinces in Vietnam. Column (a) is the estimated result of model (1), which evaluates the overall effect from the activities of MNCs. Column (b) estimates model (3) evaluates the interaction of this capital source in each industry to attract the quality of human resources. Columns (c) and (d) evaluate the combination of export and import of industries with 100% FDI enterprises. Provinces that do not have high-skilled workers or have not yet attracted 100% FDI enterprises will be removed from the estimation model. As a result, the number of provinces in the regression model is reduced to 61 provinces.

**Table 2. MNCs in VietNam and Scale of High Quality Human Resource**

| Variable | Ln(ldkn) | | | |
|---|---|---|---|---|
| | (a) | (b) | (c) | (d) |
| Ln(luong) | -0,115 | 0,0536 | -0,132 | -0,139 |
| | (0,129) | (0,149) | (0,122) | (0,122) |
| Ln(xk) | -0,0684** | -0,0241 | 0,124 | -0,0605** |
| | (0,0262) | (0,0206) | (0,0789) | (0,0279) |
| Ln(nk) | 0,0294 | -0,0372 | 0,0386 | 0,241*** |
| | (0,0269) | (0,0230) | (0,0288) | (0,0824) |
| Ln(dnnd) | 0,867*** | 0,164* | 0,875*** | 0,886*** |
| | (0,0734) | (0,0828) | (0,0711) | (0,0696) |
| Ln(quymoMNCs) | -0,0704** | 0,0898*** | 0,167* | 0,192** |
| | (0,0343) | (0,0274) | (0,0901) | (0,0913) |
| Ln(quymoMNCs)*CN | | -0,0480*** | | |
| | | (0,00707) | | |
| Ln(quymoMNCs)*NN | | -0,221*** | | |
| | | (0,0179) | | |
| Ln(quymoMNCs)* Ln(xk) | | | -0,0151** | |
| | | | (0,00581) | |
| Ln(quymoMNCs)* Ln(nk) | | | | -0,0167*** |
| | | | | (0,00593) |
| Block coefficient | -2,279* | 7,047*** | -5,353*** | -5,782*** |
| | (1,185) | (1,516) | (1,619) | (1,532) |
| Number of sample | 474 | 474 | 474 | 474 |
| R-squared | 0,336 | 0,487 | 0,354 | 0,358 |
| Number of province | 61 | 61 | 61 | 61 |
| Province Fixed Effect | Yes | Yes | Yes | Yes |

*Note: Corrected standard error in quotation marks, estimated results for effects are not shown in the table, *** p < 0,01, ** p < 0,05, * p < 0,1.*

*Source: Author's own calculation.*

The estimated results in column (a) model show that the overall impact of MNCs on attracting high-quality human resources is negative and statistically significant at the 5% level. Specifically, a 1% increase in FDI into Vietnam will reduce the number of highly qualified workers operating in the economy by 0.07 percentage points. This study is consistent with previous predictions in the situation analysis. In addition, the research results are relevant to the views of Jenkins (2006) when studying this phenomenon in Vietnam in the 1990s.

However, if disaggregated by the economic sector, this effect is very different in each field (the estimation results in column (2) clearly show that). The strongest impact of labor resources from attracting FDI is into the service sector, and this effect gradually decreases in the industrial and agricultural sectors. The influence of attracting highly qualified human resources in the service industry is positive and statistically significant when 1% of the additional capital of MNCs causes this industry to increase by 0.09 percentage points of labor from the intermediate vocational level or higher. This effect is reduced by 0.05 percentage points when this capital has shifted to the industry-construction sector; however, overall is still positive 0.04 percentage points, and statistically significant at the 1% level. MNCs investing in agriculture created large effects on highly skilled workers, making this effect less than 0.2 percentage points lower than in the service sector and statistically significant at 1%. This means that the effect on the agricultural sector tends to be negative when 1% of the capital of MNCs entering Vietnam will change by 0.09-0.2 percentage points, equivalent to 0.11 percentage points decrease. Adjusted for that, the overall effect is negative with a decrease of 0.07 percentage points for a 1% increase in FDI.

The analysis of the interaction between MNCs and import-export activities in Vietnam's economic sectors also yields interesting results. If the industry does not import and export, but specifically MNCs focus on developing the domestic market, the effect of increasing high-quality human resources is very strong. An additional 1% of FDI capital will create 0.17 percentage points of high-skilled labor size, with a significance level of 10%, if this industry only focuses on the domestic market and does not export. Similarly, if foreign goods are not imported, 1% additional

capital from MNCs will help the respective industry increase by nearly 0.2% percentage point in the size of the highly skilled workforce. This number is statistically significant at the 5% level. Concentrating on the use of domestic resources and developing the domestic market will create many positive indirect effects to attract highly qualified labor. Resonating with that is the positive direct impact when MNCs directly hire highly qualified workers.

Vietnam's economic sectors carry out very strong import and export activities. These activities make an overall negative impact as estimated in column (a). With an increase of 1% in the value of exports and imports of the industry, the effect of attracting high-skilled workers of MNCs decreased to 0.0151 and 0.0167 percentage points, with statistics respectively being 5% and 1%. Increasing exports and imports means reducing connectivity between foreign firms and Vietnam regional enterprises, creating bad fluence for the development of high-quality human resources. This process resonates with the reduction of personnel to increase competitiveness, which brings together the negative effects. That means the negative impacts have outweighed the positives from this capital source in Vietnam. Increasing imports and exports is also an important policy implication when developing Vietnam's human resources in the context of world economic integration. This rise has not improved since the 1990s to the results of Jenkins (2006).

It can be seen that the growth of asset size of domestic enterprises contributes positively to human resource development in Vietnam with a significance level of 10% in all four estimation models. The activities of domestic enterprises, with the focus on linking production and domestic consumption, have partly absorbed highly qualified labor; stimulating employees to learn and acquire skills.

## 6. POLICY IMPLICATIONS AND CONCLUSIONS

This study tried to find out the policy implications for Vietnam to attract foreign enterprises to raise the level of domestic workers. Theoretical and practical studies reflect the duality of this capital flow. And if Vietnam has appropriate policies to support FDI, this capital flow will bring a good effect on the quality of human resources.

According to the current reality of attracting MNCs, this empirical research in all provinces in Vietnam in the period 2017-2021 across the three sectors of agriculture, industry-construction, and services has shown that, overall, The operation of MNCs in Vietnam not only does not stimulate the development of high-quality human resources but also reduces the size of this human resource. However, if Vietnam has reasonable policies to attract FDI, build vertical connectivity in the agricultural sector; improving cohesion in the service and industry-construction sectors, this capital flow will help Vietnam develop highly qualified human resources.

Encouraging FDI to invest in the service industry, especially non-commercial service industries such as tourism, health care, banking and finance... is a possible solution to improve the quality of domestic human resources. These are industries that develop the domestic market, need to hire many high-quality local workers, and cannot be exported.

In addition, supporting domestic and foreign enterprises to increase linkages with the domestic market, and using domestic raw materials also helps FDI capital to promote positive effects in the process of improving the quality of human resources.

One solution that should be considered is to encourage foreign enterprises to invest more in supporting technology industries that connect the domestic business sector, which focuses on raw production and trade with foreign enterprises. Existing foreign countries have high technology levels. Accompanying those are policies to support FDI enterprises to actively share directly about qualifications and international governance standards so that domestic enterprises can gain more practical knowledge, and reduce the technology gap in these two regions.

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# PUBLIC SERVICE MOTIVATION IN POST-PANDEMIC: A CROSS-SECTIONAL DESIGN

**Nguyen Le Hoang Long**[1]

***Abstract:*** *This article uses social learning theory to explore the mechanism by which ethical leadership enhances public service motivation. The data was collected from 208 public servants working in Ho Chi Minh City, Vietnam. The dataset was analyzed by using Partial Least Square SEM. The analysis of data found that ethical leadership has a positive effect on public service motivation of public servants in both direct in indirect ways. Self-efficacy partially mediates the relationship between the perception of employees about an ethical leader and their motivation. This research also has implications for practitioners in the public sector to promote the motivation of public employees via ethical HR practices.*

***Keywords:*** *Ethical leadership, efficacy, post-pandemic, public service motivation, public sector*

## 1. INTRODUCTION

Despite the discrepancy in the national budget, governments around the world are investing a huge amount of capital in public projects (Flyvbjerg, 2014). Therefore, it is vital to keep public employees' motivation for ensuring public organizations' productivity. In the literature of public administration, scholars insisted on the role of the leader to improve employee performance (Fareed & Su, 2022; Rainey, 2014). Especially, in the period of economic recovery, the role of the public leader is more important to speed up the process by enhancing public employees' effectiveness and efficiency.

Motivation is confirmed its effect on unlocking the potential of employees and bringing more performance at work (see Çetin & Aşkun, 2018; Chien et al., 2020; Huang, 2019). In the public sector, the motivation of public employees is not only narrow in the boundary of their office but direct

[1] School of Government, University of Economics Ho Chi Minh City (UEH University). Email: longnlh@ueh.edu.vn

to serve society and improve social welfare. Thus, public service motivation is intensively studied by scholars since it is first proposed by Perry and Wise in the 1990s (Vandenabeele et al., 2014). In early 2022, Vietnam's economy is expected to see a rapid recovery (Manh Hung, 2022), public employees need to put more effort to fulfill their responsibilities and still have to ensure there are ethical standards. Ethical leadership style emerges as a valuable resource that enhances employees' public service motivation through the learning process from leaders. Employees who perceive their leader's moral behavior could be confident to express ethical manner and link it with public service ideal. Moreover, an ethical leader also communicates the practices ethical at work, public employees have a clear understanding of the organization's discipline would be easier to follow and increase their motivation direct to stakeholders' benefit. Drawing from social learning theory, this research addresses the research gaps in both theoretical and practical terms. First, we contribute to public administration literature, even public service motivation concept is well explained in their term, scholars such as Vandenabeele, Brewer, & Ritz (2014) called for developing the link of public service motivation to other theoretical perspectives to get better insights about processes. Specifically, we adopt social learning theory to explain the mechanism from ethical leadership to public service motivation. Second, this research proposed a holistic model to understand the mediating role of self-efficacy in linking the nexus between the perception about a leader and motivation. This study is an effort to get better understanding of processes from perception to leader and employees' motivation in the public sector. Finally, we collected data during the time Vietnam's economy is in recovering state after the Covid-19 outbreak to evaluate whether ethical manners could active motivation of public servants.

The research is organized as follows: a brief literature review of ethical leadership, public service motivation, and self-efficacy; next, the research methods; then we present the result findings; finally, several research implications and future directions are made.

## 2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### 2.1. Ethical leadership and public service motivation

In the workplace, leaders play an important to shape the attitude and behavior of employees (Potipiroon & Ford, 2017). Through the lens of social

learning theory (Bandura, 1977), leaders can be perceived as role modeling for employees to change their beliefs in themselves and lead to certain outcomes. In this research context, we focus on the ethical aspect of the leader through ethical leadership style. Brown et al. (2005, p.120) defined ethical leadership as "the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and the promotion of such conduct to followers through two-way communication, reinforcement, and decision-making". The definition emphasizes two aspects that form employees' perception of an ethical leader, which are *moral person* and *moral manager*. The *moral person* refers to personal traits, character, and altruistic motivation (Brown & Treviño, 2006). Not only to live a virtuous life, the ethical need to encourage ethical behavior and punish unethical behavior of their employees - this a moral manager manner (Brown & Treviño, 2006). In this research, we argue that employees learn from the ethical manner of leaders and reshape their attitudes. In the public sector, leaders embrace public service ideals (Potipiroon & Ford, 2017) and affect to the motivation to serve the society of public servants - public service motivation.

Public service motivation was defined as "A particular form of altruism or prosocial motivation that is animated by specific dispositions and values arising from public institutions and missions" (Perry et al., 2010). Scholars debated whether public service motivation is a dynamic or static attribute (Hameduddin & Engbers, 2022; Wise, 2004). In this research, we inherited the result findings from Christensen et al. (2017) that "public service motivation may be a product of long-term socialization, but it may be movable by more immediate influences in an individual's organizational environment". Following the research stream of Christensen et al. (2017) and in the light of social learning theory, we argue that employees learn in a cumulative way when interacting with ethical leadership on a daily basis. Moreover, as organizations were being in process of recovery after the pandemic outbreak, leaders need to demonstrate and encourage more ethical and supportive behaviors to employees (e.g. altruism), which will contribute to improving the motivation of public servants to serve the public.

From the above discussions, we propose a hypothesis:

$H_1$: Ethical leadership has a positive effect on public service motivation of public servant

### 2.2. Self-efficacy as mediator

This research draws on social learning theory to posit that ethical leader in public organizations could enhance public service motivation of public servants via activating their self-efficacy. Judge et al. (1998, p.19) defined general self-efficacy as "estimates of one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise general control over events in one's life". Besides, self-efficacy of one does not mainly relate to their actual behavior but emphasizes the conviction that they are capable to perform the behavior required in their organization (Bandura, 1977). Social learning theory proposed four main sources of one's self-efficacy including performance accomplishment, vicarious experience, verbal persuasion, and physiological states. In the scope of the research, we viewed ethical leadership as a source of self-efficacy through providing vicarious experiences and verbal persuasion.

Scholars found the effect of ethical leadership on self-efficacy in various context, from private to public sector (see Adnan et al., 2021; Qabool et al., 2021; Ren & Chadee, 2017; Wang et al., 2015). From the social learning perspective, ethical leadership could attract employees because of their *moral person* aspect. Employees assess the credibility of the leader and are confident to *imitate* several traits in their daily work (e.g. altruism). Besides, ethical leaders have *moral manager aspect* that they motivate employees to practice ethics at work and set clear ethical standards at work. Employees who perceived their rules and frequently communicate with their leader about ethical matters could sure of themselves about performing ethical behavior and have more serving motivation similar to their leader.

Since the ethical leaders go beyond the boundary organization and pay attention to the benefits of stakeholders (e.g. citizen) (Brown et al., 2005). Thus, public employees use their perception of ethical leader as a main source to gain confidence in behaving ethically and lead to increase their motivation to serve society. Self-efficacy has confirmed its role in raising motivation (see Çetin & Aşkun, 2018; Tannady et al., 2019). In this study, we concentrate on analyzing motivation which is particularity in the public sector. Specifically, we study the mediating role of self-efficacy in connecting public employees' perception of ethical leadership and public service motivation. Thus, we propose these below hypotheses:

$H_2$: Self-efficacy mediates the nexus between ethical leadership and public service motivation

*$H_{2a}$: Ethical leadership is positively related to self-efficacy*

*$H_{2b}$: Self-efficacy is positive related to public service motivation*


**Figure 1. Conceptual Framework**

## 3. METHOD

### 3.1. Data collection

Data were obtained from public servants at Ho Chi Minh City. An online questionnaire was sent to the participants and collected from January - February 2022. This is the period that the Covid pandemic outbreak has a decreasing trend and everything is going back to the new normal. we collected data at the beginning of the New Year and during the period of the Lunar New Year due to the Vietnamese's conception "New year comes with a new beginning" that people exchange best wishes (Dinh & Sharifian, 2017). This was a time when we went into the new normal situation and participated in the recovery phase after the Covid-19 pandemic. Since we did not have a sampling frame, we propose participants by using non-probability sampling selection based on convenience. We recruited learners in Ho Chi Minh City who were enrolled in a master's degree in Public management and asked them to complete the questionnaires.

After two months, there are a total of 208 valid responses were collected. Of the participants, 46.2% were female and almost all of them were between 25 and 45 years old (76%). On average, the tenure of respondents was 14.1 years (SD = 8.76).

### 3.2. Measures

All constructs were adapted from previous studies, scales originated in English and were translated into the Vietnamese language. Then, a

translated questionnaire was consulted by public employees to ensure its suitability in a public sector context. Finally, we re-translated the revised questionnaire (Vietnamese version) to English to compare meaning to assure accuracy (Mullen, 1995).

***Ethical leadership***

Ethical leadership was assessed using 10 items developed by Brown et al. (2005). Participants were asked to evaluate their direct supervisor. Two sample items of this scale are "My leader Disciplines employees who violate ethical standards" and "My leader makes fair and balanced decisions". Cronbach's alpha was 0.902.

***Self-efficacy***

We measured self-efficacy of public servants by adopting 8 items from Chen et al. (2001). Two sample items are " I believe I can succeed at basically any endeavors to which I set my mind" and " Even when things are tough, I can perform quite well". This scale presented a Cronbach's alpha of 0.841.

***Public service motivation***

Public service motivation was measured by global construct proposed by Wright et al. (2013). Public employees were asked to evaluate themselves with 5 questions. Two sample items are " I am often reminded by daily events about how dependent we are on one another" and " Making a difference in society means more to me than personal achievements". Cronbach's alpha was 0.852.

***Demographic variables***

In this research, we used several demographic variables as control variables such as gender, tenure, and educational background as suggested by Shim & Park (2018) that PSM may vary depending on these characteristics.

### 3.3. Analytical technique

Partial Least Squares SEM technique was employed in this research. The procedure followed Hair et al. (2017) recommendation. We evaluate the measurement model and structural model through performing PLS algorithm, bootstrapping statistics with 5000 subsamples. Data were processed by using Smart PLS 3.2.9.

## 4. RESULTS

### 4.1. Measurement model

The appropriate of measurement model was estimated via internal consistency, convergent validity, and discriminant validity. To assess the internal consistency, we retrieve the Cronbach's alpha and composite reliability values of constructs. As shown in Table 1, the internal consistency is ensured due to all constructs meet the required threshold, all constructs received Cronbach's alpha and composite reliability range from 0.7 to 0.9 - which is regarded as satisfactory (Hair et al., 2017). Next, we look at indicator reliability and average variance extracted (AVE) for evaluating convergent validity. According to Hair et al. (2017), the ideal values for an indicator's outer loading should be above 0.708, and in some social sciences, the outer loading coefficients could be obtained with a weaker value (<0.7) if the removal of items does not increase composite reliability. Hair et al. (2017) also suggested AVE of constructs should be 0.5 or higher to better explain the variance of its indicators. After analysis, the detailed result is presented in Table 1, the measurement model confirmed the internal consistency and convergent validity.

**Table 1. Constructs Reliability & Validity**

| Constructs | Loadings | CR | | AVE |
|---|---|---|---|---|
| Ethical leadership (EL) | | 0.919 | 0.902 | 0.531 |
| EL1 | 0.702 | | | |
| EL2 | 0.686 | | | |
| EL3 | 0.688 | | | |
| EL4 | 0.725 | | | |
| EL5 | 0.746 | | | |
| EL6 | 0.712 | | | |
| EL7 | 0.721 | | | |
| EL8 | 0.740 | | | |
| EL9 | 0.800 | | | |
| EL10 | 0.760 | | | |
| *Self-efficacy (SE)* | | 0.883 | 0.841 | 0.852 |
| SE1 | 0.725 | | | |
| SE2(*) | | | | |
| SE3 | 0.793 | | | |
| SE4(*) | | | | |

| | | | | |
|---|---|---|---|---|
| SE5 | 0.766 | | | |
| SE6 | 0.797 | | | |
| SE7 | 0.660 | | | |
| SE8 | 0.738 | | | |
| *Public service motivation (PSM)* | | 0.852 | 0.783 | 0.883 |
| PSM1 | 0.701 | | | |
| PSM2 | 0.756 | | | |
| PSM3 | 0.738 | | | |
| PSM4 | 0.735 | | | |
| PSM5 | 0.729 | | | |

(*) item was removed during the analysis process

### 4.2. Discriminant validity

We examined discriminant validity through Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio. Fornell - Larcker criterion (1981) requires that the value of square root AVE of construct needs to be higher than the squared correlation of any other construct. Table 2 represents the appropriate of results analysis for this criterion.

**Table 2. Fornell-Larcker Criterion**

| | Ethical leadership | Public service motivation | Self-efficacy |
|---|---|---|---|
| Ethical leadership | 0.729* | | |
| Public service motivation | 0.715 | 0.732* | |
| Self-efficacy | 0.685 | 0.717 | 0.748* |

*square root of AVE value

Henselers et al. (2015) proposed to assess the Heterotrait-Monotrait Ratio as a remedy to address the limitation of other techniques in testing discriminant validity. The suggested threshold value should below 0.9 to confirm constructs discriminant validity. HTMT values were presented in Table 3.

**Table 3. Heterotrait-Monotrait Ratio (HTMT)**

| | Ethical leadership | Public service motivation | Self-efficacy |
|---|---|---|---|
| Ethical leadership | | | |
| Public service motivation | 0.847 | | |
| Self-efficacy | 0.785 | 0.881 | |

### 4.3. Structural model

To assess in-sample predictive power, we used $R^2$ value of two endogenous variables (public service motivation and self-efficacy). The $R^2$ of public service motivation was 0.609 and for self-efficacy was 0.407 which is considered as acceptable (Hair et al., 2017). Next $Q^2$ values were estimated to measure the out-of-sample predictive power. We performed blindfolding procedure for evaluating this criterion. $Q^2$ for public service motivation and self-efficacy were 0.318 and 0.260, respectively - all values were larger than zero, which showed the patch model's predictive relevance for dependent constructs (Hair et al., 2017). Next, we performed bootstrapping process with 5000 resamples. Hypotheses $H_1$ was supported that ethical leadership has a positive effect on public service motivation of public servants.

**Table 4. Detailed Results**

| Paths | Original Sample | Sample Mean | STDEV | T values | P values |
|---|---|---|---|---|---|
| Direct effect | | | | | |
| Ethical leadership → Self-efficacy | 0.685 | 0.687 | 0.059 | 11.558 | 0.000 |
| Self-efficacy → Public service motivation | 0.428 | 0.419 | 0.096 | 4.477 | 0.000 |
| Ethical leadership → Public service motivation | 0.422 | 0.431 | 0.096 | 4.419 | 0.000 |
| Mediating effect | | | | | |
| Ethical leadership → Self-efficacy → Public service motivation | 0.293 | 0.286 | 0.064 | 4.605 | 0.000 |

*Mediating effect*

We also estimated mediating role of self-efficacy by bootstrapping results as a recommendation by Hair et al. (2017). Support was found for $H_2$ and two sub-hypotheses $H_{2a}$, and $H_{2b}$. Self-efficacy of public servants plays as a mediator in linking the nexus between ethical leadership and public service motivation. The mediating mechanism occurred partially due to ethical could also have a direct effect on PSM as mentioned in $H_1$.


**Figure 2. Direct effect coefficients**

## 5. DISCUSSION

In the early period of 2022, Vietnam's economy begins to enter the recovery phase after the Covid-19 outbreaks. Along with economic development, the government always emphasizes the ethical aspect of public servants. In order to understand the factors that promote work performance associated with ethical aspects, the study focuses on assessing the role of leaders. Specifically, the ethical leadership style has been proposed to have an impact on the public service motivation of civil servants, which is a factor that contributes to public servants' performance (Fan et al., 2022). The results showed that public employees' perception of their leader's ethics and ethical climate created by their leader, could positively relate to employees' motivation to serve the public service ideal. Research also explored the role of self-efficacy, employees are not just more motivated by their leaders, but the mechanism might be attributed to their confidence in acting ethically as a result of learning from or mastering ethical ideals within public organizations.

In theoretical, the research gives insights into the process of public service motivation by adopting social learning theory. This means that the motivation of civil servants can be activated in both active and passive learning. For the active form, *moral manager* aspect in the leader which frequently communicates the ethical standard, or emphasizes severe punishment for violating moral standards could enhance motivation to serve of employees. Besides, employees view their leader's behaviors and attitudes to learn about what should and should not do in organization. Therefore, employees unknowingly "learn" appropriate behavior and confidently express similar attitudes. Moreover, the confidence about capabilities of public employees emerged as important source of motivation which explained the influence mechanism from supervisor to subordinate.

This research also provided a deeper upstanding for practitioners in the public sector. For the policy-makers, motivation in public organizations

could active via leaders. Hence, Setting up clear ethical guidelines that go along with choosing candidates for leadership positions that satisfy the two requirements of being ethical and actively promoting moral behaviors. In turn, public sector managers also gain a better understanding of how to boost employee productivity, which is especially important not only during post-pandemic recovery. In addition to financial benefits, non-financial support from leaders (e.g. role model, verbal persuasion) could help employees in public organizations learn and follow can help them improve their personal capacity as well as become more committed to their public service ideal.

## 6. LIMITATION AND FUTURE DIRECTION

This research has some limitations that need to address further by future studies. First, public service motivation is not static (Christensen et al, 2017), it varies from the context. Further study should examine moderators at team or organizational level (e.g. perceived organizational support, ethical climate) to examine in which condition ethical leadership could foster PSM. Second, the range of leadership style in this research is limited, further studies should employ various leadership styles that are oriented to building a healthy relationship with subordinates (e.g. empowered leadership, transformational leadership). Third, this research emphasizes the intrinsic aspect of public servants (PSM) and lacks discussion about behavioral outcomes. Further studies could retest the model with specific outcomes for public servants (e.g. service-oriented OCB, maintenance OCB, etc.). Fourth, participants are public servants in Ho Chi Minh City and the results may not generalize to the public sector in Vietnam. In the future, scholars could expand the sample size to other provinces. Fifth, we collected data at a one-point time and in a quite short span of time. Next studies should conduct a longitudinal research design to gain more insights into the phenomenon.

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# THE ECONOMIC RELATIONS BETWEEN THE PHILIPPINES AND CHINA (2001-2021) AND SOME POLICY SUGGESTIONS

**Tran Thai Bao[1], Duong Quang Hiep[2] , Tran Xuan Hiep[2]**

***Abstract:*** *Between 2001 and 2021, the China-Philippines relationship went through many ups and downs, "fighting and cooperating" in a variety of domains, including the East Sea dispute. Although the two countries established diplomatic ties on June 9, 1975, the relationship between Philippines and China was almost "frozen" in the following years due to a variety of objective and subjective circumstances. For a long time, the Philippines' foreign policy has been labeled as pro-American. However, as entering the twenty-first century, the Philippines' pro-China sentiment grew, particularly during the presidency of Gloria Arroyo (from 2001 to 2010). China is viewed as a crucial partner and one of the key economic locomotives that can assist the Philippines in overcoming economic stagnation. The Philippine government advocated improving and expanding relations with China to take advantage of the opportunities presented by China's economic boom, while limiting China's support for the opposition in the Philippines, after being cold-shouldered by the US for deciding not to continue participating in the US war in Iraq and attracted by China's investment commitments. The policy of deeper ties with China also aims to achieve a balance in relations with major countries and reduce reliance on the United States. Furthermore, the Philippines recognizes China as a large neighbor with territorial ambitions, and it is constantly concerned about China intruding on Philippine maritime territory. Despite existing hurdles, trade and investment cooperation between the Philippines and China has gradually improved and is increasingly solidified and strengthened, owing to subjective and objective conditions. The regional environment and China's unstoppable progress, particularly positive results in the establishment of the ASEAN Economic Community (AEC), have aided in the development of economic cooperation between the Philippines and China. The article focuses on analyzing the achievements of the two countries' relations in the economic field, the causes and significance of this cooperation for the two sides in the first two decades of the 21st century.*

***Keywords:*** *Philippines, China, economic, trade, investment, cooperation.*

[1] University of Sciences - Hue University

[2] Institute for Socio-Economic Research - Duy Tan University

## 1. INTRODUCTION

The development of science and technology, the process of globalization and regionalization, and the changing international and regional situation at the beginning of the twenty-first century force countries to prioritize economic development, integration, and actively strengthen international cooperation. These factors have influenced and provided favorable conditions for the Philippines-China relationship to flourish in all areas. China is vigorously supporting reform and opening up as entering the twenty-first century in order to accomplish its goal of becoming a world power. China has increased its diplomatic connections with the majority of Asia-Pacific countries in order to assume leadership in the area. China's growth began in 2010, when it surpassed Japan to become the world's second largest economy[1] after the United States. This has piqued the interest of countries in the region seeking development possibilities from China. Furthermore, in order to accomplish the geopolitical ambitions of a great power in the twenty-first century, China has established clear objectives, with the economy serving as the driving force behind all of its growth efforts. In the context of globalization and regionalization, the Philippines wants to expand multilateral cooperation, diversify international relations, and seek integration with the region and the world, but first and foremost, with the region's neighboring countries, China, for the purpose of development and raising their position. Furthermore, the Philippines' stance to China is increasingly shifting toward closer ties in order to boost economic cooperation between the two countries. Faced with this situation, the Philippines and China both perceive the benefits that must be strengthened in order to promote cooperation in all fields, particularly commerce and investment for mutual development, to the benefit of both countries.

### 1.1. Progress in Philippine-China Economic Relations

#### *1.1.1. Under President Gloria Arroyo's presidency*

In terms of trade ties, the Philippines and China's commercial cooperation partnership between 2001 and 2010 made significant progress

[1] William J. Norris, (2021) China's Post-Cold War Economic Statecraft: A Periodization, Journal of Current Chinese Affairs 2021, Vol. 50(3) 294-316.

in terms of scale and nature as compared to the previous period. The key point of this development is that both countries find common ground and their own benefits in the context of globalization, integration and development of the world. President Arroyo promotes comprehensive, varied, and far-sighted economic and trade development with great powers through high-level visits to bilateral agreements on economic, cultural, and social cooperation. During her time, trade relations between the Philippines and China grew steadily. Despite many disagreements, but due to economic needs and interests, the Philippines has made changes in its foreign policy towards China, bringing the two countries' relations into the "golden age of partnership" under President G. Arroyo.

In terms of imports and export, as entering the twenty-first century, the Philippines and China have strengthened their contact with increasing flexibility, and the two nations think their relationship is entering a "golden age". President Arroyo is the first president in Philippine history to understand that China plays a critical and vital role in the global economic development process. Many high-level visits took place during the President's first term, including visiting the 9th APEC economic meeting in Shanghai, China, and holding bilateral talks with President Jiang Zemin. From October 29 to October 31, 2001, President Arroyo paid an official state visit to China. In addition, President Arroyo attended a series of ceremonies hosted by the Philippine and Chinese Ministries of Foreign Affairs in 2002[1](Shan, 2012). As a consequence, increased and more flexible engagement with China has given the two countries' economies a "new wind". The two countries' trade ties have made numerous notable achievements, particularly in the areas of import and export.

**Table 1. Trade between the Philippines and China from 2001 to 2010**

*Unit: Billion USD*

| Year | Export | Import | Bilateral trade balance | Total trade turnover |
|---|---|---|---|---|
| 2001 | 792 | 975 | -183 | 1,767 |
| 2002 | 1,355 | 1,251 | 104 | 2,606 |

[1] Shan H (2012). Timeline of major events of China-Philippine diplomacy (1975-present). 12 February. The China and Philippine Portal.

| | | | | |
|---|---|---|---|---|
| 2003 | 2,144 | 1,797 | 347 | 3,941 |
| 2004 | 2,653 | 2,659 | -6 | 5,312 |
| 2005 | 4,076 | 2,972 | 1,104 | 7,048 |
| 2006 | 4,627 | 3,647 | 980 | 8,274 |
| 2007 | 5,749 | 4,001 | 1748 | 9,750 |
| 2008 | 5,466 | 4,245 | 1221 | 9,711 |
| 2009 | 2,933 | 3,807 | -874 | 6,740 |
| 2010 | 5,724 | 4,627 | 1097 | 10,351 |

*Source: Philippines Statistical Yearbook (PSY) (2005) and Philippines Statistical Yearbook (PSY) (2011)*

Exporting Philippine products to China is becoming increasingly promising. Exports from the Philippines to China reached 792 billion dollars in 2001, then swiftly climbed to 5.749 billion dollars in 2007, the highest figure during President Arroyo's two terms (see Table 1).

China has also invested heavily in the agricultural and mining sectors of the Philippines. China sponsors the US$8.75 million Philippine-China Agricultural Technology Center in Nueva Ecija province, the rice bowl of the Philippines. China also sponsors Philippine-Fuhua Sterling Agricultural Technology Development Corporation. In 2005, China spent $450 million to renovate the Northern Luzon Railway System[1]. To reach this goal, the Philippines has made numerous efforts to develop bilateral relations with China, most notably when Philippine Vice President Noli de Castro visited China in June 2006. President Arroyo visited Zhongqing and Chengdu (China) a year later in June 2007, with the goal of expanding trade and attracting Chinese investment in the Philippines. President Macapagal Arroyo conducted an official visit to China four months later, in October 2007, and met with President Hu Jintao. The two countries have reached an agreement on a comprehensive plan to foster comprehensive, substantive, and economically effective cooperation. However, during the

[1] Xinhua News Agency. 2005a. Sino-Philippine Ties Undergoing Quick Development, http://proquest.umi.com/pqdweb?index=58&did=826999641&1 SrchMode=1&sid=1&Fmt=3, , accessed 6/5/2021

Global Economic Crisis of 2008 and 2009, imports and exports between the Philippines and China decreased. Exports totaled $2.933 billion this fiscal year (see Table 1).

In terms of trade goods structure, The Philippines exports to China products such as: food, foodstuffs, fruits (banana, coconut), crude oil, agricultural products; Imported from China the main items such as information technology equipment, semiconductor equipment, computers, telephones, transmitters, railway traffic equipment, roads, restaurants, hotels. The import situation of the Philippines also improved significantly, in 2001 the Philippines imported 975 billion USD, by the end of the President's term this amount was nearly 5 times higher, reaching 4.627 billion USD. Except for the 2009 financial year, due to the strong impact of the global financial crisis, most of the years from 2001-2010, the import level of the Philippines was always lower than that of exports, the balance of deficit tends to favor the Philippines. In general, the Philippines-China economy has benefited during his presidency, with overall trade turnover increasing from 1.767 billion USD in 2001 to 10,351 billion USD in 2010, a 485.8% rise (see Table 1).

Regarding investment relations, the Philippines, an archipelagic country is facing financial and economic difficulties, and people's living standards are still backward. In the context of globalization, in order to improve its economic competitiveness, ability to respond to natural disasters, and also fight against radical Islamic groups and terrorists at home and abroad, the Philippines has constantly used different diplomatic tools and policies to attract foreign support, therefore, at the turn of the 21st century, the Philippines has constantly opened its doors and welcomed investors, including investors from China. During his administration (2001-2010), 65 bilateral agreements were signed with contents ranging from agriculture and fishery to infrastructure construction.

*Unit: Million USD*

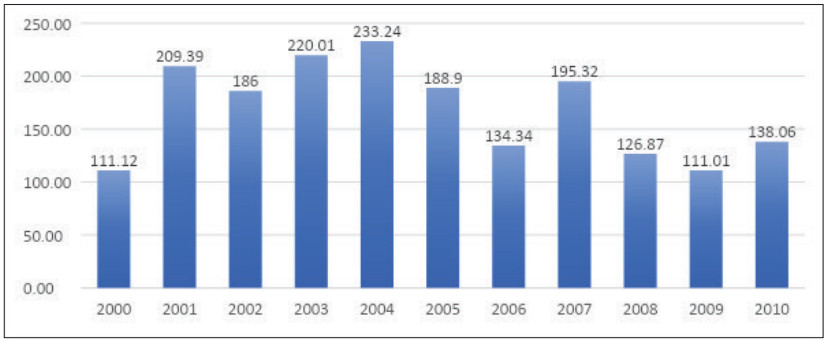


**Figure 3. FDI from China to the Philippines from 2000-2010**

*Source: Summary of China Statistical Year book (CSY) over the years http://www.stats.gov.cn/english/Statisticaldata/AnnualData/truy cập 15/8/2021)*

FDI inflows from China into the Philippines are increasing: overall FDI inflows from China into the Philippines totaled $209.39 million in 2001, and at the end of President Arroyo's first term, this sum had climbed by 11.27 percent (2004). However, during President Arroyo's second term, China's FDI inflows into the Philippines plummeted, totaling $134.34 million, a 28 percent drop from the previous year. The fall in FDI inflows from China is blamed on opposition parties and social movements.

China's ODA to the Philippines has risen since 2001. China provides interest-free or low-interest loans to the Philippines to help them implement a variety of socioeconomic development initiatives. Infrastructure building, transportation, information technology, processing, ancillary industries, assembly, real estate, restaurants, hotels, and tourism are some of the most heavily invested in industries. Project construction, investment in upgrading the railway transport system at a number of key places, Philippine e-government construction information technology supply project, and so on. China supported a project in Luzon, a strategically significant economic and political area in the Philippines, in 2003. Following that, China continues to invest in an 84-mile railway upgrading project between Albay and Sorsogan provinces. The project's entire capital investment is 932 million dollars, with Chinese imported items accounting for up to

95 percent of that[1]. In 2004, the Philippines and China agreed to spend $503 million to create a 32-kilometer rail route connecting Metro Manila, Luzon's northern cities, and major seaports. The railway, which included a 20-year loan with a 3% annual interest rate, was dubbed "China's largest project in Southeast Asia" at the time.[2]

The Philippines and China will collaborate on a project to develop a statewide broadband system to support e-government in the Philippines as their next major project. This project's purpose is to link 2,295 federal offices and 23,549 city and local offices, allowing the government to undertake administrative work across the country via the Internet. The two nations signed the project agreement on the margins of the "Boao Forum" in Hainan (China) in April 2007. As a result, the project's overall auction value might reach 329.5 million USD. China is helping the Philippines realize the project by providing a 20-year priority loan with a 3% interest rate. The condition is that China Telecommunications Equipment Corporation of China be a partner in providing Application Equipment Elements for the project's implementation.[3]

Chinese investment in the Philippines is still very small. China's direct investment in the Philippines was $33.6 million in 2008. Chinese direct investment in the Philippines peaked in late 2008. Agriculture, mining, textiles, electromechanical processing, and other areas attract Chinese investment in the Philippines. In 2008, Chinese firms signed 61 new project contracts, labor service cooperation contracts, and design consultancy contracts in the Philippines, totaling 394.87 million USD, including 361 million USD in technical contract value. The revenue in 2008 was $398 million, with a turnover of $395 million in technical contracts.[4]

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[1] Nguyen Anh Chuong, Philippines - China relations from 2001 to present, Southeast Asian Studies journal, No. 10/2016.

[2] Landingin R, (2010) Chinese foreign aid goes offtrack in the Philippines. SouthSouth cooperation: A challenge to the aid system?

[3] Nguyen Anh Chuong, Philippines - China relations from 2001 to present, Southeast Asian Studies journal, No. 10/2016.

[4] Yuan Jingjing, On Sino - Philippines Economic Cooperation from Pespective of Economic Complementary, Around Southeast Asia, 2010.

According to figures from China's Ministry of Commerce, the Philippines has invested in a total of 2,657 projects in China by the end of 2008, with a total investment capital of 2,532 billion USD. Filipino enterprises invest mostly in banking, real estate, shopping malls, and retail in China. As a result, China conducts surveys and invests in the Philippines in the sphere of investment cooperation between the two nations. Infrastructure, transportation, mining, electronics, information technology, agriculture, restaurants, and hotels are among the most common Chinese investment projects in the Philippines. China's investment projects are moderately developed and scaled; there are no truly large projects. In addition, China has expanded grants and official development assistance (ODA) to expand markets and deepen economic relations between the two nations.

### 1.2. The period of President Benigno Aquino III

It can be seen that, between the Philippines and China, there are still many disagreements and certain conflicts, but in the field of trade and investment, the trend of cooperation continues to develop. Trade and investment relations between the two countries increased sharply in the early years of the 21st century and achieved great results.

Regarding trade, since President Benigno Aquino III took office, visits to China have become more frequent in order to promote stable, long-term and sustainable development of China-Philippines cooperation relations. A Joint Action Plan on Strategic Cooperation between China and the Philippines signed on October 29, 2009 is considered a testament to this good development.[1] Since 2010, two-way trade turnover has continuously increased rapidly, although before that both the Philippines and China were affected by the global economic crisis, causing trade relations between the two sides to decrease significantly. Overcoming these difficulties, in 2010, bilateral trade turnover reached 27.7 billion USD, up to 35% compared to 2009 and China became the third largest trading partner of the Philippines[2].

[1] China-Philippines Joint Press Release, http://ph.china-embassy.org/eng/xwfb/t895079.htm, accessed September 16, 2021.

[2] Wang Qishan and Philippine President Aquino Attend the Philippines-China Economic and Trade Forum, http://www.chinese-embassy.org.uk/eng/zgyw/t855394.htm, accessed September 16, 2021.

*Unit: Billion USD*


**Figure 4. Philippine-China Trade in the Period 2009-2013**

*Source: Compiled from Philippine Statistical Yearbook (PSY) (2014).*

It can be seen that the growth of bilateral trade between the two countries increased continuously in the period 2010-2013, specifically increasing by 53% in 2010, 19% in 2011 and 4.27% in 2012 and 17.4% in 2013. However, the bilateral trade deficit between the Philippines and China started to increase, from $0.873 billion in 2010 to $1.047 billion in 2013.[1]. However, the situation became complicated since January 2013, the Philippines officially confronted China's expansionist claims in the sea by filing an application at the Arbitral Tribunal of the United Nations Convention on the Law of the Sea (UNCLOS)[2]. Therefore, bilateral trade cooperation between the two countries has slowed down, import and export has decreased since July 2013. Specifically, the export situation tends to decrease, from US$7,025 billion in 2013 to US$6.372 billion in 2016. The deficit level is getting higher and higher. For example, at the end of 2016, the total trade turnover between the two countries, according to the Philippine Bureau of Statistics, was $21.937 billion, an increase of 45% compared to 2013. In terms of trade balance, it shows that, the trade deficit is growing, from -1.047 billion USD in 2013 to 9.193 billion USD in 2016, a 9-fold increase over the same period in 2013.

[1] Philippine Statistical Yearbook (PSY) (2014).

[2] Renato De Castro (2015), *The Philippines Confronts China in the South China Sea: Power Politics vs. Liberalism-Legalis*, Asian Perspective Vol. 39, No. 1 (Jan.-Mar), pp. 71-100.

**Table 2. Philippine-China Trade in the Period of 2013 -2016**

*Unit: Billion USD*

| Year | Total trade turnover | Export | Import | Bilateral trade balance |
|---|---|---|---|---|
| 2013 | 15,097 | 7,025 | 8,072 | -1,047 |
| 2014 | 18,336 | 8,467 | 9,869 | -1,402 |
| 2015 | 17,644 | 6,174 | 11,470 | -5,296 |
| 2016 | 21,937 | 6,372 | 15,565 | -9,193 |

*Source: Philippine Statistical Yearbook (PSY) (2017)*

Although the Philippines' relationship with China under President Aquino was not as good as that of his predecessor, Arroyo, the Philippines became a very important partner as a result of China's "going out" policy.[1]. Chinese FDI inflows into the Philippines nearly quadrupled between 2009 and 2015, from $387.34 million in 2010 to $759.94 million in 2014. (See Figure 5). Between 2011 and 2015, this significant investment helped the Philippine economy rebound, with GDP growth of 3.86 percent in 2011 and 6.35 percent in 2015[2].

*Unit: million USD*

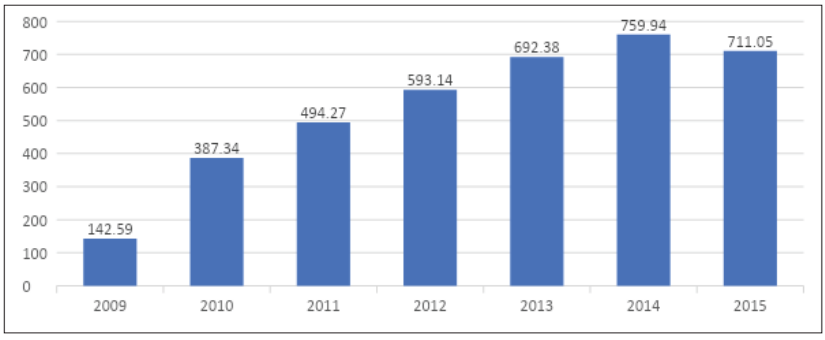


**Figure 4. Total FDI from China to the Philippines Period 2009 - 2015**

*Source: Total FDI stock from China to the Philippines, Published by C. Textor, Apr 19, 2021, https://www.statista.com/statistics/720978/outward-fdi-stock-from-china-to-the philippines / accessed June 9, 2021.*

[1] Nguyen Anh Chuong, Philippines - China Relations from 2001 to present, Southeast Asian Studies, No. 10/2016, pp.35-43.

[2] Philippines GDP growth, in annual % 2011-2015, https://wits.worldbank.org/countryprofile/en/country/PHL/startyear/2011/endyear/2015/indicator/NY-GDP-MKTP-KD-ZG, accessed September 16, 2021.

However, the amount of Chinese investment in the Philippines has decreased after the tense confrontation in the East Sea between the two sides in April 2012, as well as the Philippines' lawsuit against China in January 2013. Total Chinese FDI into the Philippines fell to $711.05 million in 2015 (see figure 4). During President Aquino III's presidency, economic cooperation between the Philippines and China has shifted dramatically. Bilateral trade grew quickly in the early phases, but the situation deteriorated after the Scarborough Shoal dispute. However, the economic benefits of cooperation between the two sides continue to be significant. In fact, both China and the Philippines are attempting to reach an agreement that will allow their economic connections to flourish.

### 1.3. Under President Rodrigo Duterte's era

Unlike its predecessor, since President R. Duterte came to power, the Duterte administration has shifted from a tough foreign policy in relations with China to more flexible contact with Beijing. On the other hand, unlike the Aquino Administration, which challenged China's expansionism in the South China Sea, the Duterte Administration kept quiet about the dispute in exchange for concessions on trade, aid and investment by China. President Duterte fostered closer economic and diplomatic ties with China, he sought China's support to build structures in Mindanao, and even purchased Chinese-made weapons for the Armed Forces of the Philippines (AFP)[1]. As a result, commercial and investment ties between the Philippines and China have accelerated. The Chinese side, too, said that the two countries had entered a "golden period"[2] in bilateral commercial relations. As a result, it can be stated that political issues and tensions in the East Sea do not impede economic cooperation between the two nations[3].

Regarding trade, with the policy of "pivot" towards China after taking office as president in mid-June 2016, economic relations between the two countries were really promoted, economic cooperation agreements

[1] Renato Cruz de Castro,(2017) *The Duterte Administration's appeasement policy on China and the crisis in the Philippine-US alliance, Philippine Political Science Journal.*

[2] Duong Van Huy, Changes in the Philippines' relations with China under President Duterte, Journal of Chinese Studies, No. 7, 2019, p.21.

[3] Vo Xuan Vinh, Philippines-China relations after three years of President R. Duterte's rule, Southeast Asian Studies No. 5/2019, pp.3-10.

between the two sides have been signed. During the 28th Conference of the China-Philippines Joint Committee on Economic and Trade Cooperation (JCETC), the two sides discussed many issues on economic cooperation, trade and investment. In addition, the two countries also discussed the 6-year development program on Economic and Trade Cooperation. This is considered an overall cooperation framework for the two countries' economic relations in the period 2017-2022.[1]

The number of cooperation agreements established during high-level visits between the Philippines and China was several times more than the number of agreements inked during President Duterte's first three years in office (2016-2018). This statistic does not include 25 cooperation agreements between the two nations in 2019 with a total value of roughly 15 billion dollars, which were signed under President Aquino III's six-year presidency.[2]

With total commerce of $21.937 billion in 2016, China became the Philippines' main trading partner, accounting for 15.5 percent of overall trade in the same year. China's exports totaled $5,372 billion, while expenditures for imported products totaled $15,565 billion, resulting in a $9.192 billion trade imbalance (see Table 3).

**Table 3. Major Trading Partners of the Philippines in 2016**

*Unit: Billion USD*

| | Export |
|---|---|
| Japan | 11.57028 |
| US | 8.85133 |
| HongKong | 5.5157 |
| China | 5.37252 |
| Singapore | 3.82399 |
| Germany | 2.32927 |
| Thai | 2.18385 |
| Korea | 2.18182 |

| | Import |
|---|---|
| China | 15.5649 |
| Japan | 9.88177 |
| US | 7.57582 |
| Thai | 6.57822 |
| Korea | 5.56789 |
| Singapore | 5.45413 |
| Taiwan | 5.18477 |
| Indonesia | 4.50759 |

[1] China, Philippines agree to deepen trade, investment.

[2] ASEAN Briefing (2017), "The Philippines Economic and Political Relations With China", ASEAN Briefing.
https://www.aseanbriefing.com/news/philippines-economic-politicalrelations-china/, accessed on June 19, 2021.

| | |
|---|---|
| Taiwan | 2.12557 |
| Netherlands | 1.74332 |
| Other | 9.50636 |

| | |
|---|---|
| Malaysia | 3.89999 |
| HongKong | 2.49183 |
| Others | 17.80093 |

*Source: Foreign Trade Statistics of the Philippines: 2016, https://psa.gov.ph/content/foreign-trade-statistics-philippines-2016, accessed September 21, 2021.*

In terms of export product structure, electronic items accounted for the most sales, totaling 3.804 billion USD and accounting for 59.7% of this country's exports to China. Other produced items came in second with $521.87 million in sales, up 8.2 percent. Electronic devices worth $3.299 billion are among the imported commodities from China, contributing for 21.2 percent of the country's overall import income. Iron and steel come next, with an import value of 2.332 billion USD, accounting for 15.0 percent of all imports.[1]

From 2016 to 2018, China has consistently been the Philippines' most important commercial partner. In general, the Philippines-China bilateral turnover market share in the Philippines' total annual trade is quite high, and it holds a significant position. At the same time, the value of commodities imported and exported in this nation has progressively expanded over time, partially as a result of policies to develop external relationships and the benefits of affordable pricing and abundant sources of goods and services. In several sectors, there are numerous incentives that are appropriate for the Philippines. Despite good signs, the bilateral trade imbalance between the two countries remains considerable. A drop in export sales of four of the top ten items, notably machinery and transport equipment, coconut oil, electronic products, and other manufactured goods, contributed to the deficit. Furthermore, the negative growth of the main import items, such as transportation equipment; other manufactured products; mineral fuels, lubricants, and related materials; telecommunications equipment and electrical machinery; food and other live animals; and electronic products, triggered the decline[2].

[1] Foreign Trade Statistics of the Philippines: 2016, https://psa.gov.ph/content/foreign-trade-statistics-philippines-2016, accessed May 20, 2021.

[2] Republic of the Philippines, https://psa.gov.ph/, accessed May 20, 2021.

The Philippines' commercial and economic standing with China has swiftly improved in the 2018-2019 era, while there are still numerous unsolved concerns between the two nations, particularly maritime conflicts. Also in 2018, significant developments in the Philippines-China relationship emerged, particularly the Philippines' support for and direct involvement in China's "Belt and Road" initiatives[1].

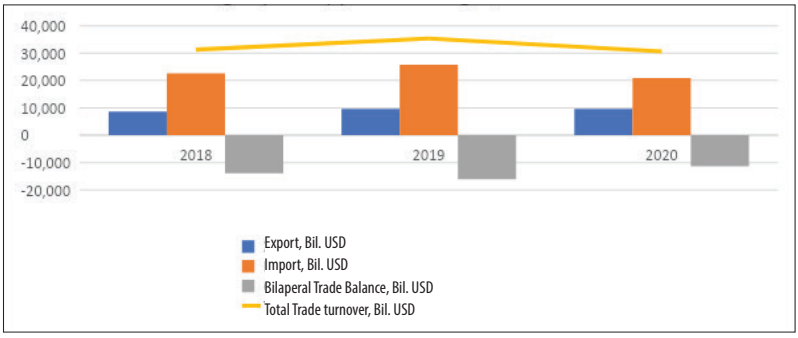


**Figure 5. Philippines-China trade from 2018-2020**

*Source: Philippine Statistical Yearbook (PSY) (2019), and Philippine Statistics Authority (PSA)*

Also according to the Philippine Board of Investments, in 2019 China was the Philippines' top trading partner, export market and import source. Bilateral commerce between the Philippines and China has surpassed $50 billion, with an average annual growth rate of 17% in the last five years. Exports to China climbed by 16.02 percent in 2019, from 18.4 billion USD in 2018 to 19.5 billion USD in 2019[2]. Electronics, minerals, fresh foods, power, chemicals, equipment, fashion accessories, transportation, and other industrial items are among the main exports. China has permitted the import of fresh young coconuts and Hass avocados from the Philippines in 2019, expanding the Philippines' fresh fruit export basket to China. According to the United Nations' COMTRADE database on international commerce, the Philippines' exports to China in 2020 will be $9.62

[1] Liang Yu (2017), "Sino-Philippine relations showing good momentum in all fields", Xinhuanet, http://www.xinhuanet.com/english/2017/11/15/c_136754233.htm, accessed May 20, 2021.

[2] Philippines-China Business Relations, https://boi.gov.ph/cifit-2020-philippines-china-business relations/#:~:text=The%20Philippines%20and%20China%20bilateral,by%2016.02%20percent%20in %202019, accessed 9/9/2021.

billion. President R. Duterte has thus far accomplished numerous positive accomplishments in increasing commercial cooperation between the two nations during his four years in office.

Despite the hurdles, Chinese Ambassador to the Philippines Huang Xilian stated on January 19, 2021 that economic and commercial cooperation between the Philippines and China "had achieved obvious successes" in 2020. Pandemic challenges posed by the Covid-19 virus[1].

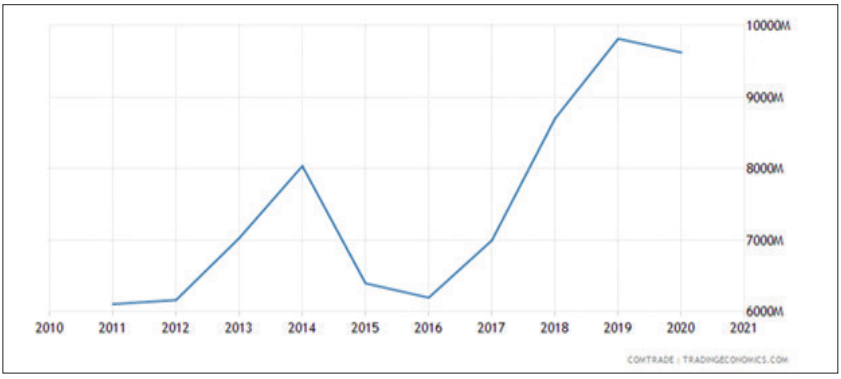


**Figure 6. Philippines exports to China (period 2010-2020)**

*Source: Trading Economics: Philippines Exports to China https:// tradingeconomics.com/philippines/exports/china, accessed on 12/3/2022.*

Regarding investment, the increase in economic contact between the two countries through the two sides' efforts to promote bilateral economic cooperation within the framework of "One Belt One Road", as well as China's establishment The financial mechanism for this strategy is the Asian Infrastructure Investment Bank (AIIB), which has helped the Philippines to attract investment capital from China. In 2018, China ranked first in foreign investment in the Philippines, amounting to 819.6 million USD, up 2,072% from 718.93 million USD in 2017 (figure 7). Businesses and corporations in industries such as information and communication technology, food production, real estate, and power are driving this expansion. With US$830.02 million, China placed second after Singapore as the second largest source of investment in the Philippines in 2019, accounting for 32 percent of overall foreign investment in the Philippines.

[1] China is PH's top trading partner in 2020: envoy, https://www.pna.gov.ph/articles/1127882, accessed September 9, 2021.

The largest initiative is a joint venture with China Telecom to create a third telecommunications operator. Related projects in the telecommunications, infrastructure, and services industries are being attracted by this investment. C&U Group Ltd., New Hope Liuhe, Azure Gaming (Hongkong) Ltd., Suzhou Boamax Technologies Group Co., Ltd., and JTK Technology (Suzhou) Co., Ltd. are some of the other significant Chinese investors in the Philippines. These are companies who have promised to invest a significant amount of money in the Philippines in the near future.

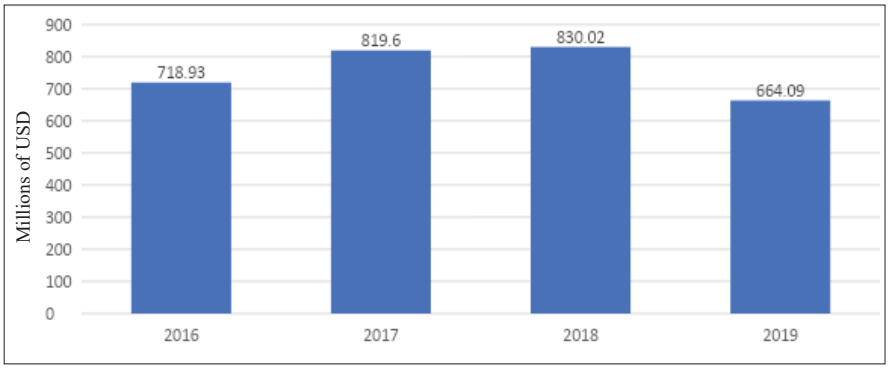


**Figure 7. Total FDI from China to the Philippines 2016-2019**

*Source: Total FDI stock from China to the Philippines, Published by C. Textor, Apr 19, 2021, https://www.statista.com/statistics/720978/outward-fdi-stock-from-china-to-the- philippines/ accessed June 9, 2021.*

As a result, commercial connections between the Philippines and China have swiftly increased under President R. Duterte's administration. The two sides have made a number of good progresses by focusing the economy and increasing trade relations. Despite the constraints of border conflicts, these successes have provided motivation for both nations to continue to deepen economic cooperation. However, after more than two decades of trade and investment cooperation between the Philippines and China, it can be argued that, the development of the security-political situation has an impact on bilateral cooperation. China's commercial investment has fallen short of the Philippines' demands and growth objectives. Environmental concerns have received little consideration in the pursuit of long-term development.

## 2. POLICY RECOMMENDATIONS

*Firstly*, the Philippines needs to adjust its foreign policy appropriately and adapt more flexibly to the rise of China. Because of the great economic benefits that China brings to the Philippines, balancing economic cooperation with China is one of the major challenges for the Philippine government. When resources are limited, the level of development is still disproportionate, the policies and views between the two countries are still in conflict, flexible adjustment and adaptation in the current period is essential that the Philippine government needs to implement to both ensure territorial security and increase economic cooperation with China.

*Second*, the Philippines must increase its competitiveness, deepen its ties with ASEAN nations, and build domestic capability in order to more readily fulfill its economic reform pledges. The competition between China and the United States is getting increasingly strong, particularly in the current situation. The presidents of ASEAN nations, including the Philippines and China, signed the "China-ASEAN Comprehensive Economic Cooperation Framework Agreement" and, in particular, the Free Trade Area, as early as November 2002. The ASEAN-China Association Agreement went into effect on January 1, 2010, providing a chance for several Philippine products to increase their exports to China, natural rubber, coffee, tea, pepper, cashew, rice, electric wire and cable, footwear, seafood, textiles, vegetables, wood, plastic, animal - vegetable oil, cassava slices, starch, confectionery and cereal products, and so on; there are also natural resources and minerals that China needs to import on a regular basis.

*Third*, the Philippines must undertake a significant power balancing policy, pursue an economic diplomacy centered on China, and rely on the United States for security. The current time has seen swift and rapid changes in Philippine-China ties, particularly under President Duterte, which have altered the internal situation in the nation and the region, as well as the implementation of the balancing strategy. Between large countries, the Philippines will gradually lose its role as a playground for huge countries, particularly the United States and China. However, putting a balanced policy in place needs flexibility and innovation; turning too rapidly will result in shortcomings and the loss of supporters. President Duterte's hasty execution of a pro-China policy, as well as his early approach to China,

may put the Philippines at risk of economic dependency on China. Since then, debt traps and China's involvement in territorial disputes, particularly the East Sea dispute, have become unavoidable.

*Fourth*, the senior leaders of the Philippines and China will exchange and visit each other more, in order to gradually build a relationship of "comprehensive strategic cooperation partnership". Mutual visits make an important contribution to timely settlement of problems posed in the process of comprehensive development of bilateral relations, especially in economic and trade cooperation

*Fifth*, in the trade relationship between the two countries, the Philippines' biggest challenge is the trade balance deficit. The Philippines has a big trade deficit with China, which is only becoming worse. Raw materials for manufacturing (chemicals, iron and steel, etc.), machinery and equipment, and industrial consumer items have all been imported from China in the past. Exports from the Philippines to China have remained unchanged. Furthermore, international commercial operations are insecure, and smuggling, counterfeit products, and low-quality commodities are nonetheless widespread. In general, Philippine producers would face significant challenges if inexpensive Chinese goods can flood the domestic market via border commerce. As a result, both in terms of economic cooperation and political security, the Philippines must be careful of China. Expanding and boosting economic and commercial cooperation with China is unavoidable as globalization and worldwide economic integration increase. However, for collaboration to benefit both nations, the Philippines must make every effort to avoid being affected.

## 3. CONCLUSION

President Macapagal Arroyo's administration (2001-2010) is regarded as a "golden period" for trade and investment partnerships. Many gains have been made, and bilateral commercial turnover has been steadily increasing. Furthermore, the Philippines is a typical nation in the area, and even though it has a trade surplus, it continues to take the lead in economic cooperation with China. The Philippines and China have generally stable economic connections, based on the advantages of the two countries, and the two nations have addressed each other's requirements to benefit the

two peoples. When entering the second decade of the twenty-first century, the Philippines has made full use of its domestic and external resources to enhance and solidify partnerships. However, the Philippines-China relationship is no longer as developed as it was under President Arroyo. However, due to the efforts of both parties, economic relations between the two nations have seen some progress. Political tensions between China and the Philippines over the East Sea issue have hampered political-diplomatic ties between the two nations under President Benigno Aquino III. However, statistics reveal that these disagreements have had little influence on bilateral trade growth, but two-way investment has reduced dramatically. The Philippines-China relationship has gradually improved under President Duterte's leadership. After approximately four years of shifting foreign policy toward "independence" commerce, investment, and finance from China have all improved significantly. Furthermore, the Philippines maintains territorial sovereignty and maintains domestic stability in order to sustain its economic progress. Furthermore, the Philippines has improved its position and role in major country relations, increasing relations with China while also altering relations with the United States in a more substantial and balanced manner. Although problems in the East Sea continue under President Duterte's leadership, he also stated that political conflicts should not impact investment and economic relations between the two nations. Aside from rapid economic development, the Philippines faces significant obstacles when it comes to attracting investment capital and investors from China. These same issues have forced the Philippines to change its diplomatic approach on a regular basis throughout President Rodrigo Duterte's four years in power. There have recently been numerous unfavorable views expressed regarding the Philippines-China relationship, owing to the growing discord between the two nations, which would surely lead to competitiveness and violence. Furthermore, because the Philippines and China's main common strategic objectives are drawn from their bilateral economic connection, there is reason to assume that the bilateral relationship will continue to expand in the future in a favorable manner.

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# THE EFFECT OF EXCHANGE RATE ON INFLATION IN VIETNAM: 1999 - 2021

**Dang Ngoc Bien**[1]

***Abstract:*** *Many countries*[2] *experienced currency crises after adjusting exchange rate without thoroughly considering the extent of its transmission to macroeconomic variables, especially inflation. It is believed that a successful devaluation or price appreciation requires strong foreign exchange reserves, unemployment, current inflation... In the open economy like Vietnam, it is extremely important to evaluate the nexus between exchange rate and such macro variables as growth, inflation, and balance of payments. This study focuses on evaluating the relationship between exchange rate and inflation in Vietnam through the empirical model VECM. The results show relatively large effect of exchange rate on inflation in Vietnam. Therefore, the State Bank of Vietnam (SBV) needs to be cautious in applying exchange rate tools. In other words, the study recommends that adjusting exchange rate should only be used as a last resort in monetary policy. In addition to the introduction, conclusion and appendices, the study is divided into three parts: the first part presents a summary of some key studies on the relationship between exchange rate and inflation in the world and in Vietnam; the second part analyzes the causes and effects of the exchange rate on inflation; the third part is an empirical model to evaluate the relationship between exchange rate and inflation in Vietnam in the period 1999-2021 with some discussion of the obtained results.*

***Keywords****: Exchange rate, Inflation, VECM.*

## 1. INTRODUCTION

Theoretically, as a country's currency depreciates, the price of goods imported into this country increases, putting pressure on inflation through a cost-push channel. In the opposite direction, a country with high inflation will lead to a depreciation of country's currency in the long run. In practice, the nexus between exchange rate and inflation is rather complicated. An increase in the exchange rate may cause import prices to rise, but it is unlikely that the increase in inflation because firms in an

[1] Banking Academy of Vietnam

[2] Mexico in 1996 and Japan in 1995

imperfectly competitive market may accept a lower profit margin when spending. input costs increase (Krugman, 2012). Taylor (2000) pointed out that a country with low inflation makes it difficult for firms in that country to change their selling prices despite rising input costs; conversely, in a country with high inflation, it is easy for businesses to include costs related to the depreciation of the domestic currency in product prices. Coming to the similar conclusion as Taylor (2000), Junttila and Korhonen (2012) used nonlinear regression estimation to measure the price elasticity of imported goods with respect to the exchange rate at 9 countries in the OECD. Studies by Minella et al. (2003), Fraga (2003) and Junior (2007) have concluded that the exchange rate pass-through to inflation in developing countries is stronger than in developed countries, so the use of The use of exchange rate tools will be a big challenge for developing countries in maintaining stable prices. Even for developing countries, the level of impact of the exchange rate on inflation is not the same across countries. Research by Bui Thi Kim Thanh (2008) used a dynamic panel data model to draw the conclusion that the impact of exchange rate on Vietnam's inflation is stronger than the 8 countries in Asia that the research has surveyed. Considering the same country, the relationship between exchange rate and inflation in different periods may not be the same. Thus, the impact of exchange rate on inflation should be considered and evaluated carefully in different countries and in different periods. Using the exchange rate tool in operating monetary policy can cause unpredictable consequences because if the operation is not careful, the risk of a currency crisis is likely to occur.

## 2. RESEARCH METHODOLOGY

The empirical model examines the influence of factors such as average interbank exchange rate, credit growth on CPI inflation in Vietnam in the period from the first quarter of 1999 to the fourth quarter of 2021. 1999 because starting from 1999 until now, Vietnam has been maintaining a regulated floating exchange rate regime. Specifically, the SBV will daily calculate and announce the average interbank exchange rate so that commercial banks can use it as a basis for determining the trading rate through the given ranges. Compared to the previous period (before 1999), the current exchange rate partly reflects the supply-demand relationship in the foreign currency market. The model does not use the money supply

independent variables M2, but instead uses credit to the economy. The initial survey showed that credit to the economy is more correlated with inflation than the money supply M2, so credit growth is chosen as a proxy variable. The remaining independent variables of the model include: CPI growth of the following period (lagged variable-CPI), natural logarithm of average interbank exchange rate (OER), natural logarithm of credit to the economy (CR).

**Table 1. Variables Description**

| Variable | CPI | CR | OER |
|---|---|---|---|
| Mean | 4.051776 | 21.13317 | 9.822210 |
| Median | 4.105110 | 21.58229 | 9.832972 |
| Maximum | 4.658616 | 23.13624 | 10.05383 |
| Minimum | 3.369018 | 18.17151 | 9.538828 |
| Standard Deviation | 0.480010 | 1.442118 | 0.178313 |
| Observation | 93 | 93 | 93 |
| Data Source | *S&P Capital IQ* | *IMF International Financial Statistic* | *IMF International Financial Statistic* |

Testing the stationarity of the variables by the ADF (Augmented Dicker Fuller) test shows that CPI, the natural logarithm of CR and OER stop at level 1. Details of the ADF test are given in Table 2.

**Table 2. ADF Test**

| Variables | Tau Co-effis | Decisions | Conclusions |
|---|---|---|---|
| CPI | -3.963 | Reject at level of 1% | DF (1) |
| CR | -2.941 | Reject at level of 5% | DF (1) |
| OER | -2.691 | Reject at level of 10% | DF (1) |

*Source: Author*

In order to examine the possibility of direct regression between LCPI, LCR and LOER variables, we check the cointegration of the variables through Johansen test using the VAR method proposed by Soren (1995). The results obtained are as follows:

**Table 3. Co-integration Johasen Test**

| **Unrestricted Cointegreation Rank Test (Trace)** | | | | |
|---|---|---|---|---|
| **Hypothesized No. of CE(s)** | **Eigenvalue** | **Trace Statistic** | **0.05 Critical value** | **Prob.**** |
| None * | 0.263195 | 45.85039 | 29.79707 | 0.0003 |
| At most 1 * | 0.137919 | 19.27787 | 15.49471 | 0.0128 |
| At most 2 * | 0.070566 | 6.366573 | 3.841466 | 0.0116 |
| **Unrestricted Cointegration Rank Test (Maximum Eigenvalue)** | | | | |
| **Hypothesized No. of CE(s)** | **Eigenvalue** | **Max-Eigen Statistic** | **0.05 Critical value** | **Prob.**** |
| None * | 0.263195 | 26.57253 | 21.13162 | 0.0078 |
| At most 1 * | 0.137919 | 12.91129 | 14.26460 | 0.0809 |
| At most 2 * | 0.070566 | 6.366573 | 3.841466 | 0.0116 |

*Source: Author*

Results from Trace and Maximum Eigenvalue show that the relationship between LCPI, LCR and LOER is co-linked or they have a long-run economic relationship; therefore, the research team can regress these variables directly against each other using the VECM or least squares method without converting to the first-order difference (due to the first-order stationary of the variables) (Hill; et al., 2011). For the purpose of considering the direct short-run relationship from the independent variables to the consumer price index, the study chooses the least squares method to conduct two regression models of the following form:

$$CPI = \beta_1 + \beta_2 \times CR + \beta_3 \times OER + \beta_4 \times D_1 \times OER + \varepsilon_t \qquad (1)$$

$$CPI = \beta_1 + \beta_2 \times CR + \beta_3 \times OER + \beta_5 \times D_2 \times OER + \varepsilon_t \qquad (2)$$

Dummy variable $D_1$ takes on a value of 1 during Covid-19 (from Q1/2019-Q4/2021), and gets a value of 0 for the rest of the time. Dummy variable $D_2$ has been equal to 1 since the State Bank implemented the central exchange rate policy (Q1/2016) and has zero for the rest of the time. The regression coefficients $\beta_5$ and $\beta_6$ represent the change in the effect of the exchange rate on inflation during the Covid-19 period and since the central bank implemented the central exchange rate policy. Using the least squares regression method, the study obtained the following results:

| | Model 1 | Model 2 |
|---|---|---|
| C | -14.389***<br>(1.243) | -13.905***<br>(1.193) |
| OER | 1.558***<br>(0.165) | 1.504***<br>(0.161) |
| CR | 0.148***<br>(0.019) | 0.150***<br>(0.019) |
| OER*Central | -0.004*<br>(0.002) | |
| OER*Covid | | -0.004*<br>(0.002) |

## 3. RESULT DISCUSSION

Except for the coefficients $\beta_4$, $\beta_5$ with statistical significance below 10%, the other coefficients $\beta_i$ all have statistical significance less than 1%.

All signs of the slopes reflect economic significance. With other factors unchanged: (i) Credit to the economy increases, causing inflation to increase; (ii) An increase in exchange rate (local currency depreciation) will cause inflation to increase; the impact of devaluation of the local currency on inflation is stronger than that of the credit supply; (iii) Since implementing the central exchange rate policy, the SBV has better controlled the negative effects of the exchange rate on inflation; (iv) During the Covid-19 period, the impact of exchange rate on inflation decreased due to the distancing and closure policies.

From the empirical model, the influence of exchange rate on inflation in Vietnam is considered to be relatively strong for the following reasons:

*Firstly*, the majority of importers in Vietnam and their partners tend to apply a price strategy that changes according to the fluctuation of the market exchange rate (mark-up price), so the increase of the exchange rate almost transferred to the prices of imported goods (Goujon, 2006). The view of Goujon (2006) is consistent with the empirical studies of Ghei and Pritchett (1999), and of Feinberg (2000), which have shown that for small and developing countries, the level of The pass-through of the exchange rate to import prices is higher than that of large and developed countries. Moreover, as a small country, Vietnam, in international trade relations, is

a country that easily falls into a passive and disadvantageous position in negotiating prices. Because the prices of imported goods are influenced by world prices, when there are shocks to world prices, Vietnam is usually an inflation importer. The fact has proven that in early 2008 when the world oil price increased, Vietnam's inflation was pushed up to double digits.

*Secondly*, Vietnam is considered as a country with a high degree of dollarization, some items are not traded on the international market (non-commercial goods) such as real estate or valuable fixed assets. Larger sizes are usually denominated in dollars (Goujon, 2006). When the dong depreciates, these commodities tend to increase in price and indirectly increase inflation. Calvo and Vegh (1992) referred to this phenomenon as local currency substitution to take advantage of the appreciation of foreign currencies, which, however, would create inflationary pressures.

Thus, in Vietnam, not only does the exchange rate affect the prices of tradable goods (tradable goods), but it also indirectly affects the prices of non-tradable goods. (non-commercial goods) on the international market. Another point is that, in the measure of money supply (M2) of Vietnam, term deposits in foreign currencies are also an integral part of M2. When the foreign currency appreciates, it will increase the money supply M2 to calculate the value of the dong, while other factors have not yet changed, it will create pressure to increase the general ground price in Vietnam.

*Thirdly*, inflation expectations have contributed to making the relationship between exchange rate and inflation in Vietnam more sensitive. When a policy of devaluation of the local currency is implemented, people's sentiment about the devaluation of the dong increases, and this effect is transmitted directly to the current consumer price index but has not yet been transmitted through the production channel. Research by Nguyen Thi Thanh Hang and Nguyen Duc Thanh (2011) has shown that in order to reduce the negative effects from people's psychology, the government needs to pay maximum attention to the goal of controlling inflation even when the inflation rate is low. Inflation is at a low level. Excessive expectations about inflation will make the results from the implementation of other policies not as planned, indirectly reducing the effectiveness of macro policies.

## 4. CONCLUSION

Exchange rate and inflation have a reciprocal relationship and influence each other. The empirical model that explains the volatility of Vietnam's inflation in the period from the first quarter of 1999 to the fourth quarter of 2021 has shown that during the Covid-19 period and since the central bank switched to the central exchange rate regime, the effect of exchange rate on inflation will decrease. In addition, the model results show that inflation in Vietnam is (i) influenced by credit growth and (ii) significantly affected by exchange rate, this result also coincides with the study of Nguyen Thi Thanh Hang and Nguyen Duc Thanh (2011). This result shows that, before the time of exchange rate adjustment, the SBV needs to carefully evaluate the current inflation situation to take adjustment steps along with appropriate accompanying policies to stimulate exports and at the same time minimize the undesirable effects of the local currency devaluation on inflation.

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# THE IMPACT OF UKVFTA ON VIETNAM'S IMPORTS OF SEAFOOD: AN APPLICATION OF SMART MODEL

**Nguyen Ngoc Diep**[1]

***Abstract:*** *This paper assesses the potential impacts of the UK-Vietnam Free Trade Agreement (UKVFTA) on Vietnam's seafood imports from the UK by adopting the SMART model based on two scenarios. The simulation results reveal that the UKVFTA will result in a significant increase in Vietnam's seafood imports from the UK, implying that the UK will be still one of the most important seafood sources for Vietnam in the upcoming time. When Vietnam also extends its coverage of tariff elimination to ASEAN+5 including China, Japan, South Korea, India, Australia, New Zealand having signed an FTA with ASEAN to which Vietnam is a country member, the reduction in Vietnam's seafood imports from the UK will occur but it will be inconsiderable. Besides, in both scenarios, trade creation effects will be higher than trade diversion effects meaning that the UKVFTA can raise the welfare of Vietnam. Based on these results, the paper ends by drawing out some implications for the Vietnamese government and domestic seafood enterprises to be better implementing the ambitious UKVFTA.*

***Keywords:*** *Seafood, SMART, UK, UKVFTA, Vietnam.*

## 1. INTRODUCTION

Vietnam is one of the largest seafood producers in the world, with a high growth rate. According to the Vietnam Association of Seafood Exporters and Producers (VASEP), the country produced over 8.15 million tons (t) of finfish and shellfish in 2019 (VASEP, 2020), of which capture fisheries accounted for 46% and aquaculture accounted for 54% of total volume. Aquaculture accounted for about 75% of the total value and its farming volumes are growing faster than that of fisheries.

Namely, over the last decade (2009-2019), production increased sharply; with output increasing from 4.9 million tons in 2009 to 8.15 million tons in 2019, an average annual growth rate of 5%. During the same period, aquaculture production increased significantly, from 2.6

[1] Thuong Mai University. Email: ngocdiep.nguyen2504@gmail.com

million tons in 2009 to 4.4 million tons in 2019, resulting in an average annual growth rate of 6 percent.

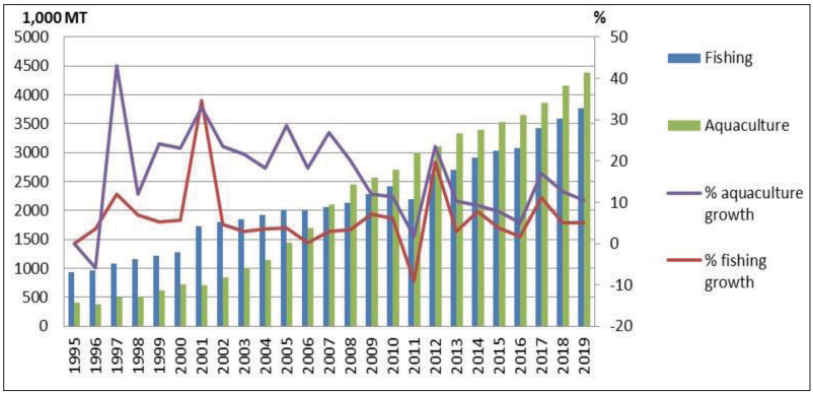


**Figure 1. Vietnam's Capture Fisheries and Aquaculture Production, 1995-2019**

*Source: VASEP 2020.*

Driven by growing global demand for food and for seafood in particular, Vietnamese seafood exports have increased significantly. The value of exported seafood increased from USD 1.8 billion in 2000 to nearly USD 8.6 billion in 2019 (VASEP, 2020). This has made Vietnam the world's third largest exporter of seafood, after China and Norway, according to the United Nations Statistics Division (UNSD, 2018).

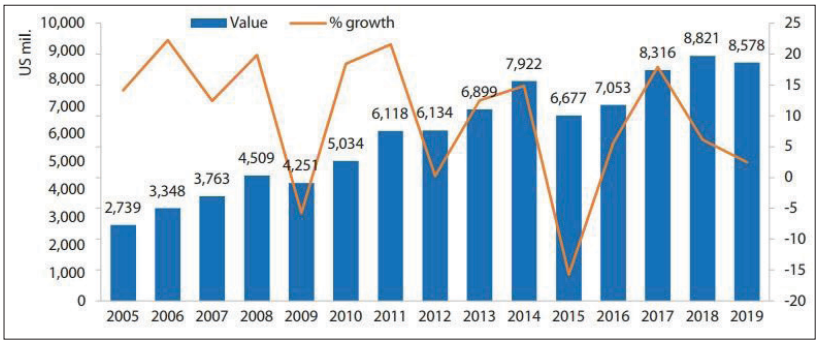


**Figure 2. Vietnam's Export Value of Seafood, 2005-2019**

*Source: VASEP 2020.*

Despite being among top seafood exporters in the world, Vietnam has recently imported more and more seafood products for domestic consumption and for processing to serve re-export purpose. Namely, in the period of 2010-2018, Vietnam's seafood imports witnessed a more

than 21.10% growth rate per annum, from USD 328,854,000 to USD 1,522,080,000. Moreover, during the outbreak of the Covid-19, 2019-2020, Vietnam's seafood imports continued to enjoy a steady rise at a rate of 3.3% and 4.7% compared to 2018, respectively. Then the import turnover even soared to a new peak at USD 1,800,002,000 in 2021 (ITC Trade map).

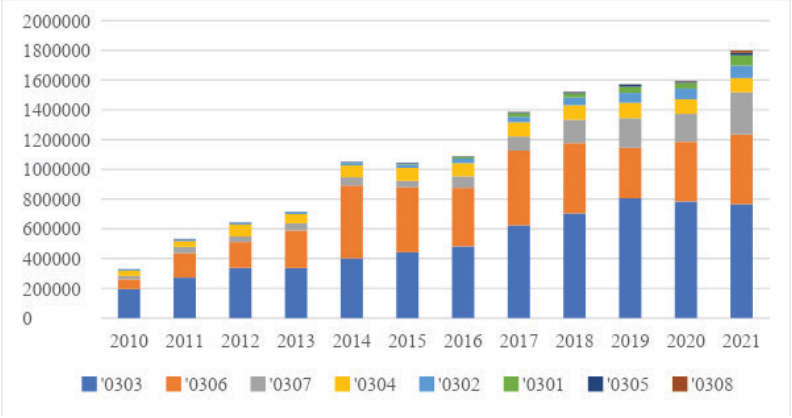


**Figure 3. Vietnam's Seafood Import Value According to HS 4-digit**

*Source: ITC Trade Map.*

Imports of seafood growing gradually on a year-over year basis could be explained by the following reasons:

Firstly, the average seafood consumption per capital in Vietnam grew steadily from 1975 and even surpassed the consumption of meat in the early 2000s and continued to go up rapidly. According to the Agro Processing and Market Development Authority at the Ministry of Agriculture and Rural Development (MARD), average seafood consumption in Vietnam was 31 kilograms (kg) per capita in 2017. Seafood consumption in the domestic market was predicted to increase sharply, with the annual average expected to hit 33-35 kg per person by 2020.

Generally, the rise in overall demand for fish and fishery products is caused by two main factors, population growth and income growth. In Viet Nam, population growth has been quite stable with the rate of about 1% recently. Income growth which is measured by growth in GDP per capita was high from 2015 to 2019 with annual growth levels between 5

and 6.1% but then collapsed to 2% and lower in 2020 and 2021 because of the Covid-19 (World Bank). However, income growth is expected to remain quite strong for the medium term making it more likely to expect a strong and sustained demand for fish and fishery products from the Vietnamese population.

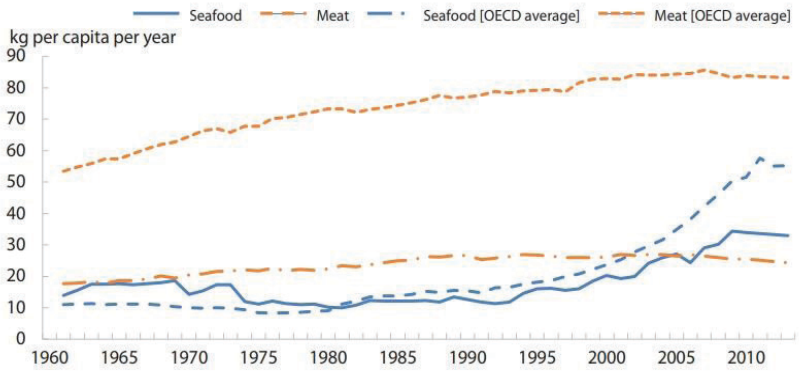


**Figure 4. Seafood and Meat Consumption in Vietnam and OECD Countries, 1961-2013**

*Source: FAO, 2016.*

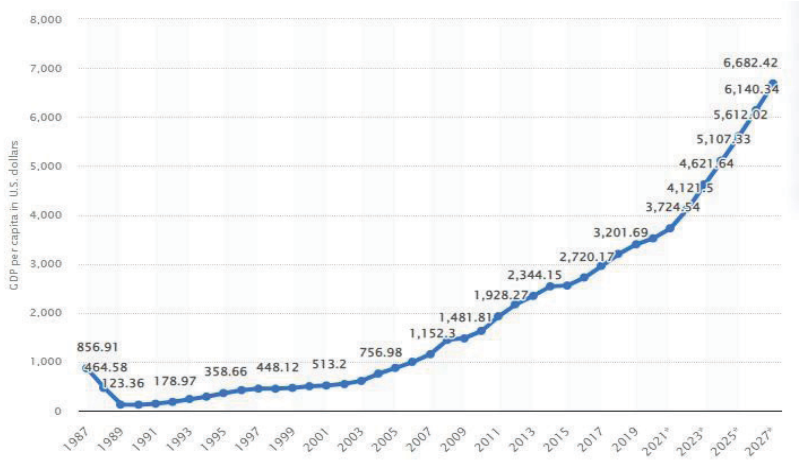


**Figure 5. GDP per Capita in Current Prices from 1987 to 2027***

*Source: Statista*

Secondly, there was an upward trend in the number of foreign visitor arrivals to Vietnam, from nearly 8 million in 2015 to more than 18,000,000 in 2019 (World Bank). Although this figure suffered a sharp decrease to

just more than 3.8 million in 2020 due to the outspread Covid-19, it could lead to a growing need of imported fresh/chilled whole fish, especially Atlantic and other salmon and some frozen fish, particularly frozen salmon for use by the higher-end food service industry and high-end retail outlets.

Thirdly, the country's current capacity still cannot meet the demand for fish fries in aquaculture production so fish fries are imported overseas.

The UK has been one of the largest and most important trade partners of Vietnam in the European market. In the fishing industry, in 2019, the UK used to be the 2nd biggest seafood exporter to Vietnam among other EU countries (EU was listed in the top 10 fish and seafood exporting countries to Vietnam and Denmark and the UK were dominant - ITC Trade Map). In 2020, after the UK officially left EU on January 31, 2020, the UK has become an independent trade partner of Vietnam and was ranked as one of twenty countries from which Vietnam imported fish and fishery products the most.

Although there was an upward trend in the UK's exports to Vietnam in general since 2010 when Vietnam and the UK signed the Joint Declaration to establish the UK-Vietnam Strategic Partnership, which was a remarkable achievement in the bilateral trade relation with the two countries, the UK's export value experienced an inconsiderable share which was less than 1% in the total import value of Vietnam from 2010 to 2020. Especially, regarding Vietnam's seafood imports from the UK, despite a 7% growth rate, they only met from 1-2% of the Vietnam's demand. That is the reason why the UK-Vietnam free trade agreement (UKVFTA), which has taken into effect since May 1, 2021, is expected to promote bilateral trade between the two countries, especially Vietnam and its imports of fish and fishery products from the UK as they still have an enormous potential.

With a view to maintaining bilateral trade relation between Vietnam and the UK after the Brexit, Vietnam and the UK actively negotiated and signed the UKVFTA on December 29, 2020. The agreement took effect temporarily on January 1, 2021, right after the EU-Vietnam free trade agreement (EVFTA) no longer applied to the UK. The UKVFTA, which has been officially and fully effective since May 1, 2021, is an important milestone in the bilateral trade relation between Vietnam and the UK after Brexit.

The UKVFTA is a "new generation" bilateral agreement aimed at a high degree of liberalization and a wide range of commitments from traditional ones such as trade in goods, trade in services, investment and nontraditional ones such as public procurement, state-owned enterprises, competition policy, … The UKVFTA also includes commitments on non-commercial aspects which are closely related to trade and play an important role in the prosperous and sustainable development of the two economies such as labor, environment, social responsibility…

The UKVFTA was negotiated on the basis of the EVFTA, therefore, almost all of the EVFTA's commitments on trade in goods, trade in services, investment were basically inherited by the UKVFTA and then open to adjustments appropriate to bilateral trade relation between Vietnam and the UK. The UKVFTA consists of nine articles, one appendix amending a number of sentences in articles of the EVFTA, one bilateral letter, one protocol on rules of origin and two explanatory notes.

Regarding the UKVFTA's commitments on trade in goods, Vietnam's import tariffs on fish and fishery products from the UK will be eliminated in 2 years after the Agreement's effective day. As the UK is among Vietnam's largest seafood import markets, tariff on seafood imported from the EU is now very high (at 11.65% on average - SMART model), this tariff elimination is likely to affect considerably Vietnam's seafood imports and industry.

On these grounds, this article, by adopting the SMART model and Partial Equilibrium theory, aims at assessing impacts of tariff elimination under the UKVFTA on Vietnam's seafood imports from the UK and provides some recommendation to Vietnam to better comply with the UKVFTA.

## 2. LITERATURE REVIEW

It is not an exaggeration to say that policy making in connection with FTAs should start and end with impact assessment. At the initial stages of creating an FTA, an assessment of the potential costs and benefits of the prospective FTA is a prerequisite for shaping the FTA's objectives, informing consultations with public and private stakeholders and formulating effective negotiating strategies. In contrast, after the FTA is

implemented, an assessment of the FTA's actual versus projected impact is necessary for determining whether the FTA's objectives have been met and what adjustments are needed. Correspondingly, two methods used to assess the impact of an FTA are ex-ante evaluation and ex-post evaluation which are usually complementary to each other.

Ex-post evaluation of an FTA's impact often applies gravity model and panel data to quantify the effect of tariff and non-tariff abolishment on nations' trade flow within a certain period.

Sunder Ramaswamy et al. (2020) evaluated the performance FTAs by analyzing the determinants of trade flows of Asian economies for a panel of 31 countries during 2007-2014 using a gravity model. Along with the OLS2, fixed and random estimators, PPML was used to arrive at the robust empirical findings. The results revealed that there were certain distortions which existed in the operation of FTAs within Asia. Variables such as GDP and population were significant in explaining total trade flows in the region. Thus, the creation of economies of scale could result in lowering of the multilateral resistance enabling lesser trade costs and more efficient trade flows. This could then lead to a higher level of intra-regional trade within the Asian region. Another feature that could be inferred from the results was that high trade costs occurred due to 'distance' between two trading partners. In case of better connectivity routes developed within these trading partners in Asia, there could be a better realization of the trade potentials within the region.

Sahar Hassan Khayat (2019) aimed to empirically analyze GCC's trade patterns based on the gravity model. Gravity model was used to explain the bilateral flow of trade determined by GDP per capita, population and distance. It was assumed that trade flow between the two countries was positively related to their economic size and population. The gravity model was analyzed in six developed countries concerning trade with GCC countries from 2001 to 2012. The study concluded that GDP per capita and population for GCC and destination countries was significant and suggested that the trade barriers among the countries must be eradicated for better trade flow as well.

With the application of gravity model, Irshad, Xin, Shahriar and Ali (2018) evaluated the trade patterns of China with the member countries

of OPEC from the period 1990-2016 and confirmed that China's bilateral trade with OPEC members positively impacted on GDP, income (GDP per capita) and trade openness in China and the WTO member countries in OPEC while negatively influenced on distance (trade cost).

Chandran (2018) using gravity model and panel data of India trade aimed at determining the trade impact of India-ASEAN FTA. The results showed the possibility of greater trade between India and ASEAN countries through FTA. Since the initial tariff levels were higher in India compared to ASEAN, ASEAN was likely to gain more in the short term. For India to exploit the trade potential with ASEAN, the FTA should be operationalized in the services and investment domain.

Lateef, Tong and Riaz (2018) investigated the effect of the China-Pakistan FTA (CPFTA) on Pakistan and China agricultural trade using PPML and trade data between the 2 countries and 110 partners. Surprisingly, the results suggested an increasingly agricultural exports from Pakistan to China but not vice versa under the CPFTA.

Main strengths of the gravity model in evaluating an FTA are that it allows analysts to control for other trade-related variables and quantify any changes in a country's trade due to the FTA. However, the model may yield misleading results if the data is inaccurate or important variables are omitted from the estimation. Moreover, the usage of ex-post analyses is limited by the availability of data as the gravity model demands data of trade flow under the FTA over time which is generally unavailable with new FTA. This problem gives rise to a range of ex-ante researches which are based on simulation rather than estimation to evaluate the potential impact of new FTA.

The ex-ante evaluation was mainly based on the GE and PE theory with GTAP and SMART model, respectively.

The GTAP model, originally formulated by Hertel (1997), is the most widely used CGE model for analyzing trade policy. The model is multi-market, with markets for final goods, intermediate goods, traded goods and factors of production. It is also multiregional, with a region representing a country or a group of countries. The quantity of endowments such as land, skilled labor, unskilled labor, natural resources and initial capital in each

region is fixed exogenously within the GTAP model. The main agents in this model are producers, consumers and the government.

Ana Shohibul et al. (2016) analyzed both qualitatively and quantitatively of the effect of free trade cooperation in the ASEAN formation + 5 FTAs (AJFTA, AIFTA, ACFTA, AKFTA and AANZFTA) using CGE and GTAP model and simulation including both partial and full liberalization. The study showed many positive influences of these FTAs. Namely, free trade cooperation among ASEAN members with Japan, India, China, Korea, Australia and New Zealand in the schema ASEAN + 5 FTAs provided bigger benefits in full liberalization scenario for all regions, except Cambodia and Australia-New Zealand. The formation of ASEAN + 5 FTA formed a trade creation in the form of less efficient domestic production transfer, which was replaced by more effective import among FTA member countries. Welfare, real GDP, international trade and the investment of all countries joined in ASEAN + 5 FTAs witnessed an upward trend. India was a country which experienced the highest increase in welfare, while Vietnam experienced the highest increase in real GDP, international trade and direct investment. In the sectoral analysis, partner countries' balance of trade (Japan, India, China, Korea, Australia and New Zealand) compared to ASEAN member countries balance of trade, the condition was better than the vice versa. The effect of resources usage allocation (land, labor and capital) for ASEAN countries was more focused on the sector of agriculture product, food, textile and some extractive industries and technologies, while for the partner countries was more focused on heavy industry, technology, equipment, construction and services.

Young Man Yoon et al. (2009) investigated the economic impacts of possible FTAs among China, Japan, and Korea and then compared the GDP and welfare effects of those FTAs by employing a multi-region, multi-sector static CGE model with 6 regions, 12 sectors and 5 endowments, assuming that land, unskilled labor and natural resource were not mobile among the regions and that skilled labor and capital were mobile among them. Considering four possible FTA scenarios, authors examined the economic effects of the FTAs and then ranked them to show which form of FTA was most beneficial for each country. Their results pointed out that Korea would establish an FTA with China, China would form a trilateral

FTA with Korea and Japan and Japan would choose to form a trilateral FTA with China and Korea.

Shagdar, Enkhbayar and Tomoyoshi Nakajima (2019) analyzed the economic effects of the ongoing FTA, China-Japan-Korea Trilateral FTA and several other prospective FTAs including Northeast Asia Preferential FTA, Northeast Asia plus the Eurasian Economic Union (EAEU) Preferential FTA and Northeast Asia plus the Regional Comprehensive Economic Partnership (RCEP) plus the EAEU Preferential FTA on the basis of CGE model and GTAP Data Base 9.0a. The results revealed that all parties of the agreements would benefit from the formation of these FTAs, having welfare gains and real GDP expansions regardless of international capital mobility status. Moreover, the results indicated that for the NEA region as a whole, the NEA FTA was preferable to the China-Japan-Korea Trilateral FTA alone and it would be even better off with the formation of wider free trade areas, such as with the other RCEP and EAEU members.

With a view to estimating the effects of trade agreements on countries linked to global value chains (GVCs) more accurately, Itakura, K., & Lee, H. (2019) utilized the GTAP database and inter-country input-output tables to construct a global CGE model that disaggregates imports of intermediate products by country of origin. Basing on the CPTPP and the RCEP, which are two mega-regional trade agreements (MRTAs) involving Asian countries, they suggested that while incorporating the GVC structure did not significantly affect the overall welfare results, the magnitudes of changes in sectoral output became considerably greater in several industries.

Similarly, Kikuchi, Yanagida and Huong Vo estimated the impact of different mega-RTAs including EVFTA, TPP, CPTPP (TPP without the US), RCEP and FTAAP as well, but on Vietnam's economy. Their results showed that EVFTA increased Vietnam's real GDP by 8.1% while TPP increased it by 13.2%. Vietnam was found to be more adversely affected by the US withdrawal from TPP than other economies in the region. CPTPP increased real GDP by 6.5% while RCEP increases it by 9.2%. The economic benefits from RCEP appeared to be relatively small given a lesser degree of liberalization for tariffs and NTMs. The increase in real GDP was the largest at 27.1% for FTAAP1 based on the TPP template

while it was 19.4% for FTAAP2 based on the RCEP template. Regarding impacts by sector, EVFTA expanded Vietnam's exports to the EU mainly for light-manufactures, especially leather products. TPP led to remarkable growth in textiles, apparel and leather products and surprisingly, without the US market, CPTPP resulted in much lower export growth for textiles, apparel and leather goods. Meanwhile, RCEP promoted substantial growth in capital-intensive sectors such as chemicals, metals, motor vehicles and transport equipment, electronics, and machinery. And finally, for the FTAAP scenarios, FTAAP1 leads to much higher growth than FTAAP2.

GTAP model uses GE theory helping it to account for economic changes in all sectors. However, on the other hand, the GTAP model faces the same limitations, as follows: (i) it is constrained by the availability of data and a lack of data may severely compromise the scope and relevance of a study and the researcher's ability to model certain trade policies; (ii) it involves many parameters, which may be difficult to estimate and validate and (iii) it contains assumptions or characteristics that may not reflect real-world features.

Contrary to the GTAP model, SMART model based on PE theory only requires data for the trade flows, the trade policy (tariff) and a couple of behavioral parameters (elasticities) which are always available. Another advantage (which follows directly from the minimal data requirement) is that it permits an analysis at a fairly disaggregated (or detailed) level. In general, by virtue of their simplicity, SMART model tends to be more transparent, easy to implement and results can be easily explained as well.

Othineo and Shinyek (2001) evaluated the role of the East African community customs unions on trade, total revenue and welfare of Uganda. Veeramani, Saini (2011) incorporated both SMART and gravity model to find out the impact of ASEAN-India FTA on export of plantation products including coffee, tea and pepper in India. Anh and Ngoc (2011) used SMART to analyze the potential economic impact of RCEP on Vietnam's automobile sector. Kumar and Ahmed (2014) utilized SMART as the framework to evaluate the impact of South Asia FTA. Llano, Perez and Hengwings (2019) used SMART to evaluate the impact of 10%-25% of aluminum, iron and steel tariff import of US on Spanish regions and indicated that US import tariff might induce a total job loss of 185,000 employees worldwide, while in Spain, it may cost 3,500 jobs.

Regarding the UKVFTA, there are a limited number of papers assessing its contribution to the Vietnam's economic development. Two reasons explain this situation might be that the UKVFTA's commitments are similar to the ones of EVFTA and the UKVFTA has only taken in effect for nearly two years. Ha Van Hoi (2021) analyzed the potential opportunities given by the UKVFTA to some of Vietnam's main exports including textiles and garments, seafood, rice, wood, vegetables and fruits and footwear. Pham Thu Thuy et al. (2022) evaluates the influence of the UKVFTA on the sustainable development of Vietnam's wood processing sector and suggested Vietnam's government to provide investment incentives on technology innovation and promotion strategy to enterprises.

Due to no papers measuring the impact of the UKVFTA on Vietnam's imports of seafood, this study focuses on evaluating the UKVFTA's potential impact on Vietnam's seafood industry and some recommendations for Vietnam's domestic seafood to compete with the UK's seafood which are entitled to enjoy tariff elimination.

## 3. METHEOLOGY AND DATA

### 3.1. PE

PE is a model that equates supply and demand in one or more markets in order to analyze and assess a particular market under the changes of the policy (increase or decrease of the tariff) or others affecting the demand or supply in a good. PE model often eliminates the impacts of changes in relevant or replaceable sectors and suggests that the sector that analyzed was a small niche in economy, so the changes of the sector could not affect to others. The nature of the model could make its usage and assessment easier. However, the weakness of the model is to miss important interactions and feedbacks between various markets. In particular, the PE approach tends to neglect the important inter-sectoral input/output (or upstream/downstream) linkages that are the basis of GE analyses. It also misses the existing constraints that apply to the various factors of production (labor, capital, land, …) and their movement across sectors.

An imported country J imports a commodity i of an exported nation K. The demand curve would be as below:

$$M = \alpha MPM\varepsilon$$

αM is a constant (αM > 0) and ε < 0 is elasticity of demand for imports. Similarly, the supply curve would be as below:

$$X = \alpha XPX\eta$$

αM > 0 is a constant and η > 0 is elasticity of supply for exports. When the exported nation has a small economy or the import turnover of i is smaller than the total international import turnover, η is the same as positive infinity.

The equal condition of the model requests: M = X

Difference between import and export prices is caused by tariff as a below curve:

$$PM = PX (1 + T/100)$$

T is tariff on import (%).

The changes in the gains from exchange to the importing and exporting countries are:

$$\Delta WM = \int_{PM_0}^{PM_1} \alpha_M PM^{\varepsilon} dPM = \frac{\alpha_M}{\varepsilon+1} (PM_0^{\varepsilon+1} - PM_1^{\varepsilon+1})$$

$$\Delta WX = \int_{PX_0}^{PX_1} \alpha_X PX^{\eta} dPX = \frac{\alpha_X}{\eta+1} (PM_0^{\eta+1} - PM_1^{\eta+1})$$

These expressions complete a basic partial equilibrium model that we can use to simulate the economic impact of tariff changes in a single sector.

### 3.2. SMART model

SMART is known as a PE model that can be used in assessing the trade, tariff revenue and welfare effects of an FTA. This model and the simulation tools are part of the World Integrated Trade Solution (WITS) database and software suite provided jointly by the World Bank and the United Nations Conference on Trade and Development. The strengths of the model are that it is easily implemented together with the WITS database, it yields important quantitative results on the trade and tariff revenue effects of an FTA and the analysis can be performed at the most disaggregated level of trade data. However, the main limitation of the model is that it is a partial equilibrium model, which means the results of the model are limited to the direct effects of a trade policy change only in one market.

The demand side of the market in SMART is based on the Armington assumption that commodities are differentiated by their country of origin. This assumption implies that, for a particular commodity, imports from one country are an imperfect substitute for imports from another country. Thus, even though an FTA entails preferential trade liberalization, import demand does not completely shift to a source from within the FTA. The SMART model also assumes that consumers' demand is decided in a two-stage optimization process that involves allocating their spending by commodity and by national variety. At the first stage, consumers decide how much to spend on the commodity given changes in the price index of this commodity. The relationship between changes in the price index and the impact on import demand for this commodity is determined by a given import demand elasticity. At the second stage, the chosen level of spending for this commodity is allocated among the different national varieties, depending on the relative price of each variety. The extent of the between-variety response to a change in the relative price is determined by the substitution elasticity.

### 3.3. Data

SMART model calculates on 3 elasticity such as demand elasticity, supply elasticity and Armington elasticity. The exactness of the model depends on selecting the elasticity for the model. Import elasticity is 1.5 in SMART. The export elasticity is defined as the changes of the export supply when the price changes. As the seafood imports of Vietnam are slight and the seafood market in Vietnam is also subtle compared to other exporters, the assumption of perfectly elastic demand (99) is used in SMART.

The Armington elasticity or the elasticity of substitution is depended on the changes of import demand on commodity that made from many export nations in the changes of prices (Kapuscinski, Warr, 1999). The selection of the Armington elasticity plays a very important role in deciding the exactness of measure in SMART model. This study would use the Armington elasticity of Hertel and partners (2007). Hertel and his partner used the regression analysis to measure the Armington elasticity for some imports and compared between the elasticity and the Armington elasticity recommended by GTAP. According to Hertel and partners, the Armington elasticity for fishing would be 2.5 that is used in the study.

This paper adopts the HS (Harmonized System) classification and assesses the impact of the UKVFTA on Vietnam's imports of fish and fishery products namely HS03 (fish and crustaceans, molluscs and other aquatic invertebrates). In 2020, the assumption was established so the data of bilateral trade turnover between the Vietnam and partners was in that year. The data of import turnover of seafood HS03 of Vietnam from the UK could be extracted from data of UNCTADTRAINS by SMART model.

### 3.4. Scenarios

Two scenarios are constructed based on Vietnam's seafood-related commitments under the UKVFTA as well as the current pace of Vietnam's integration in this sector with ASEAN+5 including China, Japan, South Korea, India, Australia, New Zealand.

- Scenario 1: Vietnam eliminates tariff on seafood imported from the UK without taking into consideration Vietnam's other FTAs.

- Scenario 2: This scenario includes FTAs of ASEAN+5 in simulation, in which Vietnam eliminates tariffs for fish and fishery products imported from both the UK, China, Japan, South Korea, India, Australia, New Zealand.

With ASEAN+5, Vietnam signed many FTAs as a member state of ASEAN including ASEAN - China FTA (ACFTA), ASEAN - Japan Comprehensive Economic Partnership (AJCEP), ASEAN - Korea FTA (AKFTA), ASEAN - India FTA (AIFTA) and ASEAN - Australia - New Zealand FTA (AANZFTA). Vietnam also has two FTAs with Japan (Vietnam - Japan Economic Partnership Agreement - VJEPA) and South Korea (Vietnam - Korea FTA - VKFTA) individually. In these FTAs, Vietnam commits to eliminate seafood import tariffs but some types of seafood which are imported from the India are still subject to a certain level of tariff rates. Therefore, this scenario aims at evaluating how ASEAN+5 will keep up with the pace of liberalization in the UKVFTA.

## 4. RESULTS

On the basis of SMART model and the assumed scenarios, results on Vietnam's imports of fish and fishery products from the UK are given as follows:

**Table 1: Change in Trade Indicators of Seafood Imports of Vietnam from the UK in Two Scenarios**

| Indicators | Scenario 1 | Scenario 2 |
|---|---|---|
| Initial seafood import value (in 1,000 USD) | 13,466.926 | 13,466.926 |
| Final seafood import value (in 1,000 USD) | 27,094.971 | 26,027.684 |
| Total import value change (in 1,000 USD) | 13,628.045 | 12,560.758 |
| Total export value change (%) | 101.2 | 93.3 |
| Trade creation effect (in 1,000 USD) | 10,245.223 | 102,45.223 |
| Trade diversion effect (in 1,000 USD) | 3,382.822 | 2,315.535 |
| Total trade effect (in 1,000 USD) | 13,628.045 | 12,560.758 |

*Source: The author's calculation in SMART model.*

Under the enactment of the UKVFTA, there will be a surge of USD13,628,045 in seafood imports of Vietnam from the UK, corresponding to a more than 100% increase in total. Overall, Vietnam's import value of fish and fishery products from the UK will reach approximately USD27.1 million. The changes in import duties on seafood between Vietnam and the UK are captured, namely, fish and fishery products under HS03 are open 11.65% of tariff on average (SMART model) and then entitled to tariff elimination to 0%, leading to the total trade effect of more than USD13.5 million. As Vietnam is the importer, the total trade effect is the sum of trade creation and trade diversion effect which are nearly USD10.3 million and USD3.4 million, respectively.

In comparison with Scenario 1, there will be a decline of USD1,067,287 in the import value of Vietnam in Scenario 2, which directly corresponds to the decrease in the trade diversion effect. In scenario 2, the imports will grow at a lower rate of 93.3% because when Vietnam also removes tariffs for ASEAN+5, the seafood prices of ASEAN+5 relative to that of the UK would be lower, making Vietnam transfer a part of its imports from the UK to the ASEAN+5.

Overall, there will be some reductions in the investigated indexes in Scenario 2 compared to Scenario 1. However, these reductions are insignificant, which are only nearly 4% meaning that Vietnam's participants in FTA with ASEAN+5 will not much affect Vietnam's seafood import growth from the UK.

**Table 2. Change in Import Value of Vietnam from 7 Specified Trading Partners**

| Country | Scenario 1 | | | Scenario 2 | | |
|---|---|---|---|---|---|---|
| | *Initial import value (in 1,000 USD)* | *Total import change (in 1,000 USD)* | *Total import change (%)* | *Initial import value (in 1,000 USD)* | *Total import change (in 1,000 USD)* | *Total import change (%)* |
| The UK | 13,466.926 | 13,628.045 | 101.2 | 13,466.926 | 12,560.758 | 93.3 |
| China | 110,666.369 | -94.838 | -0.1 | 110,666.369 | -211.706 | -0.2 |
| India | 195,917.384 | -1,146.487 | -0.6 | 195,917.384 | 73,643.048 | 37.6 |
| Japan | 154,726.418 | -383.912 | -0.2 | 154,726.418 | -700.059 | -0.5 |
| South Korea | 50,036.401 | -19.699 | -0.04 | 50,036.401 | -177.877 | -0.4 |
| Australia | 41,017.984 | -79.365 | -0.2 | 41,017.984 | -1,899.465 | -4.6 |
| New Zealand | 19,046.796 | -20.568 | -0.1 | 19,046.796 | -67.366 | -0.4 |

*Source: The author's calculation in SMART model.*

Table 2 shows that Vietnam does not import as many fish and fishery products from the UK as many as it does from ASEAN+5. However, the UK is the only country getting huge benefits in both Scenario 1 and Scenario 2 which are a more than 100% and 93% soar in seafood exports, respectively. Meanwhile, ASEAN+5 will face a fall in seafood export value, from -0.04% to -0.6% (Scenario 1). Even when Vietnam's FTAs with both the UK and ASEAN+5 are taken into account (Scenario 2), China, Japan, South Korea, Australia, New Zealand will still experience a drop in exports to Vietnam and only India's fish and fishery exports will ascend by more than 37%.

Actually, seafood exports of China, Japan, South Korea, Australia, New Zealand are already entitled to enjoy tariff elimination thanks to the FTAs with Vietnam meaning that they are open to 0% of import duty in both two scenarios (SMART model). India, by contrast, are suffering from 8.86% of tariff for seafood products under HS03 on average (SMART model). That is the reason why when it comes to FTAs of Vietnam with all mentioned-above partners, Vietnam will shift seafood imports from the UK and ASEAN+4 to India. Overall, in Scenario 2, regarding absolute change in export value of fish and fish products to Vietnam, India will be superior to the UK. However, in terms of relative change, UK's exports will far exceed the one of India.

**Table 3. The Impact of the UKVFTA on Import Value of Seafood under 6-Digit HS Codes from the UK to Vietnam**

| Product (HS code) | Initial import value (in 1,000 USD) | Scenario 1 | | Scenario 2 | |
|---|---|---|---|---|---|
| | | *Import value change (in 1,000 USD)* | *Proportion in total change (%)* | *Import value change (in 1,000 USD)* | *Proportion in total change (%)* |
| 030313 | 618.638 | 173.626 | 1.3 | 173.626 | 1.4 |
| 030349 | 30.712 | 163.148 | 1.2 | 163.148 | 1.3 |
| 030354 | 2,772.812 | 8,300.002 | 60.9 | 8,300.002 | 66.1 |
| 030355 | 388.496 | 111.771 | 0.8 | 111.771 | 0.9 |
| 030369 | 177.738 | 51.485 | 0.4 | 51.263 | 0.4 |
| 030481 | 1,430.873 | 764.638 | 5.6 | 764.638 | 6.1 |
| 030499 | 645.008 | 247.878 | 1.8 | 241.538 | 1.9 |
| 030541 | 72.423 | 34.246 | 0.3 | 34.246 | 0.3 |
| 030572 | 52.272 | 68.82 | 0.5 | 68.82 | 0.5 |
| 030579 | 111.029 | 209.743 | 1.5 | 209.743 | 1.7 |
| 030614 | 506.101 | 23.802 | 0.2 | 23.778 | 0.2 |
| 030617 | 6,660.823 | 3,478.886 | 25.5 | 2,418.185 | 19.1 |

*Source: The author's calculation in SMART model.*

The above results show that Vietnam's imports of different types of seafood will positively be influenced by the UKVFTA in both two scenarios as they will experience a considerable increase in value. It is because Vietnam's seafood imports from the UK suffer from quite high rate of tariff. Namely, seafood under HS030614 faces the lowest tariff which is 1.5% but the remaining types are open to higher one ranging from 10 to 15%. Then reduction of tariff to 0% will result in a climb in their import turnover.

Besides, Vietnam should take much more attention to the changes in imports of products under HS030354 as they will enjoy the highest rise in absolute import value (more than USD 8 million). They will also make up for more than 60% in the total change of Vietnam's imports from the UK. Moreover, when Vietnam's FTAs with ASEAN+5 are taken into consideration, Vietnam's imports of seafood under HS030354

will not change, making the UK still the second largest exporter to Vietnam (after Japan).

The second biggest product in terms of absolute import value increase will be HS030617 accounting for 25.5% of total additional seafood imports into Vietnam from the UK in Scenario 1 and over 19% in Scenario 2. In Scenario 2, the integration of Vietnam with ASEAN+5 will lead to a significant fall in Vietnam's imports of this type of product from the UK which will be replaced by imports from India.

With regard to relative change, HS030349 will see a sharp rise by over five times compared to the import turnover before the UKVFTA has come into effect, followed by HS030354 (nearly three times) and HS030579 (nearly twofold).

Overall, HS030354 will benefit the most in terms of both absolute and relative change in import turnover in both scenarios.

As above-mentioned, the total trade effect of the UKVFTA on Vietnam's imports of fish and fishery products from the UK consists of trade creation and trade diversion effect. Trade creation means that Vietnam's domestic production will be replaced by more efficient imports from the UK, leading to an increase in economic benefits of both Vietnam and the UK. Namely, the UK will enjoy specialization in production based on its comparative advantage, meanwhile Vietnam's domestic customers will be able to buy cheaper seafood and Vietnam's domestic producers will compete against foreign rivals resulting in their production efficiency improvement. Trade diversion, by contrast, means that Vietnam will import seafood from the UK due to elimination of import duty leading to a lower relative price of seafood from the UK compared to one from rest of the world. This will cause lower welfare as more efficient production of rest of the world will be replaced by the UK's one in Vietnam's market.

**Table 4. Trade Creation and Trade Diversion Effect of the UKVFTA**

| Country | Scenario 1 | | | | Scenario 2 | | | |
|---|---|---|---|---|---|---|---|---|
| | *Trade creation (in 1,000 USD)* | *Proportion of trade creation (%) in total trade effect* | *Trade diversion (in 1,000 USD)* | *Proportion of trade diversion (%) in total trade effect* | *Trade creation (in 1,000 USD)* | *Proportion of trade creation (%) in total trade effect* | *Trade diversion (in 1,000 USD)* | *Proportion of trade diversion (%) in total trade effect* |
| The UK | 10,245.223 | 75.2 | 3,382.822 | 24.8 | 10,245.223 | 81.6 | 2,315.535 | 18.4 |
| China | 0 | 0 | -94.838 | 100 | 0 | 0 | -211.706 | 100 |
| India | 0 | 0 | -1,146.487 | 100 | 60,946.853 | 82.8 | 12,696.196 | 17.2 |
| Japan | 0 | 0 | -383.912 | 100 | 0 | 0 | -700.059 | 100 |
| South Korea | 0 | 0 | -19.699 | 100 | 0 | 0 | -177.877 | 100 |
| Australia | 0 | 0 | -79.365 | 100 | 0 | 0 | -1,899.47 | 100 |
| New Zealand | 0 | 0 | -20.568 | 100 | 0 | 0 | -67.366 | 100 |

*Source: The author's calculation in SMART model.*

According to the SMART model, the trade creation effect will be bigger than the trade diversion effect in both two scenarios meaning that the UKVFTA will increase the welfare of Vietnam. In scenario 1, the trade creation effect will account for 75.2% of the total trade effect. In Scenario 2, with the combination of both Vietnam's FTAs with the UK and ASEAN+5, the trade creation effect will make up for a higher proportion which will be 81.6% due to a decreasing of the trade diversion effect. This also implies that the UKVFTA's impact on Vietnam's seafood imports will be affected by ASEAN+5 in a moderate manner.

When Vietnam only eliminates import duty on fish and fishery products from the UK in Scenario 1, Vietnam will shift seafood imports from ASEAN+5 to the UK leading to big losses of India and Japan. However, when tariff reduction to 0% is applied on both seafood imported from the UK and ASEAN+5 in Scenario 2, India will get the biggest advantage, followed by the UK. Meanwhile, China, Japan, South Korea, Australia and New Zealand will even suffer from bigger losses compared to Scenario 1.

## 5. CONCLUSION AND RECOMMENDATIONS

By adopting the SMART model, this paper analyzes the impact of tariff elimination under the UKVFTA on Vietnam's imports of seafood from the UK in two scenarios which are constructed based on Vietnam's commitments on tariff elimination under the UKVFTA and the integration of Vietnam with ASEAN+5 in seafood sector. In Scenario 1, Vietnam eliminates tariffs only for fish and fishery products imported from the UK while Scenario 2 enlarges the scope of tariff reduction to also include ASEAN+5. The results reveal that Vietnam's seafood imports from the UK will significantly increase in both scenarios, implying that the UK will still be among important seafood sources for the Vietnam's market in the future. However, Vietnam's FTAs with ASEAN+5 will result in a reduction in the Vietnam's import turnover of fish and fishery products from the UK. In Scenario 1, Vietnam's import value of seafood from the UK will shoot up by more than 100%, equivalent to USD13,628,045. Meanwhile Scenario 2 will experience a fall to 93.3% and USD12,560,758, respectively.

Moreover, an uneven distribution in Vietnam's seafood imports from the UK will occur when the UKVFTA has come into effect. Most of absolute

import value increases will focus on HS030354 and HS030617. Meanwhile, the most remarkable relative change will be registered in HS030349 and HS030354. Overall, HS030354 will benefit the most in terms of both absolute and relative change in import turnover in both scenarios.

Besides, the UKVFTA will result in a considerable trade creation effect which will be higher than the trade diversion effect in both two scenarios. Namely, trade creation effect will account for 75.2% of the total trade effect in Scenario 1. This figure will go up to 81.6% in Scenario 2, meaning that the UKVFTA will bring about an increasing welfare for Vietnam and Vietnam's integration with both the UK and ASEAN+5 will even lead to a higher social welfare.

In addition to some foregoing main points drawn from the SMART model, the paper would like to introduce some recommendations as follows:

*Firstly*, when it comes to the combination of UKVFTA and Vietnam's FTAs with ASEAN+5, India will cause Vietnam's seafood imports from the UK to reduce (in Scenario 2). Vietnam will shift imports of fish and fishery products from the UK and ASEAN+4 to India. Therefore, with a view to promoting the UKVFTA and trade relation with the UK, Vietnam should keep its commitments in existing FTAs with ASEAN+5, especially India in seafood sector.

*Secondly*, since the effective day of the UKVFTA, Vietnam's domestic seafood enterprises has faced more fierce competition not only from ASEAN+5 but also the UK's enterprises. Especially, Vietnam's domestic seafood enterprises focusing on fish and fishery products under HS030354, HS030617 and HS030349 will be competed the most as these types of products will see a surge in both absolute and relative import change. Therefore, Vietnam's businesses should increase their quantity and quality of seafood to serve the domestic market better. The Vietnam's Government should support domestic enterprises to invest in technology innovation, distribution system building, brand building and development to catch up with the UK's enterprises.

*Thirdly*, with a population of nearly 100 million people, Vietnam's domestic market indeed has huge potential to promote the consumption of aquatic products but has not been fully and effectively exploited by

Vietnam's domestic enterprises. It is because seafood export has some advantages over domestic consumption, namely: (i) selling products to domestic supermarkets, enterprises do not get paid immediately but in about a month, meanwhile the payment transactions in seafood export can be completed very quickly and conveniently; (ii) the preservation of aquatic products which are almost frozen in domestic supermarkets matters as it can negatively affect quality of products and and reputation of enterprises and (iii) because of domestic supermarkets' sales and promotions, seafood enterprises find it difficult to determine their selling price which can greatly affect their revenue, meanwhile seafood export activities are transparent on the basis of quality assurance, food safety and hygiene and disease safety. Due to the above-mentioned reasons, seafood enterprises often take advantages of their all resources to promote export activities and penetrate foreign markets rather than focus on domestic one.

However, it is clear that if enterprises are capable of well exploiting the domestic market, their pressure on export activity will reduce, especially in case of great volatility in the world market due to the Covid-19 epidemic.

With a view to encouraging seafood enterprises' participation in development of the domestic market, the Vietnam's Government should promulgate appropriate policies to solve the aforesaid barriers including counterfeit or poor-quality products, payment transaction time, aquatic product preservation or sales and promotions of supermarkets,…

Regarding seafood manufacturers, in addition to building their core competitiveness on the basis of investment in technological innovation to produce quality and highly differentiated products and meet domestic customers' needs as mentioned above, they should invest in market building and expanding and developing a strong distribution network as well.

It is also important to strengthen the connection between seafood manufacturers, suppliers and retailers in information sharing, strategic planning, brand building and development and investment cooperation.

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# THE RELATIONSHIP BETWEEN PLACE ATTACHMENT, RESIDENTIAL SATISFACTION AND HOUSING BEHAVIORAL INTENTION: A CASE STUDY IN VIETNAM

**Nguyen Thanh Lan[1,*], Nguyen Thanh Ha[1], Pham Quynh Chi[1], Nguyen Cong Hao[1], Do Thi Len[1], Le Quynh Mai[1]**

***Abstract:*** *This paper analyses the relationship between place attachment, residential satisfaction, and housing behavioral intention of people living in these apartment buildings in two big cities of Vietnam. Data were collected from 781 dwellers in different apartments in Hanoi and Ho Chi Minh City. This study uses the Partial Least Squares structural equation modeling (PLS-SEM) approach to testing hypotheses about relations among observed and latent variables. In addition, the quantitative and two states of qualitative research is utilized in order to clarify the relationship between the three factors mentioned in this topic. These results have shown that there is a relationship between place attachment, residential satisfaction, and housing behavioral intention. Notably, place attachment has a stronger effect on housing behavioral intentions than residential satisfaction, and satisfaction is confirmed to have a mediating variable function in this relationship. The multi-group analysis (MGA) proves that the legal status had altered the level of the relationship between place attachment and residential satisfaction.*

***Keywords:*** *Housing behavioral intention, Multi-Group Analysis, Place attachment, PLS-SEM, Residential satisfaction.*

## 1. INTRODUCTION

Over the past few decades, the concept of place attachment and residential satisfaction has been studied in a variety of scientific disciplines. Place attachment and residential satisfaction are keys in understanding the effect in person-place relationships.

Most previous studies were carried out in developed countries such as the Netherlands, China, Korea… meanwhile, there are very few studies

[1] Department of Real Estate and Natural Resources Economics, National Economics University, Hanoi, Vietnam.

* Corresponding Author. Email: nguyenthanhlan@neu.edu.vn

conducted in developing countries like Vietnam. Vietnam has witnessed an increasing number of apartments in big cities such as Hanoi and Ho Chi Minh City, after amended the Housing Law 2005. Therefore, Vietnam is likely to become a new potential context to research on the relationship between place attachment, residential satisfaction, and housing behavioral intention.

Currently, particularly in Vietnam, numbers of apartments grow uncontrollably and cause overcrowding, especially in Ha Noi and Ho Chi Minh City. This will trigger more harm than good, for instance, the density in urban planning, legal status... On the other hand, the value of the apartment can reduce because of the normal wear and tear which shapes the law of housing demand and supply. This will be a prologue of dissatisfaction and weakens the feeling of place attachment. Therefore, the resident will tend to think about negative housing behavioral intentions such as moving, selling...

Place attachment is considered as a key concept for capturing the effect between person-place relationships and it provides an appropriate approach for the study of human behavior. Place attachment" first proposed by Atlman & Low in 1992. Atlman believed that the bond between human and place are founded on scale about geographical, time, social and alignment processes. In this research, place attachment is defined as an emotional link or connection between people and certain places. Recent studies have suggested social link and emotional attachment as two other important aspects of place attachment. The cognitive, social, emotional and attachment aspects of place attachment are reflected as place identity, place dependence, place bonding.

Residential satisfaction is the description of the assessment of the physical and social characteristics of a place (Mesch G.S and O.Manor, 1998). Residential satisfaction is a multidimensional concept that uses both micro and macro focus and has influenced by several factors. Factors that affect residential satisfaction can analyze in terms of physical aspects and non - physical aspects (Amelia Tri Widya, Hanson Endra Kusuma and Rizal Arifin Lubis, 2019).

In psychology, intention has assumed to capture the motivational factors that influenced a behavior. Ajzen and Fishbein (1975) described

that "behavioral intention" as an individual's willingness to act, thus is an immediate predictor of behavior. According to the theory of reasoned action, Ajzen identifies two factors that affect the behavioral intention: attitude toward the behavior and subjective norm. The theory of planned behavior has built off what was assumed of human behavior in the theory of reasoned action (TRA) (Ajzen, 1991). Behavioral intention is directly affected by three main factors, including: attitude toward the behavior, subjective norm and perceived behavioral control. In this research, "housing behavioral intention" is defined as a solid foundation and has a huge influence towards action in the future state. This will be an orientation and motivate housing action.

When researching the relationship between place attachment and residential satisfaction, Ringel and Finkelstein (1991) expressed enthusiastic support for distinguishing these terms. Place attachment is believed to stand apart from residential satisfaction (Lewicka, 2010). The later research of Byungsook Choi, Jung-a Park and Hyun-Jeong (2016); Ning (Chris) Chen, C. Michael Hall, Kangkang Yu and Cheng Qian (2019); Elif Aksel and Çağrı İmamoğlu (2020), all models have had a leg to stand on a positive relationship between place attachment and residential satisfaction. To give a specific example, the research of Femke Luitse (2021) given that place attachment had a positive impact on residential satisfaction, which means that the more place attachment the residents have, the more satisfied they will be. Although there are amounts of research mention the effects of the relationship between place attachment, residential satisfaction, and housing behavioral intention, they still focus on certain aspects such as mobility intention of Amelia Tri Widya, Hanson Endra Kusuma and Rizal Arifin Lubis (2019); pro-environmental behaviors of Haywantee Ramkissoon, Liam David Graham Smith, Betty Weiler (2013).

In this case, place attachment had a stronger effect on housing behavioral intention and residential satisfaction has confirmed to mediate variable function. Moreover, the legal status had altered the level of the relationship between place attachment and residential satisfaction.

This research aims to present several concrete suggestions to address the inadequacy and shortcomings of the housing market and support the

analysis of social psychology, forecasting the rule of demand and supply at the same time, this research focus on analyzing the relationship between place attachment, residential satisfaction and housing behavioral intention and assess the moderator variable - legal status affecting on this relationship.

## 2. LITERATURE REVIEW, THEORETICAL FRAMEWORK, AND METHODS

### 2.1. Theoretical model

This study used to combine these theories including place attachment theory (PAT), residential satisfaction theory (RST), theory of reasoned action (TRA), and theory of planned behavior (TPB).

Place attachment theory: "Place attachment theory" was first proposed by John Kasarda and Morris Janowitz (1974), which is defined as an emotional link or connection between people and certain places.

Residential satisfaction theory: The theoretical framework of residential satisfaction is a branch of family housing adjustment theory (Morris & Winter, 1975), which defined as the feeling contentment when one has or achieves what one needs or desires in a house (Galster & Hesser, 1981). In 2014, Mohit and Raja pointed out 3 theories upon which most of the studies are based, including: Housing Needs Theory (Ross,1955); Housing Deficit Theory (Morris & Winter, 1978) and Psychological Construct Theory (Galster, 1985).

Theory of reasoned action (TRA): Theory of reasoned action was appeared in 1967, this theory aims to explain the relationship between attitudes and behaviors within human action. Developed by Martin Fishbein and Icek Ajzen in 1970s, the theory derived and improved from the information integration theory. The TRA points that the strongest and the most predictor of volitional behavior is behavior intention. Behavioral intention is impacted by attitudes and subjective norms, depending on the individual and situation.

Theory of planned behavior (TPB): The theory of planned behavior is an extension of the theory of reasoned action made by the original model's limitations in dealing with behaviors.

### 2.2. Research model

This research aims to measure the relationship between place attachment, residential satisfaction and housing behavioral intention of people living in these apartment buildings in Vietnam's urban areas. Therefore, our research model and hypotheses suggest:

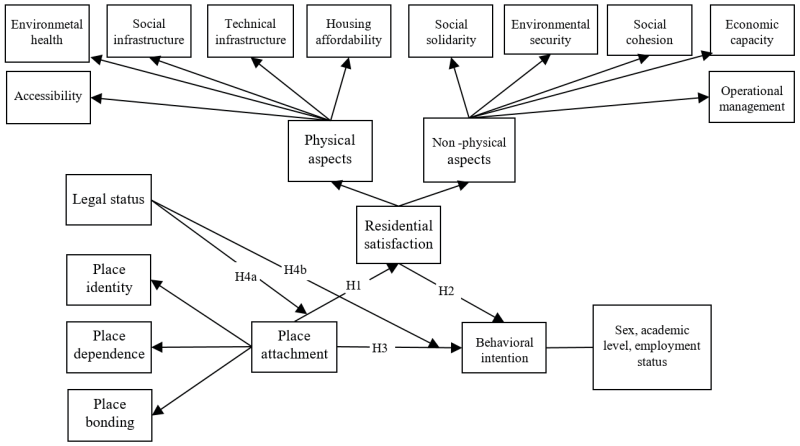


**Figure1. Research model**

*Source: Authors' suggestion*

Research Hypotheses:

H1: Place attachment has a positive impact on residential satisfaction.

H2: Place attachment has a negative impact on behavioral intention.

H3: Residential satisfaction has a negative impact on behavioral intention.

H4a: Legal status has an impact on relationship between place attachment and residential satisfaction.

H4b: Legal status has an impact on relationship between place attachment and behavioral intention.

### 2.3. Method

This research used both qualitative research and quantitative research.

#### *2.3.1. Qualitative research state 1*

In the first stage, qualitative research aims to adjust the questionnaire survey. A questionnaire survey was formed based on previous research, which we separated into two parts: demographic information of the sample

and the second part involved a range of questions using the Likert scale from 1(strongly disagree) to 5 (strongly agree) for measuring the variables in the model. Then, an interview with experts and individuals was taken to adapt and check the content, wording, and clarity before sending.

A preliminary survey was taken in 100 residents in different apartments to reassess the scale in a questionnaire and remove high correlation and meaningless in statistical variables. Afterward, a formal questionnaire was sending online via Google Form, or taken offline in different level apartments in both Ha Noi and Ho Chi Minh City from 01/02/2022 to 21/02/2022. Among 850 completed questionnaires, we obtained 781 valid responses for analysis.

#### *2.3.2. Quantitative research*

Data has been gathered to measuring the variables presented in the research model, using the exploratory factor analysis (EFA), reliability, convergent validity, and discriminant validity. Then, we use the PLS - SEM to test the appropriateness of the formative/reflective model and reliability analysis using bootstrapping with 1000 samples and using the multi - group analysis (MGA) with 3 groups, including: people who had an apartment with house ownership certificate, people who had an apartment without house ownership certificate and people who rent an apartment.

#### *2.3.3. Qualitative research state 2*

After analyzing data, to discuss and obtain more practical evidence of the results, researchers interviewed residents in the apartments a second time and collected data that offer a deeper perspective and understanding of their viewpoint. Therefore, from the results of data analysis combined with in-depth interviews with residents, the authors provide some recommendations and contributions to the topic.

## 3. RESULTS AND DISCUSSION

### 3.1. Results

#### *3.1.1. Descriptive Statistics*

A total of 850 survey questionnaires were distributed in both online and offline forms: 600 of those were distributed in Hanoi and 250 in

Ho Chi Minh City. However, after cleaning the data set and removing unsatisfactory questionnaires, final 781 samples were selected.

**Table 1. Descriptive statistics of gender, location, academic level, employment status, legal status**

| Criteria | | Frequency | Ratio (%) |
|---|---|---|---|
| Gender | Male | 404 | 51.7 |
| | Female | 377 | 48.3 |
| Location | Ha Noi | 553 | 70.8 |
| | Ho Chi Minh | 228 | 29.2 |
| Academic level | High school | 101 | 12.9 |
| | Intermediate school/ Junior college | 111 | 14.2 |
| | University | 427 | 54.7 |
| | Postgraduate education | 142 | 18.2 |
| Employment status | Employed | 585 | 74.9 |
| | Retired | 51 | 6.5 |
| | Unemployed | 43 | 5.5 |
| | Student | 48 | 6.1 |
| | Housewife | 54 | 6.9 |
| Legal status | Had house ownership certificate | 476 | 60.9 |
| | Had no house ownership certificate | 184 | 23.6 |
| | Rental | 121 | 15.5 |

*Source: Authors' calculation from survey data.*

Due to the difference in the number of questionnaires distributed in Hanoi and Ho Chi Minh City, the sample structure at these two locations also has a significant difference. Especially, questionnaires collected in Ha Noi were 70.8% - 2.4 times more than in Ho Chi Minh City (29.2%).

In the demographic variable, there are 404 male respondents and 377 female respondents with corresponding proportions of 51,7% and 48.3%. For academic level, 54.7% of respondents possess bachelor's degree (university) - the highest rate. Regarding the employment status, the highest percentage was employed with 74.9% and the lowest percentage was unemployed at 5.5%. In addition, the three remaining statuses: retired, student and housewife accounted for around 6-7%.

And the last one is legal status, for apartments that have a house ownership certificate, the rate is about 60.9%. Meanwhile, for apartments

owned without a house ownership certificate, the rate is about 23.6% and the lowest rate at 15.5% is rental status.

#### *3.1.2. Results from analysis the exploratory factor analysis (EFA)*

KMO returns values 0.832 > 0.5 and 0.832 < 1, this proves the correlation with the research data of the factors. Sig of the Bartlett test = 0,000 < 0,050 refers to the correlation of the observable variables.

There are 14 factors which have Eigenvalues > 1 means that all 14 factors are retained as part of the analytical model. Thus, the initial forty-three factors were shortened to fourteen main ones. The total variance explained (Cumulative %) = 65.608% > 50%, presented as the percentage of variation in observable variables.

Convergence test and factor loading: The variables converged to one factor (column) and all the coefficients were > 0.5% so that none of the observable variables is suppressed.

In conclusion, there are 14 factors which satisfy convergent validity and discriminant validity.

#### *3.1.3. Result of Evaluation of reflective measurement model (Smart PLS)*

**Table 2. The result of evaluating the Reliability of Scale**

| | Cronbach's Alpha | Composite Reliability | Average Variance Extracted (AVE) |
|---|---|---|---|
| AC | 0.867 | 0.904 | 0.652 |
| EC | 0.886 | 0.929 | 0.814 |
| EH | 0.781 | 0.872 | 0.694 |
| ES | 0.844 | 0.928 | 0.865 |
| HA | 0.786 | 0.875 | 0.700 |
| OM | 0.815 | 0.890 | 0.730 |
| PB | 0.894 | 0.934 | 0.825 |
| PD | 0.898 | 0.936 | 0.830 |
| PI | 0.831 | 0.922 | 0.855 |
| SC | 0.834 | 0.923 | 0.858 |
| SI | 0.818 | 0.880 | 0.647 |
| SS | 0.756 | 0.891 | 0.804 |
| TI | 0.924 | 0.946 | 0.814 |

*Source: Authors' calculation from survey data*

According to Table 3.2, the scale is highly reliable because not only the Cronbach Alpha coefficient is greater than 0.6 but also both Composite Reliability (CR) and Average Variance Extracted (AVE) values are greater than 0.5.

Verification of Convergent validity shows that all outer loadings being > 0.708 means the lowest 50% of the variance from the observed variable are taken by the latent constructs in the model; both standardized - unstandardized outer loadings and all of the AVE values are more than 0.5, which indicates that each observable variable component is greatly accepted and the explanatory level of the factors for the latent variable is high.

Verification of Discriminant validity confirms that the manifest variable of this construct is distinct from other constructs in the path model through its cross-loading value in the latent variable being greater than that in any other constructs. Furthermore, the squared root of average variance exerted along the diagonals is greater relative to all of the correlations, and all heterotrait - monotrait (HTMT) is less than 0.9, implying satisfactory discriminant validity.

#### *3.1.4. Result of Analyzing Partial Least Squares Structural Equation Modelling (PLS-SEM)*

Multicollinearity phenomenon in original formative and reflective measurement model testing: A reflective measurement model is for high - order latent variables (PA and RS) and the remainder is for dependent variable BI. The obtained results show that all VIF values are less than 5, so no independent variables are removed, and the research model structure is suitable.

Adjusted R Square coefficient: The obtained results show that all values of Adjusted R2 are less than or equal to the corresponding R2, which indicates that the model is relevant and suitable. In particular, the independent variables influence 80.2% of the variation of the dependent variable PS (physical aspect); the remaining 19.8% is due to the variables outside the model and random errors. The same goes for other dependent variables.

Verification of significance of regression coefficients in the model (PLS-SEM).

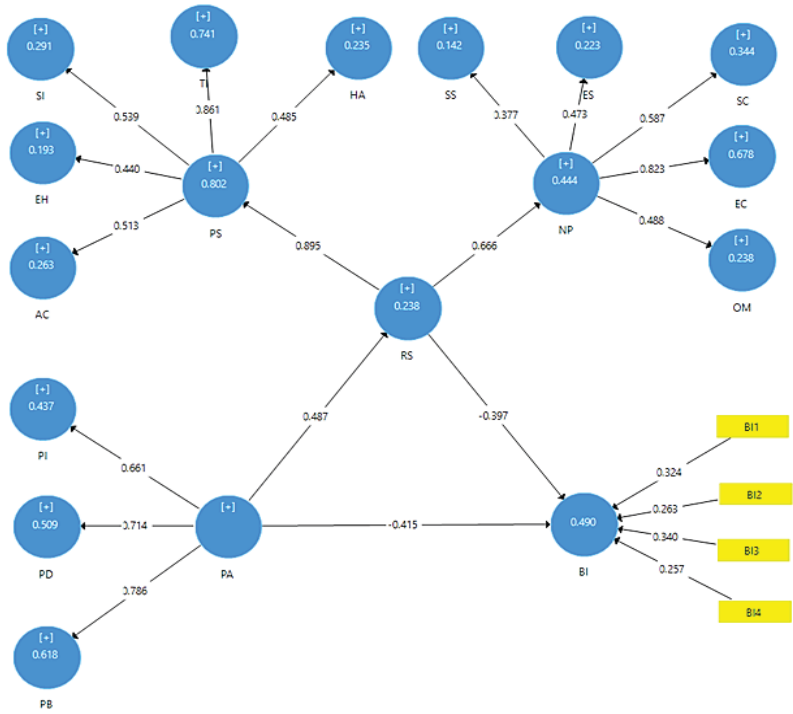


**Figure 2. Regression Coefficient Results of the Original Model**

*Source: Authors' calculation from survey data.*

Running Basic Bootstrapping with a sample size of 1000, the significance level of each regression coefficient is less than 0.001, which means that the original model has high efficiency in explaining the relationship between the lower order latent variables and observed variables (except BI, all observations inner the latent variables have been hidden to easily evaluate the model measurement results).

Outer weights results: Outer weights are applied to the formative measurement model, and p-values of observed variables BI1 to BI4 are all equal to 0.000 < 0.050. Thus, the observed variables contribute to the latent parent variable (BI) in a statistically significant way.

### *3.1.5. Repeated indicator approach*

Approach the method through a two stages approach, which is used to evaluate the relationship between a high-order latent variable and a low-order latent variable, but not a higher-order latent variable with repeated

observations within it. After reduced the model twice cause of 3rd order latent variable (RS), the authors at the same time performing tests for the new model and obtain the following results:

**Table 3. Result of Regression Coefficient in the New Reduced Model**

| | Original Sample (O) | Standard Deviation (STDEV) | T Statistics (\|O/STDEV\|) | P Values |
|---|---|---|---|---|
| PA → BI | -0.413 | 0.028 | 14.959 | 0.000 |
| PA → RS | 0.499 | 0.031 | 15.862 | 0.000 |
| RS → BI | -0.391 | 0.026 | 14.851 | 0.000 |

*Source: Authors' calculation from survey data.*

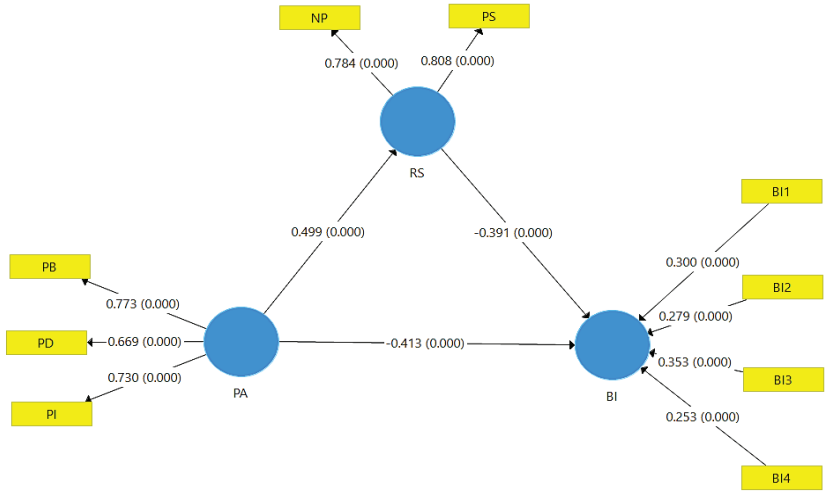


**Figure 3. Result of Regression Coefficient in the New Reduced Model**

*Source: Authors' calculation from survey data.*

Based on the table results, all P-values of the new model's regression coefficients are < 0.001, and the variables of the new model are all statistically meaningful. As the result, PA has a stronger indicator than RS when being in the relationship with BI (|-0.413| > |-0.391|). In other words, the higher the PA and RS, the lower the BI. PA affects RS positively at 0.499 > 0 and RS is confirmed as a mediator variable of the PA and BI relationship.

### *3.1.6. Multi-Group Analysis - MGA*

Verification hypothesis H4a, H4b - "legal status" moderating variable (LS)

Group 1 - LS (1.0): Residents owning apartments that had house ownership certificates.

Group 2 - LS (2.0): Residents owning apartments without house ownership certificate.

Group 3 - LS (3.0): Residents renting apartments.

**Table 4. The Result of Multi-Group Analyzing LS Variable (PLS-MGA)**

| | Path Coefficients-diff (GROUP_ LS(1.0) - GROUP_ LS(2.0)) | Path Coefficients-diff (GROUP_ LS(1.0) - GROUP_ LS(3.0)) | Path Coefficients-diff (GROUP_ LS(2.0) - GROUP_ LS(3.0)) | p-Value new (GROUP_ LS(1.0) vs GROUP_ LS(2.0)) | p-Value new (GROUP_ LS(1.0) vs GROUP_ LS(3.0)) | p-Value new (GROUP_ LS(2.0) vs GROUP_ LS(3.0)) |
|---|---|---|---|---|---|---|
| PA -> BI | -0.054 | -0.099 | -0.045 | 0.448 | 0.308 | 0.669 |
| PA -> RS | 0.131 | 0.294 | 0.164 | 0.046 | 0.000 | 0.097 |

*Source: Authors' calculation from survey data.*

Observing the LS in the relationship PA → RS, the regression coefficient of group 1 (had house ownership certificate) is greater than group 2 (without house ownership certificate) and group 3 (rental); p-value of group 2 and 3 > 0.50, so there is no difference between these two groups. Similarly, LS in the relationship PA → BI: all p-values new > 0.050, so there is no difference between the 3 groups.

After testing, it is found that there is a difference between 3 LS groups in the PA → RS relationship, so the authors will only give a table of results to test the impact of each group on this relationship through the results of bootstrapping.

**Table 5. Results of testing the impact level of each LS group (Bootstrapping Results)**

| | Path Coefficients Original (GROUP_ LS(1.0)) | Path Coefficients Original (GROUP_ LS(2.0)) | Path Coefficients Original (GROUP_ LS(3.0)) | p-Value (GROUP_ LS(1.0)) | p-Value (GROUP_ LS(2.0)) | p-Value (GROUP_ LS(3.0)) |
|---|---|---|---|---|---|---|
| PA -> RS | 0.605 | 0.475 | 0.311 | 0.000 | 0.000 | 0.000 |

*Source: Authors' calculation from survey data.*

The relationship between PA affecting RS is statistically significant in both 3 groups. Specifically, the group of residents owning an apartment that had a house ownership certificate has the strongest impact (0.605), followed by the group of residents owning an apartment without house ownership certificate (0.475) and the weakest impact is the group of people who rent an apartment (0.311).

### 3.2. Discussion

After performing two phases of qualitative research, combined with quantitative research, the authors obtained data and descriptive statistics via SPSS to get an overview and then apply the structural equation modeling PLS-SEM to analyze the data. As a result, all three hypotheses are accepted: Place attachment has a positive impact on residential satisfaction (hypothesis 1); Place attachment and residential satisfaction affect behavioral intentions negatively (hypotheses 2, 3), in which the former has a stronger impact, and the latter is a mediator variable. In addition, the results of multi-group analysis show that the relationship between place attachment and residential satisfaction is various in three groups of legal status: residents owning an apartment that had house ownership certificate, residents owning apartment without house ownership certificate and residents renting apartment. As a result, hypothesis H5a was approved and hypothesis H5b was rejected because the collected data did not have enough basis to conclude. Under hypothesis H5a, residents owning an apartment that had a house ownership certificate will make the place attachment have the strongest impact on the residential satisfaction and the weakest regulator is people who are renting an apartment.

However, despite the authors' best efforts during the research process, the study still has some limitations. Firstly, the sample size is not big enough, researchers only focused on surveying people in two big cities: Hanoi and Ho Chi Minh, leading to the research sample being not highly representative. In fact, housing behavioral intention can be affected by a few other factors. That should be mentioned as the apartment segment, people's intellect, Eastern culture such as house orientation, feng shui, spirituality… or other personal factors including household size and experiences in the past. Moreover, authors still limit the housing

behavioral intention to the specific behaviors stated in the study, there are other aspects and behaviors related to housing such as buying/selling issues, investment for accommodation, business/apartment rental... And finally, none of the previous studies including this one examined place attachment and behavioral intention in the context of the Covid-19 pandemic.

On the other hand, based on research results, these implications and recommendations for real estate policy, particularly the apartment segment, are drawn. In urban planning and construction, it is necessary to improve the approach distance of apartment buildings, ensure construction quality, water supply, and drainage system according to the regulations and population. Investors, to ensure their reputation, should speed up the process of granting the house ownership certificate. They better fulfill their responsibility to execute the procedures to apply "So hong" for the customer of the apartment and then correctly perform their duties and obligations to the state. For the state, it is recommended to implement supply adjustment policies for each specific segment, type, and demand in order to avoid massive and unbalanced development. For apartment operation management, build up a professional apartment management model to easily solve problems arising during the management and operation process such as maintenance, repair services and ensure the quality of fire protection and prevention… For residents, build a civilized and orderly lifestyle, regularly participate in extracurricular activities, holiday events, reward or combine with clubs about culture - social, physical training - sports... help to connect people in the apartment complex to gradually build a spirit of solidarity in the community. Finally, culture needs to be encouraged in urban areas, cultural richness and sustainable development are necessary and possible, at the same time still absorbing the world quintessence, advanced technology into urban areas' architectural design.

## 4. CONCLUSIONS AND POLICY IMPLICATIONS

In conclusion, this study has some contributions such as systematizing pioneering studies related to the correlation of place attachment, residential satisfaction, and housing behavioral intentions. On that basis, the authors have built a theoretical framework, research model, research hypothesis, and research scale for the relationship stated in the topic. In addition,

research quantifying the place attachment, residential satisfaction, and housing behavioral intention variable, indicates that place attachment affects positively with residential satisfaction and negatively mentioned housing behavioral intentions. Residential satisfaction has a negative impact on behavioral intentions and plays a mediate role. Moreover, three groups of legal status have a moderating effect on the relationship between place attachment and residential satisfaction. Thus, some policy implications and recommendations are given to enhance the place attachment and satisfaction of residents, concurrently reducing negative behavioral intention, such as improving urban planning and architecture construction efficiency; speeding up the process of issuing ownership certificates, regulating the supply and demand of apartments; upgrading the quality of operation management; and enriching the culture of each apartment.

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# TOURISM AND UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

**Nguyen Thi Quynh Trang[1,*], Nguyen Thi Thu Ha[2]**

***Abstract:*** *This paper reviews tourism research concerning the United Nations Sustainable Development Goals (SDGs) with the aim to identify how academics have realised the SDGs in tourism since the launch of the 2030 Agenda for Sustainable Development in 2015. Sixty-three tourism academic articles concerning the SDGs were collected and analysed in NVIVO to generate codes and themes embedded in the articles. This paper reveals critical thinking and inclusiveness as two major approaches covering six key themes: governance, contributions of the private sector, stakeholder involvement, gender equality, education and employment. Whilst the UNWTO's framework for the SDGs strongly focuses on tourism growth, tourism scholars ask for a transformation of tourism toward a balance between sustainability pillars, which is also the academic's expectation of tourism recovery after the Covid19 pandemic. Future tourism research should continue using a critical lens to explore the individual and collective contributions of wider stakeholders to attain the SDGs at local levels and examine the contribution of the SDGs as effective indicators to transforming tourism into more sustainable.*

***Keywords:*** *Critical thinking, inclusiveness, SDGs, sustainable tourism.*

## 1. INTRODUCTION

It has been seven years since 2015 when the United Nations released the 2030 Agenda aiming at transforming our world into sustainable development (UN, 2022). The Agenda includes seventeen sustainable development goals (SDGs) and 169 associated targets, which have provided indicators to lead all sectors towards sustainable manners. The 2030 Agenda sheds light on five key themes: people, planet, prosperity, peace and partnerships, in which tourism can contribute most to prosperity and the planet (UNWTO & UNDP, 2017). The World Tourism Organisation (UNWTO) designates tourism as a driver of the achievement of the SDGs, as tourism is one of the major sectors of the world economy, having

[1] National Economics University, Hanoi, Vietnam.
* Corresponding Author. Email: trangnq@neu.edu.vn
[2] Thuy Loi University, Hanoi, Vietnam.

significant effects on economies, environments, societies and cultures around the globe (Bramwell & Lane, 2014; Laimer, 2017; Pan et al., 2018; Wearing, Stevenson, & Young, 2010). The UNWTO suggests various ways that tourism organisations and destinations can contribute to the success of the Agenda and the SDGs (UNWTO & UNDP, 2017).

Despite the UNWTO's consistent and optimistic statement on the contribution of tourism to the SDGs, academic perspectives and recognitions of the SDGs and the contribution of tourism are controversial. Tourism sustainability scholars unfold various development issues covered within the SDGs. Still, there is a small number of scholars relating tourism with the specific SDGs or including specific SDGs as research objectives (Bramwell, Higham, Lane, & Miller, 2017). Hall (2019) reveals that the UNWTO and UNDP's (2017) report on tourism and the SDGs includes mostly non-academic resources. This raises a question on how tourism scholars recognise the SDGs and the contribution of tourism to these global goals. To answer this question, this paper produces a review of over 60 scholarly academic articles associating tourism with the SDGs. By doing so, the paper reveals the contribution of tourism to the goals.

This article now proceeds as follows. The first section introduces the SDGs, the UNWTO's statement on the position of tourism in these goals, and academic's critiques of the goals. The next section describes how the authors collect and analyse SDG-related tourism papers. Moving on to the finding section, the authors present general results, two broad approaches and six overarching themes in the SDG papers, followed by recommendations for future research and a remark conclusion.

## 2. SUSTAINABLE DEVELOPMENT GOALS

The establishment of the SDGs is a following step of the Millennium Development Goals (MDGs) ending in 2015, but the SDGs are broader than the MDGs in terms of purpose, conception, and political process (Fukuda-Parr, 2016). While the MDGs commit to reducing poverty and target at poor and developing countries, the SDGs aim to eliminate poverty and provide a common set of indicators for sustainable development in all nations, including both developing and developed (Bramwell et al., 2017; Ruhanen, Moyle, & Moyle, 2019; UN, 2022). For the success of goals,

the MDGs emphasise mostly the action of governments, while the SDGs involve the effort of both state and non-state actors (Grainger-Brown & Malekpour, 2019). The SDGs aim to balance environmental, social and economic pillars (Fukuda-Parr, 2016; Ruhanen et al., 2019). The goals cover a wide range of development issues for all people from all countries, such as poverty reduction, healthy lives and well-being, quality education, gender equality, sustainable management of water, sustainable and modern energy, inclusive economic growth, employment, decent work, innovation, climate change, natural and cultural resource conservation, mutual understanding, peace and partnerships. With the wide coverage of the 17SDGs, both synergies and trade-offs exist between and within the goals (Cook, Saviolidis, Davíðsdóttir, Jóhannsdóttir, & Ólafsson, 2019) and challenge the implementation of the SDGs. The Agenda for the SDGs strongly emphasises the role of governance as a means to implement the SDGs. A bottom-up governance process and flexible structures, including multi-sectors, multi-levels, and multi-actors, are needed to implement the SDGs (Niestroy, 2015).

Tourism is included directly in goals 8, 12 and 14, but tourism can contribute to all these goals (UNWTO, 2016a). Sustainable tourism can facilitate environmental preservation and promote cultural differences and understanding among people and nations (UNWTO, 2016b). The UNWTO (2016a) calls for an implementation framework to align tourism with these goals, empowering a broad range of stakeholders. While recognising the SDGs and the contribution of tourism to the goals, academics criticise the goals.

First, the triple win of the SDGs seems to be an unrealistic attempt (Scheyvens, Banks, & Hughes, 2016). The 17SDGs including 169 specific targets are regarded as complex and ambitious, which is daunting for organisations to pursue the goals (Grainger-Brown & Malekpour, 2019). Trade-offs are unavoidable between and within the SDGs when aligning tourism with the goals (Cook et al., 2019; Gössling & Hall, 2019). Second, tourism scholars question the compatibility between sustainability in general and within the SDGs. Higgins-Desbiolles (2018) theoretically argues that sustainability is incompatible with sustainable development goals. While the sustainability of the SDGs focuses on development and growth, Bramwell et al. (2017, p. 6) suppose that "sustainability is best

achieved by pursuing a non-development path". Hall (2019, p. 1052) also criticises that the UNWTO's focus on tourism growth is "insufficient to achieve many of the SDGs; instead, attention needs to be paid to the social, economic and political process behind development". Inherently, tourism growth contributes to environmental change such as climate change and results in over-tourism and uneven development (Hall, 2019). The UNWTO's attention to tourist growth was further criticised as outdated when tourism growth dropped to 0 under the impact of the Covid19 pandemic (Gössling, Scott, & Hall, 2020; Hall, Scott, & Gössling, 2020). Furthermore, Hall (2019) reveals a lack of academic basis in the report of UNWTO and UNDP (2017) on tourism and the SDGs, as the report includes a majority of non-academic sources such as institutional and industrial sources. Despite these critiques, tourism scholars are finding ways to make tourism become a driver of the achievement of the SDGs by 2030, although the tourism papers working with the SDGs account for a very small part compared with over 5000 papers in sustainable tourism literature (Ruhanen, Weiler, Moyle, & McLennan, 2015; Sharpley, 2020).

## 3. METHODOLOGY

This paper conducted a general review of tourism scholarly academic papers concerning the SDGs to provide research insights, existing gaps, and future research directions (Palmatier, Houston, & Hulland, 2017) related to the contribution of tourism to the implementation of the SDGs, by which to understand tourism academic recognition of the SDGs. To access a wide range of academic contributors aligning tourism with the SDGs, this paper searched papers via Web of Science and Google Scholar. While Web of Science is an online citation database traditionally used in academic search, Google Scholar is a web-based academic search engine providing an additional tool to find the greater body of literature (Haddaway, Collins, Coughlin, & Kirk, 2015). The search involved simultaneously two keywords, "SDGs" and "tourism", and collected over 100 papers.

The analysis process involved two steps. First, the authors had an overall reading of all papers, then eliminated 46 papers that mentioned the SDGs but failed to link tourism with the SDGs or did not aim at any SDGs. Second, the 63 remaining papers were intensively analysed with the support of NVIVO - a qualitative data analysis computer software

package. NVIVO is an effective tool that assists the authors in coding, organising codes and querying the data and codes (Bazeley & Jackson, 2013). The generated codes included the 17SDGs, methodology used, empirical locations, approaches/theories, and emerging themes. NVIVO Word Frequency was used to identify the words most frequently mentioned in the SDG nodes, by which to explore the recognition of tourism scholars towards the SDGs through their writing in the papers (Bazeley & Jackson, 2013). Each paper imported in the NVIVO was queried 'nodes coded in this pdf' to identify interconnections between codes.

This paper has a limitation regarding the use of Google Scholar and Web of Science to collect the papers. Although they are used to complement and fulfil the limitation of each other (Haddaway et al., 2015), they might not cover the works from other platforms or published in a non-English language. Moreover, this paper equally considers the contribution of all scholars regardless of their publication in high or low ranking journals, which might raise a question on the quality of findings. Indeed, this does not influence the achievement of the research objectives, as this paper tries to understand how tourism scholars recognise the SDGs and the contribution of tourism. This equal consideration expressed respect to all scholars, which is in line with the "inclusiveness" and "equality" focus of the SDGs.

## 4. FINDINGS

Tourism scholars have attempted to discover how tourism can contribute to the SDGs, particularly after 2017, designated as the UN international year of sustainable tourism for development. Around two-thirds of the papers are empirical research-based dominantly on qualitative methods, including case studies, interviews, document analysis and fieldwork. The remaining papers are conceptual, perspective, and review. A major part of the SDG empirical research is adopted in the context of the least developed and developing countries, particularly in Africa, concerning economic development and poverty reduction. The SDGs are holistic goals balancing socio-cultural, economic and environmental aspects, while, in the least developed and developing countries, tourism is a major economic sector, and economic development is prioritised. Thus, it is unsurprised when there is a particular curiosity about how developing

countries can align their tourism industry with these goals (Hughes & Scheyvens, 2016). Tourism scholars also seek the implementation of the SDGs in the context of cultural heritage destinations (Xiao et al., 2018) and protected areas such as national parks and biosphere reserves (Carius & Job, 2019; Lyon & Hunter-Jones, 2019).

### 4.1. SDGs in tourism research

In consistent with the statement of the UNWTO, tourism scholars realise that although tourism is directly included in three SDGs (8, 12 and 14), it can contribute to all the SDGs. Figure 1 illustrates the number of papers aligning tourism with each SDG. Indeed, a significant part of tourism scholars undoubtedly recognises the potential contributions of tourism to the achievement of the SDGs, which is expressed through their non-critique of the UNWTO's statement on the role of tourism. This supports Hall's (2019) statement on a lack of critical assessment of tourism's contribution to the SDGs in the tourism literature.

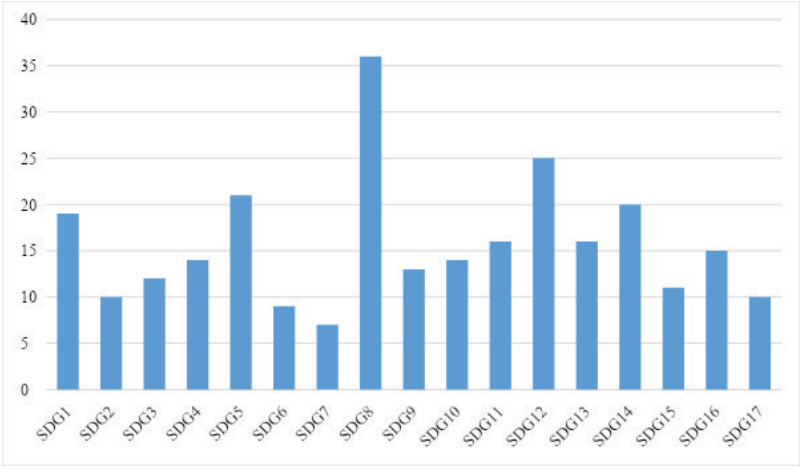


**Figure 1. Referred SDGs in Tourism Research**

Tourism scholars link tourism mostly with SDG8 (inclusive economic growth, productive employment and decent work), SDG12 (sustainable consumption and production), SDG14 (conservation and sustainable use of the oceans, seas and marine resources) and least to SDG7 (affordable, reliable, sustainable and modern energy) and SDG6 (sustainable management of water and sanitation). Tourism is also found as a significant

contributor to SDG1 (poverty reduction), SDG5 (gender equality), SDG11 (sustainable cities and communities) and SDG13 (climate change). Furthermore, as Scheyvens and Hughes (2019, p. 1069) assert, "none of the global goals exists in isolation" tourism scholars provide evidence of the interconnections between the SDGs such as the SDG 5, 6 and 8 (Alarcón & Cole, 2019), 4, 8 and 15 (Lyon & Hunter-Jones, 2019), 1, 5, 8 and 10 (Scheyvens & Hughes, 2019), and 8 and 11 (Xiao et al., 2018).

By running 'Word frequency' in NVIVO within the 17SDG nodes and excluding the word 'tourism', the most frequent words are displayed in figure 2. Excepting the certain regular appearance of "sustain" and "development", the following frequent word group refers to economic, growth and business, such as "economic', 'product', 'work', 'growth', 'economy', 'poverty, 'consumption', 'businesses', 'investment', 'companies', and 'job'. This confirms the focus of the SDGs on economic development and growth to reduce poverty and provide employment opportunities.


**Figure 2. Frequent Words Related to the SDGs**

Other most frequent words refer to social culture and environmental aspects. For example, social-culture aspects include 'work', 'community, 'poverty', 'social', 'inclusive', 'women', 'gender', 'equality', 'culture', and 'education'. Environmental aspects involve 'environmental', 'energy', 'resource', 'climate', 'water', and 'land'. This result confirms the SDGs' attempt to balance socio-culture, environment and economic development pillars (Fukuda-Parr, 2016; Ruhanen et al., 2019).

### 4.2. Overarching approaches: Critical Thinking and Inclusiveness

The broad range of the SDGs leads to various approaches in tourism research concerning with the SDGs, including critical frameworks (Boluk, Cavaliere, & Higgins-Desbiolles, 2019), inclusive tourism (Scheyvens & Biddulph, 2018), inclusive growth (Bakker, 2019; Bianchi & de Man, 2020), responsible tourism (Burrai, Buda, & Stanford, 2019), triple bottom line (Higgins-Desbiolles & Wijesinghe, 2019), political ecology (Kato, 2019), sharing economy (Gössling & Hall, 2019; Shereni, 2019), feminist perspective (Alarcón & Cole, 2019; Khoo-Lattimore, Yang, & Je, 2019), indigenous approach (Smith & Spencer, 2020; Stumpf & Cheshire, 2019), geographical perspective (Scheyvens, 2018), corporation social responsibility (Hall, 2019; Hatipoglu, Ertuna, & Salman, 2019; Hughes & Scheyvens, 2016), pro-poor tourism (Musavengane, Siakwah, & Leonard, 2019; Scheyvens & Hughes, 2019), community participation (Carius & Job, 2019), network theory (Nguyen, Young, Johnson, & Wearing, 2019), dignity (Winchenbach, Hanna, & Miller, 2019), precariat (Robinson, Martins, Solnet, & Baum, 2019), heterogeneous constructionism (Hall, 2019) and sustainable human resource management (Chams & García-Blandón, 2019; Robinson et al., 2019). Almost all these approaches are covered under two major approaches: critical thinking and inclusiveness.

*Critical thinking*

Critical thinking has been called for tourism research in sustainable development (Bramwell & Lane, 2011, 2014). The failure of the MDGs because of a lack of critical perception stimulates Boluk, Cavaliere, and Higgins-Desbiolles (2019) to consider the SDGs through a critical lens. They conceptualise a critical framework for interrogating the SDGs in tourism, which involves six themes: critical tourism scholarship, gender equality, indigenous perspectives, de-growth and circular economy, governance and planning, and ethical consumption. Their work is presented in the 2019 special issue of the Journal of Sustainable Tourism, advocating critical reflection on the SDGs and challenges that tourism may face to be "a conduit for enhanced sustainability" (Boluk, Cavaliere, & Higgins-Desbiolles, 2019, p. 14). This special issue contributes high quality works based on a critical lens, such as the critical feminism perspective (Khoo-Lattimore et al., 2019), ecohumanities perspective and gender (Kato, 2019),

transformation in education (Cotterell, Hales, Arcodia, & Ferreira, 2019), precarity in tourism employment (Robinson et al., 2019), dignity and tourism employment (Winchenbach et al., 2019), heterogeneous constructionism and managerial ecology (Hall, 2019), critical tourism citizen (Boluk, Cavaliere, & Duffy, 2019) and critical discourse analysis in nature-based tourism (Lyon & Hunter-Jones, 2019; Stumpf & Cheshire, 2019). Critical thinking is also essential in tourism education to ensure the achievement of the SDGs and the success of tourism future (Slocum, Dimitrov, & Webb, 2019).

*Inclusiveness*

It is indebtedness when inclusiveness is an approach receiving significant concern from tourism scholars, as "inclusive" is mentioned explicitly in SDG8 and SDG10 and implicitly in all SDGs (Kato, 2019). Inclusiveness is explored in the notion of inclusive tourism (Scheyvens & Biddulph, 2018), inclusive growth (Bakker, 2019; Bianchi & de Man, 2020), inclusiveness (Siakwah, Musavengane, & Leonard, 2019), feminist perspective (Alarcón & Cole, 2019; Khoo-Lattimore et al., 2019) and indigenous approach (Smith & Spencer, 2020; Stumpf & Cheshire, 2019). Working on inclusiveness, tourism scholars try to advocate "transformative tourism in which marginalised groups are engaged in ethical production or consumption of tourism and the sharing of its benefits" (Scheyvens & Biddulph, 2018, p. 592) and inclusive and productive tourism employment opportunities with a focus on the growth of tourism opportunities, equal access and equal outcome of tourism opportunities (Bakker, 2019). Tourism, to become a driver of the SDGs, must include all the marginalised people, such as the poor, ethnic minorities, women and girls, and those with lack power and or voice (Scheyvens & Biddulph, 2018).

Indeed, inclusiveness prompts tourism scholars to be critical, and conversely, critical thinking offers tourism scholars crucial ways to engage inclusiveness in their work. For example, by taking inclusiveness with a critical lens, tourism scholars explore the power of women's knowledge and gender representation in tourism knowledge production, which promotes gender equality and the role of women (Kato, 2019; Khoo-Lattimore et al., 2019). Robinson et al. (2019) critically examine tourism and employment and reveal the contribution of tourism to sustaining precarious employment, which realises decent work of the SDG8.

### 4.3. Key Themes

Various themes emerged under the approaches mentioned above, in which the six themes receiving the most concern are governance, the contribution of the private sector, stakeholder involvement, gender equality, education, and employment. These themes are synthesised as follows.

*Governance*

Both the UNWTO and tourism scholars express that governance is essential for tourism to achieve the SDGs, as governance fosters broad involvement, partnerships, and collaboration. As a key requirement to achieve sustainable tourism development (Bramwell & Lane, 2011), tourism governance includes the engagement of multi-stakeholders in decision-making (Bradford, 2015). Governance can shape future tourism in an equitable, inclusive, justice and ecologically compatible form, which, indeed, is sustainable (Boluk, Cavaliere, & Higgins-Desbiolles, 2019; Siakwah et al., 2019). However, Hall (2019) calls for a broad consideration of collaboration beyond the public-private partnerships emphasised by the UNWTO and UNDP (2017). Bowen et al. (2017) argue three governance challenges for the implementation of the SDGs: collective actions, trade-offs and accountability. Collective action for the SDGs demands new ways of collaboration that involve cross-sector actors from multiple levels, particularly poor and marginalised groups, in decision-making (Bowen et al., 2017; Bramwell et al., 2017). Trade-offs between and within the SDGs challenge governors to decide what targets are prioritised in specific time and context (Bowen et al., 2017; Gössling & Hall, 2019). The mechanism for accountability needs to ensure governments and other actors fulfil their commitments (Bowen et al., 2017). Thus, governance for the SDGs requires different systems that combine governance styles (Meuleman & Niestroy, 2015), engage the community and involve international actors, governments, and private sectors (Siakwah et al., 2019), adhere to systemic change and new ways of collaboration across economy sectors (Bramwell et al., 2017), and suit socio-culture, economic, and environment context (Bowen et al., 2017; Gössling & Hall, 2019).

*Private Sector*

The UNWTO has great attention to the role of private sectors and suggests various ways for the private sectors to become sustainable development actors (UNWTO & UNDP, 2017). Tourism scholars also pay

significant attention to the contribution of private tourism sectors in general (Antonaras, 2018; Gössling & Hall, 2019; Hatipoglu et al., 2019; Nair & McLeod, 2020; Scheyvens et al., 2016; Scheyvens & Hughes, 2019), or in specific sectors such as tourism accommodations (Gössling & Hall, 2019; Raub & Martin-Rios, 2019; Shereni, 2019), tour operators (Milwood, 2020), restaurants and café (Higgins-Desbiolles & Wijesinghe, 2019), and private destination management organisations (Dube & Nhamo, 2020). Private sectors have the ability in terms of "innovation, responsiveness, efficiency and provision of specific skills and resources" to pursue the SDGs (Scheyvens et al., 2016, p. 372). For example, Antonaras (2018) reveals that in the context of Cyprus, the tourism business sectors can engage in the SDG1, 2, 3, 7, 8 and 13. Scheyvens and Hughes (2019) assert the key contribution of private sectors to SDG1 (poverty alleviation) by ensuring workers' well-being, using local suppliers, and funding social services. However, private sectors are centrally driven by business growth and economic development targets, which challenge their contribution to the triple pillars of the goals (Scheyvens et al., 2016).

Sharing economy (Gössling & Hall, 2019) and corporate social responsibility (CSR) (Hall, 2019; Hatipoglu et al., 2019; Hughes & Scheyvens, 2016) are suggested for private tourism sectors to align their strategy with the SDGs. The consideration of sharing economy in relation to the SDGs is taken in accommodation businesses and compared with the collaborative economy (Gössling & Hall, 2019; Shereni, 2019). While the accommodations following sharing economy show more commitments to socio-culture sustainability, those with a collaborative economy provide more job opportunities. CSR offers more promises for all types of tourism businesses to contribute to attaining the SDGs, as CSR targets at education, work, community engagement, gender and social equality (Hatipoglu et al., 2019; Scheyvens & Hughes, 2019). However, many CSR policies are often short-term (Scheyvens & Hughes, 2019) or questioned whether they lead to sustainable development (Hatipoglu et al., 2019). Scheyvens and Hughes (2019) suggest that CSR policies should align with government policy to support social targets. Hatipoglu et al. (2019) developed a CSR program targeting to create shared value for society and support sustainable development.

*Stakeholder Involvement*

Sustainable development research asserts a fundamental importance of multiple stakeholders in the success of sustainable tourism development. Some SDG-studies concern the involvement of broad stakeholders in realising the SDGs through their focus on inclusive tourism (Scheyvens & Biddulph, 2018), strategic framework (Kimbu & Tichaawa, 2018), and networking (Nguyen, Young, & Johnson, 2019). Indeed, a range of research provides evidence of the contribution of tourism to advocating inclusive partnerships and collaborations (SDG17) between stakeholders to achieve all the SDGs (Antonaras, 2018; Higgins-Desbiolles & Wijesinghe, 2019; Nguyen, Johnson, & Young, 2022; Smith & Spencer, 2020). However, the processes of converging stakeholders in partnerships and collaborations toward the goals are absent in these studies. Nguyen, Young, Johnson, et al. (2019) propose a conceptual framework based on network theory and stakeholder theory which advocate networking and stakeholder involvement to attain the SDGs, yet, this framework needs empirical examination.

Furthermore, despite a significant concern on the contribution of private sectors, the tourism research concerning the SDGs has little attention to other stakeholders. The role of the UNWTO is undoubtedly expressed through its attempt to build guidelines, coordinate public and private sectors, and lead global tourism toward the attainment of the SDGs (Perdomo, 2016; UNWTO & UNDP, 2017). Although the attention of the UNWTO to development and growth is critiqued by tourism scholars, the UNWTO and its members commit to promoting tourism as a driver for economic growth, inclusive development and environmental preservation. Governments are claimed for the role in creating an environment for private sectors to pursue sustainability goals (Scheyvens & Hughes, 2019). Role and contribution of other stakeholders, although fewer concerned, are also considered, such as community involvement (Carius & Job, 2019) and marginalised people (Scheyvens & Biddulph, 2018).

*Gender Equality*

The SDG research concerning gender equality, on the one hand, recognises the negative impacts that tourism brings to women; on the other hand, it explores the vital roles of women in tourism and the achievement

of the SDGs (Boluk, Cavaliere, & Higgins-Desbiolles, 2019). Positioning gender equality as a cornerstone of sustainability to promote all SDGs (Kato, 2019), several tourism scholars express that the UNWTO framework for the SDGs has not significantly considered gender equality as a key element and neglected the role of women and gender equality in the achievement of the other SDGs (Alarcón & Cole, 2019; Kato, 2019; Khoo-Lattimore et al., 2019). Scheyvens (2018) strongly argues that while the UNWTO satisfies with their ideal that tourism empowers women through paid employment, they do not realise the disadvantages structurally that women face when working within this sector. While gender equality is directly included in SDG5, Alarcón and Cole (2019) criticise that it should not exist as a standalone goal. Still, they should be integrated as a mainstream throughout the tourism system and the other SDGs. These researchers provide an example of how gender equality links with tourism, the SDG6 (clean water and sanitation) and SDG8 (economic growth and decent work) (Alarcón & Cole, 2019). Scheyvens (2018) believes that linking SDG5 and SDG8 can reveal the issues related to threats to female labours, such as sexual harassment and the gender division of labour in the hospitality sector.

*Education*

Education is a key focus in tourism research concerning the SDGs, as education, included in SDG4, stimulates transitions to sustainability (Boluk, Cavaliere, & Higgins-Desbiolles, 2019). Tourism scholars conceptualise sustainability pedagogy towards critical and reflective thinking to advocate SDG4, ensure stronger sustainable tourism curricula (Cotterell et al., 2019) and empower future decision-makers as Critical Tourism Citizens (Boluk, Cavaliere, & Duffy, 2019). The role of tourism educators is realised in relation to building up future tourism leaders and decision-makers with a strong sustainability mindset, critical and system thinking and ethical and environmentally responsible acting through learning and teaching embedded in curricula (Cotterell et al., 2019; Slocum et al., 2019). Developing curricula integrating the concepts included within the SDGs is essential to ensure that the goals become sustainable by themselves and relate to the future of tourism (Slocum et al., 2019). More importantly, universities should be places that encourage critical, holistic,

system thinking, environmental and sustainability skill, communication of ideas and engage industry skills in the classroom to foster sustainable business practices, which assists students in integrating the SDGs in their future employment (Boluk, Cavaliere, & Duffy, 2019; Cotterell et al., 2019; Slocum et al., 2019).

*Employment*

Tourism is a significant employer of women, youth and the local population, including indigenous communities (Robinson et al., 2019; Smith & Spencer, 2020). Tourism scholars mostly align tourism with SDG8. Employment is one of the most significant themes of tourism research concerning the SDGs, which uses a critical lens and focuses on marginalised groups such as women and the precariat. Winchenbach et al. (2019) examine the value of dignity in tourism employment and reveal that dignified work that focuses on individual value and contribution of staff contributes to the SDG8. Robinson et al. (2019) found much precarious nature of tourism employment, but, tourism, conversely, can contribute to sustaining precarity employment, which contributes to the achievement of the SDG1, 3, 4, 5, 8, 10 and 16. Sustainable human resource management is suggested for the adoption of the SDGs (Chams & García-Blandón, 2019; Robinson et al., 2019), which is closely related to social responsibility, human resources and CSR (Robinson et al., 2019). Furthermore, as aforementioned, tourism education and employment link to each other, as educating under a sustainable and critical tourism curricula is the best preparation for students to integrate the SDGs and succeed in their future careers (Slocum et al., 2019).

## 5. CONCLUSION

By reviewing the scholarly academic papers relating tourism to the SDGs, this paper asserts that tourism scholars, although question the SDGs and the contribution of tourism to the SDGs, they accept the goals and are attempting to transform tourism towards the SDGs following critical frameworks. However, tourism scholars emphasise broad considerations of the SDGs beyond the UNWTO's focus on tourism growth, new ways of collaboration beyond tourism sectors and inherent public-private partnerships, flexible governance structures involving multiple actors

from multiple levels and multiple sectors, critical tourism curricula, and substantive tackle of gender equality. Tourism towards the SDGs should not adhere to economic development and tourist growth; instead, simultaneous consideration of social, cultural, and environmental aspects is needed to include all people in all nations; even a tourism de-growth should be considered to balance sustainability pillars and make tourism sustainably in the future (Boluk, Cavaliere, & Higgins-Desbiolles, 2019; Sharpley, 2020).

This paper recognises a range of research gaps that future research can focus on. First, tourism research concerning the SDGs dominantly focuses on exploring how tourism can contribute to the SDGs. The study examining whether the SDGs can be effective indicators to lead tourism towards sustainable development is very scarce. Many countries/destinations have not yet aligned with the SDGs or do not even acknowledge them. Thus, it is early to measure the role of the SDGs in sustainable tourism development. Second, while multiple stakeholders are needed to achieve the SDGs, the literature predominantly examines the contribution of the private sector. There needs more research on the role of other stakeholders, stakeholder involvement and collaboration in collective actions aiming at the SDGs. The third is a call to translate these global and universal goals into the local level and other levels, attaching to the specific context of destinations (Raub & Martin-Rios, 2019). There is no universal way for all tourism sectors and destinations to pursue the SDGs; instead a dual consideration of nature within relevant socio-economic processes is needed when studying the SDGs in tourism (Hall, 2019). Fourth, tourism scholars express the need for further research on transformations (Higham & Miller, 2018) about education (Cotterell et al., 2019) and production (Gössling & Hall, 2019). Finally, critical thinking is continuously required to explore new ways in power redistribution, equity achievement, economic paradigm, biodiversity and culture conservation, which assist inclusiveness in tourism to attain the SDGs (Boluk, Cavaliere, & Higgins-Desbiolles, 2019).

In conclusion, by reviewing the SDGs papers in tourism literature, this paper provides a glance at how tourism scholars recognise the SDGs. The Covid-19 pandemic has challenged the success of SDGs by 2030 in all sectors globally. Tourism can stimulate the post-pandemic recovery

for all sectors due to its interdisciplinary. Tourism scholars concerning the SDGs express the importance of critical thinking, transformation, and business-not-as-usual (Gössling et al., 2020; Hall et al., 2020), although many businesses and politicians expect to return tourism and the economy to normal as soon as possible (Hall et al., 2020). The Covid19 pandemic, actually, is a unique opportunity for tourism to transform into sustainable development (Ioannides & Gyimóthy, 2020; Niewiadomski, 2020) and the SDGs (Gössling et al., 2020).

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# TRADE RESILIENCE AND GOVERNMENT RESPONSE DURING COVID-19 PANDEMIC: A STUDY IN VIETNAM

**Le My Linh**[1]

***Abstract:*** *This paper aims to study the relationship between the trade resilience and government response of Vietnam in the context of Covid-19 pandemic. The study employs secondary data during the period 2019 - 2022 collected from the WTO Stats portal and Oxford Covid-19 government response tracker's database inventory to measure Vietnam's trade resilience and government response, respectively. Then, a trade resilience prediction model based on linear regression is established. The results demonstrate a positive correlation between the two study factors, which can provide reference value for policymakers and economists to grasp the potential trend of Vietnam's trade resilience considering that country's government response.*

***Keywords:*** *Covid-19, government response, linear regression, trade resilience.*

## 1. INTRODUCTION

The world and Vietnam are currently living in the third year of the Covid-19 pandemic, also known as the fourth wave of this health disaster. In the past two years, the pandemic has raged across countries around the world and has profoundly impacted all aspects of life from economy to politics and society (La et al., 2020). All over the world, the fast spread and severity of the novel coronavirus (SARS-CoV-2) has urged WTO to change its declaration from a "Public Health Emergency of International Concern (PHEIC)" on 30 January 2020 to a "Pandemic" on 11 March 2020 (World Health Organization, 2020).

As of June 30th 2022, the Covid-19 outbreak in Vietnam can be divided into four waves according to the Ministry of Health (2022). Specific timeline, number of cases, notable events and selected study period of each wave for this paper are concisely presented in Table 1.

[1] Da Nang University of Economics. Email: linhlm@due.edu.vn

In spite of being under-resourced, La et al. (2020)'s study revealed the way Vietnam expressed its political readiness to fight against the public health crisis since the earliest days. During the very first few months of Covid-19 pandemic, Vietnam was exposed to a great risk of cross-border infections owing to its long border and considerable number of commercial transactions with its northern neighbor - China (B. X. Tran et al., 2020). In response to the first case of Covid-19, the Prime Minister Nguyen Xuan Phuc announced the first diagnostic and management guidelines for the global health crisis (Van Tan, 2021). Since then, the Vietnamese Government's timely response to the Covid-19 contagion has constantly received worldwide appreciation (La et al., 2020). During the four waves, the Government conducted a series of actions in every aspects, namely the quick decision to "tighten" borders, revoke airline permits and restrict visas (Tuoi Tre, 2020), enacting regulations on concentrated quarantine 14 days for all entrants entering Vietnam, implementing social distancing within 15 days (VnExpress, 2020), or conducting the Covid-19 vaccination campaign, which is considered the largest vaccination campaign ever in Vietnam's history (VnExpress, 2021).

**Table 1. Overview of the Spread of the Covid-19 Pandemic in Vietnam**

| Timeline | Number of cases | Notable events | Study period in this paper |
|---|---|---|---|
| Wave 1 (23/01/2020 - 24/07/2020) | 415 cases | The first case appeared in Ho Chi Minh city. | February 2020 - July 2020 |
| Wave 2 (25/07/2020 - 27/01/2021) | 1,136 cases | The outbreak has the highest occurrence in Da Nang. | August 2020 - January 2021 |
| Wave 3 (28/01/2021 - 26/04/2021) | 1,301 cases | The outbreak was mainly in Hai Duong. | February 2021 - April 2021 |
| Wave 4 (27/04/2021 - 30/06/2021) | 10,743,618 cases | The outbreak has the appearance of Delta and Omicron variants, breaking out and spreading throughout the country; highest peak in Ho Chi Minh City. | May 2021 - May 2022 |

*Source: Authors' compilation based on data from Ministry of Health (2022).*

Tran et al. (2021) proposed that the destructive consequences of Covid-19 could undermine the achievements that Vietnam has been trying to achieve over the past two decades. Therefore, the collection of

contemporary data to assess and analyze the impact on economic recovery is extremely important for policymakers and development partners to support Vietnam in making timely and effective response policies in the short and long term. Likewise, Mena et al. (2022) contends that this health crisis also brings about a chance for ecologists to closely evaluate the trade resilience in both national and international scope than ever despite the severe damage it yielded. Within this context, the government response has emerged as one of the most notable factors that can make an impact on one nation's trade resilience. At the international scope, the government response was often taken into consideration simultaneously with other elements and perceived as negatively affecting trade resilience (Mena et al., 2022). Nevertheless, the influence of the government response of Vietnam on this country's trade resilience has not been confirmed yet. To address this question, the paper aims to study the relationship between the trade resilience and government response of Vietnam in the context of Covid-19 pandemic. The findings of this study can provide reference value for policymakers and economists to grasp the potential trend of Vietnam's trade resilience considering that country's government response.

The paper is structured as follows. Section 2 assesses related literature review. Methodology and data collection are presented in Section 3. Section 4 summarises empirical results and further discussion.

## 2. LITERATURE REVIEW

The Covid-19 pandemic has caused major disruptions in the business world and undermined international trade (Verbeke & Yuan, 2021). Accordingly, the merchandise trade value of countries over the world has been severely characterized amid the Covid-19 outbreak. Although most industries have reopened, not all industries have returned to the way they were before the Covid-19 phenomenon (A. Q. Tran et al., 2021). Despite the ambiguity and instability of coronavirus disease on global business, these effects have not been homogeneous across countries. Some countries were disproportionately hard hit by the global trade disruptions, while others managed to withstand the turmoil relatively well. It is the resilience that distinguishes nation from nation when it comes to a complex and uncertain environment (Mena et al., 2022).

Resilience has been defined as a parameter to evaluate a country's ability to withstand detrimental incidents and related costs (Sondermann, 2018) or a system's ability to cope with a disruption. Specifically, the term can be flexibly adopted at multiple extents, ranging from personal level (Luthar et al., 2000) to larger scope such as societies (Cacioppo et al., 2011). Literature has proved that resilience needs to meet two features, responsiveness and robustness. While the former mentions the state when it rebounds to its initial condition or even reaches a better circumstance, the latter refers to the capability of the mechanism itself to keep operating its functions no matter of internal or external interruption (Sondermann, 2018).

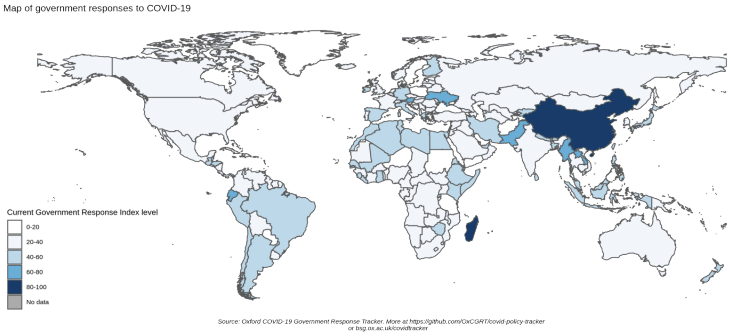


**Figure 1: Map of Government Response to Covid-19 (2021)**

*Source: Hale et al. (2021).*

It is obvious that single national *government responses* to the context of Covid-19 pandemic in distinct ways, which can be seen in Figure 1. In fact, most of them are non-pharmaceutical interventions, which turned out to be the key weapons against the health disaster (Perra, 2021). Meanwhile, the other diverse methods range from stringent containment measures (i.e., reducing mobility and creating social distancing such as school and workplace closures, cancellation of public events and international travel bans) (Deb et al., 2022) to public health measures (contact tracing) (Hinch et al., 2021) and economic response (income support, debt relief for households or international support) (Hale, Angrist, et al., 2020).

One of the most challenging hurdles countries need to overcome is the trade-offs between desirable scenarios, whether a government can tighten the economy in order to keep its residents safe from the contagious outbreak. However, as all countries are converged in their shared global

trading system, one's decision will undoubtedly affect the others. Hence, it is pivotal to understand the way government response will influence international trade in different countries (Mena et al., 2022). In other words, the heterogeneity in the health responses across Governments provides a good natural experiment to observe the relationship between a nation's Government response index and its trade resilience.

Both trade resilience and government response have still been an appealing source of investigation for both domestic and foreign scholars. At the worldwide scope, Mena et al. (2022) recently figured out key factors that influence the trade resilience amidst the Covid-19 pandemic. According to their findings, economic and social globalization, logistics performance, healthcare preparedness and high income level, performed a resoundingly good contribution in fostering trade resilience. Meanwhile, a strong government response coupled with a high number of deaths are negative factors to the country's trade resilience. Within the scope of Vietnam, the majority of Covid-19 related research predominantly concentrated on the clinical facets (Huynh et al., 2021; Thanh et al., 2020), the government's action and policy implementation (Le et al., 2021; T. P. T. Tran et al., 2020), as well as the pandemic's influence on different aspects of society (A. Q. Tran et al., 2021), and economy (Anh & Gan, 2020). To the best of the author's understanding, apart from a study about the causal effect of lockdown on stock market performance, papers studying the intersection of Government response and economics, particularly the trade resilience aspect, have still been very limited. As a result, there was a subtle call to action for scholars to dig into national scale, to reveal "each country's Covid-19 story" (Mena et al., 2022).

## 3. METHODS

The trade resilience of Vietnam in a given month is calculated based on its total exports and imports (in accordance with Vietnam's 2019 GDP) and the Year-on-Year percentage change on a monthly basis (Mena et al., 2022). The data for analysis is completely collected from the WTO Stats portal (WTO, 2021). As the paper aims to study the whole period of Covid-19 pandemic in Vietnam, monthly data from February 2020 to May 2022 was downloaded.

In order to evaluate the action that different governments take upon the context of SARS-CoV-2 virus outbreak, the University of Oxford developed the Government Response Index (Hale, Webster, et al., 2020). The indicator receives the value from 1 to 100, representing the strong or weak reaction of the policymakers based on the measures they enacted. Thereby, if a country achieves a score of 18, its authority probably took the pandemic not seriously and still let the country open and vice versa. However, this index cannot reveal if a national government's response works or not. (Mena et al., 2022). The data for Vietnam's Government response is gathered from Oxford Covid-19 Government Response Tracker by Hale, Webster, et al., (2020), from February 2020 to May 2022.

A simple linear regression model will be fitted to investigate the relationship between the trade resilience and government response of Vietnam in the context of Covid-19 pandemic. This is because regression analysis is a statistical technique appropriate for modeling the relationship between factors (Montgomery et al., 2021). The simple linear regression model is illustrated by an equation of the form (Gujarati, 2021):

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i \qquad \text{(Eq1)}$$

Where $y_i$ : the $i$ measurement of the dependent variable,

$\beta_0$ : the intercept,

$\beta_1$ : the slope,

$x_i$ : the $i$ measurement of the independent variable,

$\varepsilon_i$ : error term.

The linear regression equation will be solved using STATA 14.0 as an analytical tool.

## 4. RESULTS AND DISCUSSION

Figure 2 shows the development of Vietnam's trade resilience and government response during four waves of Covid-19 on the basis of processed data (see Appendix A).

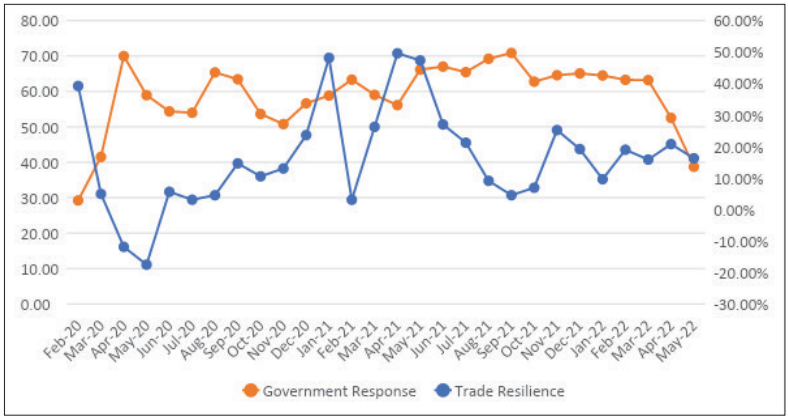


**Figure 2. Trade Resilience and Government Response of Vietnam During Four waves of Covid-19 (02/2020 - 05/2022)**

*Source: Authors' computation based on database.*

Overall, the two factors fluctuated considerably as well as appeared to follow perplexing and unrelated patterns during the study period. In detail, trade resilience received the largest value of 49.63% in April 2021 and the smallest value of -17.54% in May 2020. Noticeably, it was even below zero in April 2020 and May 2020. Meanwhile, the index of government response reached its peak at 70.88 in September 2021 and lowered to its bottom at 29.20 in February 2020, which is reasonable since there were not many infected cases at the beginning of the epidemic in Vietnam.

As each wave is characterized by different conditions, its average value is calculated and is used for conducting the simple linear regression model. The mean value of each stage in terms of trade resilience and government response is displayed in Table 2.

**Table 2. Average value of Trade Resilience and Government Response of Vietnam During Four Waves of Covid-19 (02/2020 - 05/2022)**

| Wave | Trade Resilience | Government Response |
|---|---|---|
| Wave 1 (February 2020 - July 2020) | 3.91% | 51.34 |
| Wave 2 (August 2020 - January 2021) | 19.08% | 57.37 |
| Wave 3 (February 2021 - April 2021) | 26.31% | 61.02 |
| Wave 4 (May 2021 - May 2022) | 18.62% | 58.30 |

*Source: Authors' computation based on database.*

A new chart to illustrate the two factors' average value of each Covid-19 wave in Vietnam is revealed below in Figure 3. In this way, the values of trade resilience and government response of Vietnam express a more similar trend.

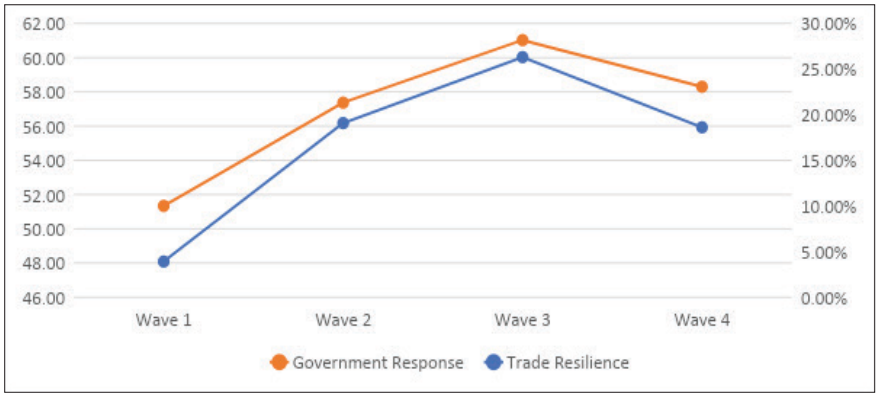


**Figure 3. Average value of Trade Resilience and Government Response of Vietnam During Four Waves of Covid-19 (02/2020 - 05/2022)**

*Source: Authors' computation based on database.*

Consequently, the linear regression equation Eq 1 is solved using STATA 14.0. The results are in Table 3.

**Table 3. Linear regression result for average value of Trade Resilience and Government Response of Vietnam During Four Waves of Covid-19 (02/2020 - 05/2022)**

```
. regress TradeResilience GovernmentResponse, beta

      Source |       SS       df       MS      Number of obs   =         4
-------------+------------------------------   F(1, 2)         =    154.68
       Model |  261.591047     1  261.591047   Prob > F        =    0.0064
    Residual |  3.38235339     2   1.6911767   R-squared       =    0.9872
-------------+------------------------------   Adj R-squared   =    0.9809
       Total |    264.9734     3  88.3244667   Root MSE        =    1.3005

------------------------------------------------------------------------------
TradeResilience |      Coef.   Std. Err.      t    P>|t|                 Beta
----------------+-------------------------------------------------------------
GovernmentResp~e |   2.286799   .1838701    12.44   0.006            .9935971
           _cons |  -113.3847   10.50212   -10.80   0.008                   .
------------------------------------------------------------------------------
```

*Source: Authors' computation based on database.*

According to results shown in Table 3, the quantitative relationship between Vietnam's trade resilience and government response could be express as:

$$y = -113.385 + 2.287x \quad \text{(Eq2)}$$

The statistics mean that there exists a positive correlation between Vietnam's trade resilience and government response. Distinctly, this finding is not in line with the previous conclusion by Mena et al. (2022), perhaps due to the fact that they take into consideration the whole international trading system with more various factors. Implementing the Eq 2 into practice, the predicted value of Trade Resilience in Vietnam and the error value are depicted in Table 4.

**Table 4. Comparison of Trade Resilience's actual and predicted results of Vietnam during four waves of Covid-19 (02/2020 - 05/2022)**

| | Government Response | Trade Resilience (Actual) | Trade Resilience (Predicted) | Error value |
|---|---|---|---|---|
| Wave 1 | 51.34 | 3.91% | 4.03% | 0.11% |
| Wave 2 | 57.37 | 19.08% | 17.82% | -1.26% |
| Wave 3 | 61.02 | 26.31% | 26.18% | -0.13% |
| Wave 4 | 58.30 | 18.62% | 19.95% | 1.33% |

*Source: Authors' computation based on database.*

As it can be observed from Table 4, the error value is quite small and seems insignificant.

Generally, the method of this study could provide a reference value for policymakers and economists to grasp the potential trend of Vietnam's trade resilience considering that country's government response.

The paper, though in its preliminary form and might be varied according to the epidemic's new condition, may ultimately be pragmatic for other nations and territories in better understanding the relationship between trade resilience and the Government response itself. The case of Vietnam provides valuable lessons for forecasting one country's future trade resilience under the turbulent context of Covid-19 pandemic in the upcoming years based on the data of the Government response index.

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**Appendix A: Trade Resilience and Government Response of Vietnam during four waves of Covid-19 (02/2020 - 05/2022) (monthly)**

| Wave | Time | Trade Resilience | Government Response |
|---|---|---|---|
| Wave 1 | Feb-20 | 39.25% | 29.20 |
| | Mar-20 | 4.94% | 41.51 |
| | Apr-20 | -11.89% | 69.99 |
| | May-20 | -17.54% | 58.96 |
| | Jun-20 | 5.62% | 54.37 |
| | Jul-20 | 3.09% | 54.00 |
| Wave 2 | Aug-20 | 4.52% | 65.39 |
| | Sep-20 | 14.65% | 63.45 |
| | Oct-20 | 10.52% | 53.65 |
| | Nov-20 | 13.02% | 50.78 |
| | Dec-20 | 23.62% | 56.64 |
| | Jan-21 | 48.17% | 58.84 |
| Wave 3 | Feb-21 | 3.08% | 63.34 |
| | Mar-21 | 26.24% | 59.05 |
| | Apr-21 | 49.63% | 56.14 |
| Wave 4 | May-21 | 47.38% | 66.17 |
| | Jun-21 | 27.02% | 67.03 |
| | Jul-21 | 21.21% | 65.47 |
| | Aug-21 | 9.10% | 69.25 |
| | Sep-21 | 4.53% | 70.88 |
| | Oct-21 | 6.91% | 62.78 |
| | Nov-21 | 25.23% | 64.59 |
| | Dec-21 | 19.18% | 65.10 |
| | Jan-22 | 9.61% | 64.51 |
| | Feb-22 | 18.98% | 63.28 |
| | Mar-22 | 15.85% | 63.20 |
| | Apr-22 | 20.77% | 52.54 |
| | May-22 | 16.27% | 38.72 |

*Source: Authors' computation based on database.*

# EXCHANGE RATE MISALIGNMENT: AN APPLICATION OF THE BEHAVIORAL EQUILIBRIUM EXCHANGE RATE TO VIETNAM

**Nguyen Ngoc Dinh**[1]

***Abstract****: The impact of exchange rate misalignment on economic growth has become an important research topic in recent years in many different countries. Especially in the context of global economic turmoil, trading conflicts between China and the United States, many countries have raised interest rates to combat the rising inflation. The governments try to find suitable exchange rate policies to help stabilize the inflation and develop their economies. This paper aims to analyze the misalignment of real effective exchange rate in Vietnam by using the Behavioral equilibrium exchange rate and purchasing power parity model.*

***Keywords****: Currency, exchange rate misalignment, real exchange rate.*

[1] Faculty of Economics - National Economics University, Hanoi, Vietnam. Email: dinhnn@neu.edu.vn

# IMPACT OF FISCAL DOMINANCE ON INFLATION IN VIETNAM: EVIDENCE FROM THE PERIOD 2001-2020

**Than Thi Vi Linh[2], Le Ha Thu[2], Nguyen Thanh Nam[2], Nguyen Thi Thai Hung[1]**

**Abstract:** *In emerging economies including Vietnam, fiscal policy is expected to be expansionary to promote economic growth. However, expansionary fiscal policy can be seen as the determinant of high inflation in emerging economies. Fiscal dominance is the situation where expansionary fiscal policy dominates monetary policy and causes high inflation. This paper employs a VAR model with four variables including inflation rate, budget deficit, government internal debt and money supply to investigate whether there is fiscal dominance in Vietnam and the determinants of inflation fluctuation in Vietnam from 2001 to 2020. The findings are: (1) there is no significant evidence of fiscal dominance in Vietnam, (2) both fiscal and monetary policies have an impact on inflation of Vietnam, and (3) among all, lagged inflation rate and domestic debt are found to be important determinants of inflation fluctuation in Vietnam.*

**Keywords***: inflation, monetary policy, fiscal dominance, Vietnam*

[1] Banking Academy, Hanoi

# RESILIENT TACTICS FOR CREATIVE ECONOMY GROWTH BASED ON DIGITAL TRANSFORMATION IN DEVELOPING COUNTRIES

**Cao Hai Van**[1]

***Abstract:*** *The creative industry, which makes up over 6% of the global GDP, is a significant driver of economic growth. In the past several years, particularly in the context of Covid-19, digital creative trade has grown significantly. Physical commodities are being replaced by digital material in this sector, such as music, books, and video games. The share of digital collections is the segment with the fastest growth in copyright revenues. Developing nations' involvement in the sector seems to be growing, despite the lack of data. Developing nations should have resilient strategies to support a shift from the typical low value-added, stand-alone practitioner industry model to a strategic collaborative approach that facilitates higher levels of creative and digital entrepreneurship in order to reap the potential benefits of the digital creative economy in the context of uncertainty. The government's involvement in business support services, such as incubators, innovation laboratories, market incubators, cluster development, and market development programs, as well as a stronger legal and institutional framework to strengthen leverage and monetize copyright are required.*

***Keywords:*** *Creative economy, digital creative economy, economic resilience, resilient tactics.*

[1] Economics Faculty, Banking Academy, Hanoi, Vietnam

# THE IMPACT OF LAND FRAGMENTATION IN RICE PRODUCTION ON HOUSEHOLD FOOD INSECURITY IN VIETNAM

**Nguyen Thai Phan[1], Ji-Yong Lee[2], Nguyen Duc Kien[1]**

***Abstract***: *The objective of this study is to examine the impact of land fragmentation in rice production on household food insecurity in Vietnam. This study provides the first evidence on the effect of land fragmentation on household food insecurity in rice production. This study uses a relatively rich panel dataset of rice farming households across different regions from the Vietnam Access to Resources Household Survey (VARHS) 2012, 2014, and 2016. The research applies the ordered probit model to identify land fragmentation and other factors affecting household food insecurity at different food insecurity levels. Findings indicate that land fragmentation and rice seed types are positively correlated with household food insecurity. Importantly, the odds of an increase of 1% fragmentation land index increase the probability of household food insecurity at a very high level of 4.79% after controlling for unobserved heterogeneity. Other factors such as total cultivated area, access to credit, and household savings help reduce household food insecurity. These findings suggest that the government needs to foster the process of consolidating fragmented rice plots to help households produce efficiently and reduce food insecurity for their families. In addition, other approaches such as increasing farm size for each rice farmer and access to credit can increase the probability of food security for rural households in Vietnam.*

***Keywords***: *Food insecurity, land fragmentation, ordered probit, Vietnam.*

[1] Faculty of Economics and Development Studies, University of Economics, Hue University

[2] Department of Agricultural and Resource Economics, Kangwon National University, Korea.

# Theme 3
# Finance

# BANKIBANKING VOLATILITY, ARE THERE ANY DIFFERENCES ACROSS INCOME GROUPS AND ACROSS REGIONS?

**Quoc Thanh Tran[1,*], Xuan Vinh Vo[2]**

***Abstract:*** *The relationship between economic growth and bank volatility is unclear across countries in different income groups and in different regions for low- and middle-income countries. By using GMM techniques for dynamic panel data to analyze the bank-growth nexus for 19 low- and middle-income countries and for five subsamples from 2003 to 2019. We find that the above relationship may not exist when all countries combined. When we study countries across income groups, this connection is marginally significant negative. When we study countries across regions, bank-growth link and the impacts of country characteristics and financial development on this link vary with the legal frameworks, institutional structure. Surprisingly, we find significant links mostly for South Asian and East Asian countries.*

***Keywords****: Banking volatility, income groups, regions.*

## 1. INTRODUCTION

Banking sector promotes economic activities through various channels. A well-functioning banking system facilitates infrastructure for other sectors to run smoothly in the form of loan, so banking crises will cause economic slowdown. This role is more profound in low-income countries (Kim and Lin, 2013). Mihail and Jordan (2014)'s paper has also proved the bank-growth connection when they use bank credit to the private sector, interest rate, and ratio of quasi money as banking sector development indicators.

[1] Department of General Education, University of Labour and Social Affairs (Campus II), Ho Chi Minh City, Vietnam.

* Corresponding author. Email: thanh.tq@vnp.edu.vn

[2] Institute of Business Research, University of Economics Ho Chi Minh City, Vietnam

Moreover, share prices are always being traded at their fair value incorporating and reflecting all relevant information in the market. Stock returns of banking industry reflect bank performance. Banks' expected future cash flows are reflected in the present stock price which depends on the efficiency of loan projects. When the financial prospects of loan borrowers get depressed, these affect loan portfolio quality and bank stock price. Moshirian and Wu (2012)'s paper proves that banking industry volatility reflects a great deal of information on economic growth through various channels including country-specific characteristics and financial development characteristics for developed markets and for emerging markets. The above relationships remain a controversial question for frontier markets and across countries in differnt regions.

Moshirian and Wu (2012)'s paper indicates the impact of country and institutional characteristics on bank-growth nexus. However, our choices of these characteristics are different than Moshirian and Wu (2012)'s paper. Firstly, insider trading laws have some flaws when being applied in the model of banking volatility and economic growth. Since judicial system is one of the most important elements for private sector development, but basic facilities contributing to an efficient judicial system are almost missing in low-income and middle-income countries. History has shown that legal regulations occur behind adverse business behaviors in these countries. Besides, in the banking sector, laws against inside trading are usually general and they can be predicted in silhouette. Because of these drawbacks, insider trading law is not proposed in our models. Secondly, the disclosure of the non-financial and financial information improves market liquidity, reduces the level of information asymmetry and brings benefits to firms and investors. Surprisingly, in recent studies, most positive information is announced to public, but negative one is coved and the transparency is used as mean of advertising (Kundeliene & Leitoniene, 2016) so that we do not employ bank accounting disclosure in this study. Thirdly, banking crisis often causes fiscal problems. Government expenditures for economic recovery have grown enormously during crisis time. This cause a rocket in government debts and asset price buddle simultaneously. Therefore, sustainable development requires commitments to sound economic policies and the effectiveness of regulations. Cornett, et al (2010) and Naceur and Ghazouani (2007) prove that institutional

frameworks (i.e. country attributes and financial development indicators) have strong influence on banking operations. Regulations and supervision incentive bank operate effectively to achieve financial goals. Economic governance shapes banking activities, performance of the stock market and affects stock liquidity. This will further increase output growth. However, this characteristic has not employed in the model of banking volatility and economic growth. Thus, government effectiveness is studied in our research rather than banking crisis in the paper of Moshirian and Wu (2012). Furthermore, the effects of political institutions on growth are significant and large in low-income countries as oppose to in rich countries (Pereira, et al 2010). State-owned banks based in developing economies almost have lower profitability and higher costs than private ones. Paper of La Porta, et al (2002) also find that higher government ownership of banks, interventionist, inefficient governments and backward financial systems are almost typical features of low-income countries. Therefore, to evaluate how characteristics of institutional economics affect performance of banks in middle income economies and in low income economies, Kaufmann (2013)'s Six Worldwide Governance Indicators (WGI) are used in our models rather than the variable (government ownership of banks) in the paper of Moshirian and Wu (2012).

Firms and households receive loans from banks and repay the loans with interest. These relationships are private and independent of the information about all public companies listed on stock market. The volatility of the bank relates to the variation of stock returns of the banking industry, which refers to each individual bank. Whereas stock market volatility refers to the information being reflected in market excess returns, which is representative for all public limited companies (PLCs) in the stock market. Hence, the relationship between banking industry volatility and economic growth is independent of overall market returns. This independent nexus is also proved in the paper of Naceur and Ghazouani (2007).

Moreover, the new economic geographical theory and economic growth theory have explained differences in income-levels and GDP growth across spaces. These differences influence the decisions of economic policy makers and affect economic activities. Therefore, the bank - growth nexus remains controversial question in countries across spaces. We extend

previous researches by examining the above connection for 3 subsamples across regions and for 2 subsamples across income groups after analyzing the full sample of 19 low- and middle-income countries by using panel GMM (Generalized-Method-of-Moments) techniques.

Furthermore, there exists the relationship between economic growth and levels of inflation in one country (the Phillips Curve and theories of Keynesian economics). Thus, we advance previous studies by examining a large amount of new measurement of country characteristics, which are inflation rates and Kaufmann (2013)'s Six Worldwide Governance Indicators (WGI). Then, we construct variables for country-specific and institutional characteristics, which are inflation rates, WGI and variables to indicate financial development including Domestic Credit to private sector, Liquid Liabilities, and Stock-Market-Capitalization to GDP. Next, these variables are interacted with banking industry volatility to evaluate the effect of country-specific characteristics and financial development characteristics on bank-growth nexus from 2003 to 2019.

Our research contributes to the literature about the banks' stock price impacting on economic growth during the past decade. First of all, we find that the impact of bank volatility on economic growth may not exist when all countries combined. When we study countries across income groups, the above relationship is marginally significant negative. When we study countries across regions, this connection is positive for Saharan African countries. Moreover, this is mix for Latin American countries. More importantly, we find significant negative impact of bank volatility on economic growth for South Asian and East Asian countries. In general, the above nexuses vary with the legal frameworks, institutional structure for market orientation of countries. Many studies prove bank-growth relationship, Campello et al. (2010) indicates that firms do not have ability to borrow externally during the credit crisis of 2008. The weakened function of the banking system causes negative effects on the flow of economic activities. Besides, Moshirian and Wu (2012) prove that there exists a negative relationship between bank volatility and future economic growth in developed markets and in emerging markets. Kim and Lin (2013) also find that banking development contributes more to economic growth in low-income countries, and stock market development

has more contribution to output growth in high-income or low-inflation countries.

Other studies show contribution of stock market to economic growth. Wang and Ajit (2013) prove that stock market does not affect economic growth positively in China. This result agrees with the report of Harris (1997) for developing countries. Osamwonyi et al. (2013) find that there is no causal relationship between stock market development and economic growth in Ghana and Nigeria, but they have a bidirectional causal relationship when Granger Causality test procedure is used. This is similar to Rahimzadeh (2012)'s findings for the Middle East and North Africa. Moreover, Rabiul (2010) prove that banks and stock markets have positive and separate impacts on economic growth. They are important to boost long-run growth in developing countries. In our study, we find the negative effect of market excess return on growth for upper middle-income economies, but this effect is positive for the low-income and lower-middle-income economies, for Sub-Saharan African countries and for Latin American countries. This is ambiguous for South Asian and East Asian countries.

Financial development indicators which are domestic credit to private sector, liquid liabilities, stock market capitalization are employed in our study. Based on the literature reviews on the relationship between financial development and economic growth, we hope these indicators affect bank - growth nexus. However, we almost do not find this impact existent for full sample, for low income and lower middle-income countries, for Saharan African countries and for Latin American countries. More importantly, these effects are more clearly for upper middle-income economies and for South Asian and East Asian countries.

Some studies prove the link between country-specific characteristics and institutional characteristics and economic growth. The effect of inflation on the economy have been studied through a wide range of applied models of economic growth. High levels of inflation undermine the confidence of domestic and foreign investors and consumers (Andrés & Hernando, 1999). Bruno and Easterly (1998) prove that high inflation (the level at which the inflation rate exceeds the calculated threshold, estimated 40 percent yearly) would hurt the economy, but low levels of inflation boost

the economic growth. Andrés and Hernando (1999)'s paper also indicates that these variables are negatively correlated, especially in the long run. Vinayagathasan (2013)'s paper proves that inflation rate excesses threshold of 5.43 %, it will damage economic growth. In our study, we find the effect of low inflation on bank-growth nexus positive for low-income and lower-middle-income countries and for upper-middle-income economies but negative for South Asian and East Asian countries. In addition, the connection between country-specific and institutional characteristics and economic growth are unclear for upper-middle-income countries and for South Asian and East Asian countries. Particularly, we find significant negative impact of control of corruption on economic growth for South Asian and East Asian countries. The above relationships may not exist for the other samples in our research. While Omoteso and Ishola Mobolaji (2014)'s paper proves that Government effectiveness has a negative impact on economic growth. Although there are anti-corruption strategies, the effect of control of corruption on economic growth is unclear. Moshirian and Wu (2012) also indicate that the effect of country-specific and banking institutional characteristics on bank-growth relationship is ambiguous. All above connections might not exist for Saharan African countries and for Latin American countries in our study. Furthermore, Omoteso and Ishola Mobolaji (2014) prove that political stability and regulatory impact economic growth positively in the separate region (Sub-saharan Africa). The positive effects are also more powerful for the variables of voice and accountability and rule of law.

This paper is organized as follows. In the next section, we outline our data and research methodology. Results and discussion are discussed in the third section. Finally, section four concludes the paper.

## 2. DATA AND RESEARCH METHODOLOGY

### 2.1. Data

Our datasets are collected in low-income and middle-income countries. The full sample covers 19 countries while the 5 subsamples are comprised of 10 upper-middle-income countries, 9 low-income and lower-middle-income countries, 7 Sub-Saharan African countries, 5 South Asian and East Asian countries and 4 Latin American countries. The data used cover

the period 2003 - 2019 on a quarterly basis. The sample period for each country is shown in Column 3 of Table 3. Our datasets are based on the available data on bank equity price, quarterly macroeconomic time series and short-term interest rates. Table 1 provides a summary of the variables calculated and their sources.

The primary variable is banking industry volatility. In this study, we use a detailed analysis, which is a disaggregate approach based on the method of Campell et al. (2001) to calculate the banking volatility. This approach is carried out using the following steps. First of all, we calculate the portfolio of listed banks for each country collected from International Datastream sources. Concerning the available market price data, we have the maximum number of thirty listed banks for Indonesia and the minimum of two listed banks for Mauritius and Uganda. Nevertheless, when collecting the available data for market capitalization, we have the maximum number of thirty listed banks for Indonesia and the minimum of one listed bank for the Philippines. In this case, the Philippines constitutes a complete data set of market price of nineteen banks, quarterly GDP series, and short-term interest rates. However, it has market capitalization for one listed bank in the Datastream, so data are based on these indicators of individual banks. Since all 19 countries have mixed economies, we only collect data for available banks on domestic stock market. The banks operating in both domestic markets and international markets but listed on international stock markets are excluded from our samples. Therefore, only a few banks can be representative of the whole market. Furthermore, variables (interest rates, GDP series and the market price index for each country) are also extracted from the Datastream. The sources of the data collected are diverse.

Secondly, this paper calculates the continuous stock return over Rf (risk-free-rate) before measuring the excess-return in weighted value on the portfolio of the bank in each country. This research collects Treasury-Bill rate in three months or Deposit-rate in three months depending on the available data in Datastream. We also use MC (Market-Capitalization) to estimate the weights. The Market-Capitalization of bank j over the total Market-Capitalization of the banking field at the end of period (t-1) is used to build the weight of bank j in period t. This weight remains constant

within period (t). Third of all, Excess-Return is calculated on the market index for each country. In the next stage, we get the beta for each country when regressing the quarterly bank excess return against the quarterly market excess return, beta is assumed to change in the long run but to be constant over the sample period. Nonetheless, this study analyzes a large number of economies. It makes more sense to simplify them for our assumption and run the same model for different economies in the most consistent way.

After taking all the above steps, we have a complete data set of 19 economies. We divide the full sample into the five subsamples. We follow the threshold levels of GNI per capita calculated by the World Bank in 2012 to collect data for low-income countries, for lower-middle-income countries and for upper-middle-income countries.

In the third step, we calculate quarterly bank volatility ($VOL_{it}$) by using monthly frequency data[1], which is documented as follows:

$$VOL_{it} = Var(R_{it}) = \beta_{im}^2 Var(R_{mit}) + \hat{\sigma}_{it}^2$$

where:

$$Var(R_{mit}) = \sum (R_{mi\mu} - M_{mit})^2$$

$$\hat{\sigma}_{it}^2 = \sum_{\mu \in t} (R_{i\mu} - \beta_{im} R_{mi\mu})^2$$

$R_{mi\mu}$ is the monthly excess market return in market i. $M_{mit}$ is the moving average monthly excess market return for country i over period t (in this case, t is quarter). $\beta_{im}$ is the beta of the banking industry. It proxies for the market in economy i.

$R_{i\mu}$ is the monthly excess-return of the banking industry in weighted value $R_{i\mu}$ in the market i. The value of is taken by deducting the monthly risk-free rate, which is obtained by dividing the annualized short-term interest rate by 12 months. As a result, we have the excess-return for each month. Following the method of Cole et al. (2008) most variables are estimated,

[1] Our estimation is different from Moshirian and Wu (2012) who use weekly frequency data

including continuous economic growth rate (dependent variable); lagged market Excess-Return (controlled variable); characteristics of each country (six governance indicators); inflation; indicators of financial development, which are Domestic Credit to private sector, Liquid Liabilities and Stock-Market-Capitalization to GDP. The indicators representing characteristics of each country relate to economic growth in a long stage. These indictors respect the difference of the cross section in banking institutional framework among economies. Next, we examine the effect of these differences in the institutional frameworks on the relationship between baking industry volatility and economic growth.

- The dependent variable is GDP growth rate. It is calculated by taking logarithm of the ratio of GDP at period t and GDP at period t-1 at constant prices (Growth=LOG($GDP_t$ / $GDP_{t-1}$)).

- The control variable is lagged market excess return. It is defined as the excess return on the market index in country i, it is estimated by taking logarithm of the difference between the continuous return and the risk-free rate (Rf). The continuous return is the ratio of market price index at the end of period t and market price index at period t-1 of country i (t is in quarter). The risk-free rate (Rf) is Treasury-Bill rate in three months or deposit-rate in three months ($R_m = R_{mit} = \log(P_{mit}/P_{mi(t-1)}) - Rf_{it}$).

**Eight country characteristic indicators:**

Six Worldwide Governance Indicators (WGI) are a dataset covering some qualify indicators. They represents the health of government in one country. They range in units from around -2.5 to 2.5, with higher values corresponding to better governance outcomes (Kaufmann, 2013).

Voice and Accountability: “The variable measures the degree to which their citizens may present in election for authorities in one country, freedom of voice and free media”.

Political Stability and Absence of Violence: “The variable measures perceptions of the likelihood that the government will be destabilized by unconstitutional or violent means, including politically motivated violence and terrorism”.

Government Effectiveness: "The variable measures the public quality in serving its citizens. The extent of its independence, the policy quality. The commitment of authorities to make their policy occur in the real life. The more effectiveness, the less vulnerability of financial sector".

Regulatory Quality: "The variable measures the ability of authorities to make the regulations feasible and improve the private sector".

Rule of Law: "The variable measures the degree to which government make the quality of policy, courts, crime laws, violence, enforcement of contract and property rights feasible".

Control of Corruption: "The variable measures the degree to which authorities exercise their power over the public".

- Inflation is the dummy variable, taking on the value of one when the value of inflation is smaller than 5.43% and the value of zero otherwise (Vinayagathasan (2013)'s paper).

**Three financial development indicators**

- Domestic-Credit to private sector is defined as financial resources mostly of corporations, which are provided to the private sector in the forms of loans, non-equity securities.

- The ratio of Liquid-Liabilities of the financial system to GDP. The total value of currency and deposit in the central bank plus deposits and electronic currency, then plus time and savings deposit and other deposit for transferable foreign currency, certificates as well as securities repurchase agreements. Next is the addition of checks for travelers, paper for trades, time deposits for foreign currency and share of funds for the market.

- The ratio of Stock-Market-Capitalization to GDP equals the total value of all listed shares on stock market as a percentage of GDP.

With the purpose of prolonging the time-series information in this research, this study handles yearly data using the overlapping method with observations in quarter. Lagged bank excess return (Rb) is computed for comparison with lagged bank volatility (Vol) and lagged market excess return (Rm). The descriptive statistics and correlation matrices are presented in Table 2.

**Table 1. Summary Information about Variables Measured**

| Variable | Definition | Expected sign | Data sources |
|---|---|---|---|
| Growth | GDP Growth rate | | Datastream International |
| Rm | Lagged market excess return | Ambiguous | Datastream International |
| Vol | Lagged bank volatility | Negative | Datastream International |
| **Indicators of country characteristics** | | | |
| Voice | Voice and accountability | Ambiguous | WGI Annually |
| Political | Political stability and Absence of violence | Positive | WGI Annually |
| Gov | Government effectiveness | Ambiguous | WGI Annually |
| Regu_qua | Regulatory quality | Positive | WGI Annually |
| Rule | Rule of law | Positive | WGI Annually |
| Controlcor | Control of corruption | Positive | WGI Annually |
| Infla | Inflation | Ambiguous | World Bank Annually |
| **Indicators of financial development** | | | |
| Credit | Private credit | Positive | World Bank Annually |
| Liquid | Liquid liabilities | Positive | World Bank Annually |
| Stock_cap | Stock market capitalization to GDP | Positive | World Bank Annually |

**Table 2. Summary of Descriptive Statistics of Primary Variables**

| | All economies | | | | Upper middle income | | | | Low and Lower middle income | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | growth | Rm | Rb | Vol | growth | rm | rb | vol | growth | rm | rb | vol |
| **Descriptive statistics** | | | | | | | | | | | | |
| Mean | -0.066 | -7.900 | -7.524 | 0.096 | -0.219 | -8.214 | -7.811 | 0.146 | 0.110 | -7.536 | -7.206 | 0.038 |
| Std. Dev | 2.113 | 5.479 | 5.648 | 0.477 | 2.777 | 6.634 | 6.870 | 0.638 | 0.836 | 3.683 | 3.854 | 0.128 |
| Min | -23.31 | -34.77 | -34.58 | 0.00 | -23.3 | -34.77 | -34.58 | 0.000 | -2.9 | -19.6 | -19.67 | 0.000 |
| Max | 4.899 | -0.028 | -0.035 | 7.774 | 4.779 | -0.576 | -0.544 | 7.774 | 4.899 | -0.028 | -0.035 | 1.385 |
| Obs | 976 | 969 | 956 | 976 | 521 | 521 | 502 | 521 | 455 | 448 | 454 | 455 |
| **Correlations** | | | | | | | | | | | | |
| Growth | 1 | | | | 1 | | | | 1 | | | |
| Rm | -0.02 | 1 | | | -0.071 | 1 | | | 0.303 | 1 | | |
| Rb | -0.02 | 0.98 | 1 | | -0.066 | 0.986 | 1 | | 0.258 | 0.954 | 1 | |
| Vol | 0.00 | -0.47 | -0.45 | 1 | 0.016 | -0.505 | -0.504 | 1 | -0.047 | -0.283 | -0.072 | 1 |

| | Africa | | | | South Asia & East Asia | | | | Latin America | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | growth | rm | Rb | Vol | growth | rm | rb | vol | growth | rm | rb | vol |
| **Descriptive statistics** | | | | | | | | | | | | |
| Mean | -0.073 | -8.177 | -7.458 | 0.040 | 0.257 | -6.030 | -5.790 | 0.022 | 0.358 | -8.324 | -8.277 | 0.073 |
| Std. Dev | 0.442 | 3.828 | 4.457 | 0.108 | 0.940 | 3.046 | 2.918 | 0.123 | 1.236 | 6.127 | 6.093 | 0.260 |
| Min | -2.9 | -19. 6 | -19.67 | 0.000 | -1.463 | -16.8 | -14.1 | 0.000 | -1.435 | -30. 4 | -30.16 | 0.000 |
| Max | 1.039 | -0.706 | -0.696 | 1.373 | 4.899 | -0.028 | -0.035 | 1.385 | 4.779 | -0.576 | -0.544 | 2.053 |
| Obs | 285 | 278 | 265 | 285 | 281 | 281 | 281 | 281 | 253 | 253 | 253 | 253 |
| **Correlations** | | | | | | | | | | | | |
| growth | 1 | | | | 1 | | | | 1 | | | |
| Rm | 0.11 | 1 | | | 0.31 | 1 | | | 0.116 | 1 | | |
| Rb | 0.08 | 0.94 | 1 | | 0.29 | 0.94 | 1 | | 0.116 | 1 | 1 | |
| Vol | -0.02 | -0.38 | -0.40 | 1 | -0.03 | -0.28 | 0.1 | 1 | -0.03 | -0.47 | -0.48 | 1 |

**Table 3. Country Specifics**

| Economy | Region | Sample period | | Interest rate (Year) | | Year | No.of banks |
|---|---|---|---|---|---|---|---|
| | | | | Median | Max | | |
| **Upper middle-income economies** | | | | | | | |
| Argentina | Latin America | Q1/2003 - | Q1/2018 | 12.15 | 48.23 | 2019 | 6 |
| Botswana | Sub-Saharan Africa | Q1/2009 - | Q4/2019 | 5.15 | 9.95 | 2003 | 3 |
| Brazil | Latin America | Q1/2003 - | Q4/2019 | 11.54 | 22.1 | 2003 | 21 |
| Chile | Latin America | Q1/2003 - | Q4/2019 | 5.42 | 6.96 | 2008 | 7 |
| Kazakhstan | Europe & Central Asia | Q2/2000 - | Q4/2019 | 3.99 | 6.7 | 2004 | 7 |
| Malaysia | East Asia | Q1/2003 - | Q4/2019 | 2.6 | 3.58 | 2006 | 10 |
| Mauritius | Sub-Saharan Africa | Q4/2008 - | Q4/2019 | 3.83 | 10.95 | 2007 | 2 |
| Peru | Latin America | Q1/2003 - | Q4/2019 | 3.83 | 5.45 | 2008 | 8 |
| South Africa | Sub-Saharan Africa | Q2/2003 - | Q3/2019 | 7.16 | 10.85 | 2008 | 8 |
| Turkey | Europe&Central Asia | Q1/2003 - | Q4/2019 | 17.65 | 37.68 | 2003 | 17 |
| **Low income economie** | | | | | | | |
| Kenya | Sub-Saharan Africa | Q2/2006 - | Q4/2019 | 7.76 | 12.58 | 2012 | 8 |
| Uganda | Sub-Saharan Africa | Q1/2009 - | Q4/2019 | 11.41 | 16.04 | 2003 | 2 |
| **Lower middle-income economies** | | | | | | | |
| Ghana | Sub-Saharan Africa | Q1/2009 - | Q4/2019 | 12.35 | 17.06 | 2009 | 7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Indonesia | East Asia | Q1/2003 - | Q4/2019 | 7.17 | 11.8 | 2006 | 30 |
| Morocco | Middle East | Q1/2003 - | Q4/2019 | 3.69 | 3.91 | 2013 | 6 |
| Nigeria | Sub-Saharan Africa | Q4/2004 - | Q4/2019 | 9.96 | 14.79 | 2003 | 15 |
| Philippines | East Asia | Q4/2003 - | Q4/2019 | 7.49 | 10.89 | 2008 | 1 |
| Sri lanka | South Asia | Q2/2003 - | Q4/2019 | 7.14 | 13.99 | 2011 | 13 |
| Vietnam | East Asia | Q2/2007 - | Q4/2019 | 12.35 | 17.06 | 2009 | 7 |

In Table 2, in general for the six samples, the mean of GDP growth rates has the smallest range around 6,1%. Whereas the mean of banking industry volatilities (6,9%) is positive and slightly higher than the previous one. To be more specific, the largest range is for the full sample, for low-income economies and for lower-middle-income economies. In contrast, the mean of market excess returns and the mean of bank excess returns are negative and fluctuate widely for the full sample. Notably, the simple correlations between GDP growth rates and banking volatilities are positive for upper-middle-income economies. This correlation may not exist for the full sample, but it is negative for the other subsamples.

### 2.2. Research methodology

We apply the generalized method of moments (GMM) econometric techniques developed for dynamic panel data. Based on the methods suggested by Cole et al. (2008), Campello et al. (2010), Cornett et al. (2010), Moshirian and Wu (2012), and Arellano and Bover (1995), we examine a fixed-effect dynamic model for the full sample and five subsamples at the beginning:

$$Y_{it} = \alpha_i + \lfloor Y_{i(t-1)} + ®'X_{i(t-1)} + n_i + \sum_{it} \qquad (1)$$

In which i and t are used to indicate country and time period. $Y_{it}$ is the GDP growth rate for the selected samples at the time t. $Y_{i(t-1)}$ is the lagged value of the dependent variable. X is the vector of explanatory variables containing lots of variables, such as banking industry volatility ($VOL_{it}$), lagged market excess return ($R_m$) and the interaction terms between banking industry volatility and the variables of financial development and country-specific characteristics. $n_i$ is the unobserved specific effect for country *i,* and $\sum_{it}$ is an error term.

We use these interaction terms to examine the effects of country characteristic and financial development on economic growth. In the

process of applying GMM, we eliminate the group effects from the fixed-effect model by taking the first difference. We have:

$$Y_{it} - Y_{i(t-1)} = \lambda(Y_{i(t-1)} - Y_{i(t-2)}) + \beta'(X_{i(t-1)} - X_{i(t-2)}) + (\varepsilon_{it} - \varepsilon_{i(t-1)}) \quad (2)$$

Then we have:

$$\Delta y_{it} = \lambda \Delta y_{i(t-1)} + \beta' \Delta x_{i(t-1)} + v_{it} \quad (3)$$

The endogeneity in the above model causes serious problems (the results calculated are inconsistent and biased or there exists the link between the lagged dependent variable and the error terms). To handle these problems, we use proper instrument variables as suggested by Arellano and Bond (1991), who documented that "instruments are lagged values of explanatory-variables in the regression at the original level". We give out the assumption that interaction among disturbances in the time-varying setting is not statistically significant. $\varepsilon_{it}$, $E(\varepsilon_{it}\ \varepsilon_{is}) = 0$, for i = 1,..., N and $\forall t$ s; and the initial conditions $Y_{i1}$ is not correlated with future realizations of the error term, $E(Y_{i1}) = 0$, for i = 1, . . ., N and t = 2, . . ., T, we can use the following m = 0.5(T− 1)(T−2) moment conditions for the autoregressive parameter:

$$E[Yi(t-s).v_{it}] = 0 \text{ for } s \geq 2;\ t\ [3, T] \quad (4)$$

$$E[X_{i(t-s)}.v_{it}] = 0 \text{ for } s \geq 2;\ t\ [3, T] \quad (5)$$

The generalized method of moments (GMM) estimators could be given by:

$$\hat{\theta} = \left[ \left( \sum_i w_i' z_i' \right) A_N \left( \sum_i z_i' w_i \right) \right]^{-1} \left( \sum_i w_i' z_i' \right) A_N \left( \sum z_i' y_i \right) \quad (6)$$

In the above equation, $W_i$ is the (T − 2)×q (q is the number of regressors) matrix, $Z_i$ is the (T − 2) ×m matrix, $A_N$ is the weighting matrix, $y_i$ is the (T − 2) vector. Here, the choices of $A_N$ give rise to a set of GMM estimators based on the moment conditions. The difference GMM is called original estimator. However, this first-differenced estimator is less suitable when it reduces the sample length, it surveys a large amount of information on the levels of the variables and on the indirect-link among the levels and the first differences. Thus, it will do an inefficient calculation (Ahn & Schmidt, 1995). The system GMM will have lower bias and highly precise results

in a finite sample. It is introduced by Arellano and Bover (1995) to handle the above problems. In the system GMM, the original level is linked to the first-differenced regressions. In the specific way, the instruments in the level regressions are the lagged first-differences variables. The lagged level variables are manipulated as instruments in the first differenced regressions. Hence, we will get the original level regressions, and then we have the additional moment conditions as follows:

$$E[\Delta y_{i(t-1).}(a_i + \varepsilon_{it})] = 0 \qquad (7)$$

$$E[\Delta x_{i(t-1).}(a_i + \varepsilon_{it})] = 0 \qquad (8)$$

In our study, we use system GMM (GMM(SYS)) for the panel data. The GMM techniques provide consistent estimators, so they have lots of advantages over others in estimating the dynamic panel data. The data of this research comprise 19 economies. The shortest time-series observation has 43 quarters and the longest one has 68 quarters. Hence, we use the commands of David Roodman (2013) to run system GMM. The estimated results of GMM(SYS) are reported below.

The main objective of this study is to examine whether there exists a relationship between banking industry volatility and economic growth. More importantly, this paper examines which factors influencing this link. We address these issues by looking at the significance of the coefficients of relevant variables rather than the scales of relevant coefficients.

In the first stage, we employ GMM-Sys estimations for the full sample. In the second stage, we repeat estimations using 10 upper-middle-income countries and 9 low-income and lower-middle-income countries. In the next step, we repeat estimations using 7 Sub-Saharan African countries, 5 South Asian and East Asian countries and 4 Latin American countries.

## 3. RESULTS AND DISCUSSION

We examine the effect of banking industry volatility on economic growth and test influence of country-specific characteristics and financial development characteristics on this link. To observe this effect, we interact banking industry volatility with country-specific variables and financial-development variables. We look at the signs of the coefficients of these interaction terms to identify how these variables influence bank-growth nexus.

Table 4 reports the results for all 19 countries. Table 5a and Table 5b present the results for the subsamples of low-income and lower-middle-income countries and for subsample of upper-middle-income countries, respectively. Table 6a presents the results for Sub-Saharan African countries. Table 6b presents the results for South Asian and East Asian countries. Table 6c presents the results for Latin American countries.

In the full sample, we find that the nexus between economic growth and bank volatility, market excess return and all the interaction effects may not exist when all coefficients are too small and insignificant. These results may be from combining all countries. These are not support by findings of Moshirian and Wu (2012). When we study countries across income groups, for low-income and lower-middle-income economies, we find the same results for all the interaction effects. Besides, the impact of banking volatility on economic growth becomes negatively significant, but the impact of market excess return on economic growth becomes positively significant. For upper middle-income economies, we find the links between economic growth and bank volatility, market excess return negative. Similarly, we find the interaction effects between bank volatility and government effectiveness, regulatory quality, rule of law, control of corruption insignificant negative. This indicates that these variables increase the negative impact of bank

**Table 4: Dynamic panel GMM (SYS) estimation results for full sample of 19 economies**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| lag | **-0.279*** | 0.0056 | -0.0074 | -0.586 | -0.0111*** | -0.0074 |
| | (-2.40) | (-0.16) | (-0.22) | (-0.18) | (-97.70) | (-0.22) |
| Vol | -0.05 | -0.045 | 0 | 0 | 0 | -0.009 |
| | (-0.33) | (-0.25) | . | . | . | (-0.09) |
| Rm | -0.012 | -0.009 | 0 | 0 | 0 | -0.006 |
| | (-0.23) | (-0.21) | . | . | . | (-0.15) |
| Vol*voice | | -1.66E-06 | | | | |
| | | (-0.51) | | | | |
| Vol*political | | | -4.58E-07 | | | |
| | | | (-0.22) | | | |
| Vol*gov | | | | -2.04E-07 | | |
| | | | | (-0.45) | | |
| Vol*regu_qua | | | | | -1.41E-06 | |
| | | | | | (-0.11) | |
| Vol*rule | | | | | | -8.41E-07 |
| | | | | | | (-0.36) |

| | | | | | | |
|---|---|---|---|---|---|---|
| cons | -0.177 | -0.139 | -0.116 | 0 | **-0.097*** ** | -0.116 |
| | (-0.25) | (-0.25) | (-0.22) | . | (-74.35) | (-0.21) |
| N | 951 | 951 | 950 | 950 | 931 | 950 |
| | 7 | 8 | 9 | 10 | 11 | |
| lag | -0.0074 | 0.0045 | 0.0017 | 0.0035 | 0.006 | |
| | (-0.22) | (-0.18) | (-0.04) | (-0.09) | (-0.02) | |
| Vol | 0 | 0 | -0.0054 | -0.0073 | 0.099 | |
| | . | . | (-0.06) | (-0.07) | 0 | |
| Rm | 0 | 0 | -0.0014 | -0.0035 | 0.0065 | |
| | . | . | (-0.04) | (-0.09) | 0 | |
| Vol*controlcor | -4.2E-07 | | | | | |
| | (-0.36) | | | | | |
| Vol*infla | | 7.52E-07 | | | | |
| | | 0 | | | | |
| Vol*credit | | | 1.12E-07 | | | |
| | | | (-0.5) | | | |
| Vol*liquid | | | | 6.72E-08 | | |
| | | | | (-0.62) | | |
| Vol*stock_cap | | | | | 7.75E-07 | |
| | | | | | 0 | |
| cons | -0.116 | -0.139 | -0.034 | -0.069 | 0 | |
| | (-0.21) | (-0.35) | (-0.07) | (-0.14) | . | |
| N | 950 | 951 | 768 | 806 | 787 | |

t statistics in parenthese: * significant 10%, ** significant 5%, *** significant 1%.

volatility on future economic growth. In contrast, the interaction effects between bank volatility and voice and accountability, low nflation, liquid liabilities and stock market capitalization are positive. These indicators would weaken the negative relationship between bank volatility and economic growth. However, in column 4, political stability affects economic growth positively. It changes negative sign of bank volatility to positive in this model. All above results are not good evidences in the model of bank-growth since all coefficients are statistically insignificant. Surprisingly, in column 10, private credit affects economic growth significantly and negatively. It changes negative sign of bank volatility to positive when entering regression. It means that negative connection between bank volatility and economic growth is primarily captured by private credit variable.

**Table 5a: Dynamic panel GMM (SYS) estimation results for Low income and lower middle-income economies**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| lag | 0.177*** | 0.252** | -0.246 | 0.222*** | 0.174*** | 0.035 |
| | (-3.51) | (-2.88) | (-0.22) | (-4.09) | (-3.44) | (-0.3) |
| Vol | -1.277* | -0.305 | 1.873 | -0.654 | -1.276* | -0.165 |
| | (-2.51) | (-0.40) | (-0.5) | (-0.43) | (-2.12) | (-0.21) |
| Rm | 0.0217 | 0.0279 | 0.0965 | 0.0222 | 0.0291 | 0.0596* |
| | (-0.82) | (-0.72) | (-0.62) | (-0.66) | (-0.93) | (-2.33) |
| Vol*voice | | -0.00001 | | | | |
| | | (-0.91) | | | | |
| Vol*political | | | -7.12E-06 | | | |
| | | | (-0.73) | | | |
| Vol*gov | | | | -2.25E-06 | | |
| | | | | (-0.69) | | |
| Vol*regu_qua | | | | | -0.00014 | |
| | | | | | (-1.05) | |
| Vol*rule | | | | | | -0.00001 |
| | | | | | | (-1.92) |
| cons | 0.244 | 0.254 | 0.777 | 0.224 | 0.242 | 0.472* |
| | (-0.9) | (-0.69) | (-0.62) | (-0.74) | (-0.82) | (-2.06) |
| N | 440 | 422 | 431 | 440 | 423 | 421 |
| | 7 | 8 | 9 | 10 | 11 | |
| lag | 0.009 | 0.0983 | 0.159* | 0.14 | -0.767 | |
| | (-0.04) | (-0.8) | (-2.1) | (-0.55) | (-1.68) | |
| Vol | -0.461 | -0.558 | -0.397 | -2.318** | -1.236 | |
| | (-0.82) | (-0.84) | (-0.64) | (-3.00) | (-0.55) | |
| Rm | 0.046 | 0.0871 | 0.054 | 0.034 | 0.0386 | |
| | (-1.56) | (-1.25) | (-0.9) | (-0.4) | (-1.59) | |
| Vol*controlcor | -0.000001 | | | | | |
| | (-1.19) | | | | | |
| Vol*infla | | 0.0001 | | | | |
| | | (-1) | | | | |
| Vol*credit | | | 6.78E-06 | | | |
| | | | (-0.79) | | | |
| Vol*liquid | | | | 3.48E-06 | | |
| | | | | (-0.86) | | |
| Vol*stock_cap | | | | | -0.000056* | |
| | | | | | (-2.33) | |
| cons | 0.418 | 0.549 | 0.39 | 0.316 | 0.739*** | |
| | (-1.54) | (-1.39) | (-0.98) | (-0.55) | (-3.48) | |
| N | 430 | 430 | 367 | 367 | 358 | |

t statistics in parenthese: * significant 10%, ** significant 5%, *** significant 1%.

For Sub-Saharan African countries, we find evidences of the nexus between economic growth and bank volatility, market excess return insignificant positive. However, all interaction effects may not exist since all the coefficients are too small and insignificant. These are inconsistent with the findings of Moshirian and Wu (2012).

For South Asian and East Asian countries, bank volatility affects economic growth negatively. In contrast, the effect of market excess return is ambiguous. We also find the interaction effects between bank volatility and voice and accountability, political stability and absence of violence, government effectiveness, private credit, liquid liabilities and stock market capitalization positive. Whereas, the interaction effects

**Table 5b: Dynamic panel GMM (SYS) estimation results for Upper middle-income economies**

| 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|
| lag | -0.0251 | -0.0472 | -0.016 | -0.0204 | -0.0242 |
| | (-1.50) | (-1.09) | (-0.62) | (-0.74) | (-0.88) |
| Vol | -0.116 | -0.598 | 0.162 | -0.827 | -1.187 |
| | (-0.75) | (-0.85) | (-0.83) | (-0.49) | (-0.50) |
| Rm | -0.0309 | -0.0528 | -0.0252 | -0.0639 | -0.0747 |
| | (-0.66) | (-0.75) | (-0.60) | (-0.66) | (-0.61) |
| Vol*voice | | 0.0407 | | | |
| | | (-0.11) | | | |
| Vol*political | | | 0.258 | | |
| | | | (-1.88) | | |
| Vol*gov | | | | -1.676 | |
| | | | | (-0.66) | |
| Vol*regu_qua | | | | | -2.016 |
| | | | | | (-0.56) |
| Vol*rule | | | | | |
| cons | -0.453 | -0.582 | -0.34 | -0.504 | -0.597 |
| | (-0.63) | (-0.66) | (-0.57) | (-0.69) | (-0.66) |
| N | 491 | 501 | 511 | 511 | 501 |
| | 7 | 8 | 9 | 10 | 11 |
| lag | -0.0273 | -0.0254 | -0.0287 | -0.02 | -0.0211 |
| | (-1.44) | (-1.58) | (-0.97) | (-0.51) | (-0.61) |
| Vol | -0.116 | -0.0595 | 0.726 | -0.497 | -2.941 |
| | (-1.05) | (-0.82) | (-1.79) | (-0.24) | (-0.56) |
| Rm | -0.0375 | -0.0334 | 0.00101 | -0.0213 | -0.0285 |
| | (-0.73) | (-0.83) | (-0.06) | (-0.62) | (-0.77) |

| | | | | | |
|---|---|---|---|---|---|
| Vol*controlcor | -0.0753 | | | | |
| | (-0.29) | | | | |
| Vol*infla | | 46.27 | | | |
| | | (-0.99) | | | |
| Vol*credit | | | -0.0476* | | |
| | | | (-2.46) | | |
| Vol*liquid | | | | 0.0125 | |
| | | | | (-0.19) | |
| Vol*stock_cap | | | | | 0.139 |
| | | | | | (-0.55) |
| cons | -0.515 | -0.561 | 0.0018 | -0.263 | -0.32 |
| | (-0.65) | (-0.77) | (-0.01) | (-0.54) | (-0.63) |
| N | 511 | 501 | 419 | 419 | 429 |

t statistics in parenthese: * significant 10%, ** significant 5%, *** significant 1%.

between bank volatility and low inflation is negative. These above variables are not good evidences in explaining economic growth since all coefficients are statistically insignificant.

**Table 6a. Dynamic panel GMM (SYS) estimation results for Sub-Saharan Africa**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Lag | -0.0181 | 0.0639 | 0.0444 | 0.0237 | -1.317* | -0.255 |
| | (-0.40) | (-0.53) | (-0.9) | (-0.14) | (-2.22) | (-0.21) |
| Vol | 0.396 | 5.231 | 0.612 | 0.411 | -11.50*** | 7.517 |
| | (-0.42) | (-0.65) | (-0.55) | (-0.08) | (-3.76) | (-0.43) |
| Rm | 0.0108 | 0.0185 | 0.008 | 0.0081 | -0.002 | 0.058 |
| | (-0.84) | (-1.55) | (-1.47) | (-0.26) | (-0.03) | (-0.58) |
| Vol*voice | | 0.00007 | | | | |
| | | (-0.54) | | | | |
| Vol*political | | 3.21E-07 | | | | |
| | | | ( -0.1) | | | |
| Vol*gov | | | | -2.49E-07 | | |
| | | | | (-0.03) | | |
| Vol*regu_qua | | | | -0.0008 | | |
| | | | | | ….. | |
| Vol*rule | | | | | | 9.92E-06 |
| | | | | | | (-0.32) |

| | | | | | | |
|---|---|---|---|---|---|---|
| cons | 0.0461 | 0.0933 | 0.0338 | -0.486 | -0.486 | 0.234 |
| | (-0.81) | (-1.15) | (-0.29) | (-0.54) | (-0.54) | (-0.5) |
| N | 264 | 258 | 271 | 257 | 257 | 264 |
| | 7 | 8 | 9 | 10 | 11 | |
| lagG | -0.272 | -0.266 | -0.118 | -0.124 | -0.656 | |
| | (-0.24) | (-0.23) | (-0.77) | (-0.79) | . | |
| vol | 7.238 | 7.357 | 8.419 | 8.457 | 72.89 | |
| | (-0.44) | (-0.43) | (-0.64) | (-0.64) | …. | |
| Rm | 0.0443 | 0.0479 | 0.022 | 0.0234 | 0.0958 | |
| | (-0.62) | (-0.59) | (-1.13) | (-1.1) | …. | |
| Vol*controlcor | 5.19E-06 | | | | | |
| | (-0.34) | | | | | |
| Vol*infla1 | | 6.17E-07 | | | | |
| | | (-0.29) | | | | |
| Vol*credit | | | -0.000006 | | | |
| | | | (-0.60) | | | |
| Vol*liquid | | | | -3.81E-06 | | |
| | | | | (-0.61) | | |
| Vol*stock_cap | | | | -0.0002 | | |
| | | | | | ….. | |
| Cons | 0.119 | 0.13 | 0.0206 | 0.0622 | -0.34 | |
| | (-0.58) | (-0.55) | (-0.51) | (-0.84) | (-0.50) | |
| N | 271 | 271 | 210 | 209 | 202 | |

t statistics in parenthese: * significant 10%, ** significant 5%, *** significant 1%.

Surprisingly,in column 8, we find significant negative impact of bank volatility on economic growth. Besides, the interaction effect between bank volatility and control of corruption is statistically significant negative. This result imply that control of corruption exaggerates the negative association between bank volatility and economic growth. This is not consistent with the research of Omoteso and Ishola Mobolaji (2014), findings that the effect of control of corruption on economic growth is unclear although there are anti-corruption

**Table 6b. Dynamic panel GMM (SYS) estimation results for South Asia and East Asia**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| lag | -0.906 | -0.995 | 6.084 | -1 | -0.902 | -0.117 |
| | (-1.19) | (-0.74) | (-0.94) | (-0.92) | (-1.19) | (-0.30) |
| Vol | -3.9 | 71.85 | -45.48 | -4.082 | -9.3 | -0.637 |
| | (-1.38) | (-0.09) | (-0.81) | (-1.18) | (-1.63) | (-0.76) |
| Rm | 0.122 | 0.182 | -1.179 | 0.128 | 0.105 | 0.0873 |
| | (-1.57) | (-0.64) | (-1.27) | (-1.34) | (-1.21) | (-1.44) |
| Vol*voice | | 48.01 | | | | |
| | | (-0.09) | | | | |
| Vol*political | | | 88.47 | | | |
| | | | (-0.85) | | | |
| Vol*gov | | | | 25.77 | | |
| | | | | (-0.09) | | |
| Vol*regu_qua | | | | | 0 | |
| | | | | | . | |
| Vol*rule | | | | | | 0 |
| | | | | | | . |
| cons | 1.305 | 1.395 | -7.352 | 1.452 | 1.311 | 0.695 |
| | (-1.79) | (-0.38) | (-1.30) | (-0.84) | (-1.7) | (-1.59 |
| N | 276 | 271 | 276 | 276 | 266 | 266 |

| | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|
| lag | -2.603 | -0.92 | -0.958 | -1.185 | -0.964 |
| | (-0.97) | (-0.59) | (-0.88) | (-1.01) | (-1.09) |
| Vol | -34.19** | -13.88 | -863.3 | -14197 | -23.27 |
| | (-2.87) | (-0.10) | (-1.55) | (-1.52) | (-0.13) |
| Rm | 0.392 | 0.113 | -2.067 | -26.89 | 0.0332 |
| | (-1.17) | (-0.08) | (-0.78) | (-1.55) | (-0.02) |
| Vol*controlcor | -64.60** | | | | |
| | (-2.60) | | | | |
| Vol*infla | | -28.94 | | | |
| | | (-0.20) | | | |
| Vol*credit | | | 7.869 | | |
| | | | (-1.49) | | |
| Vol*liquid | | | | 132.5 | |
| | | | | (-1.51) | |
| Vol*stock_cap | | | | | 0.597 |
| | | | | | (-0.12) |
| cons | 3.302 | 1.531 | -5.738 | -94.59 | 0.967 |
| | (-1.15) | (-0.27) | (-0.55) | (-1.56) | (-0.15) |
| N | 271 | 266 | 231 | 231 | 226 |

t statistics in parenthese: * significant 10%, ** significant 5%, *** significant 1%.

strategies. The above results are not supported by Kaufmann, (2013) findings that WGI with higher values correspond to better governance outcomes. For Latin American countries, the relationship between economic growth and bank volatility is mix. Whereas market excess return affects economic growth positively and insignificantly. Besides, most of interaction effects might not exist when their coefficients are too small and insignificant.

In short, the bank-growth nexus may not exist for the full sample. When we study countries across income groups, for low-income and lower-middle-income economies, the above relationship is negative. Besides, all the interaction effects may not exist in the above two samples. For upper middle-income economies, the above relationships are more clearly, but not good evidences (insignificant). These results

**Table 6c. Dynamic panel GMM (SYS) estimation results for Latin America**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| lagG | 0.367 | -12.52 | -5.667 | 0.271 | -0.0221 | -0.0129 |
| | (-0.55) | (-1.11) | (-1.55) | (-0.42) | (-0.04) | (-0.02) |
| vol | 7.45 | -3.108 | -1.615 | 7.609 | 0.438* | 0.599 |
| | (-1.07) | (-0.13) | (-0.49) | (-1.05) | (-2.02) | (-1.61) |
| rm | 0.178 | 0.284 | 0.14 | 0.158 | 0.0387 | 0.042 |
| | (-1.24) | (-0.84) | (-1.39) | (-1.32) | (-1.68) | (-1.6) |
| Vol*voice | | 0 | | | | |
| | | …. | | | | |
| Vol*political | | | 0 | | | |
| | | | …. | | | |
| Vol*gov | | | | 0 | | |
| | | | | … | | |
| Vol*regu_qua | | | | | 0 | |
| | | | | | …. | |
| Vol*rule | | | | | | 0 |
| | | | | | | …. |
| cons | 1.170* | 7.59 | 3.735 | 1.021* | 0.652** | 0.665** |
| | (-2.06) | (-1.44) | (-1.7) | (-2.57) | (-2.76) | (-2.71) |
| N | 249 | 241 | 241 | 249 | 241 | 241 |
| | 7 | 8 | 9 | 10 | 11 | |
| lagG | -12.19 | -12.89 | -8.275 | -8.374 | -8.35 | |
| | (-1.11) | (-1.04) | (-1.01) | (-1.05) | (-1.05) | |
| vol | 7.743 | -3.659 | 0 | 0 | 0 | |
| | (-1.12) | (-0.15) | . | . | . | |
| rm | 0.528 | 0.281 | 0.348 | 0.175 | 0.166 | |
| | (-1.12) | (-0.81) | (-1.02) | (-1.04) | (-1.03) | |

| | | | | | |
|---|---|---|---|---|---|
| Vol*controlcor | 0 | | | | |
| | . | | | | |
| Vol*infla | | 0 | | | |
| | | . | | | |
| Vol*credit | | | 0.528 | | |
| | | | (-1.04) | | |
| Vol*liquid | | | | -0.00785 | |
| | | | | (-0.59) | |
| Vol*stock_cap | | | | | -0.0629 |
| | | | | | (-0.91) |
| cons | 8.678 | 7.643 | 5.968 | 4.949 | 4.914 |
| | (-1.13) | (-1.37) | (-1.05) | (-1.08) | (-1.08) |
| N | 245 | 249 | 216 | 220 | 220 |

t statistics in parenthese: * significant 10%, ** significant 5%, *** significant 1%

are inconsistent with the findings of Moshirian and Wu (2012) proving that the bank-growth link is negative and it is affected by indicators of country-specific characteristics and financial development characteristics for developed markets and emerging markets. We can interpret that upper-middle-income countries have found their own ways in boosting economic growth, diversified economy or market-based economy. These above nexuses are not driven by a small number of countries having evolving market-based system.

When we study countries across regions, bank-growth link is positive for Saharan African countries. This is mix for Latin American countries. Above all, bank-growth link and the interaction effect between bank volatility and control of corruption are statistically significant negative. Whereas the coefficient signs in other columns are clear but not statistically significant for South Asian and East Asian countries. Simply, we can interpret that the results are stronger for South Asian and East Asian countries since most of South Asian and East Asian countries have been successful in boosting their economic performances in the standard models for the market economic success. The models dominated by developed countries while most of Latin American countries emphasizes macroeconomic stabilization, trade openness and domestic market development. These countries reform institution policies to meet short run development-strategies not dominated by developed countries. On the contrary, for Saharan African countries, these countries run excessive

government agencies, public services and they have serious problems in bureaucratic and poor administrative. Strategies based on exporting materials are constructed to boost the economy instead of pursuing strong institutional reform based on market oriented.

## 4. CONCLUSION

There are evidences proving the connection between economic growth and bank volatility for developed markets and for emerging markets. However, it is not clear to assume this relationship across income groups and across regions for 19 low-income and middle-income countries from 2003 to 2019. This paper advances others when our sample has frontier markets and countries across regions. We also advance previous studies when examining WGI, inflation rates as indicators to proxy for country characteristics in the model of bank volatility and economic growth.

The bank-growth link may not exist for the full sample. When we study countries across income groups, the above relationship is marginally significant negative. When we study countries across regions, this is positive for Saharan African countries. Moreover, this is mix for Latin American countries. Surprisingly, we find the above connection significant negative for South Asian and East Asian countries. More importantly, bank-growth link is affected by country-specific characteristics and financial development characteristics for upper middle-income economies and for South Asian and East Asian countries. In general, the above connection vary with the legal frameworks, institutional structure for market orientation in countries.

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# BEHAVIORAL FACTORS AFFECTING INVESTORS' DECISIONS IN THE VIETNAM'S STOCK MARKET

**Dao Thi Huong[1], Nguyen The Anh[2,*], Nguyen Thi Quynh Cham[3]**

***Abstract:*** *The article used behavioral theory to analyze the influence's factors on the decision of individual investors on the Vietnam stock exchange, including: agency tendency, crowd effect, overconfidence. belief, remorse, and decision making. The quantitative methods used in this study are exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and structural model fit test (SEM). Research results have shown that all 5 factors of the research model have an influence on investment decisions but have a negative effect on the investment efficiency's individual investors in the stock market.*

***Keywords:*** *Investment decision, investor, individual, stock market.*

## 1. INTRODUCTION

Vietnam's stock market has officially been in operation for more than 20 years. Since established, the market has experienced ups and downs as shown by the volatility of the VNIndex. In particular, in the first half of 2022, the Vietnamese stock market had unusual trading sessions such as the session on May 9, 2022 and the session on May 10, 2022. The application of standard financial theories has not been able to clearly explain these fluctuations in the stock market. The signs of stock market bubbles or excessive price reductions in the past has shown that individual investors do not always act wisely. Meanwhile, the understanding of individual investors' behaviors and behavioral factors influencing their investment decisions is very limited. Behavioral factors are psychological factors including emotions and perceptions that play an important role in investor decision making (Waweru et al., 2008). These studies suggest that

[1] Department of Economic and Management, Thuy Loi University, Hanoi, Vietnam

[2] Department of Economic Information System, Academy of Finance, Hanoi, Vietnam

* Corresponding author. Email: nguyentheanh@hvtc.edu.vn

[3] Academy of Finance, Hanoi, Vietnam

rational investors maximize their returns by following basic financial rules and making investment decisions based on their profit considerations. However, the level of risk tolerance of investors depends on their individual characteristics and attitudes towards risk (Maditinos et al., 2017). Therefore, it is necessary to understand the behavioral factors affecting the decision-making process of individual investors in the Vietnamese stock market in order to help investors as well as securities companies to make predictions and better decisions for their own business.

Previous studies on investment decision making have provided relevant guidelines for investors to make informed decisions in developed countries (Dima et al., 2018). Vietnam's stock market is considered an emerging market, so it is necessary to study the factors that affect investors' decision making as the awareness of these potential impacts helps investors make informed decisions in a market with high stock price volatility (Greenberg & Hershfield, 2019). Dima et al. (2018) argue that appropriate investment decisions can help individual investors positively increase their investment performance. Motivated by these arguments, our research focuses on behavioral factors. The objective of this research is to examine the effects of behavioral factors (referred to as behavioral finance) on investment decisions in the stock market to improve the decision making and investment efficiency of individual investors.

## 2. THEORETICAL BACKGROUND AND RESEARCH MODEL

### 2.1. Theoretical background

#### *Behavioral finance concept*

Behavioral finance is a branch of finance that studies how investors behave in the markets and how psychological factors influence their buying or selling decisions, and thus market prices. Behavioral finance can be defined as the field of finance,whose aim is to explain stock market anomalies using psychological factors. It is assumed that individual investors and market outcomes are influenced by structural information and by the different characteristics of market participants. Behavioral finance is often based on the assumption that the information structure and characteristics of stock market participants are systematically influenced

by individual investment decisions as well as by market forces. Studies of Behavioral finance show that the mechanism for adjusting the market to equilibrium is not always possible. This means that there will be cases where "rational" investors will not be able to win over "irrational" investors. When financial assets are overvalued or undervalued, the market is inefficient. There have been many studies showing that the phenomena occurring in the stock market contradict market efficiency theory, which cannot be satisfactorily explained according to this model but can be explained based on other behavioral finance models.

According to Bikas et al. (2013), there are currently many different conceptions of behavioral finance, but most agree that behavioral finance studies the influence of psychology on the behaviors of participants in the financial market and the resulting effects of those behaviors on the market. Thus, behavioral finance, in a new way of understanding finance, complements the basic financial theories by explaining the behaviors of investors in their decision making. Contrary to the theory of Markowitz (1952) and Sharpe (1964), behavioral finance deals with the problems of individuals and the ways in which they collect and use information; behavioral finance seeks to understand and predict decision-making processes related to the financial market system. In addition, it focuses on applying psychological and economic principles to improve financial decision making (Olsen, 1998). Behavioral finance is defined as the field of finance that explains stock market anomalies by using psychological biases rather than ignoring random outcomes consistent with market efficiency (Fama, 1998). It is assumed that individual investors and market outcomes are influenced by different information structures and personality traits of market participants (Bakar & Yi, 2016).

Fernandes et al. (2007) divided behavioral tendencies into two groups: cognitive biases and emotional biases. Cognitive biases such as decision anchoring, availability, and typical situations stem from incorrect inference, and better information and advice can often correct them. In contrast, emotional predispositions, such as regret and risk aversion, originate from impulsive feelings or intuition, rather than from conscious reasoning, and are difficult to correct.

### 2.2. Research hypothesis and proposed model

It can be seen from previous studies discussed earlier that there are many psychological factors identified in behavioral finance, each factor has different implications for investment decision making. In this research, we focus on the behavioral factors shown in Table 1.

**Table 1. Behavioural Factors Influencing Investors' Decision Making in the Stock Market**

| Behavioral factor | Investors' reasoning | Investors' decision |
|---|---|---|
| Representative | Tend to associate recent events with a known fact and make decisions based on the known fact | Buy stocks at too high price |
| Over-confident | Too many transactions, risk, failure to diversify portfolio | Pay a lot of brokerage fees and taxes, high possibility of loss |
| Anchoring | Tend to consider irrelevant prices as important in their decision making | Miss investment opportunities and have inappropriate market penetration timing. |
| Herd behavior | Lack of individuality in decision making | Investment bubble burst |
| Fear of regret | Sell growth stocks too soon, hold on to losing stocks for too long | Lose profit |

***Representative bias***

Representativeness is a rigidly pattern-based decision. The investors believe that their current success tends to continue into the future. Their tendency to make decisions based on experience is known as a stereotype (Shefrin, 2000). Ritter (1991) points out an interesting result of representative bias is that the long-term underperformance of IPOs affects investors' short-term orientation. This has many implications for investment decisions. In making decisions, individuals tend to attribute the good characteristics of a "good company" to having a direct influence on the characteristics of the stock of that company.

*H1: Representative bias positively affects investment decisions of individual investors.*

***Overconfidence***

The concept of overconfidence comes from experimental psychology studies and surveys in which participants overestimate their predictive

ability and the value of the information they have. Investors fail in estimating probabilities - events that they think are bound to happen, often do not happen or events do not happen exactly in the way investors think they would happen. Investors believe that they have more accurate and complete information, thus are smarter and better informed than other investors (Pompian, 2006).

According to Shefrin (2000), overconfidence relates to how well people understand their abilities and the limitations of their knowledge. Individuals who are overconfident in their own abilities tend to think they are better than they really are. Overconfidence does not mean that individuals are ignorant or incompetent, it means that their view of themselves is better than it actually is. A common trait among investors is being overconfident in their ability to pick stocks and decide when to continue or exit the situation. These trends are studied by Odean (1998) and it is suggested that investors who conduct their trading activities based on their overconfidence will have significantly lower performance in the market. In addition, psychologists have determined that overconfidence causes people to overestimate their knowledge and abilities, underestimating risks. Selecting stocks is difficult, so this activity will most clearly demonstrate investor overconfidence (Nofsinger, 2001).

Fagerström (2008) conducts a research to investigate the effects of overconfidence and over-optimism in the market on investment decisions. The study uses a quantitative approach and is based on historical data. The data used is a summary of the expected growth in earnings for S&P 500 businesses over the next 12 months, compared with profits taken from February 1986 to April 2008. The results show that the analysis of the S&P 500 is inflated by problems of overconfidence and over-optimism. It also confirms the Anchoring and herd behavior.

*H2: Overconfidence positively affects investment decisions of individual investors.*

***Anchoring***

Anchoring is a psychological bias that occurs when random investors calculate a certain value and decide to "anchor" according to their subjective psychology. When asked to estimate the good buy price of a stock, they

start by using the first value - an anchor - without much analysis. They then adjust this anchor up or down to reflect new information or their analysis, but studies show that this adjustment is not enough and ends up becoming a bias. Investors who exhibit this bias seem to "anchor" while answering the question: "Is this the best time to buy or sell stocks?". Therefore, it can be understood that investors tend to "anchor" their thoughts at a logically inappropriate reference point while making investment decisions (Pompian, 2006).

Andersen (2010) points out the relevance of Anchoring in the decision making of market participants using trading algorithms. This algorithm is applied to real market data of the Dow Jones index and the CAC40 index to find the possibility of arbitrage. It provides evidence that the Anchor bias plays an important role in determining the weekly price of the Dow Jones and CAC40.

*H3: The decision "anchor" positively affects the investment decision of individual investors.*

***Herd behavior***

The herb behavior describes a situation where individuals have to imitate the actions of a large organization, regardless of whether they make individual decisions or not. One reason is that people are sociable and tend to agree with the group's ideas rather than being the only one who disagrees. Another reason is that people often think that a large group is less likely to make a wrong decision. This will cause the investor to herd with the illusion that the crowd may know things that he does not.

The herb behavior in financial markets can be defined as a mutual mimicry, leading to a convergence (Hirshleifer and Teoh, 2003). This is the most common mistake investors make. That is why, in financial markets, when the best time to sell or buy stocks comes, an investor even suffers from a strong psychological pressure that prevents him from doing so. The main reason for this is the pressure or influence of other investors in the market. Investors are influenced by the herd effect because they care about what others think of their decisions (Scharfstein and Stein, 1990).

Individual investors tend to be swayed by the opinions and recommendations of well-known analysts. Welch (2000) found that the

herd effect can also be present in the analysis. Economou, Kostakis and Philippas (2010) examine the herb behavior under the most extreme conditions, using daily data from the stock exchanges of Greece, Italy, Spain, and Portugal from 1998 to 2008, for example, the existence of the herd is related to market returns, trading volume and volatility of returns. In this study, authors also investigated the presence of the herd effect during the 2008 financial crisis. The results showed that herd sentiment was considered stronger during periods of faster growth.

*H4: The herd effect positively affects the investment decision of individual investors.*

***Fear of regret***

Regret is a psychological error that occurs by focusing too much on regret when making a decision, mainly because the unchosen case has a clearly seen better outcome. The cause of this type of mistake is the tendency that individuals hate to admit their mistakes. Affected by this trend, investors are often hesitant to make decisions because they fear that whatever decision they make will be suboptimal. The tendency to fear regret often occurs when individual investors delay making decisions. Other experimental psychology studies suggest that regret influences decision making under uncertainty.

*H5: Regret affects individual investors' investment decisions.*

***Proposed model***

In order to test the research model, we have conducted the following tasks:

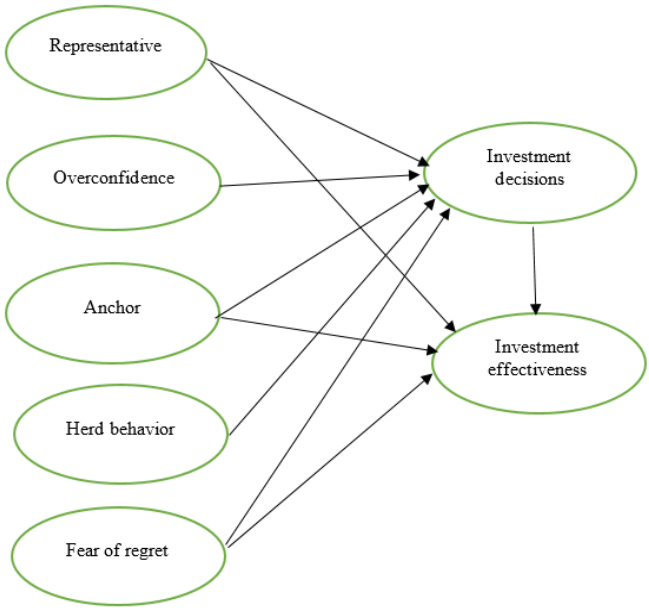
- Measure the reliability of each scale by using the Cronbach alpha index, provided that Alpha > 0.6 and the item-to-total correlational index > 0.3 to ensure reliability.

- Carry out an exploratory factor analysis for each variable (EFA - Exploratory factor analysis), this test step is meaningful to ensure that the observed variables measuring the same latent variable must be loaded into the correct position of that variable, do not load to another variable, remove inappropriate measurement criteria to ensure that the variables are not potentially multicollinear. Next, our research uses confirmatory factor

analysis of each variable (CFA), the purpose of this stage will be to show whether the scale ensures the highest reliability or not.

On the basis of assessing the fit of the whole model by including all observed variables in the model into confirmatory factor analysis to ensure all observations are appropriate (Hair, 1998).

A survey questionnaire was designed based on 5 criteria and 25 questions. The questions are designed to assess the level of agreement on a 5-point Likert scale from 1 to 5. Specifically: (1) Strongly disagree; (2) Disagree; (3) Normal; (4) Agree; (5) Strongly agree.




## 3. EMPIRICAL RESULTS

### 3.1. Findings

The research was conducted through two main phases: (1) Qualitative research to build and complete the survey questionnaire according to the scale; (2) Quantitative research to collect, analyze survey data and test the model's assumptions.

Sampling method: The sample is selected by random method. The number of samples selected in the study is 336 samples, which is appropriate. According to Tabachnick & Fidell (2007), when using MLR

(Multiple Linear Regression), the sample size n should be calculated using the following formula: $n \geq 50 + 8p$ (p: number of independent variables).

### 3.2. Empirical results of the model on the data sample

#### *3.2.1. Confidence level by Cronbach's Alpha coefficient*

We use the Cronbach's Alpha reliability coefficient to test the correlation between the observed variables. The results of calculating Cronbach's Alpha coefficient for 7 groups of questions are shown in Table 2.

**Table 2. Confidence Level**

| Item-Total Statistics | | | | | |
|---|---|---|---|---|---|
| | **Scale Mean if Item Deleted** | **Scale Variance if Item Deleted** | **Corrected Item-Total Correlation** | **Cronbach's Alpha if Item Deleted** | **Cronbach's Alpha** |
| **Representative** | | | | | |
| XHDD1 | 12.00 | 9.737 | 0.918 | 0.958 | 0.967 |
| XHDD2 | 12.05 | 9.224 | 0.923 | 0.956 | |
| XHDD3 | 12.10 | 9.486 | 0.937 | 0.952 | |
| XHDD4 | 12.07 | 9.377 | 0.899 | 0.963 | |
| **Anchor** | | | | | |
| NEO1 | 8.61 | 11.707 | 0.815 | 0.931 | 0.938 |
| NEO2 | 8.66 | 10.857 | 0.873 | 0.913 | |
| NEO3 | 8.68 | 11.036 | 0.876 | 0.912 | |
| NEO4 | 8.75 | 10.970 | 0.851 | 0.920 | |
| **Overconfidence** | | | | | |
| QTT1 | 9.54 | 12.780 | 0.869 | 0.946 | 0.954 |
| QTT2 | 9.62 | 12.140 | 0.921 | 0.930 | |
| QTT3 | 9.50 | 12.740 | 0.876 | 0.944 | |
| QTT4 | 9.60 | 12.252 | 0.888 | 0.940 | |
| **Fear of regret** | | | | | |
| HH3 | 7.57 | 5.726 | 0.881 | 0.931 | 0.948 |
| HH2 | 7.60 | 5.685 | 0.885 | 0.928 | |
| HH1 | 7.52 | 5.456 | 0.906 | 0.912 | |
| **Herd behavior** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| HU1 | 9.89 | 10.656 | 0.777 | 0.918 | 0.925 |
| HU2 | 9.67 | 10.556 | 0.829 | 0.901 | |
| HU3 | 9.91 | 10.185 | 0.845 | 0.895 | |
| HU4 | 9.85 | 10.046 | 0.850 | 0.893 | |
| **Investment effectiveness** | | | | | |
| HQ1 | 8.63 | 10.698 | 0.832 | 0.866 | 0.907 |
| HQ2 | 8.68 | 10.309 | 0.865 | 0.853 | |
| HQ3 | 8.51 | 10.627 | 0.845 | 0.861 | |
| HQ4 | 8.29 | 11.418 | 0.638 | 0.936 | |
| **Investment decisions** | | | | | |
| QD1 | 6.98 | 4.005 | 0.786 | 0.891 | 0.906 |
| QD2 | 6.77 | 4.134 | 0.863 | 0.826 | |
| QD3 | 6.66 | 4.189 | 0.796 | 0.880 | |

The results show that the factor groups all have Cronbach's Alpha coefficients that meet the requirements with the standard level of Cronbach's Alpha coefficient not less than 0.6 and the variables that do not violate the condition have the total correlation coefficient (Item- rest correlations) not less than 0.3

Cronbach's Alpha coefficient if the variable type (Cronbach's Alpha if Item Deleted) of HQ4 (0.936) is larger than the current Cronbach's Alpha coefficient. (0.907) but the correlation coefficient of the total variable (Corrected Item-Total Correlation) is 0.5 > 0.3, so the scale still ensures reliability and does not need to be excluded from the scale.

Thus, all measurement components of the scale performed for the study sample will be used in the EFA analysis.

#### *3.2.2. EFA - exploratory factor analysis*

The study uses Principal Axis Factoring (PAF) with Promimax in exploratory factor analysis to determine the number of factors in a set of questions representing the factors that we are seeking and trying to measure. Total variance extracted ≥ 50% and coefficient KMO ≥ 0.5; Bartlett test has statistical significance (Sig < 0.05) (Gerbing & Anderson, 1988); factor loading coefficient of the observed variable ≥ 0.5 (Hair et al., 1998). The results of the exploratory factor analysis are presented in Table 3.

**Table 3. KMO and Bartlett's Test**

| KMO and Bartlett's Test | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy | | 0.878 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 9323.184 |
| | df | 325 |
| | Sig. | 0.000 |

In Table 3, the KMO coefficient value is 0.878 > 0.5, and the Bartlett's test shows the Sig value = 0.000 < 0.05, which gives the conclusion that the EFA exploratory factor analysis for survey data sample is suitable.

The analysis results of the total variance extracted showed that the Eigenvalues of the 7 groups of factors were all greater than 1, representing the 7 factors that summarize the information of the 25 research variables to be included in the EFA analysis in the best way. The total extracted variance is 80.14% > 50%, which is understood as 7 extracted factors that explain 80.14% of the data variation of 25 research variables, so the extracted variance is satisfactory.

The factor analysis process for 25 observed variables including dependent variables, all have factor loading coefficients greater than 0.4 and grouped into 7 measurement scales.

The results of EFA factor analysis based on a survey sample of behavioral factors affecting individual investment decisions in the stock market have ensured two important values of the scale: convergent value and value. discriminant value. These seven different scales help to evaluate individual investment decisions in the stock market, all observed variables meet the next test standards with confirmatory factor analysis (CFA).

### *3.2.3. CFA - Confirmatory factor analysis*

After the EFA analysis step, we analyze the CFA model indexes including $\chi 2$/df, RMSEA, CFI, TLI indexes.

**Table 4. CFA Test Resutls**

| Indexes | Results | Meaning |
|---|---|---|
| Chi-square/df | 2.329 | Good |
| CFI | 0.961 | Good |

| | | |
|---|---|---|
| RMSEA | 0.063 | Good |
| GFI | 0.878 | Acceptable |
| P - value | 0.000 | Acceptable |
| TLI | 0.926 | Good |

The results of the CFA analysis of the ladder model show that the CFA model is consistent with the data. Specifically, the CFA model indicators satisfy all conditions: Chi-square/df = 3.112 (< 5); CFI = 0.938 (≥ 0.9); RMSEA = 0.078 (< 0.08); P- value = 0.000 (< 0.05), TLI = 0.926 (≥ 0.9) according to Hair et al. (2010) and Hu & Bentler (1999). Particularly, the index 0.8 < GFI = 0.843 < 0.9 is not satisfied, but according to the opinion of Baumgartner and Homburg (1995), and Doll, Xia, and Torkzadeh (1994), the minimum value of GFI of 0.8 is still acceptable.

The results of running data show that all observed variables have P - value = 0.000 < 0.05, so all observed variables are significant in the model. The estimated regression coefficients after normalization are all greater than 0.7, which means that all observed variables have a high degree of agreement.

#### *3.2.4. SEM structural model test*

The theoretical model has 277 degrees of freedom, the Chi-squared value has a P-value = 0.000, less than 0.05 (showing that the impact between the variables in the model is statistically significant. The criteria for measuring the model are all good, as shown in Table 4 (CFI = 0.96, TLI = 0.953), it can be concluded that the scale is good. Thus, we can conclude that the model is suitable for the collected data.

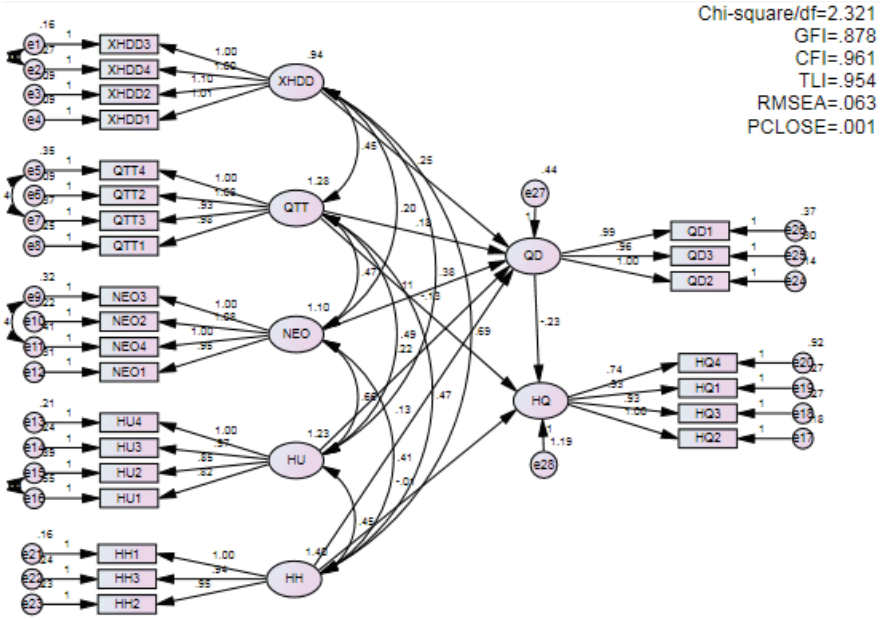



**Figure 1. SEM Estimates**

*Source: Author empirical research findings.*

**Table 5. SEM Test**

| Indexes | Value | Meaning |
|---|---|---|
| Chisquare (χ2) | 642867 | Good |
| Freedom degree (df) | 277 | |
| (CFI) | 0.961 | Good |
| Tucker - Lewis index (TLI) | 0.954 | Good |
| RMSEA | 0.063 | Good |

**Table 6. SEM Model Test Results**

| | Unstandardized Coefficients | Standardized Coefficients | Standard error | Probability | Research hypothesis test results |
|---|---|---|---|---|---|
| Representative (XHDD) → Investment decision (QD) | 0.255 | 0.256 | 0.058 | *** | Accept the hypothesis |
| Overconfidence (QTT) → Investment decision (QD) | 0.182 | 0.214 | 0.043 | *** | Accept the hypothesis |
| Anchoring (NEO) → Investment decision (QD) | 0.107 | 0.119 | 0.05 | 0.032 | Accept the hypothesis |

| | | | | | |
|---|---|---|---|---|---|
| Herb (HU) → Investment decision (QD) | 0.224 | 0.255 | 0.049 | *** | Accept the hypothesis |
| Fear of regret (HH) → Investment decision (QD) | 0.126 | 0.155 | 0.046 | 0.006 | Accept the hypothesis |
| Overconfidence (QTT) → Investment effectiveness (HQ) | -0.126 | -0.125 | 0.067 | 0.06 | Accept the hypothesis |
| Fear of regret (HH) → Investment effectiveness (HQ) | -0.014 | -0.015 | 0.064 | 0.827 | Reject the hypothesis |
| Investment decision (QD) → Investment effectiveness (HQ) | -0.232 | -0.196 | 0.089 | 0.009 | Accept the hypothesis |

From Table 6, there is a SEM model with Unstandardized Coefficients. The factors proposed in the study of model 1 are statistically significant (P value < 5%, 10%).

Model 1:

$$QD = 0.255XHDD_i + 0.182QTT_i + 0.224HU_i + 0.126HH_i + e_i$$

Model 2:

$$HQ_i = -0.126QTT_i - 0.014HH_i - 0.232QD_i + e_i$$

The results of the SEM model show that the following factors: Representative, Overconfidence, Anchor, Herd effect, fear of Regret positively affect Investment decisions in model 1. Investment decisions are influenced by the behavioral biases of investors, Overconfidence has a negative impact on Investment Performance. Specifically:

Representative bias is the first factor affecting investment decisions of individual investors. The results indicate that investors tend to favor representativeness, which can be the cause of serious errors while investing. When a business reports bad results for a few quarters, investors tend to label it as a lousy business, and hope that all the other lousy businesses will have bad results in the future. In these cases, investors will be swayed with past results and ignore certain signs of developments in the near future, thus missing out on their opportunities. Representativeness can lead them to too good or too bad information, while they are trying to predict future stock prices, which hinders their chances of making the right decisions. with optimal market selection.

The herd effect is the second factor affecting the investment decisions of individual investors in the stock market. The crowd effect is the factor that has the strongest impact on investment decisions. An investor will show

his tendency to herd when he relies too much on information confirmed by the crowd rather than on individual decisions. If an investor is heavily influenced by other investors, analysts, etc., their ability to reach harmony in their analysis and decisions will be impeded. In general, the crowd effect is likely to work well, but when everyone has similar thoughts it can be really difficult to achieve extraordinary returns. On the other hand, when a downside occurs, it amplifies psychological trends and can lead to unusual losses, especially for individual investors, who hold losing stocks. There is no certainty because of the lack of one's own point of view, so it is possible to fail to find information from multiple sources. With the majority of investors in the market today, buying and selling stocks of large investors will greatly influence the investment decisions of other investors.

Overconfidence has a positive effect on investment decisions ($\beta = 0.182$) and negatively affects investment efficiency ($\beta = -0.125$). Investors tend to be overconfident in their ability to function in the market. Some of them believe that based on the information they have, they can predict the future of stock price changes more than others. However, this trend can bring unexpected results, reducing investment efficiency.

Fear of Regret has a positive impact on investment decisions but does not affect investment efficiency. This bias stems from the investor's desire to avoid the pain of regret arising from his or her wrong investment decisions. The result of this bias is that investors end up holding underperforming stocks because avoiding selling stocks prevents perceptions of loss and in turn underperforming investments. This shows that the fear of regret will make investors reluctantly consider their next investment decisions.

***Conclusions and managerial implications***

The research results show that all 5 factors of the research model have an influence on the investment decision of individual investors in the stock market. However, these factors have the opposite effect on investment efficiency. Therefore, in order to improve the efficiency of investment decisions, individual investors need to improve their investment behavior through understanding factors such as representative, herd effect, overconfidence, fear of regret and anchor bias. Individual investors need to improve their ability to read and analyze information in the financial statements of listed companies, and at the same time improve the psychological factors in investment to improve the effectiveness of their investment decisions.

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# DETERMINANTS OF CAPITAL ADEQUACY RATIO IN VIETNAMESE COMMERCIAL BANKS

**Nguyen Thi Minh Huong**[1]

***Abstract:*** *The main objective of the study is to identify the factors affecting the capital adequacy ratio in Vietnamese commercial banks. The study employs the regression of panel data with fixed effects model (FEM) and random effects model (REM) for 28 commercial banks in Vietnam for the period from 2017 to 2021 to analysis determinants of capital adequacy ratio. Key findings from this study indicate that return on assets (ROA) are positively related to banks' capital adequacy ratio. In addition, loans loss reserves (LLR), bank size (SIZE), leverage (LEV), deposits on assets (DAR), economic growth (GDPR), inflation rate (INF) negatively affect banks' capital adequacy ratio. Non-Performing loan (NPL), loans on assets (LAR) and interest rate (IR) is not important factor with banks' capital adequacy ratio.*

***Keywords:*** *Capital adequacy ratio, commercial banks, bank capital, Vietnam.*

## 1. INTRODUCTION

There have been many studies on capital adequacy ratio in the world. In recent years, determining a reasonable capital adequacy ratio for commercial banks has received the attention of many researchers in Vietnam. Capital adequacy ratio is an important measure to measure the bank's operational safety, which has been built and developed by leading experts in the banking sector under the Basel Committee. In Vietnam, the minimum capital adequacy ratio is 9%, according to the provisions of Circular 22/2019/TT-NHNN of the State Bank of Vietnam (SBV).

Capital adequacy ratio is an economic indicator that reflects the relationship between equity capital and risk-adjusted assets of commercial banks. This ratio is often used to signal depositors against the bank's risks and also aims to increase the stability and efficiency of the commercial

[1] Faculty of Finance and Banking, University of Finance and Accountancy, Quang Ngai, Vietnam. Email: nguyenthiminhhuong@tckt.edu.vn

banking system. With this capital adequacy ratio, investors can determine the bank's ability to make payment of term debts and risks.

This study focuses on studying the main factors affecting the capital adequacy ratio of Vietnamese commercial banks in the period of 2017-2021. On the basis of the results obtained from the research, a number of solutions for SBV and commercial banks are proposed to contribute to the stable development of commercial banks in particular and the Vietnamese banking system in general.

## 2. US EXPERIMENTAL STUDIES

Buyukslvarcil and Abdioglu (2011) studied the factors affecting CAR of 24 banks in Turkey during the period 2006-2010. The author uses the analytical method Regression between capital adequacy ratio with variables independence. The analysis results show that the ratio of loans to total assets and relative return on equity inversely proportional to the capital adequacy ratio; while that is the credit risk provision ratio and profit margin on assets is positively correlated with the ratio an full capital.

Shingjergji and Hyseni (2015) use the conventional linear regression estimation method to measure the impact of factors on the CAR of commercial banks in Albania in the period 2007-2014. The estimated results show the debt ratio. bad, loan-to-deposit ratio, equity multiplier are negatively correlated with CAR; meanwhile, asset size is positively correlated with CAR.

Dao and Ankenbrand (2014) used statistical data from 11 Vietnamese commercial banks in the period 2008-2013 to determine the impact of a number of independent variables on the capital adequacy of banks. Through the analysis, the author concludes that there is a significant relationship between return on equity, return on total assets, capital risk and shareholder equity on risky assets with CAR.

Thuy and Chi (2015) conducted research on 22 Vietnamese commercial banks from 2007 to 2013. The results show that there are four factors that negatively affect the capital adequacy ratio of Vietnamese commercial banks, namely the size of the bank, loans, deposits and the rate of return

on total assets. Meanwhile, leverage ratio has a positive relationship with CAR. Liquidity, risk provision has no relationship with CAR.

In general, there have been a number of studies in the world and in Vietnam on the factors affecting the capital adequacy ratio of commercial banks. However, the conclusions of these studies are still mixed and controversial. Empirical studies in Vietnam are carried out in different periods, some exogenous variables such as economic growth and inflation have not been taken into account, mainly focusing on endogenous variables (profit rate on equity, rate of return on total assets, size of the bank, provision for risks, etc.). This is the research gap for this article, with the goal of analyzing the factors affecting the capital adequacy ratio of Vietnamese commercial banks in the period of 2017-2021, the author has inherited the endogenous variables in the banks of previous research; at the same time, adding exogenous variables to this study.

## 3. BUILDING RESEARCH HOSPHONES

H1: Provision ratio for credit risk use has a positive correlation or inversely with the ratio a full capital.

H2: Bad debt ratio is correlated covariate or inverse with capital adequacy ratio.

H3: Bank size is negatively related to capital adequacy ratio.

H4: Profit-to-total ratio assets are positively correlated with capital adequacy ratio.

H5: Financial leverage is positively or negatively correlated variable with the capital adequacy ratio.

H6: Loan-to-total assets ratio product is negatively correlated with capital adequacy ratio.

H7: Mobilization to total ratio assets are negatively correlated with the ratio a full capital.

H8: Lending rate is negatively correlated with capital adequacy ratio.

H9: Economic growth has negatively correlated with the ratio capital safety.

H10: The inflation rate is negatively correlated with the capital adequacy ratio.

**Table 1. Summary of factors affecting the minimum capital adequacy ratio**

| Factors | Relationship | The author studied |
|---|---|---|
| Risk reserve ratio credit | +/- | Al-Sabbagh (2004), Thiam, (2009), BuyukslvarcIl and Abdioglu (2011), Mili et al (2014), Masood and Ansari (2016) |
| Bad debt ratio | +/- | Ahmad et al (2008), Abusharba et al (2013) |
| Size of the bank | - | Kleff and Weber (2003), Wong et al (2005) |
| The above profit ratio total assets | + | Rose and Hudgins (2008), Gropp and Heider (2007), Yuanjuan and Shishun (2012) |
| Financial leverage ratio | +/- | Ahmet and Hasan (2011), Thuy and Chi (2015) |
| Loan ratio above total assets | - | Buyuksalvarcil and Abdioglu (2011) |
| Deposit ratio total assets | - | Asarkaya and Ozcan (2007), Bokhari et al (2012) |
| Interest rates | - | Demirguc-Kunt and Detragiache (1997), Mili et al (2014) |
| Economic growth | - | Wong et al (2005), Asarkaya and Ozcan (2007) |
| Inflation rate | - | Akhter and Daly (2009), Shaddady and Moore (2015) |

*Source: Author's compilation.*

## 4. DATA AND RESEARCH METHODS

### 4.1. Database

This study was conducted on a sample of 28 commercial banks in Vietnam. The basis for choosing these banks are listed joint stock commercial banks. Therefore, it can be concluded that the selected sample is representative of commercial banks.

### 4.2. Research Methods

The research method used is a quantitative research method, using panel data regression with fixed effects model (FEM) and random effects model (REM) to analyze the factors affecting the capital adequacy ratio of Vietnamese commercial banks. Besides, the study also uses Hausman test to check whether the model with FEM or REM effect is more suitable in this study.

### 4.3. Research models

The research model is built to understand the impact of the factors Factors affecting the capital adequacy ratio of bank *i* in time *t*:

$$CAR_{it} = \beta_0 + \beta_1 LLR_{it} + \beta_2 NPL_{it} + \beta_3 SIZE_{it} + \beta_4 ROA_{it} + \beta_5 LEV_{it} + \beta_6 LAR_{it} + \beta_7 DAR_{it} + \beta_8 IR_t + \beta_9 GDPR_t + \beta_{10} INF_t + u_{it} \quad (1)$$

**Table 2. Description of Measurement Variables Used in the Study**

| Variable | Explain | How to determine |
|---|---|---|
| ➢ **Dependent variable** | | |
| CAR | Capital adequacy ratio is calculated according to Circular 22/2019/TT-NHNN | $\frac{\text{Equity capital}}{\text{Total Assets At Risk}}$ |
| ➢ **Independent variables** | | |
| LLR | Provision ratio for credit risk | Ratio between provision for credit risk and total outstanding balance of customers |
| NPL | Bad debt ratio | Ratio between total debt of group 3 (sub-standard debt), group 4 (doubtful debt), group 5 (debt likely to lose capital) and total outstanding loans of customers |
| SIZE | Bank size | Natural logarithm of total wealth |
| ROA | Return on total assets | Ratio between profit after tax and total assets |
| LEV | Financial leverage ratio | Ratio of total debt to total equity |
| LAR | Loan-to-total assets ratio | Ratio of total loans to total assets |
| DAR | Ratio of mobilized capital to total assets | Ratio between total customer deposits and total assets |
| IR | Interest rates | Loan interest rate of commercial banks |
| GDPR | Economic growth | GDP growth rate of Vietnam (in 2010 prices) |
| INF | Inflation rate | Vietnam's inflation rate in years |

*Source: Author's summary.*

## 5. RESEARCH RESULTS

The author conducted multivariate regression analysis using panel data analysis with fixed effects (FEM) and random effects (REM). Then,

conduct Hausman test to choose FEM or REM model. The results of the analysis are presented in Table 3.

**Table 3. Results of Model Estimation with Fixed Effects and Random Effects**

| | REM model | FEM model |
|---|---|---|
| β 0 | 0.5754<br>(0.000) | 0.6234<br>(0.000) |
| Credit Provision Ratio (LLR) | -1.9743<br>(0.000) *** | -1.8675<br>(0.000) *** |
| NPL ratio (NPL) | -1.5643<br>(0.501) | -1.6473<br>(0.703) |
| Bank Size (SIZE) | -0.0178<br>(0.000) *** | -0.0193<br>(0.000) *** |
| Return on Assets (ROA) | 0.6754<br>(0.070) * | 0.6647<br>(0.085) * |
| Financial leverage ratio (LEV) | -0.2574<br>(0.014) ** | -0.2451<br>(0.019) ** |
| Loan-to-total assets ratio (LAR) | -0.0123<br>(0.521) | -0.0324<br>(0.769) |
| Fundraising to Total Assets (DAR) | -0.0634<br>(0.007) *** | -0.0691<br>(0.006) *** |
| Lending Rate (IR) | -0.0501<br>(0.675) | -0.0592<br>(0.693) |
| Economic Growth (GDPR) | -1.4532<br>(0.004) *** | -1.4869<br>(0.003) *** |
| Inflation Rate (INF) | -0.1279<br>(0.083) * | -0.1403<br>(0.076) * |
| R-Squared | 0.609 | 0.560 |
| F-Stat. | 16.87 | 17.37 |
| Durbin-Watson | 1,719 | 1.635 |
| VIF | 2.713 | 2.965 |
| Observations | 140 | 140 |
| P-value of Hausman test: 0.1016<br>P-value of Wald test: 0.0713 | | |

*Note: *, **, *** indicate that regression coefficients are statistically significant at 10%, 5%, and 1%, respectively.*

*Source: Author's data analysis results.*

- *Check for autocorrelation and multicollinearity*:

VIF (variance inflation factor) is an indicator used to test the multicollinearity of the regression equation. If VIF > 10, there will be multicollinearity. The above regression results for VIF are all less than 10, namely Fixed effect VIF = 2.965 and Random effect VIF = 2.713. Thus, absolutely no multicollinearity occurs in the above regression model.

To test the phenomenon of autocorrelation in econometrics, the Durbin Watson criterion is often used, if this indicator is in the range (1.5 - 2.5) (Baltagi, 2005), the regression model does not occur autocorrelation. The results also show that the D-W indicator is within a defined range, namely 1.635 (Fixed effect) and 1.719 (Random effect), which means that the regression model is completely free of autocorrelation.

- *Check the error variance*:

To test the variance of errors, the author uses the Wald test. If the p-value is > 0.05, there is no change in variance. The results show that: The P-value in Wald's test is greater than 0.05; from which it is possible to come to the conclusion that there is no phenomenon of variable variance in the research model.

- *Hausman test:*

To test whether the Fixed effects or Random effects model is a more suitable model in studying the impact of factors affecting the CAR of Vietnamese commercial banks, we use the Hausman test. The results show that: The P-value in Hausman's test is greater than 0.05, from which it is possible to come to the conclusion that rejects the null hypothesis H0 that is, the Random effects model is a more suitable model in the study. In the REM model, the coefficient of determination $R^2 = 0.609$ shows that the independent variables in the model have the ability to explain 60.9% of the variation of the CAR variable.

## 6. SUMMARY OF RESULTS AND RECOMMENDATIONS

### 6.1. Summary of results

- Return on total assets (ROA) has a positive correlation with capital adequacy ratio at 10% significance level. This positive correlation is consistent with the experimental results of Yuanjuan and Shishun (2012).

- Credit risk provision ratio (LLR) has a negative relationship with capital adequacy ratio at 1% significance level. This result is consistent with the results from the empirical evidence of banks in Jordan (Al-Sabbagh, 2004; Thiam, 2009); not consistent with the study of Mili et al. (2014), Masood and Ansari (2016).

- Total bank assets (SIZE) has a negative relationship with capital adequacy ratio at 1% significance level. The more Vietnamese banks expand, the lower the capital adequacy ratio will be. This result is consistent with previous research results of Kleff and Weber (2003), Wong et al. (2005).

- Financial leverage ratio (LEV) is statistically significant at 5% and has a negative correlation with capital adequacy ratio of Vietnamese commercial banks. This result coincides with the research results of Ahmet and Hasan (2011) and contrasts with the results of Thuy and Chi (2015).

- The ratio of capital mobilization to total assets (DAR) has the opposite effect with the capital adequacy ratio at 1% significance level. This result coincides with the results of Asarkaya and Ozcan (2007) when studying banks in Turkey.

- Economic growth (GDPR) is negatively correlated with CAR at 1% significance level. This result is completely consistent with the conclusion of Asarkaya and Ozcan (2007), Wong et al. (2005).

- Inflation rate (INF) is negatively correlated with capital adequacy ratio of Vietnamese commercial banks at the 10% significance level. This result is similar to the experimental results of Akhter and Daly (2009), Shaddady and Moore (2015).

### 6.2. Request

➢ *For the State Bank*

*First*, it can be seen that bank size is negatively correlated with CAR. That correlation indicates that the more open Vietnamese commercial banks are the larger the scale, the lower the capital adequacy ratio. Therefore, the SBV needs to control and supervise the process of expanding the scale of commercial banks.

*Second*, SBV needs to cooperate with commercial banks to organize training courses to foster and update knowledge for managers to improve their ability to assess, measure, analyze and control credit risk or risks mentioned in the Basel Agreement.

➢ *For commercial banks*

The results show that financial leverage and CAR are negatively correlated. Therefore, increasing equity is a necessary solution to improve CAR along with reducing risky assets. Here are some measures to increase equity in Vietnamese commercial banks:

*First*, tier-2 capital of Vietnamese commercial banks can be increased by issuing bonds in the international market. However, this method is only suitable for commercial banks with good reputation and financial capacity due to high bond issuance costs.

*Second*, the merger and acquisition plan can help increase equity. However, the merger plan is only possible when a strong bank combines with a weaker bank.

*Third*, Vietnamese commercial banks can increase share capital by issuing more shares.

In addition, the credit risk provision ratio and economic growth are negatively correlated with CAR. This indicates that, in the context of economic growth, reducing credit size, tightening credit commitments and conditions, reducing credit term and restructuring asset portfolio are possible solutions. as much as possible to reduce the total risk asset. Moreover, commercial banks should pay more attention to assets with a risk coefficient of 0%, reduce assets with a large risk coefficient of 150% and 200% such as securities investment loans and real estate investment loans. mentioned in Circular 22/2019/TT-NHNN.

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# EFFECTS OF THE COVID PASSION ON VIETNAM STOCK MARKET IN POST-PANDEMIC PERIOD

**Le Thi Thuy Hang**[1]

***Abstract:*** *The Covid-19 pandemic affects global financial markets, including Vietnam. This study aims to investigate the impact of the Covid-19 outbreak on the stock market over different periods. The purpose of the study was to find out the impact of increased infections and Covid deaths on the stock market. In particular, consider the impact of the Covid pandemic on the stock market during the period when the government no longer implements the blockade order. In this study, the VAR model is used to study the estimation of stock market movements during different periods of the Covid-19 epidemic. The results show that during the period when the government no longer implemented the shutdown order, the effects of the Covid-19 epidemic on the stock market were leveled off and no longer tended to increase. A number of recommendations have been made to regulators and investors in the stock market in Vietnam during periods of Covid-19.*

***Keywords:*** *Covid-19, post-pandemic period, stock market, Vietnam.*

## 1. INTRODUCTION

In early 2020, the outbreak of Covid-19 caused panic around the globe. According to the WHO report, as of September 1, 2020, there were 25,327,098 confirmed cases of Covid-19, including 848,255 deaths globally. Since the outbreak of Covid-19, to curb the spread of the pandemic, many countries have taken a series of necessary measures, including shutting down production and business activities and implementing a nationwide shutdown order. . The implementation of these stringent measures has had a great impact on the economic development and operations of businesses. Currently, there have been a number of studies on the impact of Covid-19 on the world's economic and social development. Studies have found that even in the early stages of Covid-19, its impact on the real economy is already reflected, the pandemic has negatively impacted trade, travel and

[1] University of Finance - Marketing, Ho Chi Minh City, Vietnam. Email: ltt.hang@ufm.edu.vn

transportation, and it increases the unemployment rate; Some studies even show that the global spread of Covid-19 has had an impact similar to an economic crisis.

Covid-19 not only has a great impact on economic and social development, but also affects the functioning of financial markets. Several studies show a negative impact of Covid-19 on financial market volatility and the risk of contagion between financial markets. Baig et al (2020) investigated the impact of Covid-19 on stock market liquidity and volatility and found that an increase in confirmed cases and deaths from Covid-19 have exacerbated illiquidity and volatility in the market, and strict closure measures have also reduced market liquidity and stability. Rizwan et al (2020) studied banking system risks in eight major countries that have been severely impacted by Covid-19; The risks of each country's financial system increase significantly during the pandemic. In addition, some studies focus on stock performance in different sectors or different countries. Mazur et al (2020) found that the healthcare, food, natural gas, and software sectors performed well during the pandemic; however, the crude oil, real estate, entertainment and hotel sectors fell sharply and experienced great volatility.

Clearly analyzing the impact of Covid-19 on the stock market is not only of great significance for investors in diversifying investments and building portfolios during the pandemic, but also beneficial to financial market risk management by regulators. In addition, more and more investors hope to obtain higher profits and reduce investment losses as much as possible through scientific investment methods. Diversifying investment, distributing assets into shares of listed companies in different sectors, has become a very popular way for investors. The main contribution of this study examines the role of the pandemic on the stock market. Especially examine the volatility of the stock market in the new period of the Covid-19 pandemic. Section 2 introduces relevant empirical studies. Section 3 introduces the model approach and research data and Section 4 explains the experimental results. Finally, Section 5 presents the conclusion of the research topic.

## 2. STUDIES ON THE CONNECTION BETWEEN THE COVID PLAN AND THE STOCK MARKET

With the emergence of the Covid-19 pandemic, stock markets around the world have faced great uncertainties. As a result, most stock market indexes worldwide have posted record declines. Contessi and De Pace (2020) presented statistical evidence of the contagion of volatility from the Chinese stock market to all other markets, especially between the end of February and the beginning of April. 2020. Ozili and Arun (2020) highlight that during the week of February 24, 2020, the 10 largest companies in the United States lost significant amounts of money from their accounts. Furthermore, Fernandes (2020), analyzing the trend of the US stock market, shows that it has fallen below 30% from its peak in March 2020. After the US stock market, Fernandes (2020) studied the developments of other major world economies and pointed out that the stock market performance of the UK, Germany, Brazil and Columbia is even worse than the performance in the stock market. the US stock market, with declines of 37%, 33%, 48% and 47%, respectively.

Various studies have reported that the growth of new Covid-19 infections and new deaths has a significant impact on the stock market. Alber (2020) conducted panel data analysis and showed that the stock markets of China, France, Germany and Spain have been affected by Covid-19. Covid-19 negatively impacted stock markets in several countries.

Kartal et al. (2021) focused on East Asian Countries (China, Hong Kong, Japan, Mongolia, South Korea and Taiwan) to study the response of their major stock market indices. for the Covid-19 pandemic. The study covers the period from January 2, 2019 to September 30, 2020, and the authors place two sub-periods on the date of the first Covid-19 case (i.e. Pre-pandemic periods) and pandemics). The results of the regression model show the negative impact of the pandemic on the stock markets studied. Al-Awadhi et al. (2020) studied the impact of the Covid-19 pandemic on two of the most important stock market indices in China (the Hang Seng Index and the Stock Exchange Composite Index). Shanghai Stock Exchange) for the period January 10, 2020 to March 16, 2020. By using a panel data approach, it was found that they were significantly negatively related to both the increase in Daily increases in total new cases and total new deaths

caused by Covid-19 for the most important stock market indexes in China. Similar results have been reported by Adenomon et al. (2020) in Nigeria, using the GARCH model and finding the negative impact of pandemic variables on the stock market between January 2, 2020 and April 16, 2020.

Elsayed and Abdelrhim (2020) used multiple regression analysis in a study investigating the impact of new cases and deaths from Covid-19 between March 1, 2020 and May 10, 2020. on the Egyptian stock exchange in 17 sectors (IT, Media, and Communication Services; Food, Beverage, and Tobacco; Banking; Trade and Distribution; Educational Services; Commodities, Services); Services and Automotive Industry; Healthcare and Pharmaceuticals; Building Materials; Tourism and Recreation; Energy and Supporting Services). The authors report that returns for most sectors appear to be more sensitive to cumulative mortality metrics than daily deaths.

Research by Gherghina et al. (2020) shows the high impact of Covid-19 on the Romanian stock market (BET index) between December 31, 2019 and April 20, 2020 due to the crisis in China and IDEA. The results of the ARDL model based on new Covid-19 infections have the most significant coefficients compared to the model containing the number of new deaths. According to Ozili and Aund (2020), Chowdhury et al. (2021) extended the analysis to include several countries from Europe (e.g. Italy, Germany, Spain) following a panel approach. The authors point out that the number of days of shutdown and the number of new Covid-19 patients, internal movement restrictions, and international travel restrictions have affected stock market prices.

Zoungrana et al. (2021) focused on the stock returns of companies listed on the stock exchanges of the West African Economic and Monetary Union (Benin, Burkina Faso, Ivory Coast, Guinea-Bissau, Mali)., Niger, Senegal and Togo) during the outbreak of Covid-19. Their aim is to examine the effect of the government's anti-Covid-19 measures on companies in general and on sectors that represent the majority of listed companies. On a general level, while social distancing and governance measures have been linked to a positive market response, movement restrictions and lockdowns have contributed to the decline in stock values. The results also show that

movement restrictions have a negative and significant impact on the stock returns of companies from the three sectors, while regarding lockdown measures, companies from the sector Industrial and financial sectors are affected more than companies from the distribution sector. In Indonesia, Utomo and Hanggraeni (2021) also analyze the impact of Covid-19 on the stock market, focusing on a number of companies at both general and industry levels. The results of the fixed-effects panel regression show that, at the general level, in addition to new cases and new deaths caused by the Covid-19 pandemic, the stock market is also significantly affected by the door lock measures. Turning to the analysis of firms by sector, the authors show that firms from several sectors (basic industries; consumer goods; mining and trade, services and investment) are affected. benefit more than other sectors (agriculture and infrastructure).

In summary, the available studies only investigate the impact of Covid-19 on a particular country's key indicators. Although some studies have focused on analyzing some of the affected areas, the analysis needs to be conducted more comprehensively. Therefore, this study aims to fill the knowledge gap by investigating the relationship between the Covid-19 outbreak and the performance of all sectors in the Vietnamese stock market.

## 3. RESEARCH METHODS

### 3.1. VAR regression model

VAR model is a vector autoregression model that combines two unidimensional autoregression (AR) and simultaneous equations (Ses) models. VAR is a system of dynamic linear equations, all variables in the system are considered endogenous variables, each equation of each endogenous variable in the system is explained by its own lagged variable and other variables in the system. VAR models include many different forms such as reduced form VAR, Recursive VAR, Structure VAR, and Vector Error Correction. In terms of the nature of the VAR model, which is commonly used to estimate the relationship between macroeconomic variables in stationary time series, there is an interaction and this effect is lagged in time because usually the Macroeconomic variables are often endogenous, meaning they interact with each other, which will affect the

reliability of the regression results for unidirectional equation regression research methods.

General formula for multivariable VAR model:

$$y_t = Dd_t + A_1 y_{t-1} + \cdots + A_p y_{t-p} + u_t$$

Where, $y_t = (y_{1t}, y_{2t,} \ldots y_{nt})$ is the series of line vectors (nx1) endogenous variables over time series t, D is the matrix of intercept $d_{t,}$ $A_i$ is the coefficient matrix (k x k) for i = 1,…, p of endogenous variables with lag $y_{t-p}$. $u_t$ is the white noise error of the equations in the system where the covariance matrix is the unit matrix $E(u_t,u_t') = 1$.

Based on relevant theories and previous empirical studies, the author builds a research model to analyze stock market fluctuations in different periods of the Covid-19 pandemic based on a regression model with time series (VAR) data. Regression model will be considered and selected after conducting tests, especially testing the stationarity of time series. Nonstationary time series should be stationary transformed by taking the difference of a higher order. However, the results show that the stationary data series have the same association order ~ I(1). Therefore, the study should continue to conduct the cointegration test and since there is no cointegration result, the VAR model will be used to test.

### 3.2. Description of the model's variables

The study has 4 variables: the number of Covid cases (CASES), the government shutdown order (LOCKDOWN), the trading value on the stock market (TRANS), and the VN-Index of the stock market (VNINDEX). In fact, there may be more variables that are deemed appropriate for the present analysis. However, the VAR model that the author uses requires a sufficient number of observations. An increase in variables in the system can quickly render the regression inefficient. The study will examine how the number of Covid cases, the government's shutdown order will have an impact on the VN-Index and the trading value of the stock market at different times in the context of Vietnam's economic crisis. the Covid-19 epidemic situation. The data is taken by date for the period from January 30, 2020 to June 30, 2022. January 30, 2020 is the first day the stock market opens after Vietnam's traditional Tet, the period from January 30,

2020 to June 30, 2022 is the period before, during and after the government implemented order to close to prevent the spread of disease. The daily number of Covid cases in Vietnam is obtained from the website of the Vietnamese Ministry of Health. VnIndex and trading value on the stock market are taken from VNDirect. In total, there were 606 observations in the study. The number of daily Covid cases, the stock trading value and the VN-Index are not normally distributed, so logarithms are taken. The government shutdown order is a dummy variable and takes on a value of 0 or 1.

## 4. RESEARCH RESULTS AND DISCUSSION

### 4.1. Tests of the model

#### *4.1.1. Stationality of data series*

The unit root test results show that with the significance level $\alpha = 0.05$, all accept the hypothesis Ho about the existence of unit roots, so the series CASES, LOCKDOWN, TRANS, VNINDEX all do not stop at difference d = 0 and the series are stationary at the first difference. Thus, the data series are stationary of the same order of difference.

**Table 1. Unit root test of data series (d=1)**

| Unit root test | t-Statistic | Prob.* |
|---|---|---|
| Hypothesis: CASES has a unit root | -3.176036 | 0.0218 |
| Hypothesis: LOCKDOWN has a unit root | -8.628432 | 0.0000 |
| Hypothesis: TRANS has a unit root | -25.75793 | 0.0000 |
| Hypothesis: VNINDEX has a unit root | -24.24396 | 0.0000 |

*Source: Compiled from regression results.*

#### *4.1.2. Cointegration test*

In the Engle-Granger test, the sequences CASES, LOCKDOWN, TRANS, VNINDEX all stop at first difference: I(1). Using Johansen test

to check whether CASES, LOCKDOWN, TRANS, VNINDEX are co-linked or not.

**Table 2. Cointegration Test**

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
|---|---|---|---|---|
| None | 0.024887 | 26.28214 | 47.85613 | 0.8800 |
| At most 1 | 0.010674 | 11.13569 | 29.79707 | 0.9578 |
| At most 2 | 0.006720 | 4.686107 | 15.49471 | 0.8412 |
| At most 3 | 0.001054 | 0.633599 | 3.841466 | 0.4260 |
| Trace test indicates no cointegration at the 0.05 level | | | | |

*Source: Compiled from regression results.*

The results obtained from the Trace test show that CASES, LOCKDOWN, TRANS, VNINDEX are not cointegrated, at the significance level $\alpha = 0.05$, when $k = 0.05$ (None), p -value = 0.8800 > $\alpha$ should accept the hypothesis. set Ho: $r = 0$ (no cointegration between variables). The chains have no cointegration, so the VAR model is suitable for regression.

#### *4.1.3. Test for choosing the optimal delay for the model*

Normally, it is possible to use the PACF chart of the BOX - JENKIN method or use the LogL, AIC, SC... criteria to determine the optimal delay for the model. In this case, the criteria LR, FPE, HQ will be used to determine the optimal delay for the model. Correspondingly, in the present analysis, the authors define their proposed lag: $p = 3$.

**Table 3. Test for Choosing the Optimal Delay for the Model**

| VAR Lag Order Selection Criteria | | | | | | |
|---|---|---|---|---|---|---|
| Endogenous variables: D(VNINDEX) D(TRANS) D(LOCKDOWN) D(CASES) | | | | | | |
| Exogenous variables: C | | | | | | |
| Sample: 1 606 | | | | | | |
| Lag | LogL | LR | FPE | AIC | SC | HQ |

| | | | | |
|---|---|---|---|---|
| 0 | 3644.148 | NA | 5.70e-11 -12.23579 -12.20629 -12.22430 | |
| 1 | 3970.176 | 646.5763 | 2.01e-11 -13.27790 -13.13039 -13.22046 | |
| 2 | 4110.376 | 276.1582 | 1.33e-11 -13.69538 -13.42986 -13.59198 | |
| 3 | 4151.906 | 81.24413* | 1.22e-11* -13.78119 -13.39766 -13.63184* | |
| 4 | 4181.377 | 57.25961 | 1.16e-11 -13.82648 -13.32493 -13.63116 | |
| 5 | 4204.349 | 44.32261 | 1.14e-11 -13.84991 -13.23035 -13.60864 | |
| 6 | 4221.887 | 33.60202 | 1.13e-11 -13.85508 -13.11751 -13.56785 | |
| 7 | 4252.980 | 59.15473 | 1.07e-11 -13.90582 -13.05023 -13.57263 | |
| 8 | 4277.009 | 45.39275* | 1.05e-11* -13.93280* -12.95921 -13.55366 | |
| 9 | 4284.086 | 13.27380 | 1.08e-11. -13.90281 | -12.81120 -13.47771 |
| 10 | 4294.568 | 19.51889 | 1.10e-11. -13.88426 | -12.67464 -13.41320 |

*Source: Compiled from regression results.*

### *4.1.4. Check the stability of the model*

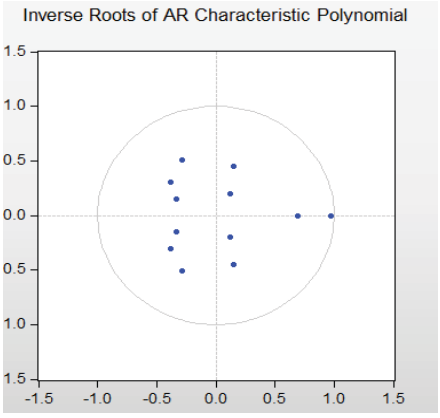


**Figure 1. Testing the Stability of the Model**

*Source: Compiled from regression results.*

To test the stability of the VECM model, use the AR Root Test to consider whether the solutions or the eigenvalues are all less than 1 or all within the unit circle, the VAR model achieves stability. The results show that the solutions are all within the unit circle, so the VAR model is stable.

#### *4.1.5. Test for white noise of residuals*

The residuals of the VAR model must be white noise before the VAR model can be used for forecasting. The results show that p-value > α (α = 0.05) from the 4th lag. Therefore, no autocorrelation occurs from the 3rd lag. Therefore, the appropriate lag of the model is p = 3, at where the residuals of the model are white noise. The VAR model is suitable for regression.

**Table 4. Test for White Noise of Residuals**

| VAR Residual Portmanteau Tests for Autocorrelations | | | | | |
|---|---|---|---|---|---|
| Lags | Q-Stat | Prob. | Adj Q-Stat | Prob. | Df |
| 1 | 2.628222 | --- | 2.632595 | --- | --- |
| 2 | 18.79195 | --- | 18.85021 | --- | --- |
| 3 | 36.43507 | --- | 36.58168 | --- | --- |
| 4 | 59.20959 | 0.0000 | 59.50855 | 0.0000 | 16 |

*Source: Compiled from regression results.*

Thus, the tests show that the stationary series are at the same order of difference, the cointegration test has no cointegration, which ensures that the VAR model selection is reasonable. With the appropriate delay selected as 3 and the VAR model is guaranteed to be stable, the variables included in the model are necessary, the residuals are not white noise, suitable for regression. From there, the author conducts analysis of variance decomposition and impulse response functions as the basis for the conclusions.

### 4.2. Model results and discussion

#### *4.2.1. Impact of Covid-19 on the stock market during the Pandemic period*

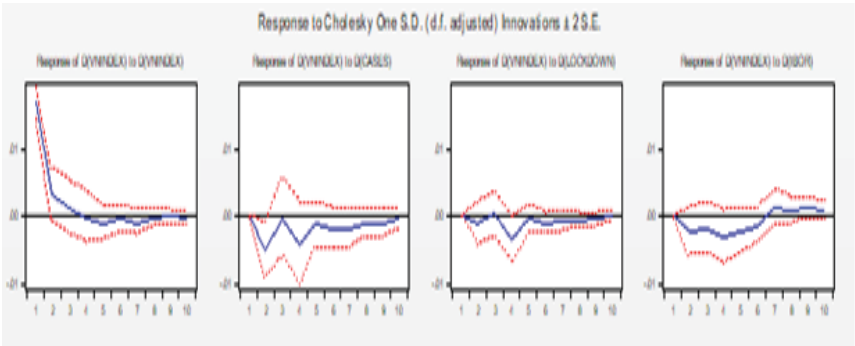


**Figure 2: Repulsion Function**

*Source: Compiled from regression results.*

**Table 5. Variance Decomposition**

| Variance decomposition of D(VNINDEX): | | | | | |
|---|---|---|---|---|---|
| Period | S.E. D(VNINDEX) | D(CASES) | D(LOCKD | D(TRANS) | |
| 1 | 0,017122 | 100,0000 | 0,000000 | 0,000000 | 0,000000 |
| 2 | 0,018256 | 91,03857 | 7,217705 | 0,310161 | 1,433565 |
| 3 | 0,018378 | 90,31333 | 7,127628 | 0,376954 | 2,182087 |
| 4 | 0,019388 | 81,15900 | 10,93026 | 3,615954 | 4,294782 |
| 5 | 0,019558 | 80,04809 | 11,09520 | 3,569188 | 5,287519 |
| 6 | 0,019707 | 78.85510 | 11,67201 | 3,807883 | 5,665002 |
| 7 | 0,019870 | 77,81745 | 12,21036 | 3,825815 | 6,146378 |
| 8 | 0,019927 | 77,37595 | 12,34475 | 3,859167 | 6,420125 |
| 9 | 0,019986 | 76,91787 | 12,47888 | 3,861633 | 6,741618 |
| 10 | 0,020009 | 76,74491 | 12,48657 | 3,866270 | 6,902259 |

*Source: Compiled from regression results.*

The volatility shocks that increase the number of infections have a significant impact on the VNINDEX index on the stock market. The VNINDEX index of the stock market reacts inversely to the fluctuation of the number of Covid-19 infections. This is explained by the increase in the number of infections, which has halted production and business activities of the economy. In addition, when the government implemented a blockade order to reduce and prevent the spread of the disease, this had a clear impact on the stock market from the 4th period. blockade orders cause negative effects on the stock market. Although the forecast error in the VNINDEX index of the stock market due to the implementation of the nationwide blockade order is more than 3%, it is maintained through the next periods and after that. The number of infections contributed to the volatility of the VNINDEX index of the stock market quite large over 10% from the 4th period.

### *4.2.2. Impact of Covid-19 on the stock market in the Post-pandemic period*

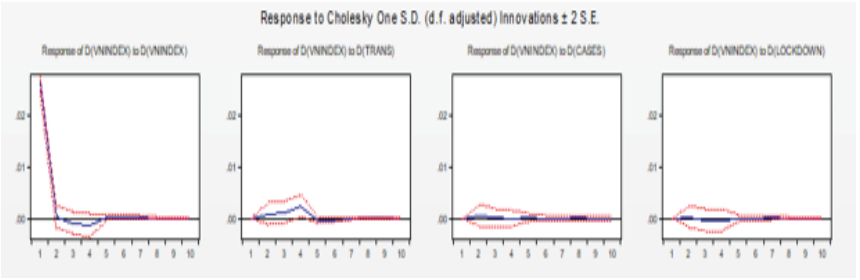


**Figure 3. Repulsion Function**

*Source: Compiled from regression results.*

**Table 6. Variance Decomposition**

| **Variance decomposition of D(VNINDEX):** | | | | | |
|---|---|---|---|---|---|
| Period | S.E. D(VNINDEX) | D(TRANS) | D(CASES) | D(LOCKD) | |
| 1 | 0.026279 | 100.0000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 0.026298 | 99.85876 | 0.104511 | 0.034148 | 0.002577 |
| 3 | 0.026341 | 99.68694 | 0.258367 | 0.034752 | 0.019937 |
| 4 | 0.026494 | 98.84416 | 1.075614 | 0.034385 | 0.045837 |
| 5 | 0.026499 | 98.80643 | 1.111911 | 0.034975 | 0.046687 |
| 6 | 0.026503 | 98.79391 | 1.124285 | 0.035091 | 0.046715 |
| 7 | 0.026503 | 98.79083 | 1.126928 | 0.035184 | 0.047060 |
| 8 | 0.026503 | 98.78962 | 1.127764 | 0.035493 | 0.047124 |
| 9 | 0.026503 | 98.78913 | 1.128091 | 0.035575 | 0.047200 |
| 10 | 0.026503 | 98.78898 | 1.128090 | 0.035728 | 0.047204 |

*Source: Compiled from regression results.*

The impulse response function and p decay the variance of the error when forecasting variables in the VAR model in order to separate the contribution of other time series as well as the time series itself in the variance of the forecast error. The variance decomposition results are consistent with the results of the impulse response function and more importantly, determine the impact of the Covid-19 epidemic on the stock market in the period after the government stops implementing the shutdown order. The results show that at the stages after Vietnam stopped implementing the blockade order and the economy entered a new period, the impact of the number of Covid-19 infections on the VNINDEX index of the stock market has decreased. leveled off and was almost insignificant and did not tend to increase.

## 5. CONCLUSION

This study provides further empirical evidence of stock market movements amid the Covid-19 pandemic using daily data from January 30, 2020 to June 30, 2022. the results show that (a) a gradual increase in the number of confirmed cases of Covid-19 had a negative impact on the stock market during the peak of the epidemic and the implementation of the government shutdown order; (b) government interventions such as social distancing have had a negative impact on the stock market; and (c) however, during the period when Vietnam no longer implements the

blockade order and implements a new period for economic recovery, the impacts of the Covid-19 epidemic on the stock market have slowed down and no longer exist. increase further.

Overall, the spread of Covid-19 has had a devastating impact on the world economy, and as the pandemic in Vietnam drags on, the government's economic recovery is adaptive and the new era has come to an end. have positive results for the stock market and the economy. This study also recommends that investors should monitor changes in the number of Covid-19 cases in Vietnam before making any investment decisions regarding the Vietnamese stock market. However, the number of Covid-19 cases should not be too much focus at the moment for investment decisions.

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# EXPERIENCE IN HANDLING DOUBLE TAXATION ON INCOME IN THE CONTEXT OF GLOBALIZATION

**Nguyen Tien Kien**[1]

***Abstract:*** *With the aim of studying international experiences in handling double taxation of some countries to draw valuable lessons from experience for Vietnam. The article recommends solutions in handling double taxation in Vietnam, including: (i) It is necessary to follow the basic principles in handling double taxation. (ii) It is necessary to promote the sharing of information, training and professional training on handling double taxation, especially provisions of double taxation agreements (DTAs) that can be used for tax evasion and avoidance for tax officials are assigned to handle the application of the DTA. (iii) Strengthening and expanding bilateral and multilateral tax cooperation is very important in tax administration. (iv) It is necessary to promote the application of transparency standards in global cooperation on the exchange of tax information. (v) It is necessary to promote reform of the national legal system and the administrative system. (vi) It is necessary to carefully study and choose an appropriate plan to join the signing of the Multilateral Convention to Implement Tax Treaty Related Measures to Prevent Base Erosion and Profit Shifting (MLI) and Convention on Mutual Administrative Assistance in Tax Matters (MAAC) because these are an effective Instrument and help to reduce the time for negotiating and amending the bilateral DTAs; and stipulate forms of international tax cooperation to deal with tax evasion, tax avoidance and double taxation on income.*

***Keywords:*** *Income tax, double taxation, experience in handling double taxation.*

## 1. INTRODUCTION

With the globalization of the economy, the increasing investment activities abroad, the movement of labor from one country to another is increasing, the double taxation often occurs when two or more countries are at the same time reserve the right to tax an income of the same taxpayer according to two main principles (residence principle and source principle). This is because a company, or individual, who is a resident of one country, but operates and earns income in another

[1] Department of Taxation, Hanoi, Vietnam. Email: ntkien01@gdt.gov.vn

country (such as companies that invest abroad, or provide services, goods abroad; or individuals earning income from an employment, investing in a number of commercial activities, ... abroad); The double taxation causes many problems such as trade barriers (does not encourage cross-border investment), is the cause leading to the violation of tax obligations, tax evasion ... of the persons involved.; To deal with the problem of double taxation on the incomes of the above-mentioned persons, countries often sign a bilateral tax agreement, also known as an Agreement for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with respect to Taxes on Income (and on Capital) (often referred to as the Double Taxation Agreements or DTA), which principally agrees on the division of the taxing rights of each Contracting State on certain amounts of the income of the related persons. In the process of opening up the economy, in order to attract investment and develop trade, Vietnam has negotiated and signed many Double Taxation Agreements with other countries and territories. The first Double Taxation Agreement that Vietnam signed was with Australia in 1992. As of September 1st, 2022, Vietnam has signed Double Taxation Agreement with 80 countries and territories around the world. Among them, there are 76 Agreements that have come into effect, contributing to creating a legal basis and a stable and transparent investment environment, attracting foreign investors to do business in Vietnam as well as promoting Vietnamese enterprises to invest abroad. Compared with other countries in the world, Vietnam's Double Taxation Agreement network is relatively wide.

However, after 30 years, the development of the Vietnamese economy itself as well as that of the world economy, especially Vietnam's trend of opening up and integration, some provisions of the DTA are not really suitable for the current economic situation. In addition, many DTAs have been signed for too long, and some DTAs lack provisions to apply (for example, there are no provisions on permanent establishments providing services, no provisions on interest, regulations on tax exemption for the supply of machinery and equipment in Vietnam that easily lead to discrimination against foreign enterprises or take advantage of the DTA to evade taxes...) or some provisions are inconsistent with international practice, does not cover all possible cases and situations that give rise to tax obligations between taxpayers in Vietnam and foreign partners in the

new integration conditions; the organization of implementation of DTAs at Province Tax Offices after the DTA's entry into force is not really effective; The exchange of information with foreign tax authorities under bilateral DTAs to serve tax administration and prevent tax evasion by taxpayers has not yet been paid attention, and in many cases is still delayed,... Besides, in the current international context, countries have negotiated and signed the MLI to amend and supplement existing bilateral DTAs in a synchronous and effective manner to quickly implement the provisions that need to be revised in the DTA system under the OECD's Base erosion and profit shifting (BEPS) Project.

## 2. METHOD

*Research Objectives:* Developing and supplementing the theory of double taxation. At the same time, systematize the contents of the basic theoretical framework on dealing with double taxation on incomes within the scope of DTAs, thereby determining the factors affecting the treatment of double taxation in the process of settling disputes over taxing rights between two countries under the DTAs; Analysis of international experiences in handling double taxation of some countries to draw valuable lessons for reference for Vietnam.

*Research Methods:* The article uses the general research method which is the dialectical materialism and historical materialism of Marxism - Leninism; specific research methods such as: synthesis, situation, analysis, comparison and desk research.

## 3. RESULTS

The fact that countries simultaneously exercise the privilege of taxing based on different principles as well as the design of residency and income source regulations are not the same in each country's domestic law, resulting in double taxation. Double taxation is where income tax is paid twice on the same income during the same tax period. In the context of international trade, double taxation is the taxation by two or more countries/territories on the same income, assets, or financial transactions of a taxpayer who is a resident of one country but whose income, assets or financial transactions arise in another country. The double tax liability can be mitigated in a

number of ways, for example, the country/territory may be exempt from tax on foreign source income (unilateral way); signing DTA with other countries/territories (bilateral way);...

Types of double taxation include: (i) In case of duplicate residence (dual residence) (ii) In case of duplicate source (iii) In case of competition for source or residence (iv) In case of profit adjustment.

Experience in handling double taxation on income in other countries:

* Austria: Austria taxes the global income of its residents. Under the Austrian Corporate Income Tax Law (KStG), companies have unlimited tax obligations if they register a physical headquarters or headquarters in Austria. The term "place of effective management" refers to a location where major decisions are made on a routine basis; Corporate entities pay taxes at a uniform tax rate of 25%. If the company does business, all types of income fall under the concept of "business income" and are generally subject to a uniform tax treatment. Taxpayers are allowed to deduct any expenses incurred for business purposes.

Under domestic law, Austria allows for double tax relief according to the Austrian Federal Tax Procedure Law (BAO). Under this provision, the Austrian Ministry of Finance may allow double tax relief on a reciprocal basis. This relief may be permitted either by withholding tax charged abroad or exempting from tax on foreign income. In the past, unilateral relief required a taxpayer's application and was only done on a case-by-case basis. In principle, there is no regulation on the responsibility of the Ministry of Finance to reduce double tax. However, now, the Austrian Ministry of Finance has issued a Circular on uniform procedures for tax relief in accordance with BAO regulations. The Circular implements tax treaty practice, which will only apply to income arising from countries that do not have an agreement. Income from activities such as employment, independent personal services, artists, and business income, as well as income from immovable property located in other countries, will be exempt from income tax in Austria provided that case the actual foreign income tax liability on this total income is less than 15% calculated according to the Austrian tax principles. However, tax-free income is added to the calculation of general income to determine the progressive tax rate according to Austrian domestic law. If the conditions are not

satisfied (e.g. passive income, income in low-tax countries) the double tax relief is granted only by deduction from the tax payable in Austria. To apply the double tax relief that coincides with the new Circular, taxpayers must maintain accounting records that reflect each item of income by source country, taxable income, nominal and actual tax rates, and time information.

In terms of agreement practice, in general, Austria allows for double tax relief under the progressive exemption method. However, the deduction method is applicable for certain countries (for example, the United States). When applying this measure, the amount of tax that can be deducted is limited to the amount of tax that could be taxed if it was domestic income according to the following formula:

$$\text{Amount of tax that can be deducted} = \text{Austrian tax} \times \frac{\text{foreign income}}{\text{total income}}$$

Companies that do not have a physical headquarters or headquarters in Austria are subject to tax in Austria only on certain types of income. For example: income from domestic agriculture and forestry; income from independent professional services performed or used in Austria; income from business or trade if a permanent establishment is maintained in Austria for such business or trade; ...

* The Netherlands: The Netherlands taxes resident taxpayers on their global income, and from January 1st 2005, companies are taxed at the rate of 32.5% (with a reduced tax rate of 27.5% on profits to 22,689 EURO). From 2007, these tax rates are reduced to 30% and 25% respectively. However, the intention of the legislators is that from 2007, a tax reform on CIT will come into effect.

Taxable income arising from a foreign PE is determined in accordance with Dutch law. As a result, losses arising from foreign PE are deducted from global taxable income.

In general, the double tax relief on the income of foreign PE is implemented through the progressive exemption method. Accordingly, the progressive exemption method operates as a regular deduction for Dutch taxable income based on the exempt portion of global income. The deduction is calculated as follows:

$$\frac{\text{Foreign income}}{\text{Active income (+) certain types of passive income}} \times \text{Income before tax exemption applies}$$

It seems likely that losses arising from foreign PE would reduce a taxpayer's global taxable income. However, if in the following years foreign active income is recognised, the amount of the exempt income will be reduced by the amount of the previously deducted foreign loss. In the event of a domestic loss and foreign active income, the Netherlands will allow a future tax exemption for non-exempt foreign income.

A typical exception to the application of the progressive mechanism to the tax exemption method is for the foreign PEs of an entity subject to CIT that generates only passive income from passive investments or passive corporate financing activities. If an exception applies, the deduction is essentially limited to 50% of the tax payable under the 1969 Netherlands CIT Law. The Dutch tax treaties also provide for the application of progressive tax exemptions to double tax relief with the income of foreign PE. Since 1995, tax exemptions have been applied on a country-by-country basis (previously the unilateral exemption method was applied on an aggregated basis).

* France: The French corporate tax system is based on territorial principles. Companies residing in France are taxed only on income sourced in France, foreign income is ignored. According to French tax law, the profits of an enterprise that conducts business in France and other types of profits governed by international tax treaties are subject to Corporate Income Tax (CIT). Thus, with exceptions, companies incorporated in France are subject to CIT on profits arising from business activities in France and exempt from CIT on profits related to business activities conducted outside of France. France; An enterprise may conduct business outside France (i) within the framework of an autonomous entity, or (ii) if there is no such entity, through a non-personally independent agent, or (iii) when activities carried out in France constitute a "closed business cycle".

France has a global system of taxation. The standard corporate tax rate is 26.5%/27.5%. The standard tax rate is increased by an additional contribution. Companies with sales above a certain threshold will have to make an additional social contribution. The reduced tax rate is applied to long-term income.

* UK: The UK imposes global tax obligations on UK residents. Historically, the criterion of residency for a company has been central management or control, and is based on legal cases rather than regulations. The 1988 Finance Act provides a company is a UK tax resident if it is incorporated or is principally managed or controlled in the UK. There are two main exceptions to this concept with respect to: (i) companies that are also residents of another country under the laws of that country, and subject to the exclusions to which Britain's tax treaty with country of which the company is deemed a resident for tax purposes; and (ii) certain companies incorporated in the UK but migrated out of the UK through transfer of central management or control out of the UK before March 1st 1998. In these two cases, the companies are not considered as UK residents for tax purposes.

The UK has adopted a Scheduled system of taxation which dates back to 1803 Tax Act. The Scheduled system of taxation has the following practical consequences:

As a general rule, deductions are made on a source-by-source basis. An excess in one source of income cannot be offset against income taxes from another, even within the same country. As an exception, there is a complex system of sharing deductions for dividends subject to a ceiling of 45% on the amount of tax that can be withheld (that is, if the tax deduction exceeds 45% of gross income, no sharing is allowed); Shared deductibles can be carried forward to subsequent and prior years within a 3-year range. The second exception concerns foreign PE, excess deductions from a foreign PE are not shared but can be carried forward indefinitely to subsequent years or three years prior to the tax of the same foreign PE.

With regard to dividends, DTAs generally allow deductions not only for direct taxes payable (for example, withholding tax) but also for indirect taxes paid by the company paying the dividends, but generally with at least 10% ownership (voting rights). In the absence of an DTA, a unilateral deduction is made.

A non-resident company is subject to corporate income tax (the usual 19% tax rate as a resident company) if it carries on a commercial activity through a PE in the UK. In this case, the company is subject to UK corporate tax on any profits attributable to the PE UK regardless of where they arise.

Non-resident companies may also be subject to income tax on income not subject to corporate income tax on the basis of the above criteria.

## 4. DISCUSSION AND CONCLUSION

Through studying the general characteristics of the double tax system of some countries (Austria, Netherlands, France and the UK) mentioned above, lessons can be drawn for Vietnam as follows:

*Firstly,* it is necessary to follow the basic principles in handling double taxation. Including: (i) When applying, tax treatment for each case must be based on the provisions of each DTA (including the Protocol and/or the Letter of Exchange, if any); (ii) Application of the DTA, tax laws and related laws.

*Secondly,* it is necessary to promote the sharing of information, training and professional training on handling double taxation, especially provisions of DTAs that can be used to evade or avoid taxes for tax officials are assigned to handle the application of the DTA.

*Thirdly,* strengthening bilateral and multilateral cooperation on taxation is very important in tax administration, especially in dealing with double taxation of taxpayers' incomes in the global context.

*Fourthly,* it is necessary to promote the application of transparency standards in global cooperation on tax information exchange. Information is received through the automatic exchange of Common Reporting Standard (CRS) and Country-by-Country (CbC). Transparency and openness through the exchange of information, which allows countries to get their fair share of taxes, has been undeniable in the program of international tax cooperation.

*Fifthly,* for the issues of interpretation of the DTA arising mainly from the DTA, only general handling principles are stated, not case-specific. Therefore, when applying each specific case in practice, the DTA will not be able to cover all issues arising in reality, causing difficulties in the application and interpretation of the DTA. Accordingly, the Ministry of Finance (General Department of Taxation) issued the Instruction Manual, Instructional Official Letters, Training on DTAs for officials handling directly at Province Tax Offices; directly discuss with enterprises and

the Province Tax Offices to handle any difficulties or doubts arising the interpretation or application of the Agreement.

*Sixthly,* it is necessary to promote the reform of the national legal system and the administrative system. As the experience of the Netherlands shows, this is a very strong obstacle to the treatment of double taxation on income. Through reform activities, many issues of information exchange have been made easier and more convenient for tax authorities of different countries to cooperate in exchanging information as well as proceeding to carry out simultaneous tax examinations or tax examinations abroad, to completely handle the double taxation.

*Seventhly,* it is necessary to carefully study and choose an appropriate plan to join the signing of the MLI and MAAC because these are an effective Instrument and help to reduce the time for negotiating and amending the bilateral DTAs; and stipulate forms of international tax cooperation to deal with tax evasion, tax avoidance and double taxation on income.

Vietnam's integration process is going deeper and deeper, as shown by the fact that Vietnam has signed more and more bilateral and multilateral agreements, as well as participated more and more in international and regional organizations to promote international cooperation and attract foreign investment. In that context, in order for businesses and individuals with investment and business activities abroad and vice versa to really benefit from the bilateral and multilateral agreements that Vietnam has joined/signed, the treatment of double taxation on income plays a very important role.

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# FINANCIAL FLEXIBILITY, INVESTMENT AND FIRM VALUE: EVIDENCE FROM VIETNAMESE FIRMS DURING COVID-19 PANDEMIC

**Le Thi Phuong Vy[1,*], Vo Thi Thuy Duong[1], Nguyen Thi Ngoc Huyen[1]**

***Abstract:*** *This paper aims to explore the effects of financial flexibility on Vietnamese firms through two factors: investment activity and firm value. This paper uses the dataset of 233 Vietnamese-listed firms from 2010 to 2020. First, the study determines which companies in the sample are the most financially flexible by examining their simultaneous low leverage and high cash holdings. Second, the study utilizes the Generalized Method of Moments (GMM) to investigate whether financial flexibility impacts investment activity and company value. Our results indicate the significant positive influence of financial flexibility on investment activity and firm value.*

***Keywords****: Financial flexibility, investment activity, firm value, Covid-19 pandemic.*

## 1. INTRODUCTION

Financial flexibility, which is not a new concept, is the capacity of an organization to react to sudden changes in its cash flows or investment opportunity set in a timely and value-maximizing way (Denis, 2011). The standard theory (such as MM theory) states that businesses are not required to have financial flexibility if capital markets are perfect and there are no financing frictions. However, the fact is that the capital markets are not perfect. External capital decisions are major problems for firms, especially in emerging economies, due to their underdeveloped capital markets and high volatility of capital (Bekaert and Harvey, 2003; Demir, 2009; Stepanyan and Guo, 2011; Agosin and Huaita, 2012). Therefore, high financial flexibility influences their capital structure and financing decisions.

[1] School of Finance, UEH University, Vietnam

* Corresponding author. Email: phuongvyqt@ueh.edu.vn

Researchers analyzed how valuable high financial flexibility is, especially in unexpected events, in different economies. The ability of a company to utilize its financial resources in response to unpredictable future scenarios is referred to as financial flexibility by Byoun (2011). Gamba and Triantis (2008) believe that financially flexible companies can withstand the negative effects of external shocks better than less flexible ones; hence financial flexibility is desirable. In line with this idea, Graham and Harvey (2001) claims that financial flexibility is the key component influencing a company's capital structure. Yung et al. (2015) examine the value of financial flexibility in 33 emerging countries and discover that financial flexibility improves firms' ability to make investments, lowers the sensitivity of those investments to cash flow, reduces the equity payout boosts cash holdings, and enhances firm value. While many empirical studies highlight the impact of financial flexibility on capital structure and company performance are evaluated in developed countries, similar projects in developing economies are even less (Faris, 2011).

This paper first explores the effects of financial flexibility on Vietnamese firms through 3 factors: investment activity, cash holdings, and firm value. Firstly, Vietnam's economy is a small, partially open economy with financial markets and institutional development that lags behind major economies. Since the 'reform' in 1986, Vietnam's economy is steadily shifted from a command to a market-oriented strategy, which makes the economic environment more competitive with equal opportunities for types of domestic and foreign investment enterprises to get funding in the financial markets (Batten and Vo, 2014; Batten and Vo, 2015). Despite the increasing number of investment funding options, most domestic businesses still rely heavily on or even exclusively on bank credit as their primary source of outside financing. This can be explained by the higher volatility and higher costs in the Vietnam stock market, which is considered still at the infant stage (Vo, 2016). Accordingly, financial flexibility plays a vital role in Vietnamese companies' growth.

This paper investigates the value of financial flexibility to listed companies in Vietnam. Specifically, this study examines the impact of financial flexibility on two main factors: investment activity and firm value. The dataset contains Vietnamese companies for the ten years between 2010 and 2020, consisting of 233 companies practically in an industrial sector.

The rest of the paper is organized as follows. A theoretical framework for constructing hypotheses is presented in Section 2, along with recent articles that are related. Section 3 describes the methodology. Section 4 explains the analysis process and results of the three models. Section 5 concludes and gives some discussions about the issues.

## 2. LITERATURE REVIEW

### 2.1. Definition of financial flexibility

The factors influencing capital structure decisions are essentially related to financial flexibility (Graham and Harvey, 2001). The definition of corporate financial flexibility is the amount of unused loan capacity (Graham and Harvey, 2001; Gamba and Triantis, 2008; DeAngelo and DeAngelo, 2007; Denis and McKeon, 2010; Marchica and Mura, 2010; De Jong et al., 2012). Financial flexibility is the ability of businesses to capitalize on opportunities or deal with unforeseen circumstances so they can get funding and reorganize at a cheap cost to prevent financial hardship when faced with shocks. In other words, it describes a firm's ability to respond effectively to unpredictable cash flows or investment opportunity changes. It is essential to the long-term success of a company.

According to Yi (2020) and Zhang et al. (2020), financial flexibility is the capacity of an enterprise to timely modify resources, capture investment opportunities, provide persistence to confront any future unforeseen circumstances, and contribute to achieving maximum firm value. The few studies investigating the consequences of financial flexibility in the face of external shocks include Aslan-Adaydin et al. (2014) and Bancel and Mitoo (2011). Rahimi and Mosavi (2016) state that companies can restructure their financial resources to achieve the lowest costs and maximize the firm value. If financial crises arise, they can also aid in reducing their costs (Hameedi et al., 2021). Financial flexibility refers to a company's capacity to quickly mobilize the resources needed for investment and gain back returns that will enhance the firm value. In other words, it refers to the capacity to shift the cash flows due to stockholders and bonds over time to achieve long value with lower risk (Pendar et al., 2019).

Researchers are paying more attention to financial flexibility because it is a key factor in financial managers' capital structure decisions (Graham and Harvey, 2001). One requirement for managing challenges and differences in both the internal and external financial environments is the ability of the company to access financing, rebuild its capital, work on lowering expenses in order to avoid financial distress when facing shocks and finance investment activities. (Byon, 2011). Corporate financial policies that they actively adjust to funding positive action projects are mostly motivated by financial flexibility (Bonaimé, 2013).

The need to achieve and maintain financial flexibility is the primary motivator for organizations' capital structure decisions, according to recent studies of American and European CFOs (Bancel and Mittoo, 2004; Graham and Harvey, 2001). According to surveys of corporate CFOs, one of the most important objectives in corporate finance decisions is financial flexibility. It is recommended that businesses keep unused debt capacity on purpose so they can continue to access low-cost sources of outside financing and prevent issuing shares at a later date at a price that is not appealing. Additionally, it is claimed that businesses desire financial flexibility to avoid any possible suffering in the event of adverse shocks and promptly fund investment when lucrative opportunities present themselves. Financial flexibility is a function of a corporation's capital structure, liquidity, investment strategies, and external financing costs that may show corporate characteristics. According to Gryko's (2018) analysis of the literature on the subject, financial flexibility is crucial for businesses. However, an organization's intents and capacity to achieve and sustain financial flexibility will determine its efficiency. Avoiding the expenses of financial hardship in a crisis and reducing problems brought on by underinvestment are the two main ways that financial flexibility becomes essential for businesses (Erdoğan, 2019).

## 2.2. Empirical Framework

### *2.2.1. Financial flexibility and investment activity*

Marchica and Mura (2010) explore the relationship between financial flexibility and investment capabilities using a sample of all UK-listed companies included in Datastream from 1965 to 2008. This

paper identifies financial flexibility firms by using the spare debt capacity of Frank and Goyal's (2009) baseline leverages model. To measure the value of financial flexibility to company investment, Marchica and Mura (2010) use a similar model to Bond et al.'s (2003) one. According to their findings, a conservative leverage strategy implies to maintain financial flexibility can boost investing capability, which is in line with the theories of Modigliani and Miller (1963) and Myers (1984). Additionally, their data shows that enterprises increase atypical investments and make higher capital expenditures after low leverage, financed by fresh debt issuances. Long-term performance assessments also show that financially flexible organizations invest more wisely, going beyond simply investing more money. Their results are also consistent with DeAngelo et al. (2010), which demonstrated that firms use spare debt capacity to cover costs related to unexpected investment shocks while saving on the costs of issuing equity and keeping cash flow.

Using a huge sample of private and public companies in Europe during the 2007 financial crisis as a natural experiment, Ferrando et al. (2017) show that enterprises can decrease the detrimental effects of liquidity shocks on investment by having a higher level of financial flexibility. Additionally, having financial flexibility makes it easier for businesses to make future investments even when market tensions limit their potential for expansion. Their findings imply that by implementing a conservative leverage policy, enterprises can maintain financial flexibility, enabling them to more easily access the external market when confronted with positive shocks to their investment opportunity set. Their research also demonstrates that financial flexibility enterprises can invest substantially more following a time of spare debt capacity, demonstrating the flexibility factor's significant economic impact. A typical company can boost its investment by about 37%. Additionally, their research shows that businesses that gain financial flexibility through extra loan capacity can invest more and appear to invest more effectively. Therefore, financially flexible enterprises have more substantial investment capability than non-flexible ones in the UK and Europe, according to Marchica and Mura (2010) and Ferrando et al. (2017).

Arslan-Ayaydin et al. (2014) examine how financial flexibility affects investment and performance by utilizing a sample of 1,068 East

Asian enterprises from 1994 to 2009 with a focus on the 1997-1998 Asian Crisis and the most recent credit crisis 2007-2009. The analysis indicates financially flexible firms simultaneously through leverage and cash holdings policies following recent studies (DeAngelo and DeAngelo 2007, Byoun 2008, Gamba and Triantis 2008) instead of using the two separately as in previous papers. The findings show that enterprises can achieve financial flexibility through cautious rules regarding leverage and less frequently maintaining high cash holdings. Particularly, companies with greater financial flexibility before the crisis are better able to take advantage of investment opportunities, rely less on internal funds being available for investment, and outperform better than less flexible companies in the crisis.

Using the same measurement of financial flexibility - spare debt capacity - following Marchica and Mura (2010), Yung et al. (2015) analyze the benefit of financial flexibility for 8604 distinct businesses in 33 emerging markets over the 1991 - 2010 period. When examining the relationship between financial flexibility and investment activity, Yung et al. (2015) add financial flexibility as a dummy to prior models (Arslan-Ayaydin et al., 2014; Ferrando, 2014). The paper proves that financial flexibility improves investment capability and lessens the sensitivity of investments to cash flow, which is in line with Arslan-Ayaydin et al. (2014) demonstration. Similarly, by identifying financially flexible companies using unused debt capacity, De Jong et al. (2012) show that firms that maintain their debt can prevent future investment distortions. Therefore, these firms invest more in the future than those with low unused debt capacity.

Setianto and Kusumaputra (2017) investigate the effect of financial flexibility on investment activities using a sample of Indonesian manufacturing enterprises from 2011 to 2015 and regression methodologies. Following Marchica and Mura's (2010), the researchers classify firms with unused debt capacity and predict investment activities by employing Yung et al.'s (2015) model. The analysis also looks into how the degree of financial flexibility affects how sensitive investment activities are affected by cash flow. It suggests the same results as the previous paper (Marchica and Mura, 2010; DeAngelo et al., 2010; Yung et al., 2015). Financial

flexibility increases investment capability and reduces the sensitivity of investment activities to cash flow.

Cherkasova and Kuzmin (2018) investigate the influence of a company's financial flexibility on the efficacy of its investment using a sample of 1736 enterprises from 8 Asian nations between 2005 and 2015. The study's primary findings conclude the relationship between investment efficiency and flexibility and the effects of internal and external influences on this relationship. They also demonstrate that flexible businesses typically invest more money since it enables them to embark on initiatives with a positive net present value (NPV) and spend less money inefficiently. Flexibility during the financial crisis reduced the number of wasteful investments, which supported the growth of the Asian economy at the time. In addition to demonstrating the benefits of flexibility on investment performance, this study offers proof that flexibility significantly influences corporate decisions.

#### *2.2.2. Financial flexibility and firm value*

Gamba and Triantis (2008) create a model endogenizing dynamic financing, investment, and cash retention strategies to examine how financial flexibility affects firm value. Their research demonstrates that the cost of external funding, the level of corporate and individual tax rates that influence the effective cost of holding cash, the firm's potential for development and maturity, and the reproducibility of capital all affect the value of financing flexibility. They show through simulations that businesses encountering funding friction should concurrently lend and borrow. Their research also looks at the characteristics of dynamic debt and liquidity policies and the worth of corporate liquidity.

Using the same measurement of financial flexibility - spare debt capacity - following Marchica and Mura (2010), Yung et al. (2015) analyzed the value of financial flexibility of 8604 unique firms in 33 emerging countries from 1991 to 2010. Yung et al. (2015) evaluate firm value by Tobin's q calculated as the sum of all liabilities' book value and the common equity market value. We find that over the whole sample period, financial flexibility has a slightly positive impact on the value of the company. Additionally, businesses with financial flexibility experience

negative shocks less than businesses without financial flexibility. Moreover, during the 2007-2009 financial crisis, financial flexibility had a strong and largely positive impact on firm value, demonstrating the benefits of financial flexibility, especially during difficult periods.

Based on the dataset covering 4,334 enterprises from 15 developed nations and 1,436 companies from 6 developing countries in Europe between 2000 and 2016, Bilyay-Erdogan (2020) investigates the impact of financial flexibility on firm value in comparison to emerging and developed European nations. His findings confirm the opinions of Yung et al. (2015) and Gamba and Triantis (2008) by demonstrating that companies' financial flexibility enhances their value in all assessments. The robustness studies, which are carried out using several definitions of financial flexibility, also state that financial flexibility considerably and favorably influences business value. Furthermore, compared to wealthy European nations, his analysis provides previously unheard-of proof that emerging countries are more affected by financial flexibility's impact on business value. Additionally, his research demonstrates for the first time how business characteristics, such as age and size, which serve as proxies for unequal information within an organization, negatively affect the relationship between flexibility and firm value.

## 3. METHODOLOGY

### 3.1. Hypothesis

Marchica and Mura (2010) examined a sample of UK firms and found that high financial flexibility enhances investment ability. According to their findings, an average firm might increase capital expenditures by 37% if it has unused debt capacity for three years. They also discovered that after two years of obtaining financial flexibility, businesses improve their operating performance by more than 18%. Similar results were found in Europe by Ferrando et al. (2014). Ferrando et al. (2017) demonstrate that enterprises may lessen the adverse effects of liquidity shocks on investment by having greater financial flexibility by using the 2007 financial crisis as a natural experiment. They conclude that financial flexibility enhances companies' capacity to make future investments despite market frictions impeding potential development prospects. Similar findings were made by

De Jong et al. (2012), who discovered that US businesses with high levels of untapped loan capacity invest much more than those with low levels. Their findings indicate that financial flexibility helps the firm because it lessens investment distortions. According to their research, financial flexibility improves future investments by 5% for every standard deviation rise. Financially flexible companies are better able to obtain investment opportunities and rely less on internal funding sources for investments. (Arslan-Ayaydin et al. (2014). According to Cherkasova and Kuzmin (2018), companies with financial flexibility invest more effectively during times of crisis, and there is no significant difference between developed and developing countries.

Previous research in developing countries also brought similar findings. Due to their immature capital markets' high volatility of capital flows, companies in developing economies are more vulnerable to external shocks. (Bekaert and Harvey, 2003; Joyce and Nabar, 2009). Arslan-Ayaydin et al. (2014) indicate that financially flexible enterprises benefitted from investment opportunities during the 1997-1998 Asian financial crisis. Corporate financial flexibility increases investment ability and lessens the sensitivity of investment to cash flow. These effects were exacerbated during the global financial crisis of 2007-2009 (Yung et al., 2015). Setianto and Kusumaputra (2017) conducted analyses using annual data from Indonesian manufacturing companies over five years and proved that financial flexibility increases investment ability and reduces the sensitivity of investment activities to cash flow. Financial flexibility makes a company more likely to avoid financial distress and negative shocks. It is hypothesized that firms with financial flexibility in developing economies have improved investment viability because financial flexibility allows firms to invest sustainably and chase unexpected investment opportunities. This research, therefore, suggests that the ability of financially flexible enterprises in emerging countries relies less on internal money since their unused debt capacity enables raising external funding to finance their project simpler (Marchica and Mura, 2010). Therefore, we suggest the following hypothesis:

*Hypothesis 1: Financial flexibility improves investment ability and reduces investment cash flow sensitivity for companies in Vietnam.*

Financial flexibility and firm value have a certain relationship, as proved in many pieces of research. Financial flexibility enables firms to avoid financial distress and increases firm value by funding investment opportunities (Gamba and Triantis, 2008). In all estimations, firms' financial flexibility positively influences company value, which is even more obvious for emerging countries than for developed countries in Europe (Bilyay-Erdogan, 2020). Arslan-Ayaydn et al. (2014) found that financial flexibility empowers companies with the skills they need to deal with unexpected events or benefit from them at a minimum expense. Additionally, businesses can avoid underperforming due to poor investment decisions by covering funding needs resulting from unforeseen earnings shortfalls. According to de Jong et al. (2012), firms with high financial flexibility are more beneficial because it helps reduce investment distortions.

In emerging economies, financial flexibility increases firm value because financially flexible companies are less vulnerable to negative shocks, avoid high capital costs, and pursue profitable investment opportunities. It enhances firm value (Yousefi and Yung, 2021), particularly during a financial crisis (Yung et al., 2015). The previous evidence shows that unstable capital flows in developing nations have resulted in slower economic development and worsened business performance (Joyce and Nabar, 2009; Demir, 2009). When extremely variable capital flows are present, enterprises in emerging economies are forced to look for financing from outside sources (Bekaert and Harvey, 2003; Demir, 2009), which slows economic growth and degrades company performance (Demir, 2009). We suggest that the financial flexibility of Vietnamese businesses increases company value because these firms are better competent to respond to negative shocks, avoid high capital costs, and pursue promising investment opportunities. We have the hypothesis as follows:

*Hypothesis 2: Financial flexibility in Vietnam positively affects firm value.*

### 3.2. Sample and data

#### *3.2.1. Identification of financial flexibility firms*

Literature classifies a high financially flexible company as having a low leverage ratio (Faulkender et al., 2012; Bilyay-Erdogan, 2020). Spare Debt Capacity is a measurement used by Marchica and Mura (2010), Yung

et al. (2015), and Ferrando et al. (2017) to estimate a company's financial flexibility. Companies' actual leverage is compared to their expected maximum leverage level to determine if they have spare debt capacity. Firms gain financial flexibility through low-leverage policies (Byoun 2008) and high cash holding policies (Faulkender and Wang, 2006). According to Arslan- Ayaydin et al. (2014), financially flexible firms have high cash holdings and low leverage as they are more outstanding at raising external capital that they use financial flexibility as a proxy for a firm's leverage and cash holdings.

In this paper, we identify financial flexibility companies following the work of Baños-Caballero et al. (2016) by estimating leverage and cash holdings. We use the sample of 233 companies from 2010 to 2020 with 2563 observations to identify financial flexibility.

Firstly, we group companies based on their total debt to total assets ratio, and we recognize companies with higher financial flexibility if their ratio is lower than the sample median.

Secondly, we classify companies based on the proportion of cash and equivalents to total assets. We define them as having more financial flexibility if their ratio is higher than the sample median. To be financially flexible, a company must have a total debt to total assets ratio in the lowest 50% of all observations. In this way, we discover that approximately 29% of observations simultaneously satisfy both criteria. There are 744 observations identified as greater financially flexible and 1819 observations identified as less financially flexible. The median ratio of total debt to total assets is 0.5424, and this figure for cash and equivalents to total assets is 0.0648.

#### *3.2.2. Data collection*

To examine the relationship between firms' financial flexibility, investment activities, and firm value, we collect a sample of 233 firms in Vietnam over the 2010-2020 period. These are companies listed on three stock exchanges: Unlisted Public Company Market (UPCOM), Ho Chi Minh City Stock Exchange (HOSE), and Hanoi Stock Exchange (HNX). Secondary data of these firms are collected in the annual reports in cafef.vn and vietstock.vn, which are reliable financial and securities information and data channels in Vietnam. Some data are collected from the official

companies' websites. Depository receipts, companies in the utilities, and financial industries are not included in our sample. Almost all of the samples are in industrial areas. According to our measurement of financial flexibility, the sample is divided into two groups, higher financial flexibility and less financial flexibility, which include 744 and 1819 observations, respectively.

### 3.3. Empirical model

#### *3.3.1. System Generalized Method of moments (SGMM)*

System GMM has been shown by Antoniou et al. (2008) to be an effective technique for dynamic model estimation. To solve endogeneity problems, these researchers advise applying System GMM. In fluctuating residuals and autocorrelation, the two-step SGMM method provides reliable estimates and test results (Roodman, 2009). By employing a system of original and differential equations, the endogeneity caused by the interaction of the dependent variable and the explanatory variables may be managed (Roodman, 2009).

The Hansen and second-order autocorrelation tests are used to confirm that the SGMM estimations are reliable (Roodman, 2009). The GMM model's instrumental variables' suitability is validated using the Hansen test. The over-defined limit of the model is being tested here. Hansen's test, which uses H0 as the instrumental variable, is exogenous, meaning that its error is unrelated to the model's error. The test results must therefore demonstrate a p-value of at least 10%. Because there was no second-order autocorrelation, the second-order autocorrelation test was also carried out to make sure the instrumental variables used from lag 2 were acceptable (Arellano and Bond, 1991).

#### *3.3.2. Financial flexibility and investment activity*

In Hypothesis 1, we argued that financial flexibility positively influences the investment activity of firm value in Vietnam. We include financial flexibility as the independent variable of interest in earlier models (Arslan et al., 2006; Ferrando et al., 2014; Arslan-Ayaydin et al., 2014) to investigate how financial flexibility affects investing behavior. The enhanced model is described as follows:

$$\text{Investment activity}_{it} = \beta_{0i} + \beta_{1i}\text{Financial Flexibility}_i + \beta_{2i}\text{Financial Flexibility}_i \text{ x Cash Flow}_{it-1} + \beta_{3i}\text{Financial Flexibility}_i \text{ x COVID19}_t + \beta_{4i}\text{Financial Flexibility}_i \text{ x Cash Flow}_{it-1} \text{ x COVID19}_t + \beta_{5i}X_{it-1} + \sum_t y_t \text{Year}_{it} + \sum_j \lambda_j \text{Ind}_j + \varepsilon_{it}$$

where,

Investment activity is measured by capital expenditures to total assets (CapEx TA).

Xit-1 presents control variables, including the lagged of capital expenditures_TA, cashflow_TA, sales growth, Tobin's q, and firm size. The descriptions of these variables are shown in Table 1.

Financial flexibility is a (0,1) dummy with a value of one if the firm is classified as financially flexible based on the primary measurement of financial flexibility and a value of zero otherwise.

Covid-19 was a (0,1) dummy variable with the value of one when the Covid-19 pandemic lockdown was in effect in 2020 and zero otherwise.

#### *3.3.3. Financial flexibility and firm value*

In Hypothesis 2, we argued that financial flexibility increases firm value in Vietnam. We applied a similar model to Yung's (2015) one. Since Tobin's q is a widely used proxy for firm value, they contribute to earlier models exploring the relationship between Tobin's q and firm attributes. The enhanced model is described as follows:

$$\text{Firm value}_{it} = \beta_{0i} + \beta_{1i}\text{Financial Flexibility}_i + \beta_{2i}\text{Financial Flexibility}_i \text{ x COVID19}_t + \beta_{3i}X_{it-1} + \sum_t y_t \text{Year}_{it} + \sum_j \lambda_j \text{Ind}_j + \varepsilon_{it}$$

where,

Tobin's q is the measurement of firm value, calculated as the market value of common equity plus the book value of total liabilities divided by the book value of total assets.

Xit-1 presents control variables, including firm size, leverage, capital expenditures, cash flow, firm age, cash holdings, EBITDA_Sales, and the lagged of Tobin's q. The descriptions of these variables are shown in Table 1.

Financial flexibility is a (0,1) dummy with a value of one if the firm is classified as financially flexible based on the primary measurement of financial flexibility and a value of zero otherwise.

Covid-19 is a dummy variable with the value of one during the Covid-19 pandemic lockdown in 2019 and 2020 and zero otherwise.

### 3.4. Measurement

The dependent variable in the second research model of this study (Model 2) is firm value. Tobin's q was introduced as a proxy for this dependent variable by Chung and Pruitt (1994) and utilized by numerous researchers like Yung et al. (2015) and Bilyay-Erdogan (2020). Following Yung et al. (2015), the control variables in this model include firm size, cash flow, cash ratio, and firm age. Because the methodology adopted by Yung et al. (2015) is used to develop the investment activity and firm value models, all significant factors are considered. Following Lemmon and Lins (2003) and Bilyay-Erdogan (2020), leverage is included as a control variable. The investigations by Yung et al. (2015), Bilyay-Erdogan (2020), and Lemmon and Lins (2003), the specifics of which are shown in Table 1, served as the foundation for the measurement techniques of each variable utilized in the investment activity and firm value model.

**Table 1. Descriptions of the Study's Variables**

| Variables | Definitions |
|---|---|
| Covid-19 | A (0,1) dummy variable that has a value of one during the pandemic period of 2020 and is zero otherwise |
| CapEx_TA | Capital expenditures scaled by total assets |
| Cashflow_TA | Earnings before interest, taxes, depreciation, and amortization divided by total assets |
| Sales growth | Current period sales minus prior period sales divided by prior period sales |
| Tobin's q | The market value of common equity plus the book value of total liabilities divided by the book value of total assets |
| Firm size | The logarithmic value of (total assets) |
| Firm age | The logarithmic value of (1+ firm age) |
| Cash_TA | Cash and equivalents cash scaled by total assets |
| EBITDA_Sales | Earnings before interest, taxes, depreciation, and amortization divided by sales |

## 4. RESULTS

### 4.1. Descriptive statistics

Descriptive statistics provide an overview of the data, allowing for a brief comparison of variables.

**Table 2. Descriptive statistics**

| Variables | Obs | Mean | Std.Dev | Min | Max |
|---|---|---|---|---|---|
| CapEx_TA | 2,563 | 0.0153 | 0.0882 | -0.7583 | 0.8817 |
| Tobinsq | 2,563 | 1.021 | 5.7248 | -2.7697 | 246.4138 |
| Cashflow_TA | 2,505 | 0.085 | 0.0889 | -1.1125 | 0.8085 |
| Salegrowth | 2,322 | 0.3167 | 3.9774 | -24.1617 | 127.4579 |
| Firmsize | 2,563 | 27.5147 | 1.4556 | 23.7389 | 32.5101 |
| Cash_TA | 2,563 | 0.0995 | 0.1076 | 0.0001 | 0.9437 |
| EBITDA_Sales | 2,496 | 0.0867 | 2.4504 | -115.8629 | 35.7656 |
| Firm age | 2,563 | 2.5937 | 0.5036 | 0.6931 | 3.8286 |

Table 2 shows the sample statistics, which include 2563 observations from 233 listed firms in Vietnam from 2010 to 2020. According to Greene (1991), the research sample of the variables is over 470 observations, which is a large sample in statistical regression and thus suitable for performing regression and other tests. The number of observations, mean, standard deviation, and minimum and maximum values were all included in this table. Capital expenditure scaled by total assets has a mean of 0.0153, with a standard deviation of 0.0882. Tobin's q has a mean of 1.021, indicating that a firm's stock is equal to its assets' replacement cost, implying that most of Vietnam's stock is price parity. In terms of the remaining financial variables, the sample's mean firm has Earnings before interest, taxes, depreciation, and amortization divided by total assets of 0.085; sales growth of 0.3167; a firm size of 27.513; Cash and equivalents cash divided by total assets of 0.0995; and Earnings before interest, taxes, depreciation, and amortization scaled by sales of 0.0867. The average firm is about 13 years old.

### 4.2. Multicollinearity

**Table 3. Pearson Correlation Matrix**

| | CapEx_TA | Tobinsq | Cashflow_TA | Salegrowth | Firmsize | Cash_TA | EBITDA_Sales | Firm age |
|---|---|---|---|---|---|---|---|---|
| CapEx_TA | 1.0000 | | | | | | | |
| Tobinsq | 0.0102 | 1.0000 | | | | | | |
| Cashflow_TA | 0.0166 | 0.0130 | 1.0000 | | | | | |
| Salegrowth | -0.0063 | 0.0007 | -0.0150 | 1.0000 | | | | |
| Firmsize | 0.1900 | 0.0148 | -0.1437 | 0.0380 | 1.0000 | | | |
| Cash_TA | -0.0157 | 0.0044 | 0.2924 | -0.0262 | -0.1752 | 1.0000 | | |
| EBITDA_Sales | 0.0096 | 0.0046 | 0.0387 | 0.0068 | 0.0157 | 0.0200 | 1.0000 | |
| Firm age | -0.0761 | 0.0608 | -0.0748 | -0.0162 | -0.0198 | -0.0807 | -0.0247 | 1.0000 |

The Pearson Pairwise correlation matrices for all variables used in this study are shown in Table 3. The findings enable the researcher to rule out the possibility of variable multicollinearity in the prescribed empirical model. The highest value is 0.2924 between Earnings before interest, taxes, depreciation, and amortization divided by total assets and Cash and equivalents cash scaled by total assets. However, a value below 0.80 is considered harmless. Most variables have a low correlation relationship, fluctuating around 0. The findings indicate no multicollinearity among the variables in the experimental model.

### 4.3. Financial flexibility and investment activity

**Table 4. Regressions of Financial Flexibility Effect on Firm Investment**

| | (1) | (2) |
|---|---|---|
| | CapEx_TA | CapEx_TA |
| FF | 0.0605*** | 0.164** |
| | (1.90) | (2.42) |
| | | |
| FF x Covid19 | -0.275** | 0.364*** |
| | (-2.57) | (1.70) |
| | | |
| CapEx_TA | 0.419** | 0.503** |
| | (5.57) | (3.32) |

| | | |
|---|---|---|
| Cashflow_TA | -0.0641 | 0.136 |
| | (-0.66) | (0.61) |
| | | |
| Salegrowth | 0.000182 | 0.00202 |
| | (0.35) | (0.50) |
| | | |
| Tobinsq | 0.000207 | -0.00174 |
| | (1.28) | (-0.35) |
| | | |
| Firmsize | 0.00688** | 0.00789** |
| | (2.93) | (2.10) |
| | | |
| FF x Cashflow | | -0.780*** |
| | | (-1.87) |
| | | |
| FF x Cashflow x Covid-19 | | -3.755*** |
| | | (-1.65) |
| | | |
| _cons | -0.184** | -0.236** |
| | (-2.67) | (-2.12) |
| | | |
| AR(2) | 0.167 | 0.135 |
| Hansen test | 35.6% | 28.8% |
| N | 1783 | 1539 |
| R-sq | | |
| t stastistic in parentheses | | |
| *** p<0.1, **p<0.05, *p<0.01 | | |

Table 4 presents the test results on how financial flexibility affects investment activity. Financial flexibility has been used as a dependent variable. It is also a (0,1) dummy that 1 defines whether a firm is called financial flexibility and 0 is otherwise. Capital expenditures scaled by total assets are used to measure investment activity. The independent variables include the lagged values of capital expenditures, cash flow, firm size, and sales growth. It can see that there is a positive effect of financial flexibility on investment activity as financial flexibility increases, capital expenditures scaled by total assets increase by 0.0605. These results suggest that financially flexible firms in Vietnam have higher investment expenditure than less financially flexible firms, which may imply that after achieving a flexible status, firms tend to increase their investments to finance more projects. The result is in line with Marchica and Mura (2010), Arslan-Ayaydin et al. (2014), Yung

et al. (2015), and Setianto et al. (2017) reported that firms tend to have the financial flexibility to boost future investment to sustain the flexibility even after the investment has been made.

Meanwhile, investment activity increases when the lagged of Capital expenditures is scaled by total assets and firm size increases. Column 2 shows that in Covid-19, financial flexibility still affects capital expenditures positively with a 0.364 increase, and this demonstrates the importance of financial flexibility during the Covid-19 period.

Simultaneously, the paper examines how financial flexibility influences the sensitivity of firms' investments to operating cash flow. According to the results in model 2 of table 4, the interaction variable between financial flexibility and cash flow has a negative and significant coefficient of -0.780. The explanation is that financial flexibility allows firms to raise external funds for investment projects, making them less reliant on or sensitive to internal funds. The findings are consistent with previous research by Arslan-Ayaydin et al. (2014) and Yung et al. (2015), as well as Setianto et al. (2017). The interaction effect between cash flow and financial flexibility is more pronounced during Covid-19. Specifically, the CashFlow _ TA x FF x Covid-19 coefficient is -3.755 more negative than the CashFlow _ TA x FF coefficient, which is -0.780. The findings support Arslan-Ayaydin et al. (2014) contention that financial flexibility has a more significant impact during economic downturns. Table 4 thus supports our first hypothesis.

### 4.4. Financial flexibility and firm value

**Table 5. Regressions of Financial Flexibility Effect on Firm Value**

| | Tobinsq |
|---|---|
| FF | 5.671* |
| | (2.71) |
| | |
| FF x Covid19 | -0.634* |
| | (-3.18) |
| | |
| Firmsize | 0.213 |
| | (1.64) |

| | |
|---|---|
| EBITDA_Sales | 1.290*** |
| | (1.96) |
| | |
| Cash_TA | -13.61* |
| | (-3.99) |
| | |
| Firm age | 0.966* |
| | (3.57) |
| | |
| _cons | -7.650** |
| | (-2.15) |
| | |
| AR(2) | 0.38 |
| Hansen test | 74.7% |
| N | 1812 |
| R-sq | |
| t stastistic in parentheses | |
| *** p<0.1, **p<0.05, *p<0.01 | |

Table 5 shows that this result supports hypothesis 2 when we have shown the effect of financial flexibility on Tobin's q. Financial flexibility positively impacts firm value because its coefficient is 5.671. One possible explanation is that the firm has used a suboptimal capital structure. These results support the finding of Bilyay-Erdogan (2020), Gamba and Triantis (2008), Kenneth et al. (2015), Yung et al. (2015), and Seda (2020) that financial flexibility enhances firm value. Firm age increased 0.966 when Tobin's q increased 1, indicating that the older the company, the higher the value of the company. However, the findings of this study contradict the findings of Bilyay-Erdogan (2020), who reported that a company's age has no significant impact on firm value in emerging markets, indicating that a company's longevity is not an essential factor for investors in these markets. We believe that this disparity is due to the differences in the business environments of Vietnam and the countries chosen for research by Bilyay- Erdogan (2020)

The effect of the cash ratio on company value is significantly negative because excess cash reserves may cause managers to invest in ineffective ventures to gain nonpecuniary benefits, causing firm value and shareholder

wealth to decline (Jensen and Meckling, 1976). When a company has more cash flow than it needs, managers tend to pass up positive NPV projects to generate more cash flow, lowering the firm value. This gives support to Bilyay- Erdogan's (2020) discovery.

Financial flexibility did not have much effect at the time of Covid-19. We see that Tobin's q increased by 5,671, and Covid19 decreased by 0.634 when financial flexibility increased. Cash and equivalents cash scaled by total assets increase Tobin's q decreases by 13.61, which shows that it has unimproved firm value.

## 5. CONCLUSION

Financial flexibility indicates how responsive a business is to unexpected situations. The paper will conduct an empirical study on 233 Vietnamese listed companies between 2010 and 2020 to determine the impact of financial flexibility on investment activities and company value. Firms are financially flexible if their total debt to total assets ratio is in the bottom half of all observations while their cash and equivalents to total assets ratio are in the top half of all observations. The research results show that the analysis supports the two proposed hypotheses. First, financial flexibility improves investment activity, and financial flexibility reduces the sensitivity of investment activities to cash flow. The regression analysis results show that businesses tend to be financially flexible to promote future investments and easily collect external capital for investment activities. Companies that use flexibility as a mediator to undertake projects with a positive net present value and reduce the level of suboptimal expenditure. During Covid-19, the flexibility helped to reduce the level of inefficient investments. Second, financial flexibility has a positive effect on firm value.

Financial flexibility is a critical goal in making financial decisions. Although some Vietnamese researchers have studied the impact of financial flexibility on capital structure and corporate financial policy, there has been little research on firm value and investment activity. The study's findings have some interesting implications for companies and investors when deciding on a firm's capital structure. The research in this field is rather topical because an increasing number of companies are interested

in gaining greater access to capital markets around the world, and the presence of financial flexibility is a significant advantage that can improve the performance of these firms. The positive impact of financial flexibility on firm value and investment activity discovered in this study provides strong evidence for the hypothesis that financial flexibility is valuable. Companies in emerging countries will benefit more from financial flexibility due to a positive relationship between financial flexibility and operational investment, allowing them to project the financing required to realize future investment opportunities. In the context of Vietnam, the country's domestic market is rapidly expanding, creating numerous business opportunities. This opportunity motivates businesses to grow faster; as a result, there is a need to increase financial resources to finance companies' expansion. By maintaining low debt levels to increase financial flexibility, businesses can take on investment opportunities at lower costs. The study's results on the effect of financial flexibility on investment, particularly the positive impact during Covid-19, highlight the benefits of financial flexibility.

This study has limitations, which in turn create opportunities for future research. First, only listed public companies are considered in the article, but no unlisted companies are mentioned, so a comprehensive view of all enterprises in Vietnam is impossible. Second, we perform the regression with only a few independent variables. As a result, some financial indicators remain unmentioned in the topic. Further research can increase the number of explanatory variables and data from unlisted companies to provide a more comprehensive and general picture of the Vietnamese economy. Future research may explore other factors, such as the impact of financial flexibility on equity payouts, cash holdings, etc.

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# GAME THEORETICAL ANALYSIS ON HEALTH INSURANCE FRAUD

**To Minh Huong**[1]

***Abstract:*** *Around the whole world, insurance fraud has become a main obstacle to the smooth development of health insurance industry. In Vietnam the health insurance fraud causes a certain degree of economic loss every year, posing a great threat to the safety of medical insurance fund. Besides, the most direct impact of spreading of insurance fraud is that it can result in distortion of insurance pricing mechanism, which eventually harms the interests of the honest insurance applicants. As for the deep influence, insurance fraud seriously violates the principle of the greatest good faith in the insurance business and erodes the basis of insurance business. Based on this, this paper studies Vietnamese health insurance systematically, trying to do empirical research on health insurance fraud identification and then putting forward pointed anti-fraud measures. This research, not only reveals the inherent characteristics of the health insurance fraud in Vietnam to a certain extent, improving the insurance institutions' ability to identify fraud risks, which is conductive to the stability of health insurance market and the implementation of medical insurance policies, but also has important reference value to our country's insurance credit construction research and anti-fraud research.*

***Keywords:*** *Health insurance, insurance fraud, game analysis, fraud identification.*

## 1. INTRODUCTION

From a global perspective, with the continuous development of the health insurance industry, insurance fraud has become a major obstacle to the smooth development of the health insurance industry. Statistics from the American Health Insurance Anti-Fraud Association show that, as the country with the most developed insurance industry in the world today, the insurance crime in the United States is second only to drug crime, and the annual loss caused by insurance fraud is about 3% of the total expenditure on health insurance claims. That is, insurance fraud costs the health insurance industry about $6.8 billion, and according to the US Insurance Crime Bureau, this loss may be as high as 10%, or

[1] Department of Faculty of Economics and Management, Thuy Loi University, Hanoi, Vietnam. Email: huongtm@tlu.edu.vn

about $23 billion. In the United Kingdom, statistics from the Insurance Fraud Bureau show that in 2020, the direct economic loss caused by insurance fraud to the United Kingdom was as high as about 1.9 billion pounds, and about 12% of health insurance claims were suspected to be related to insurance fraud. Three-quarters of the applications turned out to be insurance fraud.

From our country's point of view, although there is no authoritative organization to release statistics on health insurance fraud, the number of health insurance fraud cases reported by news media in recent years has been increasing year by year. In addition, the research report of the domestic Bao Viet organization also pointed out: At present, the losses caused by insurance fraud worldwide account for 15% of the total insurance compensation, because my country does not pay enough attention to this aspect, and there are certain deficiencies in management, insurance fraud, so the problem is even more serious. The proportion of insurance fraud is estimated to be between 20% and 30%.

International and domestic practice shows that, at present, health insurance fraud, motor vehicle insurance fraud, and home property insurance fraud have become the three major frauds that endanger the development of the insurance industry. Countries or regions with a mature insurance industry such as the United States and Europe have fully realized the importance of anti-fraud work, and have successively established anti-fraud mechanisms suitable for the characteristics of their own insurance industries. However, compared with the increasingly serious insurance fraud, my country's of health insurance operators have not taken effective anti-fraud measures, and most insurance institutions are still in the battle for market share. The high cost of fraud identification and the externality of benefits make anti-fraud not yet a central task.

## 2. LITTERTURE REVIEW

In terms of theoretical research, foreign scholars mainly use the horizontal relationship between different disciplines, comprehensively consider the knowledge of game theory, law, psychology and other disciplines, from moral hazard, information asymmetry, insurance contracts and psychology, etc.

(1) From the perspective of moral hazard: Pauly (2001) believes that the optimal insurance system should be to establish a new mechanism with insurance thresholds and deductibles. Considering the incompleteness of information between policyholders and insurers, he believes that the Carry out anti-fraud work from the perspective of managing and controlling moral hazard. The research of Caudill and Ayuso (2005) shows that insurance fraud arises from the insurer's incomplete grasp of the insured's information, and the insurer also needs to consider the particularity of the insurance subject when avoiding the problem of insurance fraud. Watt et al. (2006) believe that the information of both parties of the insurance contract can be restored, so the insurer can identify the insurance fraud by eliminating the signal manipulated by the policyholder, although their research is still theoretical. However, the idea of refining information proposed by them has become the guiding ideology for the current insurance industry to carry out anti-fraud measures. Stefan et al. (2008) constructed an insurance anti-fraud management system including "deterrence, prevention, identification, investigation, sanctions and compensation, and monitoring". On the basis of Stefan's research, he proposed specific anti-fraud measures, that is, strengthening the integrity education and information management of policyholders, strengthening the government's punishment for fraudulent behaviors, and using data mining technology to identify insurance fraudulent behaviors, etc.

(2) From the perspective of information asymmetry: Caudill and Aysuo (2005) believe that the key to identifying insurance fraud is to identify information. They analyze the objective reality of insurance fraud from the perspective of information. The study believes that insurance fraud stems from the unsymmetrical grasp of insurers. Information about the insured accident occurred to the insured, so in the process of insurance claims, the insured often exaggerates or even creates an insured accident. Subsequently, Watt (2010) et al. conducted in-depth research on this issue based on Caudill's research results. They believed that in a competitive insurance market, in order to maximize the expected effect, policyholders choose insurance Contracts tend to focus on the following two aspects: First, in the equilibrium set, there is no contract with negative expected profit; second, outside the equilibrium set, there is no contract that will make the future profit of the policyholder negative.

(4) Statistical regression stage

The core idea of statistical regression is "model and regression analysis", which establishes a regression model through a given insurance claim case, finds out the key indicators of fraud identification, and assigns corresponding weights to these indicators according to the actual situation to guide Review of claims in insurance claims practice. The methods widely used in empirical analysis in foreign countries include regression analysis, factor analysis, Logit model, and Probit model analysis. insurance fraud.

Chiappori and Salanie (2010) used the Probit model to study the problem of insurance fraud, and they found that under the condition of a single insurance rate, high-risk policyholders tend to choose policies with high claims The probability of loss of human beings often also shows a high phenomenon. Therefore, they believe that if insurance companies can find the relationship between high payouts and high risk rates, it is the insurance's verification of the existence of fraud.

The PRIDIT analysis mainly adopts the comparative analysis method, which takes a group of distributions that appear more frequently in the research data as a specific distribution, and calculates the reference unit values of each grade based on it as a standard, and then refers to the weighted average of these reference unit values. hypothetical test. Brokett and Gerrig (2012) constructed a PRIDIT model to study the fraud problem based on the data of motor vehicle insurance fraud in the United States. From its research results, it can be found that the PRIDIT model can not only identify the cases of motor vehicle damage insurance, but also identify the risk of personal injury caused by the occurrence of insurance accidents. By sorting out and summarizing the research results of domestic and foreign scholars, it can be found that although domestic research on insurance fraud theory has developed rapidly in recent years and achieved some results, there is still a lack of in-depth theoretical research on the causes of health insurance fraud; in addition, Limited by research data, identification methods and technologies, domestic empirical research on health insurance fraud identification has just started. To this end, the next step can be further in-depth research in the following aspects:

(1) Conduct a systematic study on health insurance fraud in my country, and establish a theoretical analysis framework for health insurance fraud.

Through research and expert interviews, I analyze the problems of health insurance fraud in my country, and sort out and analyze the manifestations, harms and causes of health insurance fraud in my country.

(2) From the perspective of theoretical research, use the relevant theoretical methods of static game with complete information and static game with incomplete information to establish a game analysis model for the specific manifestations of health insurance fraud (such as the collusive behavior of policyholders and medical service institutions). Theoretically analyze the deep-seated causes of health insurance fraud and the key elements leading to fraud, etc.;

(3) Through the summarization and reference of the successful experience of foreign health insurance anti-fraud, combined with the actual situation of my country's health insurance market, research and propose targeted anti-fraud measures.

## 3. RESULTS AND DISCUSSION

As a socialized contract, after the insurance contract is signed between the applicant and the insurer, the applicant can transfer the specific risk to the insurer, while the insurer forecasts the risk loss through professional means, and uses the insurance premium paid by the applicant to pay the loss caused by the risk. Therefore, the insurance contract contains two necessary elements: one is that the applicant pays a certain amount of premium when both parties of the insurance contract sign the contract, and the other is the compensation loss that the insurer needs to pay to the applicant if the applicant has an agreed loss during the agreed period of the insurance contract.

In the following, I will use the relevant theories and methods of complete information static game and incomplete information static game, take the collusion fraud of policyholders and medical service institutions as the starting point, establish a game model, and analyze the deep-seated causes and key elements of health insurance fraud from the perspective of game analysis, From the perspective of optimal insurance contract design and insurance company management, the basic ideas of anti fraud of health insurance are given.

### 3.1. Static game analysis of health insurance fraud with complete information

#### *3.1.1. Basic assumptions*

Assuming that the insurance market is a perfectly competitive market, although insurance companies carry out their daily business activities for the purpose of making profits, in a perfectly competitive insurance market, it is impossible for every insurance company to obtain excess profits that exceed other companies. Therefore, under this assumption, the bottom limit of the insurance company's maximum expected utility is no loss.

In the health insurance relationship, the following two types of stakeholders will be involved: one is the policyholder and the medical service organization, hereinafter referred to as the policyholder, assuming that the initial wealth of the policyholder is $w$. The premium paid to the insurer is $x$. At the same time, all policyholders are risk-averse, that is, their utility function is concave $u(\cdot)$, that is $u'(\cdot) > 0$, and $u''(\cdot) < 0$; one type is insurers, assuming that the initial wealth of the insurers is $Y$, and at the same time, all insurers are risk-neutral. Their utility function $v(\cdot)$ is linear.

Assuming that the loss suffered by the insured in the event of an insured accident is $L$ that when the insured applies for a claim to the insurance company in accordance with the insurance contract, the insurance company pays the insured amount to the insured $\beta$. However, if the insurance company discovers that the insured has insurance fraud, The insured will not only be unable to obtain insurance reimbursement, but will also be punished by the insurance company's quota $k$.

In addition, after signing the insurance contract, both parties of the insurance contract assume that the insurance premium that the insured needs to pay is ($x_0$), and the insurance compensation amount expected from the insurer after the occurrence of an insured accident is ($s_0$). According to the contract, the insured must consciously carry out loss prevention behavior, the cost at this time is ($c_1$), and the insurance payout obtained will be (S), where ($S < S_0$). Only when ($x < x_0$-$c_1$), the insured will consciously take loss prevention measures; when the insured applies for insurance compensation, the insurance company will review the behavior of the insured according to the insurance contract to determine whether the insured. For an honest claim application, the audit fee spent by the

insurance company at this time is ($c_2$). If the insurance company finds that the policyholder has committed insurance fraud, the insurance company will impose a penalty of (k) on the policyholder. In this game model, the policies of the policyholder and the insurer are {honest claim, fraudulent claim}, {check, no check}.

**Table 1. Static game payment matrix between policyholders and insurers**

| | | Policyholder | |
|---|---|---|---|
| | | **Honest claim** | **Fraud claims** |
| **In Su rer** | No check | $(x-S, S-x-c_1)$ | $(x-S_0, S_0-x)$ |
| | Check | $(x-S-c_2, S-x-c_1)$ | $(x-S_0-c_2+k, S_0-x-k)$ |

### *3.1.2. Game Analysis of Health Insurance Fraud*

It can be seen from Table 1 that if the insured makes an honest claim application, the optimal strategic choice for the insurer is not to review the policyholder's claim application; if the insurer will not review the policyholder's claim application, then for the policyholder, the optimal strategic choice is to make a fraudulent claim; if the policyholder makes a fraudulent claim, the insurer will not review the policyholder's claim application only when ($k < c_2$), that is to say, in the static game of complete information, only when the penalty k from the insurer to the policyholder for fraudulent claims is less than or equal to ($c_2$, then there is a unique Nash equilibrium: (no review, fraudulent claims).

As far as the insurer is concerned, it is only worthwhile for the insurer to review the claim application of the insured if the amount it confiscated at ($k > c_2$) is greater than the fee it paid for the review; and for the insured, only When ($k > c_1 + S_0 - S$), that is, when the amount the policyholder punishes the policyholder who commits the fraudulent act is greater than the sum of the cost of the policyholder for taking loss prevention measures and the resulting difference in compensation, the penalty for fraudulent claims paid by the insured can effectively curb the occurrence of the insured's moral hazard, but at this time there is no equilibrium state of the game between the insured and the insurer. Assuming that the policyholder only makes honest claims, the insurer's optimal strategy is not to review; assuming that the insurer does not review the policyholder's claim application, the

policyholder's optimal strategy is to make an insurance fraud claim; a given policyholder makes an insurance fraud claim, the insurer's optimal strategy is to make honest claims, and no combination can constitute a Nash equilibrium. But the reality is that both the policyholder and the insurer want to know each other's strategies, and at the same time do not want the other party to know their own strategies. Therefore, although there is no pure strategic Nash equilibrium between the two parties, there is a mixed strategic Nash equilibrium, that is, the policyholder will make honest claims and fraudulent claims with a certain probability, and the insurer will also use a certain probability to review or not review the claimant's claims.

**Table 2. Static game payout matrix between policyholders and insurers**

| | | Policyholder | |
|---|---|---|---|
| | | Honest claim $(1-\alpha)$ | Fraud claims $(\alpha)$ |
| In Su rer | No check $(1-\beta)$ | $(x-S, S-x-c_1)$ | $(x-S_0, S_0-x)$ |
| | Check $(\beta)$ | $(x-S-c_2, S-x-c_1)$ | $(x-S_0-c_2+k, S_0-x-k)$ |

Assume that the probability of an insured making a fraudulent claim is $\alpha$, then the probability that he makes an honest claim is (1-a); Similarly, assuming that the probability that the insurer will review the policyholder's claim application is $\beta$, then the probability of not reviewing the policyholder's claim application is $(1-\beta)$. At this time, the static game payment matrix between the policyholder and the insurer is shown in Table 2.

At this point, the expected benefit of the policyholder is:

$$U_1 = (1-\alpha)(1-\beta)(S-x-c_1) + (1-\alpha)\beta(S-x-c_1) + \alpha(1-\beta)(S_0-x) + \alpha\beta(S_0-x-k)$$

The insurer's expected return is:

$$U_2 = (1-\alpha)(1-\beta)(x-S) + (1-\alpha)\beta(x-S-c_2) + \alpha(1-\beta)(x-S_0) + \alpha\beta(x-S_0-c_2+k)$$

According to the Nash Equilibrium Theorem, if the following formula holds:

$$\begin{cases} U_1(\alpha^*, \beta^*) \geq U_1(\alpha^*, \beta) \\ U_2(\alpha^*, \beta^*) \geq U_2(\alpha, \beta^*) \end{cases} \quad (1)$$

That is to ask:

$$\begin{cases} \dfrac{\partial U_1}{\partial \alpha} = 0 \\ \dfrac{\partial U_2}{\partial \beta} = 0 \end{cases} \qquad (2)$$

Then the unique Nash equilibrium point of the game can be obtained, and the solution is:

$$\begin{cases} \alpha^* = \dfrac{c_2}{k} \\ \beta^* = \dfrac{c_1 + S_0 - S}{k} \end{cases} \qquad (3)$$

at this time

$$\begin{cases} U_1(\alpha^*, \beta^*) = S - x - c_1 \\ U_2(\alpha^*, \beta^*) = x - S - \dfrac{c_2(S_0 - S)}{k} \end{cases} \qquad (4)$$

That is, when the probability of a policyholder making a fraudulent claim is $\alpha^* = \frac{c_2}{k}$ and the probability that the insurer will review the policyholder's claim is $\beta^* = \frac{c_1 + S_0 - S}{k}$ the insured's income is $U_1(\alpha^*, \beta^*) = S - x - c_1$, and the insurer's income is: $U_2(\alpha^*, \beta^*) = x - S - \frac{c_2(S_0 - S)}{k}$. Because $x = S + \frac{c_2(S_0 - S)}{k}$ that is $U_2(\alpha^*, \beta^*) = 0$, is the lowest premium that the insurer can accept, and if it is lower, the insurer will refuse to cover it.

In my country's health insurance fraud, usually, the insured knows or may know that he suffers from a major disease before applying for insurance, but he can successfully pass the physical examination required by the insurer, and when he signs an insurance contract with the insurer After that, the risk of disease increases. In this case, we assume that the probability that the insured person will be ill before insured is $p$ , after signing an insurance contract with the insurer, the insured's probability of illness rises to $p'$. Now we discuss this situation. In this game model, the

strategies of the policyholder and the insurer are {truly inform, conceal illness} and {check, not check}.

**Table 3. Static game payout matrix between policyholders and insurers**

| | | Policyholder | |
|---|---|---|---|
| | | **Honest claim** $(1-\alpha)$ | **Fraud claims** $(\alpha)$ |
| **In Su rer** | No check $(1-\beta)$ | $(Y+\alpha L-p'L, w-\alpha L)$ | $(Y+pL-p'L, w-pL)$ |
| | Check $(\beta)$ | $(Y+\alpha L-p'L-c, w-\alpha L)$ | $(Y+pL-c, w-pL-p'L)$ |

From Table 3, it can be seen that for the insured, if he truthfully informs the condition, the insurer will definitely charge a higher premium. At this time, the expected income of the insured is $w-\alpha L$, but if the insured conceals the condition from the insurer, and the insurer does not review it, the insured's expected benefit is $w-pL$, under the condition that the insurer reviews it, the insurer will no longer be liable for compensation for the insured accident. At this time, the insured's expected income is $w-pL-p'L$; As far as the insurer is concerned, if he conducts an audit and the insured voluntarily informs the condition, the insurer's expected benefit is $Y+\alpha L-p'L-c$, under the circumstance that the insured conceals the illness, the insurer's expected benefit is $Y+pL-c$, but if the insurer does not conduct an audit, in the case where the insured voluntarily informs the illness, the insurer's expected benefit is $Y+\alpha L-p'L$, and in the case of the policyholder concealing the condition, the insurer's expected benefit is $Y+pL-p'L$.

If the insurer's audit fee is high, then $c \geq p'L$, the insurer's audit fee is higher than the loss caused by the increase in risk. At this time, the insurer will not audit the insurance applicant's claim information. Similarly, the insurance applicant will choose the strategy of concealing the disease. The game has a unique Nash equilibrium (no censorship, concealment of illness).

If the insurer's audit fee is not high, then $c < p'L$, the game has a mixed-strategy Nash equilibrium instead of a pure Nash equilibrium.

If the insurer does not review the applicant's claim application, the expected benefit of the insured who chooses to truthfully inform the insurer of the condition is:

$$u_1(1,\beta) = w-\alpha L \qquad (5)$$

The expected benefit of the insured who chooses to conceal the condition from the insurer is:

$$u_1(0,\beta) = w - pL - p'L \qquad (6)$$

At that time $u_1(1,\beta) = u_1(0,\beta)$ it can be obtained:

$$\beta^* = \frac{\alpha - p}{p'} \qquad (7)$$

That is, the probability that the insurer will review the policyholder $\beta^* = \frac{\alpha - p}{p'}$. Conversely, the probability that the insurer will not review the policyholder $1-\beta = \frac{p + p' - \alpha}{p'}$. When the insurer does not review the probability of the policyholder, $1-\beta > \frac{p + p' - \alpha}{p'}$. For the insured, the optimal strategy is to conceal their illness, but if the insurer does not review the probability of the insured $1-\beta < \frac{p + p' - \alpha}{p'}$ for the insured, it is his best strategy to truthfully inform his condition.

When the insurer chooses not to check the policyholder's information, his expected benefit is:

$$u_2(\alpha,1) = Y + pL - p'L \qquad (8)$$

When the insurer chooses to check the policyholder's information, his expected benefit is: $u_2(\alpha,0) = Y + pL - c$ (9)

When: $u_2(\alpha,0) = u_2(\alpha,1)$ the solution is

$$\alpha^* = \frac{c}{p'L} \qquad (10)$$

That is, the probability that the policyholder conceals the condition from the insurer $\alpha^* = \frac{c}{p'L}$, and the probability that the policyholder will truthfully inform the insurer about the condition $1-\alpha = \frac{p'L - c}{p'L}$ Probability if the policyholder truthfully informs the insurer about the condition $1-\alpha > \frac{p'L - c}{p'L}$ the insurer's optimal strategy is not to review the policyholder's information. If the policyholder truthfully informs the insurer of the probability of illness, $1-\alpha < \frac{p'L - c}{p'L}$ the insurer's optimal strategy is to review the policyholder's information.

### 3.2. Static game analysis of incomplete information of health insurance fraud

#### *3.2.1. Basic assumptions*

It is assumed that the policyholder and the medical service organization have reached a community of interests, that is the common collusion between the patient and the medical service organization. In this case, the policyholder and the medical service institution are regarded as the policyholder; at the same time, it is assumed that during the review process, the insurance company does not have review technical problems, that is, as long as there is insurance fraud, the insurance company will conduct the review and be able to screen all insurance frauds. At the same time, after insurance fraud is discovered, both the policyholder and the medical service provider will be punished; in addition, the scope of insurance fraud discussed in this chapter is whether the policyholder is really sick, not the types of diseases are discussed.

This chapter discusses the single-stage static game behavior, that is to say, the insurance institution as the principal cannot observe the behavior of the policyholder and the medical service institution. As soon as a round of game behavior ends, the insurer will immediately pay the policyholder. Insurance payouts. In *Y, S, L, Z, k,* a, b, *c* and other letters still satisfy the basic assumptions in Section 3.1.1, which are expressed as:

$Y$ : Initial wealth of policyholders and medical service providers;

$S$ : Insurance compensation paid by the insurance company to the policyholder;

$L$: The loss to the insurance company when the insured suffers the accident stipulated in the insurance contract;

$Z$: Insurance premiums charged by insurance companies to policyholders;

$k$: The amount paid by an insurance company when a review discovers that a policyholder and a medical service provider colluded and committed insurance fraud;

$\alpha$: the probability that the insured person and the medical service institution collude to commit insurance fraud, that is, the probability that the insured person makes a claim;

1-$\alpha$: the probability that the policyholder will not commit insurance fraud;

$\beta$: the probability that the insurance company will review the insurance claim requested by the policyholder;

1-$\beta$: The probability that the insurance company will pay the insured directly without reviewing the claim of the insured;

$c$: The cost paid by the insurance company to review the claim of the policyholder;

Also assume:

$p$: the probability that the insured will not have an insured accident;

$1-p$: the probability that the insured will have an insured accident.

### *3.2.2. Game Analysis of Health Insurance Fraud*

Under incomplete information, the game process of health insurance fraud can be divided into the following five stages:

(1) The policyholder signs an insurance contract with the insurance company, at this time, $Y, Z, S$ the values of the three are given;

(2) There are two states of the insured, that is, no insurance accident occurs. At this time, the probability is $p$, conversely, the probability of occurrence of an insured event is $1-p$, at the same time, the insurance company cannot independently know whether the insured has an insured accident;

(3) The insured decides whether to apply for a claim to the insurance company, but the application made by the insured may be that he has actually had an insured accident, or may not have an insured accident, but colluded with a medical service institution in an attempt to defraud compensation from insurance companies;

(4) When an insurance company receives a claim application from an insured, it will take the initiative to make judgments based on factors such as the insured's claim type, the amount of the claim, the cost of reviewing the insured's claim, and the company's rules and regulations. Whether to review the claim application of the policyholder, if the

insurance company reviews the policyholder, the probability of review is $\beta$, the cost to be paid is $c$.

(5) The insurance company accepts the claim application of the policyholder. If the claim application is not reviewed, the claim amount paid to the policyholder is *S*; if the insurance company needs to review the policyholder's claim application, the cost to be paid is $c$, at this time, if the insured did not commit fraud, the insurance company paid the insured the claim amount of *S*, if the insured commits fraud, the insurance company will not only not pay the insurance claim to the insured, but will also give the insured an agreed amount of punishment, and the penalty amount is *k*.

If the insured has an insured accident, the insurance company's best choice is not to review the insured's claim application, but pay the insurance compensation directly to him; but if the insured does not have an insured accident, and in order to obtain the insurance compensation. If an insurance claim is deliberately filed with an insurance company, the insurance company's best choice is to review the policyholder's claim. Since the insurance company does not know whether the insured person actually has an insured accident, the insurance company's optimal choice depends on how much he thinks the insured person has an insured accident, that is, he relies on the insured person to have an insured accident. The probability $1-p$ the size of. In order to see the final payment method of policyholders and insurance companies more clearly, we transform the expansion of the game into a strategic one.

**Table 4. Strategic formulas of incomplete information static games**

| | | Policyholder | | | |
|---|---|---|---|---|---|
| | | insured accident $1-p$ | | no insurance accident $p$ | |
| | | apply for compensation $\alpha$ | do not apply for compensation $1-\alpha$ | apply for compensation $\alpha$ | do not apply for compensation $1-\alpha$ |
| insurance company | Check $\beta$ | $(Z-S-c, Y-Z-L+S)$ | $(Z-c, Y-L-Z)$ | $(Z-c+k, Y-Z-k)$ | $(Z-c, Y-Z)$ |
| | No Check $1-\beta$ | $(Z-S, Y-Z+S-L)$ | $(Z, Y-Z-L)$ | $(Z-S, Y-Z+S)$ | $(Z, Y-Z)$ |

When the policyholder has the insurance accident agreed in the contract, the equilibrium result between the insurance company and the policyholder

is (examine, apply for compensation in the event of an accident), and the payment function can be expressed as: $(Z-S-c, Y-Z-L+S)$.

When the policyholder does not have the insurance accident stipulated in the contract, there is a mixed strategy game between the policyholder and the insurer.

Under the circumstance that the insurance company has a certain probability of review, the expected benefits of the insured who commit insurance fraud and do not commit insurance fraud are:

$$U=(fraud,\beta)=\beta(Y-Z-k)+(1-\beta)(Y-Z+S) \quad (11)$$

$$U=(unfraud,\beta)=\beta Z+(1-\beta)(Y-Z) \quad (12)$$

Solutions have to:

$$\beta^{*}=S/(S+k) \quad (13)$$

That is, the probability that when an insurance company conducts a review of a policyholder's claim $\beta^{*}<S/(S+k)$, the best choice for the policyholder is to commit insurance fraud; but when the insurance company reviews the policyholder's claim application, the probability $\beta^{*}>S/(S+k)$, the best choice for the policyholder is not to commit insurance fraud; of course, if the insurance company reviews the policyholder's claim, the probability of $\beta^{*}=S/(S+k)$ then the policyholder can either choose to commit insurance fraud, or choose not to commit insurance fraud.

Under the condition that the insured has a certain probability of making a claim, that is, the probability that he makes a claim is $\alpha$ then, for the insurance company, it chooses to review or not review the policyholder's claim application, and the two expected benefits are:

$$U(investigate,\alpha)=\alpha(Z-c+k)+(1-\alpha)(Z-c) \quad (14)$$

$$U(uninvestigate,\alpha)=\alpha(Z-S)+(1-\alpha)Z \quad (15)$$

Solutions have to:

$$\alpha^{*}=c/(k+S) \quad (16)$$

That is to say, when the policyholder chooses to apply for compensation, the probability of $\alpha^{*}<c/(k+S)$ for the insurance company, his best choice is not to review his application; but if the insured applies for the

probability of payment $\alpha^* > c/(k+S)$ then, the best choice for the insurance company is to review the claim of the policyholder; if the probability of the policyholder applying for compensation is $\alpha^* = c/(k+S)$ then the insurance company can randomly choose whether to review the insured's claim application.

To sum up, we can know that the Nash equilibrium of this strategy is:

$$\beta^* = S/(S+k) \tag{17}$$

$$\alpha^* = c/(S+k) \tag{18}$$

That is, in the insurance market there are $\alpha^* = c/(S+k)$ of policyholders choose to file an insurance claim to defraud insurance payouts, and there are $1-\alpha^* = 1-c/(S+k)$ of policyholders would not choose to file an insurance claim to defraud insurance payouts, and at the same time, insurance companies randomly $\beta^* = S/(S+k)$ The probability of reviewing the claim application of the policyholder.

Further analysis is based on the results in Table 4:

The insurance company believes that the probability of an insured accident happening to the insured is $1-p$, the probability of no insured accident is $p$, then, the expected benefit of the insurance company from reviewing the policyholder's claim application is:

$$U(investigate, p) = p(Z-c) + (1-p)(Z-S-c) \tag{19}$$

The expected benefit of the insurance company for not reviewing the claim application of the policyholder is:

$$U(uninvestigate, p) = p(Z-S) + (1-p)(Z-S) \tag{20}$$

Order: $U(investigate, p) = U(uninvestigate, p)$ (21)

Solutions have to:

$$p^* = Z/S \tag{22}$$

That is, if the insured does not have the probability of an insured event $p^* > Z/S$, the insurance company's best choice is not to review the insured's claim application; but if the insured does not have the probability of an insured accident $p^* < Z/S$, the best choice of the insurance company is to review the claim application of the insured; when the probability

of the insured not having an insured accident is $p^* = Z / S$, then the insurance company's best choice is to randomly review the insurer's claim application.

### *3.2.3. Analysis of Health Insurance Fraud Game Results*

Through the game analysis of the health insurance fraud problem, it can be known that in $1 - p$ in the event of an insured accident occurring to the insured, if $p > Z / S$, then the insurance company should review the policyholder's claim; if the probability of the policyholder fraud is $\alpha > c / (k + S)$. The probability that the insurance company will review the claim submitted by the policyholder is $\beta = S / (S + k)$ in the actual operation of insurance claims, due to the small amount of compensation involved in small insurance accidents, in order to save manpower, material resources and time costs, insurance companies often review a very small proportion of such claims, and the insurance waiver in the insurance contract. The amount of compensation is often set to reduce the cost of this part, but the results of the game analysis tell us that this type of case is a frequent category of insurance fraud, so insurance companies cannot let this phenomenon go.

## 4. CONCLUSION

From the game analysis results, it can be known that insurance companies are often affected by the following factors when reviewing the claim application of the insured: The insurance premium that the insured needs to pay $Z$, the cost paid by the insurance company to review the claim of the policyholder $c$, the insurance benefits paid by the policyholder after review and the punishment for fraudulent policyholders after review $k$. In the model, we assumed the insurance premium $S$ is a constant, then the only factor that affects the insurance company's review of the policyholder's claim application is the cost to be paid during the review $c$ and fines for fraudulent policyholders $k$. In order to further find the relationship between the above factors, the following optimization method is used to analyze the insurance company's compensation problem, and the cost of the insurance company's review of the claim application and the penalty imposed on the insured who have fraud problems are examined. Cost Impact:

Assumption 1: The utility function of the policyholder is:

$$U(S,\alpha) = S - k(\alpha) \qquad (23)$$

$k(\alpha)$ indicates the losses incurred by the insurance company due to insurance fraud, that is, if the policyholder's fraud is discovered, the policyholder must pay the corresponding penalty.

Assumption 2: Insurance companies suffer losses from insurance fraud $k(a)$ satisfy the conditions:

$$k^{'} > 0\ ,\quad k^{"} > 0 \qquad (24)$$

Assumption 3: The insurance company's monitoring cost $C$ satisfies the condition:

$$C^{'}(\beta) > 0, C^{"}(\beta) > 0, C(0) = 0, C(1) = \infty \qquad (25)$$

Formula 5-(27) means that the supervision cost of insurance companies will increase with the increase of their audit frequency. If the insurance company does not conduct audits, then the cost in this regard is zero. A comprehensive inspection, then the cost that the insurance company needs to invest will be infinite.

The expected utility of the policyholder in the occurrence of moral hazard is:

$$U = \beta S^{1} + (1-\beta)S \qquad (26)$$

$S^{1}$ represents the income obtained by the insured who commits insurance fraud. For the insured, only when the expected utility of not committing insurance fraud is greater than or equal to the expected utility of committing insurance fraud, the insured will not take the initiative to commit insurance fraud, that is:

$$S - k(\alpha) \geq \beta S^{1} + (1-\beta)S \qquad (27)$$

which is:

$$S(\beta) - S^{1} \geq k(\alpha)/\beta \qquad (28)$$

$k(\alpha)/\beta$ represents the income difference between the insured and the fraudulent behavior. For the insurance company, this is the expenditure for the insured with different credit ratings.

Because, the total cost of the insurance company has two components, namely $C(\beta)$ and $k(\alpha)/\beta$.

The insurance company's total cost function is:

$$AC(\beta) = C(\beta) + k(\alpha)/\beta \qquad (29)$$

Because the insurance company pursues cost minimization in cost control, construct equations to obtain the optimal cost control conditions for insurance companies. That is to take the first-order derivation of the above formula to solve:

$$C'(\gamma) = k(\alpha)/\beta^2 \qquad (30)$$

Through game analysis, we can see that in the process of insurance claims, although small insurance accidents involve a small amount of insurance compensation, in addition, the proportion of insurance companies reviewing such claims is very small, and there are often more fraud problems. In order to effectively to avoid the occurrence of such fraud cases, insurance institutions can take measures from the design of insurance contracts and the operation and management of insurance institutions:

From the perspective of insurance contract design, insurance institutions can set the difference in compensation. That is the insurance compensation paid by the insurance institution will be related to whether the insured has a history of insurance fraud. If the insured has committed insurance fraud, then the insurance payout he gets when he has an insured event is worse than the insurance payout obtained by the insured who has the same insured event but has not committed insurance fraud. The insurance payout received in the event of an insured event is a difference to the insurance payout received by the insured who had the same insured event without committing insurance fraud. The size of the difference will be determined by the insurer's probability of reviewing claims and the cost of insurance fraud suffered by the insurer. Therefore, insurance companies can increase the cost of participating in fraud by expanding the payment difference between the insured and whether there is a fraud record, and ultimately guide the insured to actively refuse to commit insurance fraud.

From the point of view of operation and management, insurance institutions can design the optimal operation state. From a theoretical point of view, if the insurance company can fully supervise, then there will be no insurance fraud in the insurance industry. At this time, the insurance company only needs to do a good job of paying the insured's claim application. But in practice, it is impossible for insurance companies to fully supervise all claims. Increasing the review of claims application cases can certainly reduce insurance fraud from policyholders and reduce losses to the company due to moral hazard, but when insurance companies increase review efforts, the review cost is much higher than the reduction. This model of preventing insurance fraud is unreasonable. In this case, the optimal state for insurance companies is to make their marginal cost of reviewing claims equal to the losses caused by insurance fraud. Only in this way can the cost of moral hazard be minimized.

Conclusion at the level of theoretical research, I used the relevant theoretical methods of static game with complete information and static game with incomplete information, taking the typical health insurance fraud problem of doctor-patient collusion as an example, it analyzes the deep-seated causes of health insurance fraud from the perspective of game analysis. And the key elements that cause fraud, and from the perspective of optimal insurance contract design and the perspective of insurance company management, the basic idea of health insurance anti-fraud is studied, that is, in the process of insurance contract design, it should be based on whether the insured has fraud records. Set up payment difference clauses in the process of operation and management, the insurance business organization should achieve the optimal state so that the audit cost of the claim application case is equal to the loss caused by insurance fraud.

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# IMPACTS OF THE EMERGENCY ASSISTANCE PACKAGES ON ADAPTABILITY OF MICRO, SMALL AND MEDIUM ENTERPRISES IN THE POST-COVID-19

**Do Thi Thu[1,*], Le Thi Hong Thuy[2]**

***Abstract:*** *Resilience of private enterprises is one of the key solutions to achieve economic recovery target in the post-Covid-19 context. In which, adaptability is one of the four aspects of resilience. Based on the theory of the resilience of the organization, this study aimed to assess the impact of the two emergency assistance packages of the Government, according to Resolution NO. 42/NQ-CP and Resolution No. 68/NQ-CP, on the adaptability of micro, small and medium enterprises (MSMEs) in Vietnam. The results of this study showed that the two emergency assistance packages had positive impacts on the adaptability of MSMEs. Nonetheless, there were still some limitations and barriers which reduce the effectiveness of the support policies.*

***Keywords:*** *Emergency assistance, adaptability, resilience, MSMEs, Vietnam.*

## 1. INTRODUCTION

Impacts of the Covid-19 pandemic along with political instabilities caused by the war between Russia and Ukraine recently has greatly affected economic growth and inflation in many countries. Supply chains are broken which is a main cause of decline in economic growth rate, even stagflation in many countries, including Vietnam.

Meanwhile, at the micro level, the Covid-19 pandemic has significantly affected most businesses of different sizes in many industries and fields of the economy of Vietnam. In particular, micro, small and medium enterprises (MSMEs) are one of the "vulnerable" groups to socio-economic shocks. In Vietnam, according to data published by the General Statistics Office, in 2021, the number of bankrupt and dissolved

[1] Faculty of Economics, Banking Academy of Vietnam

* Corresponding author. Email: thudt@hvnh.edu.vn

[2] Faculty of Economics, Academy of Finance, Vietnam

enterprises is 16,741 enterprises, a decrease of 4.1% compared to 2020. However, there were 54,960 enterprises temporarily ceased operation, increase 18% compared to 2020. They were mainly MSMEs. In addition, a large number of enterprises also suffered from loss of business and had to cut labor, affecting not only economic growth but also having a great impact on ensuring social security of the nation.

To support employees and employers, the Government of Vietnam has implemented two emergency assistance packages. Particularly, the Resolution No. 42/NQ-CP dated April 9, 2020 aimed to support people facing difficulties due to the Covid-19 pandemic. The second assistance package was regulated in the Resolution No. 68/NQ-CP dated January 7, 2021 with a number of policies to support employees and employers facing difficulties due to the Covid-19 pandemic. This package have been carried out towards the goal of supporting the restoration of production and business, minimizing the negative impacts of the pandemic on private enterprises in particular and on socio-economic development in general.

To give further information for policy makers in economic recovery period, this study aims to analysis positive impacts as well as shortcomings and limitations of the second assistance packages on resilience of MSMEs in Vietnam who are "vulnerable enterprises" in the economy facing the shocks.

## 2. IMPACTS OF COVID-19 ON VIETNAMESE MSMES AND EMERGENCY ASSISTANCE POLICIES OF THE GOVERNMENT

### 2.1. Impacts of Covid-19 shocks on MSMEs in Vietnam

The Ministry of Planning and Investment (2021) showed that the proportion of small and medium enterprises with a decrease of more than 60% in total revenue in the first 6 months of 2020 was 21%. Meanwhile, this ratio was 45% for micro enterprises and only 18% for large enterprises. Similarly, according to THE UNWomen & UNDP (2020), the small and micro enterprises in Vietnam were the heaviest affected in terms of total revenue due to the Covid-19 pandemic. In particular, 90% of MSMEs in the tourism, hotel and restaurant industries experienced a decline of 50% or more in total revenue in April 2020 and May 2020 compared to the

period of December 2019. This decrease was the lowest in the agriculture and the construction field.

*Unit: (%)*

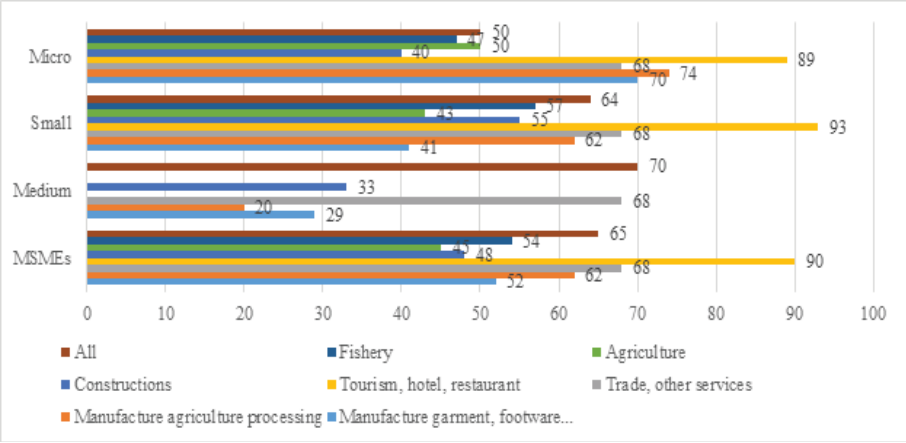


**Figure 1. Percentage of Enterprises with a Decrease in Revenue of 50% or More by Size and Economic Sector, from April to May 2020 Compared to December 2019**

*Source: Own illustration using data published by UNWomen & UNDP (2020).*

The effects of the Covid-19 pandemic on MSMEs passed through two major shocks: a supply shock and a demand shock.

*Firstly, the supply shock directly affects the production activities of MSMEs.* First of all, the impact of the pandemic has directly affected human resources for production and business. As Covid-19 cases continued to increase, employees had to quit their job due to regulations to ensure safety and prevent disease. At the same time, mandatory social distancing measures have caused major delays in the production and supply of goods of most MSMEs. In addition, the lockdown measures were applied in many countries around the world which affect to the supply resources. Therefore, all of enterprises, including MSMEs, have been severely affected due to the lack of supply of raw materials.

Up to now, China has continued to implement the Zero-Covid strategy. This shutdown of China influent strongly on the growth and inflation of the economy of Vietnam. Then this situation has affected directly and indirectly the resilience of Vietnamese enterprises, especially the vulnerable enterprises such as MSMEs.

*Secondly, the demand shock affected directly the consumption market and revenue of MSMEs.* From the end of 2019 to the end of 2021, due to the impact of the Covid-19 pandemic, the demand for products and services of domestic consumer also dropped sharply which reduced revenue of many enterprises. In particular, the decline is over 60% of total revenue in about 45% of micro enterprises, especially in the tourism sector.

In addition, the pandemic also affected the demand for export products of MSMEs in Vietnam. Recently, with the Zero-Covid strategy, blockade and distance measures are still applied, which has reduced China's demand for exported products and services of many MSMEs in Vietnam in various industries such as tourism, restaurants, hotels, wood and wood products or agricultural product processing industry.

### 2.2. Overview of support policies for MSMEs in the two emergency assistance packages of the Government

The outbreak of the fourth wave of Covid-19 has been very complicated and has had a serious and prolonged negative impact on people's health, livelihoods and the economy. In response, the Government of Vietnam, based on the experience of the first social protection package to mitigate the impact of Covid-19 in 2020 (under Resolution 42/NQ-CP- hereafter referred to as the first package), has issued Resolution 68/NQ- CP dated July 1st, 2021 on policies to support workers and employers impacted by the Covid-19 pandemic (hereafter referred to as the second package). The second package, with a total budget of VND 26 trillion, was designed with the dual goal of *"Ensuring social protection and promoting economic recovery, production and business stabilization."* Therefore, there were many types of policies which supported directly to private enterprises and focused mainly on Vietnamese MSMEs. These were illustrated in the Table 1.

**Table 1. Types of Policies Were Transfered Directly to Employers in the First and the Second Assistance Package**

| Policies | 1st assistance Package | 2nd assistance Package |
|---|---|---|
| **1. Insurance policy (from the Fund of Labor Accident and Occupational Disease Insurance)** | | |
| Reduce the insurance premium for occupational accidents and diseases | Not available | All employers and employees participate in occupational accident and occupational disease insurance |
| Suspension of contributions to retirement and death funds | Employers and employees participating in social insurance in enterprises must reduce 50% of employees because of the impact of Covid-19 (then adjusted to 20% according to NQ154). | Employers and employees participating in social insurance, in enterprises must reduce 15% of employees because of the impact of Covid-19 |
| Support training to maintain employment | Not available | Employers have to pay unemployment insurance for employees; there is a change in technology structure; revenue decreased by 10%; have a training plan |
| **2. Loan policy (The State Bank refinances the Bank for Policies)** | | |
| Loan to pay severance wages | The employer has financial difficulties and has paid 50% of the severance pay to the employee in accordance with the provisions of the Labor Code. | Employers are entitled to borrow money to pay severance pay for employees participating in social insurance who are forced to stop working for 15 consecutive days or more. |
| Loan for production recovery | Not available | Employers who have to temporarily suspend operations due to the requirements of pandemic prevention and control when returning to production are entitled to a loan to pay for employees participating in social insurance. |

*Source: Own illustration based on the UNDP (2021).*

Notably, the policy to support business households and the policy of loans to pay salaries and restore production. These are two policies that directly affect MSMEs.

Firstly, a business household who registered and must stopped operating to control the pandemic, can get a one-time support of VND3 billion.

Secondly, employers have allowed to borrow capital from the Vietnam Bank for Social Policies at 0% interest rate to pay salary for severance of employees participating in compulsory social insurance. The maximum loan amount is equal to the regional minimum wage for the number of employees according to the actual pay-off period of up to 3 months. The term for loans is less than 12 months.

In addition, the employers returning to production after social distancing policies and employers operating in the fields of transportation, aviation, tourism, accommodation services and sending Vietnamese workers to work abroad have entitled to a loan from the Bank for Social Policies with an interest rate of 0% to pay salary to employees working under a labor contract and participating in compulsory social insurance. The maximum loan amount is equal to the regional minimum wage for the number of employees in the period of up to 3 months. Loan term is less than 12 months.

## 3. OVERVIEW OF ADAPTABILITY OF MSMES IN VIETNAM

According to Fiksel (2003), resilience of an organization can be measured by four basic attributes, including:

(i) Diversity: diversity allows an organization to transform in the presence of external influences.

(ii) Efficiency (high efficiency and resource saving): The productivity of using resources is considered a key factor for the sustainable development of the organization.

(iii) Adaptability (flexibility to new pressures): Adaptability depends on the diversity of the organization and the respect and development of diversity in the use of resources.

(iv) Alignment and unity in the organization.

These are also considered as criteria for assessing the resilience of the organization after the impact of socio-economic shocks. This section is going to analyse the adaptability, which is the third basic attributes of organization resilience, of Vietnamese MSMEs.

Most of Vietnamese MSMEs have responded to the economic shock caused by the Covid-19 pandemic in the context of applying social

distancing polocies to control the pandemic. According to ILO (2020), the adaptation of enterprises including MSMEs in Vietnam can be classified into 4 groups as follows:

(i) Searching for alternative sources of revenue

(ii) Changing work arrangements

(iii) Cutting labour costs; and

(iiii) Suspension (whole or part) of the business operations

The proportion of enterprises applying specific measures to adapt to the Covid-19 pandemic can be illustrated in Figure 2.

*Unit: (%)*

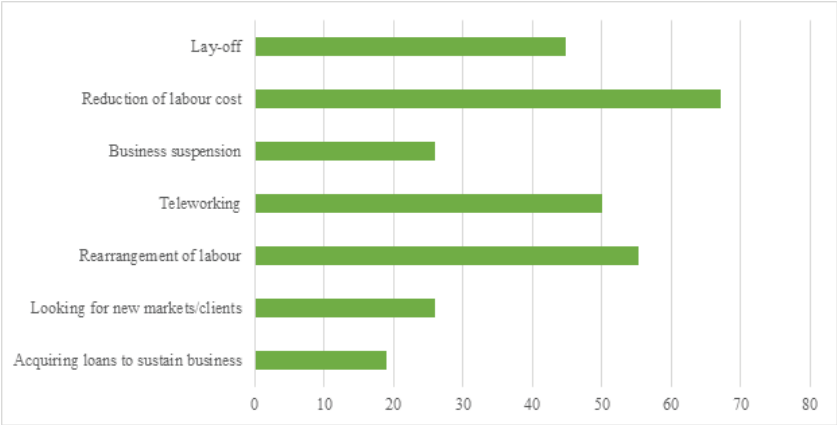


**Figure 2. Measures of Enterprises to Respond to the Covid-19 Pandemic**

*Source: Own illustration basing ILO (2020).*

According to the ILO (2020), most of enterprises, including MSMEs in Vietnam changed their business operations to reduce production costs, improved labor productivity and sought opportunities to access capital to deal with the difficulties caused by the Covid-19 pandemic. In particular, the main cost-cutting solutions are to cut the working hours of employees or even cut the number of employees in their enterprise. The reason is breaking supply chains reducing the demand for labour. Most of MSMEs cut down business operations in terms of reducing numbers of workers, due to the serious decrease in demand for output and input supply disruption. At the peak of the pandemic, 23.8% of MSMEs reported a workforce

reduction in April and May 2020 by more than 50% of the December 2019 level. Specifically, at the peak of the pandemic in April 2020, the workforce of MSMEs was 33.8% on average, of the December 2019 level (*UNWomen & UNDP, 2020).*

About the financial difficulties and opportunities to access capital, although there was a positive signal of the adaptability of MSMEs that most enterprises were supported to reschedule payments of current loans, so they are not under hard financial pressure. However, there were about 21% of medium enterprises were unable to repay their principal loan in time. This rate were lower at 12% and 13% for small size and micro size enterprises in respectively.

*Unit: (%)*

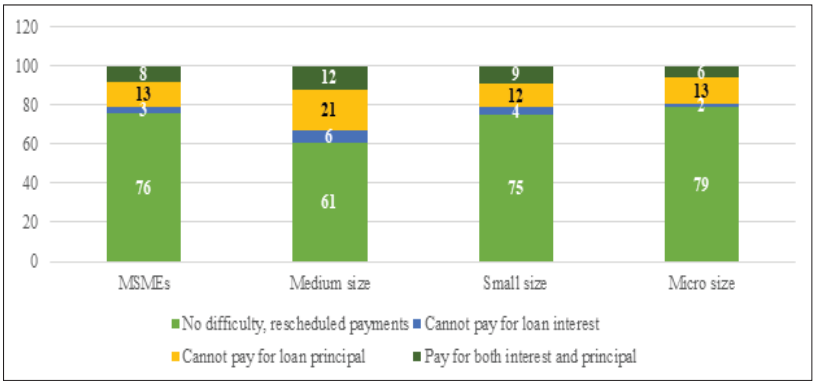


**Figure 3. Percentage of Vietnamese Firms Faced Financial Difficulties in 2020**

*Source: Own illustration using data published in the UNWomen & UNDP (2020).*

Due to the impact of the pandemic and social distancing policies, over 50% of enterprises allowed their employees to work from home (WFH). This is not a new working trend, but it is a quite creative plan for businesses to maintain operations in the context of complicated epidemics. WFH is also setting a new working trend in the context of great support from the industrial revolution 4.0 and the current trend of digital economy development.

Finding new customers was also a solution chosen and implemented by 25.9% of enterprises. However, this is not a viable solution for all enterprises in the context of serious domestic and international supply

chain disruptions, especially for MSMEs in the field of tourism, hotels and restaurants.

In addition, regarding to group solutions of changes work arrangements, UN ESCAP (2020) showed that businesses changed their business and production models, and start to embrace a greater use of Information Communication Technology (ICT). When enterprises change their way of working, a range of efficiencies and other gains can be unlocked, thereby benefiting them and their customers. Although the percentage of enterprises applying digital technology is still limited, MSMEs have shown positive signs that they were fully capable of adapting and changing according to the general trend of the economy. This was a positive signal reflecting the ability of MSMEs to accelerate and rise to develop after the shock (World Bank, 2020).

Besides, setting up contingency planning to better adapt to risks has also been concerned and implemented by a part of MSMEs (UN ESCAP, 2020). The Covid-19 pandemic reminded enterprises of the need for strategic to move forward and passthrough the shock.

## 4. IMPACTS OF THE EMERGENCY ASSISTANCE PACKAGES ON ADAPTABILITY OF MSMES

### 4.1. Positive effects of the assistance packages on adaptability of MSMEs in Vietnam

The main beneficiaries of the two emergency assistance packages include poor and near-poor people; the beneficiaries of the social assistance system; workers with labour contract who must temporarily stop working; individual business households that cease to operate; freelancers losing their jobs. However, these two support packages affect directly and indirectly MSMEs.

Firstly, the second emergency assistance package supported directly MSMEs that faced difficulties in accessing capital resources to pay wages for their employees. This support help the enterprises to maintain their production activities during and after the Covid-19 period.

Secondly, both of the two emergency assistance packages covered workers who have to temporarily stop working in enterprises, including MSMEs. This policy is not only ensured income security for workers affected by the Covid-19 pandemic, but also helps enterprises including

MSMEs improve their adaptability. Rearrangement of labour is one of the temporary solutions that MSMEs apply to adapt to social distancing policies and economic shocks caused by the pandemic. Therefore, the policy to support workers who have to stop working and support enterprises in paying wage for employees contributed to maintain both of quality and quantity of labour source and ensure demand for labour of MSMEs in the post-Covid-19 period. As a result, the policy contributed to support MSMEs to restore production, improve adaptability in particular and resilience in general.

Additionally, roles of the two emergency assistance packages can be assessed by MSMEs' general assessment of support policies (Figure 4). The temporary support to help pay the salaries of employees was rated at 4.11 points out of 5 points when the MSMEs' leaders were asked to assess the importance of the Government's support policies in the period of Covid-19 pandemic. Although the rate is not the highest but this results illustrated that the support policy on paying salaries in the second emergency package was very necessary for MSMEs to respond the Covid-19 and maintain production.

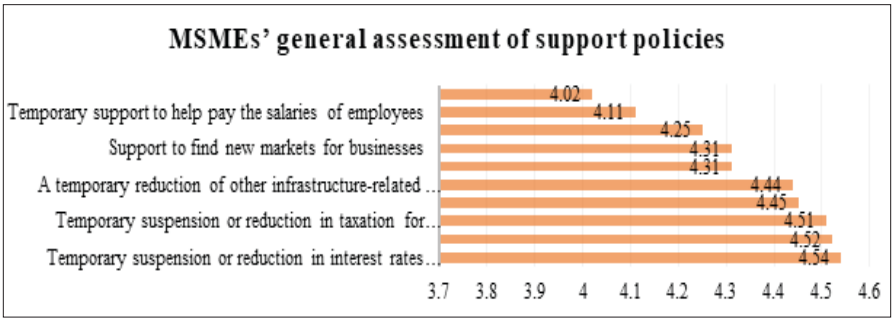


**Figure 4. MSMEs' General Assessment of Support Policies**

*Note: MSMEs that participated in the survey were asked to rate, from 1 to 5 (where 1 = very unnecessary and 5 = very necessary), which of the Government's support measures were most important to them.*

*Source: Own illustration based on the UN ESCAP (2020).*

Regarding to effectiveness of the supports, the survey data of UN ESCAP *(2020)* calculated the score of the temporarily stop paying social insurance is 3.98 points out of 5 points. This showed that the social insurance support policy was useful for MSMEs in the Covid-19 period. Although this point was lower than the average score of 4.21 of all support

measures for MSMEs such as the exemption, extension and/or reduction of bank loan interest rates and fees, no increase in prices in the electricity, water, gasoline..., the social insurance support was still an useful support policy for MSMEs to passthrough the Covid-19 shock.

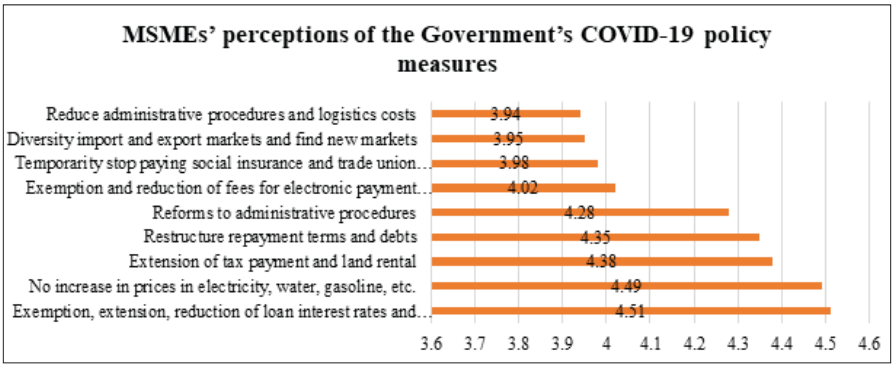


**Figure 5. MSMEs' Perceptions of the Government's Covid-19 Policy Measures**

*Source: Own illustration based on the UN ESCAP (2020).*

### 4.2. Limitations and barriers to access the assistance packages of MSMEs in Vietnam

Besides the positive impacts, design and implementation of two emergency assistance packages also have many limitations and barriers to access.

Firstly, administrative procedures were complicated in the context of social distancing, which were barriers to access and receive support. Conditions for MSMEs to be able to receive support were that the enterprises must suspend operations under a decision of a competent state agency, and settle social insurance contributions of the enterprise for their employees. However, in the context of Vietnam applying the social distancing measures to control the Covid-19 pandemic, many enterprises do not have time to prepare the necessary documents as well as complete the proofs in a timely manner.

Secondly, the benefit level was low and only one time support. The support levels of both packages under Resolution 42/2020 and Resolution 68/2021 were low and did not meet the minimum standard of living. The common rate for employees, whose labour contracts have been terminated or suspended, was 3,710,000 VND/person. Most of the policy supported once, lack of flexibility and timeliness in the context of a prolonged and

increasingly complicated pandemic as it is today. The regulation of "one beneficiary only once in a support policy" with a low level of benefit might cause the suitability of the benefit level (or the purchasing power of the support level) to decrease when the gap is prolonged and inflation risk due to scarcity of goods.

The next limitation concerned to the design of beneficiaries of the two assistance packages. Although the policies aimed to support directly enterprises including MSMEs through the loan support to pay salaries for employees or support indirectly through employee retention policies, it seemed that these two support packages were not really focus on the most vulnerable. Because, enterprises with the worst "health" could not overcome the difficult period caused by the Covid-19 pandemic to be able to continue to fulfill their social responsibilities to their customers or employees.

In addition, the disbursement progress of the support packages was still slow, affecting the effectiveness of the policies. Although the second assistance package was issued on July 1, 2021 and took effect immediately after that, after 2 months of implementation, the disbursement rate of the support package for social assistance policies and loan support policies to pay employees' salaries has only reached 18% and 4% of the planned budget expenditure, respectively (Figure 6).

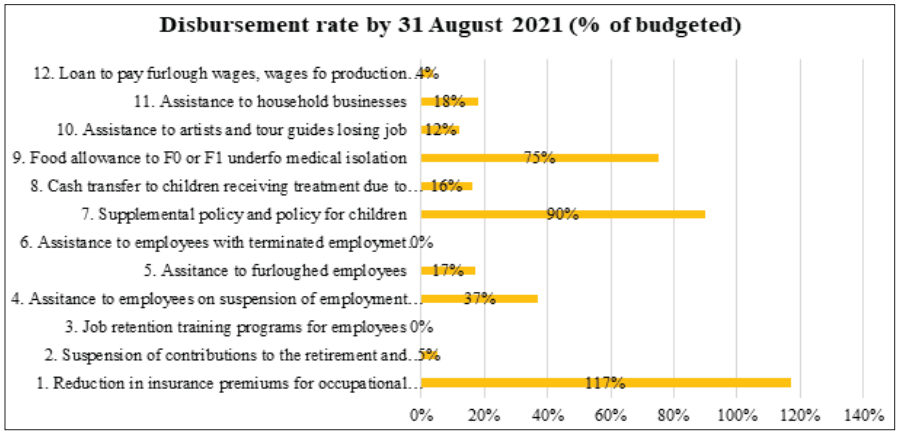


**Figure 6. Disbursement Rate by 31 August 2021 (% of budgeted)**

*Source: Own illustration using data published by UNDP (2021).*

## 5. DISCUSSION AND POLICY RECOMMENDATIONS

The shock caused by the Covid-19 pandemic along with macro uncertainties has been posing difficulties and challenges to the resilience of enterprises in general and MSMEs in particular. Besides, the resilience of enterprises is also a prerequisite, having a strong impact on aggregate supply, thereby affecting the growth and inflation of the economy. Therefore, besides internal solutions from enterprises, the government needs to have policies to stabilize the macro-economy and support firms to recover after the pandemic. In which, improving the adaptability of the MSMEs, which is one of the four measurements of their resilience (Fiksel, 2003), is very important. Although the two emergency assistant packages were very useful for MSMEs in the period of Covid-19 pandemic, the policies also have many limitations and barriers to access. To improve the adaptability of MSMEs in coming time, some solutions of enterprises and policy recommendations of The Government should be considered.

### 5.1. Solutions of MSMEs to improve their adaptability in the post-Covid19 context

To enhance the adaptability in the context of post-Covid-19 and improve the accessibility to the Government's supports, each MSMEs should focus on three main solutions as follow.

Firstly, it is necessary to diversify products and supply sources to take advantage of opportunities and limit challenges in the post-Covid-19 context. The pandemic has created major changes in consumer behavior. Therefore, besides maintaining traditional products, each business should update new consumption trends to best meet the needs of consumers. It is necessary to actively explore domestic and foreign raw material sources. In particular, it is necessary to focus on the application of digital technology to fully access input and output markets at domestic and international market.

Secondly, it is necessary to focus on improving the enterprises performance. In addition, deeper participation in the global value chain, moving up the ladder in the value chain will improve enterprises's performance. To do this, Research & Development is an important of improving enterprises's performance. In the current context, with social support packages from the government through Resolutions No. 42/NQ-CP and Resolution No. 68/NQ-CP, MSMEs should actively learn

and approach to receive benefits. enjoy preferential policies, support from the government, as a premise and financial motivation for business restructuring, product development, thereby restoring businesses.

Thirdly, MSMEs should take advantages of social insurance and loan policy to pay salary for employees to restore production activies as soon as possible. Besides, MSMEs also should attract high-quality workers to return to work at the enterprise after the time off due to labor reduction approaches. According to Do Thi Thu and Giang Thanh Long (2020), MSMEs were less likely to contribute social insurance for employees. This impacted on dedication and productivity of employees. Therefore, MSMEs should be more active in complying with regulations on social insurance in particular and well implementing social responsibility in general, in order to sustainably develop high-quality human capita sources in long-term.

Finally, MSMEs should to prepare for the "new normal" post-Covid-19 business ecosystem, especially improving the awareness and application of digital technology to adapt to the trend of digital economy development in the new normal.

### 5.2. Policy recommendations

To improve the effectiveness of support policies on adaptability of MSMEs, the Government should have further support policies and more focus on vulnerable MSMEs.

Firstly, the Government should improve dissemination of support policy information. Most MSMEs are generally aware of the Government's Covid-19 support policies, but they are less clear on the specifics, including the application process and information requirements. To be more effective, these policies need improved outreach and dissemination, notably around the provision of specific guidance, processes and eligibility criteria. It would therefore be valuable to provide online seminars and other outreach activities, preferably tailored to MSMEs in different sectors, with very specific instructions on how to apply.

Secondly, simplifying administrative procedures and applying more digital applications when implementing support packages**.** To improve the support policies to be more useful, it is necessary that they are implemented quickly, and that this is done and is widely seen to be done as

transparently, consistently and equitably as possible. Therefore, it should be desirable to implement ways of fast-tracking, categorizing and filtering and evaluating by using digital applications in order to make procedures more user- friendly, efficient, and less subjective, for enterprises as well as Government agencies.

Furthermore, it should be applied approaches for MSMEs could "self-evaluate" about what support measures they might be eligible for, and what they need to provide in order to access this support, would be helpful, and potentially save a lot of time. Therefore, a set of clear criteria is needed for enterprises. According to UN ESCAP (2020), "one option might be to establish a dedicated Covid-19 internet portal where all relevant information, forms and contact details are easily accessible and download- able. Ideally, this portal should span across the relevant state agencies, as a "one stop shop" platform".

Finally, the Government should to contiue with the stratergy of digital economy development and prepare for the "new normal" post-Covid-19 business ecosystem. Advancing the digital economy in Vietnam will be a critical element in this, for which MSMEs are often poorly equipped and/or prepared, relative to foreign investors and larger local companies. Entrepreneurs may perceive this to be a daunting prospect, as it is often perceived to be outside their areas of core competence, for various socio-cultural reasons. But with access to the right training and other inputs, MSMEs could leverage ICT to great competitive effect, such as reducing various transaction and fixed costs, and unlocking significant efficiency gains.

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# IMPROVING FINANCIAL LITERACY FOR A FURTHER RESILIENT FINANCIAL SYSTEM: WHAT TO FOCUS?

**Ngo Thi Hang[1,*], Nguyen Thi Hoai Le[2]**

***Abstract:*** *Financial literacy and financial education certainly help to improve the people's understanding about the financial products and services, equip people with better understanding of personal finance planning, which eventually leads them to efficient financial decisions as well as future financial prosperity. Other than that, a well-financially educated community will help the community to have more efficient responses towards personal financial difficult time as well as financial shocks and economic turmoils. This, at the country-level, will help to reduce the severely negative reactions of individual investors and financial products' consumers, and then bring more stability as well as resilience to the national financial system, especially in the phases of unexpected external shocks under the increasingly financial integration context across the globe. This paper, by empirically investigating the financial literacy of youngsters, students in particular, reveals some of key areas - financial education at home, increasing the acknowledgement and role of parents in educating younger generations about finance, widening the incorporation of financial courses in education programs - that financial institutions and policymakers should drive their focus on in designing appropriate policies and solutions to improve financial literacy for the young generations - the future of the country and the national financial system - to reach a more resilient and stronger financial system.*

***Keywords*****:** *Financial literacy, resilient, financial system.*

## 1. INTRODUCTION

Mairead McGuinness, the European Commissioner for Financial Stability, Financial Services and the Capital Markets Union, at the Financial Literacy and Inclusion Campaign emphasized the importance of raising financial literacy for the public for the stability of the financial markets and economies, especially after the presence and outbreak of

[1] Faculty of Finance, Banking Academy, Hanoi, Vietnam

* Corresponding author. Email: ngohang@hvnh.edu.vn

[2] Institute of Human Studies, Vietnam Academy of Social Science, Hanoi, Vietnam

Covid-19 epidemic and political-economic unexpected and unwanted events (McGuinness, 2022). Those circumstances have blurred the gap between financial resilence and financial vulnerability, and the financial literacy could be a catalyst to the probem too. With limited understanding of financial world, people, in general, could have not built their financial strength and resilience against external shocks. Besides, facing difficulties and those shocks, they along with their hasty, lack of understanding decisions, could drive up the tensions and the negative impact of the shocks, possibly leading to the severe systemic breakdown. McGuinness (2022) indicated that two in every three European households confront unexpected financial shocks in regular time, most of them do not know how to respond to sudden falls in their income or unanticipated changes in their expenses, some of them have savings but do not know how to manage at the best benefit. These show the limited financial literacy of the community and in the long term could affect the stability of the economy and the financial system.

There are many reasons leading to poor personal financial management of each person, and one of the key reason is that they do not have access to training programs in a good educational environment to emerge and enrich themselves with basic skills and knowledge related to financial field in general along with basic understanding of personal financial management in particular at a young age, especially at the stage of high school and post-secondary education such as college or university (Bakken, 1967, Mandell, 2009).

Obviously, increasing financial education could not itself improve the stabibility of the financial system, but it is one of the key contributors to go along with a well-regulated financial system and good consumer protection to strengthen the financial system's resilience (McGuinness, 2022). Besides, financial education should be done from the young ages (McGuinness, 2022).

The need for personal financial education from a young age, especially for students, to raise their awareness and preparation for life has been pointed out in many studies accross economies and financial systems around the globe. Furthermore, the preparation of this promising young labor force will surely help to enhance the financial literacy of

the entire population, which eventually help to strengthen the financial stability as well as the financial resilience, especially during the market distress periods.

Chen and Volpe (1998) confirmed that students who lack understanding of finance in general and personal finance in particular will face many difficulties related to finance in later stages of their lives. In detail, research showed that it is the lack of understanding of personal finance that will make those students have many negative or incorrect views about finance and investment in line with their management behaviour towards their wealth and financial planning. This drawback could lure them into making wrong decisions about money and financial issues for themselves and their families, limiting their ability to get wealthy in the future. Davidson (2006) shares similiar views on the importance of financial education for students. Many students do not know how to manage their income (Davidson, 2006). Once students have abundant financial resources, they often think simply to consume according to their own needs, sometimes they even buy things that are not really necessary. This consumption habit represents a lack of financial literacy among young generation, and this needs to be changed as soon as possible, starting with personal finance education from high school, and need to comprehensive training at the university level (Davidson, 2006).

In addition, it can be seen that financial literacy plays an important role in shaping the future consumption of financial services and financial management strategies of students, or more broadly, the future workforce and the entire population of a particular country. Financial literacy helps to improve an individual's financial situation, which in the long run will also reduce pressure on the social security system, especially in the context of an aging population in Vietnam. At the same time, a more complete perspective on financial management thanks to improved financial understanding will also encourage students, and even spread to students' friends and family, and the surrounding community, to be highly proactive in approaching, learning, and using financial products and services to meet individual financial management needs, strategies and plans.

Finally, better understanding of financial related concepts could also have an indirect impact on the development of financial services, financial

institutions and the financial system. Other than accesing and adopting to use traditional financial services provided by traditional institutions, higher financial literacy could induce people to have higher demand for various types and innovations of financial products and services. This tendency could encourage the development of the financial institutions and the financial system as a whole.

In Vietnam, financial literacy, particularly, nurturing the financial literacy for students has gotten limited attention. Dinh Thi Thanh Van and Nguyen Thi Hue (2016) have concluded that students' financial literacy in Hanoi - the center of socio-economic activities of the country as well as financial institutions, international educational institutions - is relatively low with 87% of the respondents showing low levels of financial literacy. This fits in the current picture of Vietnam's financial system in which the field of personal financial management along with personal finance education have only been known in the past few years. New wealth management services began to emerge around 2017 to partially meet this need for financial advice. However, the number of people who come to this service is not many. Most people, especially students, have accumulated their knowledge about personal finance through experience or education of the family not at educational sites and institutions. This fact is believed to reduce people's accessibility to personal finance-related educational programs, posing the risk of unintended low personal financial management.

Therefore, it is very important to identify factors contributed to strengthening the students' financial understanding in order to have timely and focused supporting solutions to improve students' personal financial management skills, aiming to higher resilience of the financial system.

With the above context and with the aim of bringing new contributions to the research field of financial literacy in general and students' financial understanding in particular, this study has chosen to examine the level of personal financial literacy of students in the north central provinces in Vietnam. Specifically, the research's contributions to the research area of personal financial literacy include: (1) the research covers a research sample of students from the north central region - the area has not been studied by any previous research in Vietnam; (2) consider students' personal financial

literacy in the relationship with personal financial education, level of financial education from home, major of study - aspects that have not been covered in previous studies in Vietnam; (3) these new factors covered in the research reveal the key focus for designing appropriate solutions to promote educational programs in personal finance to help students and the community to improve their understanding, thereby actively enhancing their personal financial management capacity in tandem with widening their opportunities to achieve proper future financial plans.

## 2. LITERATURE REVIEW

Previous studies have discovered many factors influencing personal financial literacy. Specifically, factors including demographic characteristics, gender, family background, living environment, personal relationships, have a certain relationship with the people's knowledge, behavior, and attitudes towards financial matters.

*Gender is an important factor differentiating the financial literacy among youngsters*. According to Ergun (2018) researching a sample of students in eight European countries (including Estonia, Germany, Italy, the Netherlands, Poland, Romania, the Russian Federation and Turkey), male students were more financially literate than female students. Similarly, Chen and Volpe (1998) studied the personal finance issues of more than 900 students at 14 universities in the US, found that female students, with majors unrelated to finance and business and minor working experience, often have a very low level of personal finance knowledge. The difference in financial literacy between male and female students is also examined in many other studies such as Danes and Hira (1987), Beal and Delpachitra (2003).

*Family background also has a certain influence on students' financial literacy*. Specifically, parents' educational attainment has a positive effect on students' financial literacy. Mandell 2009 showed that students whose parents have graduated from college or university have better financial literacy than students whose parents did not attend college or university. Similarly, Murphy (2005) asserted that students whose parents graduated from high school also have better financial literacy than students whose parents did not graduate from high school.

Besides, students whose parents often complained about finances were more likely to engage in bad financial behavior than other students, such as overconsumption or debt.

*The living environment and conditions also have a certain impact on a student's financial literacy*. In particular, students who live in university dormitories or are financially supported for education have lower savings levels than other student groups, but have better understanding of credit cards and personal loans (Ergun, 2018) since they received the financial supports via those financial products. Students with working experience and higher levels of personal income have a high level of personal financial literacy. Working experience and personal income encourage students have better financial literacy because they need to manage to manage their own financial sources and money flows (Beal and Delpachitra, 2003). This is also confirmed in the study of Akben-selcuk and Altiok-Yilma (2014) where working students were found to have better financial literacy than non-working students. Thus, it can be seen that independent living has a positive effect on improving students' financial literacy.

*Personal relationships are also an influential factor in students' financial literacy*. According to Jamal et al. (2015), friends have a great influence on the formation of students' saving behaviors. Research by Ergun (2018) shows a very interesting finding that students who often follow the advice of friends are more financially savvy than students who follow the advice of their parents. For business students, a networking with professionals and professors has a very positive effect on increasing their financial literacy (Chung and Park, 2014).

*In addition to factors closely linked to students' charactertistics and background, studies show that education level has a positive effect on personal financial literacy*. First-year students often have low financial literacy than students in higher grades (Ergun, 2018, Jorgensen, 2007, Danes and Hira, 1987), while master's students and doctoral students have better financial literacy than undergraduates, those at master's level, respectively (Ergun, 2018, Jorgensen, 2007). Meanwhile, some studies conversely indicated that student academic performance has no statistically significant association with their financial literacy (Akben-selcuk and Altiok-Yilmaz, 2014).

*Financial education at schools is very important for improving students' personal financial understanding, however, different forms and levels of education have a different impact* (Ergun, 2018, Albeerdy and Gharleghi, 2015, Pintye and Kiss, 2016, Beal and Delpachitra, 2003). Ergun (2018) added that accessing financial information from higher education is the most effective way to improve students' financial literacy. Additionally, Akben-selcuk and Altiok-Yilmaz (2014) claimed that students have formal education of financial and economic matters at the school, could get higher scores of financial understanding. Albeerdy and Gharleghi (2015) found a positive association between financial education in universities and financial literacy of students, and they also asserted that the information that students receive from the school has a much greater influence on their financial literacy than the information they receive from the media. Likewise, Ergun (2018) argued that for good personal financial skills, social media is not as effective as higher education, and that increasing finance courses at higher education programs will produce positive outcomes for students' perception of financial issues. Mimura et al. (2015), Chen and Volpe (1998), Xiao et al. (1995) shared a similar conclusion that the information that students receive from financial and business courses in the school has a positive relationship with their financial understanding, financial practices as well as saving behavior.

However, there are also studies that show that financial education in schools has a negligible effect on students' financial literacy (Nano and Cani, 2013, Pintye and Kiss, 2016), and even confirm that there is no link between students' financial literacy level and their financial education in colleges (Mandell and Schmid Klein, 2009).

*The field of study, also has a certain impact on the level of financial literacy and active learning about finance of students*. Research in Australia has shown that business students have generally superior financial management knowledge compared to non-business students (Beal and Delpachitra, 2003).

*Besides financial education from school, the level of financial education at home is found by studies to have a positive impact on students' financial literacy.* Family, including parental influence and family background, have a certain impact on students' financial literacy. Implementing financial

education from the earliest years of life helps children learn the skills to develop responsible financial behaviors through each stage of their education (OECD, 2012). The personal financial information that young people receive from their parents is positively related to their financial knowledge and practice. Financial education helps to improve the management of financial plans, reducing under-saving and over-borrowing situations.

Several studies have confirmed that the role of parents is positively related to students' financial literacy (Clarke et al., 2005, Jorgensen, 2007). Students who were financially informed by their parents often scored higher when assessing their financial knowledge, attitudes, and behaviors (Jorgensen, 2007).

In addition, family is also the most influential factor in students' money management skills. Students who said they learned more or less from their parents' money management practices often had better understanding than students who said they did not study (Jorgensen, 2007). Similarly, Akben-selcuk and Altiok-Yilmaz (2014) also assessed the influence of financial education from parents on students' financial literacy, and come to a suggestion that parents should to be aware of their role in the financial socialization of their children and should discuss financial matters with their children to gradually equip their children with financial understanding.

Danes and Hira (1987) made the observation that university students know very little about financial skills, especially issues related to money management; This explains why they have little insight into insurance, credit cards and financial management. Therefore, it will be necessary if parents care and share more with their children about money management skills, helping the younger generation understand the meaning of earning and keeping an income for themselves and their families.

Thus, it can be seen that the factors affecting personal understanding are very diverse and at different levels. In which, there are: (i) elements of personal characteristics and experiences, (ii) factors representing living environment and social relationship, and especially (iii) factors coming from family conditions and the schools' supports to the young generation's financial literacy. Therefore, to promote financial literacy among students in particular and among the young generation in general, it is important

to define what factors play the important role in driving up the people's financial understanding.

This study, on the basis of inheriting the research results of previous studies, incorporate a number of typical factors that affect students' personal financial knowledge into an empirical model to search for vital elements that financial providers and policymakers should focus on to improve the public' financial literacy and espcially at first to improve the financial awareness and knowledge of students - the future of the whole economy.

## 3. METHODOLOGY AND DATA

To determine the influence of factors on the level of personal financial knowledge of students in the research sample, we conducted a survey of 34 main questions and 150 options/sub questions to students studying in universities based on North Central areas. The questions from survey are then coded into variables representing factors that are suspected to have impact on the students' financial literacy levels. The detailed design of the variables in the study is tabulated below.

**Table 1. Variable Descriptions**

| Variable name | Notation | Variable Description |
|---|---|---|
| I - Dependent variable | | |
| Financial literacy | hbtc<br>(binary variable) | Variable values are calculated based on the survey results of 11 questions about financial literacy for survey participants). Each correct answer will be assigned 1 point (for 8 general knowledge questions) and 1.5 points (for 3 advanced knowledge questions), wrong answers will be assigned 0 point. The value of the Financial Literacy variable is defined based on the total score of 11 financial literacy questions. The higher the value of 11 questions, the higher the level of financial literacy of the respondents.<br>Accordingly, for each respondent, the financial literacy variable ("hbtc") takes on a value of 0 (little financial literacy) if the total score of those 11 questions is less than 5 (the mean value of the entire sample), and takes on a value of 1 (relatively well-financially educated) if the calculated score is 5 or more. |
| II - Independent variable | | |
| Gender | gioitinh<br>(binary variable) | The value of "gioitinh" is 1 if the respondent is female, and 0 otherwise |

| | | |
|---|---|---|
| Education | hocvan<br>(category variable) | "hocvan" has values from 1 onwards corresponding to the academic year during undergraduate education. For example, a value of 1 indicates a student in their freshman year of college. |
| Major | chuyennganh<br>(binary variable) | "chuyenganh" has a value of 1 if the respondent is studying economics-finance-banking, and 0 otherwise. |
| Regular address | diachi<br>(binary variable) | "diachi" is assigned value of 1 if the respondent lives in an urban area, 0 otherwise (rural). |
| Income | nguonthunhap<br>(category variable) | "nguonthunhap" receives values from 1 to 6, specifically:<br>1. Financially supported by family and relatives<br>2. Scholarships<br>3. Borrowings<br>4. Part-time jobs / self-employment<br>5. Other sources of having financial supports for studying and living<br>6. Have at least 2 of the above 5 sources |
| Current financial situation | taichinh<br>(rank variable ) | "taichinh" is measured through a survey question about the response of total income / month to spending needs, and receives the following values:<br>1. Sufficient and have savings<br>2. Just enough for studying and living expenses<br>3. Not enough for basic needs of studying and living |
| Father's education level | hocvanbo<br>(rank variable) | These variables hold one of the values from 1 to 6, specifically as follows:<br>1. Primary & lower elementary<br>2. Junior high School<br>3. High school<br>4. Vocational school<br>5. College / Undergraduate<br>6. Graduate |
| Mother's education level | hocvanme<br>(rank variable) | |
| Parents' financial management skills | qltcgiadinh | The total score of the answers in questions of parents' financial management skills. Higher scores represent better skills . |
| Financial education from parents to children | gdtcgiadinh | The total score of the answers in questions asking the levels of financial education of parents for their children in the family. Higher scores mean better education. |

To conduct research on factors affecting personal financial knowledge of university students in the North Central region, in which the dependent variable - Financial literacy - is a binary variable, the authors have used probit model with regression equation as follows:

$$\Pr(Y=1\left|X_i\right.)=\phi(\beta_0+\sum_{i=1}^{i}\beta_i X_i)$$

*Where:* Y: "Financial literacy" of students (hbtc)

f is the cumulative standard normal distribution function;

and $X_i$ are the explanatory variables in the model.

The probability that the dependent variable Y reaches a value of 1 is calculated through the z = $\phi(\beta_0+\sum_{i=1}^{i}\beta_i X_i)$ value of the cumulative normal distribution, z = $\phi(\beta_0+\sum_{i=1}^{i}\beta_i X_i)$ , and then finds the probability corresponding to the z value in the distribution table. The estimated value of the coefficient reflects the change of the value of z when the value of one variable Xi changes by 1 unit, while the remaining variables Xi remain unchanged. Therefore, in order to measure the impact of a particular explanatory variable on the dependent variable, it is possible to calculate the z value and look up the probability Y = 1 according to the explanatory variable value (before and after the change) and take the difference in probability, this value is the impact of the change in the value of the explanatory variable on the probability of the occurrence of the case Y=1. For the purpose of finding out the factors that have an impact on students' financial literacy, the authors only focus on finding the factors as well as the relationship between the factors affecting financial literacy of students.

Besides, tests such as Hosmer-Lemeshow Chi-squared and Classification are also used to confirm the stability and reliability of the estimated results from the model as well as to assure that the conclusions made from the results of the empirical model are also appropriate and reliable.

## 4. RESEARCH FINDINGS DISCUSSION

Finishing the survey phase, we collected 487 qualified responses for further steps of the empirical research process. Of which, regarding the major of study, 41.27% of students participated in the survey are currently taking economic and business related programs, 58.73% of the respondents are from non-economic undergraduate programs. Besides, among the respondents, a relatively large portions of 65.4% of students are studying

and living based on family's financial support, 25.67% students are having their own source of finance from part-time jobs or even running their own small business, and the rest of the respondents have additional financing sources from scholarships and other kinds.

Barely screening over the survey results, it is clearly seen that in general, students from the North Central provinces responded to most of the questionnaires at a rather low level. This is a remarkable warning for both managers in the education field and policy makers in the field of human resource in developing solutions to improve financial literacy for young people in general and students in particular. Interestingly, students majoring in economics have the highest rate of correct answers, while students studying majors of humanities and social sciences have the lowest correct answer rates. This shows that, in the economic and business related educational programs, the relevant subjects have helped increase the financial literacy for students.

To have further understanding of the students's financial literacy and important drivers of the students' financial understanding, the survey results are proceeded with the probit model as introduced earlier and the regression results are presented in Table 2.

**Table 2. Regression Results**

| hbtc | Probit, vce (robust) | | | | | |
|---|---|---|---|---|---|---|
| | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. Interval] | |
| gioitinh | 0.139 | 0.269 | 0.520 | 0.606 | -0.388 | 0.665 |
| school | | | | | | |
| 2 | 0.354 | 0.254 | 1.390 | 0.164 | -0.145 | 0.852 |
| 3 | 0.019 | 0.279 | 0.070 | 0.944 | -0.527 | 0.566 |
| 4 | -0.759 | 0.364 | -2,090 | 0.03 7 | -1.472 | -0.047 |
| special | 0.031 | 0.213 | 0.140 | 0.885 | -0.387 | 0.449 |
| source | | | | | | |
| first | -0.464 | 0.321 | -1.440 | 0.149 | -1.094 | 0.166 |
| 2 | -1.705 | 0.754 | -2,260 | 0.024 ** | -3.183 | -0.228 |
| 3 | 0.000 | (empty) | | | | |
| 5 | -2.192 | 0.927 | -2,370 | 0.018 ** | -4.008 | -0.376 |
| 6 | 0.331 | 0.418 | 0.790 | 0.429 | -0.490 | 1.151 |
| address | 0.161 | 0.249 | 0.650 | 0.517 | -0.327 | 0.650 |
| taichinh | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | -0.059 | 0.265 | -0.220 | 0.824 | -0.578 | 0.460 |
| 3 | -0.629 | 0.312 | -2,020 | 0.044 ** | -1.240 | -0.017 |
| school | | | | | | |
| 2 | -0.257 | 0.482 | -0.530 | 0.594 | -1.202 | 0.688 |
| 3 | -0.518 | 0.472 | -1,100 | 0.273 | -1.444 | 0.408 |
| 4 | -0.652 | 0.530 | -1.230 | 0.219 | -1,692 | 0.388 |
| 5 | 0.174 | 0.565 | 0.310 | 0.758 | -0.934 | 1.282 |
| 6 | -0.654 | 0.696 | -0.940 | 0.347 | -2,018 | 0.710 |
| school | | | | | | |
| 2 | 0.764 | 0.451 | 1.690 | 0.091* | -0.121 | 1.648 |
| 3 | 0.356 | 0.427 | 0.830 | 0.405 | -0.482 | 1.193 |
| 4 | 0.420 | 0.623 | 0.670 | 0.501 | -0.802 | 1.641 |
| 5 | 0.345 | 0.498 | 0.690 | 0.488 | -0.630 | 1,320 |
| 6 | 1.174 | 0.635 | 1,850 | 0.064* | -0.070 | 2.418 |
| qltcgiadinh | -0.030 | 0.024 | -1,250 | 0.211 | -0.078 | 0.017 |
| gdtcgiadinh | 0.040 | 0.022 | 1,840 | 0.066* | -0.003 | 0.083 |
| _cons | 1.534 | 0.722 | 2.120 | 0.034 | 0.118 | 2.949 |
| Prob > chi2 | | | 0.000 | | | |
| **Model Fitness Test** | | | | | | |
| Hosmer-Lemeshow chi2 | | | 4.49 | | Prob > Chi2 | 0. 2131 |
| *(H0: There is no difference between observed value and model estimate).* | | | | | | |
| Predictability of the model | | | | | | |
| *(Correctly Classified)* | | | 93. 96 % | | | |

*Notes: *, **, ***estimated regressors are statistical significance at the 10%, 5% and 1%;*

*Firstly,* there is no difference in financial literacy between male and female students (*gioitinh),* between students from urban and rural areas *(diachi),* or even among students from different academic major *(chuyennganh).* Meanwhile, the education level of parents (*hocvanbo, hocvanme)* has different relationships to children's financial literacy, especially with the students participating in the survey. Mother's education at the graduate level (master's, doctorate, ...) has a significant positive impact on the level of financial literacy in survey students. However, the research results also show that the mother's education level at the lower secondary level, similar to that of the mother with a post-graduate education, has a positive impact on the financial literacy level of the mother. students compared to mothers with other educational qualifications. This result also suggests adding a new research variable in future studies, which is about

mother's occupation and family's financial situation because these factors can affect the mother's financial management behavior and affect the financial management orientation and financial education for her children.

*Second,* students whose monthly income comes from part-time or part-time employment or self-employment are often possessing better financial understanding than students whose income comes from scholarships or other sources of funding. This result is consistent with the study of Beal & Delpachitra (2003) and Akben-selcuk and Altiok-Yilma (2014). It can be seen that, instead of finding sources of income and self-managing a business to generate income, which requires students to be proactive in seeking and increasing financial knowledge and understanding, having source of income from grants and scholarships, reducing the financial burden on students, and reducing the motivation to manage finances, thereby indirectly affecting students' limited financial literacy.

*Third,* the estimated results of the variable "taichinh" show that students with limited financial situation (level 3: lack of income to spend monthly), often do not have savings and therefore are not motivated to learn and improve understanding of basic finance in general and advanced financial literacy in particular.

*Fourth,* similar to Clarke et al. (2005), Jorgensen (2007), Cude et al. (2006), Akben-selcuk and Altiok-Yilmaz (2014), the results from this study also assert the influence and important role of home financial education in building a foundation and improving financial literacy for students. Accordingly, the more parents pay attention to communicating and educating their children (students/respondents of this survey research) on issues related to finance, spending management, financial management, savings,..., the more children has a better level of financial literacy.

## 5. CONCLUSION REMARKS AND RECOMMENDATIONS

Financial education is an important factor to help increase students' personal financial understanding which then will equip them with sufficient knowlege to make effective financial decision, financial plannings and provide them with an active layer of consumer protection thanks to better understanding of financial issues. This financial education process not only begins when entering college, university, but also needs to be done

from an early age, especially should be done more at family-level, as asserted by the research results. The research findings have successfully reveal that for young generation, particularly students in research, if they do not accumulate their income themselves from active sources (part-time jobs, their own business) and do not have savings, they will barely have incentive to acquire financial knowledge for their future lives and financial planning. The educational background of parents also has specific impact on the parents' intention to educate their chidren about finance.

Therefore, approaches of providing financial education need to be diverse, not only by educational institutions (e.g. universities) but also by many other entities and in different forms, including increasing education at the family, from mass media, and from financial service providers...

This study, based on the empricial results, proposes some key recommendations to enhance the financial literacy for the young generation and bring more financial resilience to the economy and the financial system in the future. In detail, the policy makers and the financial provides together with the managers of educational instution should focus on following points:

First, advanced financial education from the family should be highly encouraged. Parents are proactive in introducing and equipping their children with basic financial knowledge, personal financial management, and orientation for their children to actively seek and participate in short-term training courses about personal finance

Second, higher education institutions should survey students' needs to improve financial literacy, thereby developing and implementing projects and plans to improve students' financial literacy. For those studying non-economic majors, it is necessary to have appropriate educational programs to supplement financial understanding. Most of the students in the North Central region do not answer the questions correctly with investment knowledge, therefore, it is necessary to focus on learning more about investment knowledge, this is an important springboard for stability. future personal finance.

Third, educational institutions at all levels, from primary to university, should also actively design and integrate short-term programs

and courses to improve financial literacy for students and students into the program content.

Forth, regarding the subjects implementing education, not only schools, parents also need to acknowledge their certain role in educating their children. Eventhough, of the parents, mothers and fathers have different influences, it is necessary for both to pay attention to personal financial education for their children from a young age.

The research also suggests that it is necessary to learn more about other causes (family's financial conditions, occupations of parents,…) leading to the people' financial understanding in order to have appropriate measures to improve the community's financial knowledge both in the short term and in the long term. In addition, because the research group's sample is still relatively limited due to the research team's accessibility to the sample as well as the students' willingness to respond to the survey and provide personal information, so the results of the study are not strongly representative. Therefore, with the addition of the research variable as suggested above, expanding the research scope to different student groups of other geographical areas is encouraged. It is also needed to consider to conduct a comprehensive survey process to obtain extremely more valuable results, for example survey before and after a particular financial education programs offered to students, target customers of financial providers. This approach will have to amend the programs further for better solutions for improving financial literacy of the public in general.

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# INCREASE THE MARKET SHARE OF CUSTOMERS TRANSACTION ON DIGITAL BANKING PLATFORM OF SOME SOUTHEAST ASIA COUNTRIES

**Le Thi Thuy Hang**[1]

***Abstract:*** *The development potential of digital banking is relatively large, stemming from market demand, development orientation of the banking industry and financial integration. Digital banking has a very fast growth rate and is expected to gradually replace the traditional banking model. This article studies the increase in customer transactions with banks on digital platforms from 2010 to 2020 in 5 Southeast Asian countries: Indonesia, Malaysia, Myanmar, Thailand and Vietnam. Using POOL, FEM, REM, FGLS models to examine the impact of banking transactions made by digital technology on the bank's deposit and lending revenue. The results show that the flexible products and services of digital banks bring many benefits, with a high level of interaction, not only supporting the relationship between customers and banks, but also improving operating revenu bank. Banks in different parts of the world are revamping their long term-strategies in order to harness the opportunities offered by digitization.*

***Keywords:*** *Customers, digital bank, Southeast.*

## 1. INTRODUCTION

The penetration of digital technology into the banking sector has brought about a paradigm shift in the banking sector, creating what is now known as Digital Banking. In a broad sense, digital banking refers to the use of technology to smoothly conduct banking transactions. It therefore includes online banking, e-banking, and mobile banking, terms that are commonly used. In contrast to traditional banking, digital banks aim to develop digital products and services that can adapt to meet the needs of their customers. While traditional online banks use pre-designed software to increase reach, presence, and respond to customer needs, digital banks employ information technology experts. trust to understand and understand their customers and design their products accordingly. The transfer of technology has now become indispensable for any industry, and falling

[1] University of Finance - Marketing, Ho Chi Minh City, Vietnam. Email: ltt.hang@ufm.edu.vn

behind can have dire consequences. Accepting the challenge is something an industry should aim for, especially when that industry relies heavily on customer volume.

Thus, digital banking is understood as an operating model of a bank based on digital technology. More specifically, the way and operation process of an organization, based entirely on advanced technology, to perform the functions of a bank. The bank integrates digitization for all areas of banking services, applying digitalization in financial institutions' business activities and customer interactions.

Digital banking has become an integral part of the economy, especially in developing countries. And it is the most effective and feasible tool to add value and benefits to customers and banks. Banks focus on improving customer service and user experience, based on the digitization of customer interactions, expectations and experiences on a database.

Based on research and real-life situations, the key role of digital banking in the development of the banking industry has recently been recognized, especially in developing countries in Southeast Asia. . The objective of the study is to examine the impact of digital transactions on banking performance. In the next section, the study presents background information to promote the research. Section 3 outlines the empirical approach of the research model. Specifically, the study uses POOL, FEM, REM, and FGLS models. The estimated results are then presented and discussed in Section 4. Finally, Section 5 provides some conclusions.

## 2. STUDIES ON THE BENEFITS OF DIGITAL TECHNOLOGY TO THE BANK'S BUSINESS ACTIVITIES

A trend related to the rapid implementation of digital banking is taking place. This is not only new technology, but also measurable customer support. In a study of 400 customers at 4 major banks in Brunei Darussalam, 31% of respondents were using Internal Banking and 46% said they were satisfied with the service (Columbus, 2020). Digital banking is not only about customer satisfaction, but innovative digital banking channels also help reduce costs compared to traditional channels. Terminal-based banking reduces transaction costs by 58% and mobile-based channels by 15% compared to traditional costs (Pilcher, 2020).

Another study, across 170 branches of a major bank, showed the important role that banking institutions play in customer-centricity and digital play an important role. This relies on two servicing capabilities, customer orientation and customer responsiveness (Bhutani & Wadhwani, 2018). What makes this digital revolution so appealing even with so many traditional banks? Business strategy has to adapt or become obsolete, and the bank's digital strategic posture has an increasing influence on the overall digital business strategy. This is according to a study of 400 US-based companies from 1999 to 2006 (Harvey, 2010).

Disruptive technology in financial services, fintechs have digitally transformed the banking industry with a focus on customer-centric financial services, extending to SMEs. Overwhelmed by fintech and the innovations and advancements of tech companies, traditional investment banks are rethinking their operations by expanding their core platforms to retail in an attempt to boost sales. digital transformation faster, safer and more personalized customer banking experience. Virtually all traditional banks, leveraging their strength in existing and regulated customer bases, have partnered with fintech market participants to integrate emerging cutting-edge technologies. in the past few years. As we enter a new decade, the banking and fintech industry will further evolve in the form of joint ventures, mergers and acquisitions, towards a merger of banks, fintechs and technology companies as well as technology companies. social network providers. Digital tools such as AI and blockchain, data platforms, cybersecurity regtechs and strategic partnerships will essentially be well positioned to be maintained in the banking market of the financial ecosystem. fully digital transformation (Khanna & Martins, 2018).

As such, digital can be used to create positive effects on trust and relationship between customers and banks in the long term by incorporating all aspects of products, services and services. services, brands and communications. Interactive elements on the digital platform allow customers to self-monitor, self-manage and execute transactions related to their accounts. With the growing number of e-customer service and marketing channels, it seems that banks are trying to implement online marketing campaigns to enhance customer market share and operating revenue.

## 3. RESEARCH METHODS

### 3.1. Regression model POOL, FEM, REM

Regression model of panel data:

$$CDP_{it} = \beta_0 + \beta_1 NAD_{it} + \beta_2 VTD_{it} + e_{it}$$

n there:

$CDP_{it}$: the dependent variable of the model, showing the total amount of deposits and loans from customers transacting with national banks in year t.

$NAD_{it}$: independent variable of the model, showing the total number of customer accounts opened at the bank to conduct transactions using digital technology of country i in year t.

$VTD_{it}$: independent variable of the model, showing the total value of customers making transactions in the form of digital technology through banks of country i in year t.

$\beta_0$, $\beta_1$, $\beta_2$ are the intercept coefficients of the model.

$\varepsilon_{it}$: error of the model, it satisfies the assumptions of OLS.

*i*: country, i (Indonesia, Malaysia, Myanmar, Thailand, Vietnam).

*t*: year, t (2010, 2020).

### 3.2. Description of the model's variables

The object of the study is to focus on studying the impact of banking digital technology on customer transactions with banks. The study has 3 variables, namely CDPit, NADit and VTDit. The study examines the increased level of bank digital technology, which is shown through: the total number of accounts that customers open at the bank to conduct transactions in the form of digital technology and the value of customers making transactions using digital technology. The form of digital technology through national banks will have an impact on increasing customer deposits and loans with banks of other countries.

### 3.3. Research data

The scope of the study is the impact of digital banking services on the banking business of 5 Southeast Asian countries, the data is taken

from 2010 to 2020. The data is taken from the Group. International Monetary Organization (IMF). Variables total sales of deposits and loans to customers who transact with banks of the country (CDP), total value of customers making transactions in the form of digital technology through the country's banks ( VTD) and the total number of customer accounts opened at banks to conduct transactions in the form of national digital technology (NAD) are both trend variables that do not have a normal distribution, the deviation must be very high. Research to convert these variables into the logarithm of the natural base so that the variable has a distribution close to the normal distribution, meeting the input data conditions of the model.

## 4. RESEARCH RESULTS AND DISCUSSION

### 4.1. Choosing the best regression model

Set up a matrix of correlation coefficients showing the degree of interaction of independent variables with each other. Based on the correlation analysis table, it shows that all independent variables can be included in the model and ensure that the model does not have multicollinearity.

**Table 1. Matrix of Correlation Coefficients between Independent Variables**

| Values | NAD | VTD |
|---|---|---|
| NAD | 1.0000 | |
| VTD | 0.2760 | 1.0000 |

*Source: Stata14 regression results*

Perform OLS estimation regression on data consisting of many objects. Pooled regression model (POOL) was used:

**Table 2. Pooled Regression Results POOL**

| F(2, 52) = 1548.79 Prob > F = 0.0000 | | | | | | |
|---|---|---|---|---|---|---|
| R-squared = 0.9835 Adj R-squared = 0.9829 | | | | | | |
| CDP | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. Interval] | |
| NAD | .3258751 | .0275021 | | 11.85 | 0.000 | .3810621 |
| VTD | .9845689 | .0177279 | | 55.54 | 0.000 | .9489952 |
| _cons | 6.815498 | .5590561 | | 12.19 | 0.000 | 5.69367 |

*Source: Stata14 regression results*

Coefficient P = 0.0000, POOL model has statistical significance. Based on the model showing the total number of customer accounts opened at the bank to conduct transactions in the form of digital technology (NAD), the total value of customers conducting transactions with the bank in the form of digital technology of the bank. countries (VTD) will have an impact on the performance of countries' banks through the impact on the amount of deposits and loans made by customers with banks of countries (CDPs).

Carry out the regression with the difference in intercept between the regression function of the objects is determined. Fixed-effects model FEM is used:

**Table 3. Fixed Regression Results FEM**

| F(2,48) = 70.46 Prob > F = 0.0000 | | | | | | |
|---|---|---|---|---|---|---|
| CDP | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. Interval] | |
| NAD | .0685112 | .0562918 | 1.22 | 0.230 | .0446711 | .1816934 |
| VTD | .4049716 | .0640229 | 6.33 | 0.000 | .2762449 | .5336983 |
| _cons | 9.888935 | .762886 | 12.96 | 0.000 | 8.35505 | 11.42282 |
| F test that all u_i=0: F(4, 48) = 22.17 Prob > F = 0.0000 | | | | | | |

*Source: Stata14 regression results.*

Coefficient P = 0.0000, FEM model has statistical significance. Based on the model for the total value of customers making transactions with banks in the form of digital technology (VTD) will have an impact on the activities of banks in countries through the impact on deposit sales and Loans of customers dealing with the country's bank (CDP).

Carry out the regression with the difference in intercept between the regression function of the subjects being random. The REM random effects model is used:

**Table 4. Random Regression Results REM**

| Wald chi2(3) = 1568.29 Prob > F = 0.0000 | | | | | | |
|---|---|---|---|---|---|---|
| CDP | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. Interval] | |
| NAD | .3187998 | .035569 | 8.96 | 0.000 | .3885138 | .2490858 |
| VTD | .967101 | .0245648 | 39.37 | 0.000 | .9189548 | 1.015247 |
| _cons | 7.003634 | .7099593 | 9.86 | 0.000 | 5.612139 | 8.395128 |

*Source: Stata14 regression results.*

Coefficient P = 0.0000, REM model has statistical significance. Based on the model showing the total number of customer accounts opened at the bank to conduct transactions in the form of national digital technology (NAD), the total value of customers making transactions with the bank in the form of public The digitalization of the country (VTD) will have an impact on the operations of the banks of the country through the impact on the volume of deposits and loans of customers dealing with the country's banks (CDP).

From the results of the research models, the author will perform tests such as F (to choose between Pooled OLS and FEM), Hausman test (to choose between REM and FEM) and finally choose the method. suitable estimate.

The author uses the F-test to select the model between Pooled OLS and FEM, with the assumption:

H0: Choosing the OLS model is more suitable for the sample data than the FEM

H1: Choosing the FEM model is more suitable for the sample data than OLS

**Table 5. Model selection test between Pooled OLS and FEM**

| F | P-value |
|---|---|
| 22.17 | 0.0000 |

*Source: Stata14 regression results*

Through F test: P = 0.0000, a = 0.05

Since P = 0.000 < 0.05, reject H0. Therefore, choosing the FEM model is appropriate.

Perform Hausman test, to choose a model between FEM and REM, with the assumption:

H0: Choosing the REM model is more suitable for the sample data than the FEM.

H1: Choosing the FEM model is more suitable for the sample data than REM.

**Table 6. Model selection test between FEM and REM**

| Chi2 | P |
|---|---|
| 101.37 | 0.0000 |

*Source: Stata14 regression results.*

From the test results, the value P = 0.0000 > 0.05, should reject H0, decide to use the model with fixed effects FEM. So regression with FEM fixed effects model will yield the best results.

### 4.2. Regression model tests

#### *4.2.1. Checking for multicollinearity*

Multicollinearity is a phenomenon in which the independent variables in the model are linearly correlated with each other. The study tests the hypothesis that there is no multicollinearity phenomenon by using the VIF criterion.

**Table 7. Multicollinearity Test**

| Values | VIF | 1/VIF |
|---|---|---|
| VTD | 1.08 | 0.923800 |
| Mean VIF | 1.08 | 0.923800 |

*Source: Stata14 regression results.*

All correlation coefficients are less than 2, indicating that there is no multicollinearity between the independent variables. That shows that independent variables can be used to estimate the model.

#### *4.2.2. Checking for the phenomenon of variance of variable error*

The variance of the error changes will make the estimates obtained by the OLS method stable but ineffective, the regression coefficient tests are no longer reliable. Test the hypothesis that the variance of the error is constant using the Breusch - Pagan Lagrangian test, with the hypothesis H0: There is no phenomenon of variance.

**Table 8. Variance Test of Variable Error**

| Values | Chi2 | P |
|---|---|---|
| **Result** | 2935.96 | 0.0000 |

*Source: Stata14 regression results.*

With the alpha = 5% significance level, the Breusch and Pagan Lagrangian tests give the results: P = 0.0000. So, P < 0.05 should reject the hypothesis H0: There is no phenomenon of variance change. Thus, the model has the phenomenon of variance change.

#### *4.2.3. Check for autocorrelation*

The phenomenon of autocorrelation is that between errors that have a correlation relationship with each other will make the estimates obtained by the OLS method stable but ineffective, the regression coefficient tests are no longer reliable. The study tests the autocorrelation phenomenon on panel data with the hypothesis H0: no autocorrelation.

**Table 9. Autocorrelation Test**

| Values | F | P |
|---|---|---|
| **Result** | 1054.766 | 0.0000 |

*Source: Stata14 regression results.*

With significance level alpha = 1%, the test results are: P = 0.0000. So, P < 1% should reject hypothesis H0. Thus, the model has the phenomenon of autocorrelation.

After testing, if the model violates assumptions such as autocorrelation, variable variance, then these methods are not optimal but must use another better method, which is the normal method. Feasible Generalized Minimum Method - FGLS to overcome the above phenomenon to ensure that the obtained estimates are robust and efficient.

**Table 10. Regression results by least squares method - FGLS**

| chi2(3) = 3623.75 Prob > F = 0.0000 | | | | | | |
|---|---|---|---|---|---|---|
| CDP | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. Interval] | |
| NAD | .3010643 | .0203393 | 14.80 | 0.000 | .3409286 | .2612 |
| VTD | .9824257 | .0163242 | 60.18 | 0.000 | .9504309 | 1.014421 |
| _cons | 6.320816 | .4520091 | 13.98 | 0.000 | 5.434894 | 7.206737 |

*Source: Stata14 regression results.*

At the alpha level of significance = 1%, the result is: P = 0.0000. So, P < 1% should reject hypothesis H0. Thus, the model overcomes the phenomenon of autocorrelation and variable variance.

### 4.3. Regression model results

**Table 11. Synthesis Results of Regression Models POOL- FEM - REM - FGLS**

| Model | POOLed OLS | FEM | REM | FGLS |
|---|---|---|---|---|
| Values | CDP | CDP | CDP | CDP |
| NAD | 0.326*** | 0.0685 | 0.319*** | 0.301*** |
| | [11.85] | [1.22] | [8.96] | [14.80] |
| VTD | 0.985*** | 0.405*** | 0.967*** | 0.982*** |
| | [55.54] | [6.33] | [39.37] | [60.18] |
| _cons | 6.815*** | 9.889*** | 7.004*** | 6.321*** |
| | [12.19] | [12.96] | [9.86] | [13.98] |
| p<0.1, ** p<0.05, *** p<0.01 | | | | |

*Source: Stata14 regression results.*

From the experimental results of the research model, the author will discuss and make comments on the impact of banking digital technology on the market share of customers' transactions with banks in Southeast countries. Asia: Indonesia, Malaysia, Myanmar, Thailand and Vietnam. Through the above partial test results, we see that the model does not have multicollinearity. However, the model has autocorrelation between errors and variable variance, which will make the estimates obtained by conventional regression on panel data ineffective. and tests are no longer reliable. Therefore, the author uses the feasible general least squares method - FGLS to overcome the phenomenon of autocorrelation between errors to ensure that the obtained estimates are stable and efficient.

Looking at the model results, it shows that with the alpha = 1% significance level, the total number of customer accounts opened at the bank to make transactions in the form of national digital technology (NAD), the total customer value conducting transactions with banks in the form of national digital technology (VTD) will have an impact on the activities of

banks in countries through the impact on the volume of deposits and loans customers make with them. Bank of Southeast Asian Nations (CDPs): Indonesia, Malaysia, Myanmar, Thailand and Vietnam. On the other hand, when the total number of customer accounts opened at banks to conduct transactions in the form of national digital technology (NAD) increases by 1 unit, the activities of banks in other countries through the Sales of deposits and loans made by customers with banks of the country (CDP) increased by +0.301 units. When the total value of customers conducting transactions with the bank in the form of national digital technology (VTD) increases by 1 unit, the bank's business activities will increase the sales of deposits and loans from real customers. current with banks of countries (CDP) add +0.982 units. The study results are completely consistent with previous studies. Digital banking technology helps to increase the market share of customers' transactions with banks of Southeast Asian countries: Indonesia, Malaysia, Myanmar, Thailand and Vietnam.

## 5. CONCLUSION

Looking back at the successful digital transformation of banks in the region, mainly based on such platforms as the changing population structure, better and cheaper technology, the need to maximize capital efficiency, an open and flexible legal corridor. These factors drive banks to transform to serve increasingly diverse and complex customer needs. An effective digital banking model meets 3 core criteria: simplicity, connectivity and efficiency.

Most banks in Southeast Asia currently have a digitization strategy, and are oriented to develop digital banking. However, each bank is having a different orientation towards digital banking, depending on their target audience. There are banks that promote retail and serve small and medium-sized business customers that focus on developing digital banking to bring the most convenience and services to customers. Some banks have implemented digital technology in implementing the digital banking revolution with the policy of fewer branches, fewer transaction offices, and putting in a Chatbot application to replace part of the work of customer care staff.

Besides, to be able to build and maintain a team of personnel with in-depth knowledge of artificial intelligence and huge data networks is

also a challenge. On the other hand, the financial market data in the region is still not enough to be able to apply digital technology data. Customer profile data, history of credit relationships at banks are still limited. This makes it difficult to have a basis to correctly identify good / bad customers according to advanced practices, or with new products and services, the bank will also lack customer information to serve the risk appetite classification. To apply new technology also requires banks to have a full and consistent awareness of governance models, transformation plans, resources and risks when changing business models from traditional to traditional digitization.

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# LIQUIDITY FACTORS AND PROFITABILITY OF VIETNAM'S COMMERCIAL BANKS

**Nguyen Thi Dieu Chi**[1]

***Abstract:*** *The study focuses on two important issues of commercial banks which are liquidity and profitability. The stockholders desire a maximum level of profitability as a return on their investment, while the depositors hope for maximum liquidity as a guarantee of safety and the ability to pay their money on demand. Therefore, this study examined the impact of bank liquidity on the profitability of commercial banks in Vietnam by using Stata 14 software to analyze the data. The study was based on a sample of 19 listed commercial banks in 14 years from 2007 to 2020 with sources of data used from the financial statements. The liquidity indicators are the Loan-Deposit ratio, Deposit-Asset ratio, and Cash-Asset ratio selected as independent variables, while Return on assets (ROA) illustrates profitability as a dependent variable. Data were analyzed using descriptive statistics, correlation analysis, and regression analysis to test the hypotheses. The results show that Return on assets (ROA) is positively affected by the Cash-Asset ratio (CTA) and negatively affected by the Loan-Deposit ratio (LTD), and Deposit-Asset ratio (DTA).*

***Keywords:*** *Liquidity, profitability, return on asset, ROA.*

## 1. INTRODUCTION

Vietnam formed a banking system in 1951 with the first financial institution called National Bank, after thirty-eight years, a commercial banking system that served business purposes was born officially. During the last decades, the financial sector has experienced significant changes in its operational environment as well as a globalization trend. Changes in both internal and external factors have affected financial institutions' structure and profitability. In this research, the author focus on liquidity and profitability, which has tremendous importance in the banking world. Liquidity refers to the management of current assets and current liabilities of a bank. It plays a key factor when defining whether a bank

[1] School of Banking and Finance, National Economics University, Hanoi, Vietnam. Email: chintd@neu.edu.vn

can effectively manage its short-term obligations. Balanced liquidity is essential for effectiveness and profitability, therefore, the bank always has to determine the optimum level of liquidity to ensure the highest profitability. On the other hand, profitability is defined as the revenues earned by a bank. Enhancement of profitability is always the ultimate purpose of any commercial bank and each of them finds a way to optimize it. Since liquidity and profitability are inversely related, it means when liquidity increases, profitability decreases and vice versa. Thus, one of the most important dilemmas of banks is how to find the balance between liquidity and profitability.

In today's developing and competitive world, banks have to encounter many challenges. Consequently, each of them always has to try its best to maximize returns to ensure profitability while maintaining high liquidity to meet its obligations. The objective of this research is to examine banking liquidity management on the profitability of Vietnamese listed commercial banks. Therefore, this research focuses on identifying the most important indicators of liquidity management, investigating the impact of each indicator on liquidity, and the effect of liquidity on profitability as a whole in commercial banks in Vietnam.

The study selected 19 listed Vietnam commercial banks to serve for analysis because all of their statistics are public and transparent on annual reports.

## 2. LITERATURE REVIEW

### 2.1. Bank liquidity

Liquidity means the amount of capital that is available for investment (Ibe 2013). Today, the majority of this capital is usually credit, not cash. Bank liquidity simply means the ability of the bank to maintain sufficient funds to pay for its maturing obligations. The bank can respond immediately to cash, checks, other withdrawal obligations, and legitimate new loan needs while still complying with existing reserve requirements. As Marozva (2015) indicated, even though the subject area of bank liquidity is not a new phenomenon, there has not been a universally accepted definition. Adler (2012) argues that the shortage of universally agreed definitions for

bank liquidity is because of its derivation from a different economic point of view. On the other hand, Koranteng (2015) said that the liquidity of a bank is the ready funds available to banks and their ability to readily fulfill their growing requirements. Because of this, Amengor (2010) concerning commercial banks puts liquidity as the ability of banks to finance their contractual obligations such as lending, investments, and customers' withdrawal of deposits and maturity of liabilities in the course of banks' activities. From the above definitions, it can be noted that the scope of liquidity is based on the time required in converting banks' assets into monetary assets or cash; the certainty relates to the conversion and the value realized from the assets and the banks' ability to meet obligations without losses.

### 2.2. The relationship between liquidity and bank profitability

Commercial banks are profit-seeking organizations. They have to earn profits for their shareholders and at the same time maintain liquidity to satisfy the withdrawal needs of their customers. Bank liquidity management involves a trade-off between the cost of attaining higher liquidity and the cost of inefficient allocation of such liquidity. As Marozva (2015) points out, there have been several studies conducted and still ongoing debates to investigate the relationship between bank liquidity and bank profitability. He indicated that the findings of these studies resulted in varying conclusions. Besides, some other researchers conclude that there is a negative relationship between these variables, and other writers conclude otherwise. There are some findings by some researchers that support the positive relationship between bank liquidity and bank profitability. Bourke (1989) finds some evidence of a positive relationship between assets' liquidity and bank profitability for ninety commercial banks in Europe, North America, and Australia from 1972 to 1981. Research by Bordeleau and Graham (2010) of Canadian and US banks for the period 1997 to 2009, as cited in Tamunosiki (2017) sought to determine the bearing of banks holding assets' liquidity using econometric analysis. Their result concluded that banks holding liquid assets have a positive impact on profitability. On the other hand, other researchers argue that holding liquid assets imposes an opportunity cost on the bank given their low return relative to other assets, thereby impact

negatively on profitability. For example, Molyneux and Thornton (1992) and Goddard et al. (2004) show evidence of a negative relationship between liquidity and profitability for European banks in the late 1980s and mid-1990s, respectively.

According to Eichengreen and Gibson (2001), the fewer the funds tied up in liquid investments, the higher we might expect profitability to be. The recent research conducted by Oluwasegun and Samuel (2015) found a positive relationship between liquidity and bank performance for a panel of 13 commercial banks in the period from 2004 to 2012. Liquidity might impact profitability, but this impact might not be clear whether is it positive or negative as some authors mentioned. The fact that each researcher has found many relationships between the liquidity and profitability of banks in many countries. The literature review shows that the impact of liquidity on profitability is still not clear because some authors obtained linear relationships while other found nonlinear one.

Although there are many types of research on the relationship between liquidity and profitability of banks in the world, there are quite a few articles on this issue in Vietnam. Therefore, the researcher chose this topic to study the relationship between liquidity and profitability of banks in Vietnam to expand the literature on this issue as well as explore the impact of liquidity on bank profitability.

## 3. METHODOLOGY

The data used in this study was collected from annual reports of 19 listed commercial banks on the Vietnam Stock market including their income statements and balance sheets on both banks' official websites and securities companies. All the information from these commercial bank statements has been selected and examined to find the impact of liquidity on profitability in the period 2007 to 2020. These samples have been tested through descriptive statistics, correlation analysis, and regression analysis using Stata software. Profitability has been selected as a dependent variable through return on assets, while liquidity is determined as an independent variable through. The models and variables for this study have been used as follows:

Variables:

Dependent variables:

ROA (Return on Assets) = Net profits after tax/Total assets

Independent variables:

LTD (Loan Deposit ratio) = Loans and advances/Total deposits

DTA (Deposit Assets ratio) = Total deposits/Total assets

CTA (Cash Assets ratio) = Total cash/Total assets

Models:

$$ROA_{it} = + LTD_{2it} + DTA_{3it} + CTA_{4it} + u_{it}$$

Hypothesis:

- There is a negative relationship between the Loan-Deposit ratio (LTD) and Returns on assets.
- There is a positive relationship between the Deposit-Assets ratio (DTA) and Returns on assets.
- There is a negative relationship between the Cash-Assets ratio (CTA) and Returns on assets.

## 4. FINDINGS AND ANALYSIS

### 4.1. Descriptive statistics

Table 1 reports descriptive statistics which are the minimum, maximum, mean, and standard deviation of all independent variables which are the Loan-Deposit ratio (LTD), Deposit-Asset ratio (DTA), Cash-Asset ratio (CTA), and dependent variable Return on Assets (ROA).

**Table 1. Descriptive Statistics of the Variables**

| Variables | Mean | Std.Dev. | Min | Max |
|---|---|---|---|---|
| ROA | 0.0105038 | 0.0080425 | 0.0001007 | 0.0595185 |
| LTD | 0.707501 | 0.304538 | 0.154379 | 3.698367 |
| DTA | 0.7842979 | 0.1921436 | 0.1322398 | 2.95934 |
| CTA | 0.0153376 | 0.0189865 | 0.0006990 | 0.1235943 |

The table shows that the average return on assets (ROA) is 0.0105 (1.05%) with a minimum value of - 0.0001 (0.01%) and a maximum value of 0.05852 (5.95%). Similarly, the descriptive statistics for the independent variable show that the Loan-Deposit ratio (LTD) has a minimum value of 0.0154 (1.54%) and a maximum value of 3.6984 (369.84%) leading to the mean of 0.7075 (70.75%). The average Deposit-Asset ratio (DTA) is noticed to be with a minimum value of 0.1322 (13.22%) and a maximum value of 2.9593 (295.93%). Cash-Asset ratio (CTA) ranges from minimum value of 0.0007 (0.07%) to maximum value of 0.1236 (12.36%) with an average of 0.0153 (1.53%).

### 4.2. Correlation analysis

Table 2 reveals the correlation coefficients of ROA with the independent variables including LTD as Loan-Deposit ratio, DTA as Deposit-Asset ratio, and CTA as Cash-Asset ratio.

**Table 2. Correlation Coefficients for Return on assets (ROA) and Determinants of Liquidity**

| | ROA | LTD | DTA | CTA |
|---|---|---|---|---|
| ROA | 1.0000 | | | |
| LTD | -0.1039 | 1.0000 | | |
| DTA | -0.2433 | -0.4081 | 1.0000 | |
| CTA | 0.1072 | 0.0168 | -0.1349 | 1.0000 |

Table 2 shows that the Cash-Asset ratio is positively related to return on assets which indicates that the higher the Cash-Asset ratio is, the higher the return on assets of the banks will be. However, a correlation between the Loan-Deposit ratio and return on assets shows a negative relationship. Similarly, Deposit- Asset ratio is negatively related to return on assets which indicates that the higher the Cash-Asset ratio is, the lower the return on assets of the banks will be.

### 4.3. Regression analysis

Regression analysis results are the statistical tools for the data analysis. The regression analysis has been conducted to examine whether or not the return on assets is affected by liquidity determinants of Vietnam commercial banks. Table 3 and Table 4 show regression analysis results of variables based on panel data of 19 listed commercial banks from the year 2007 to 2020.

**Table 3. Random- effects GLS Regression Result of the Return on Assets.**

| ROA | Coef. | Std. Err. | P value |
|---|---|---|---|
| LTD | -0.0043729 | 0.0019206 | 0.023 |
| DTA | -0.0129056 | 0.0028689 | 0.000 |
| CTA | 0.0621757 | 0.0325388 | 0.056 |
| _cons | 0.0227659 | 0.0032968 | 0.000 |

**Table 4. Fixed- effects GLS Regression Result of the Return on Assets.**

| ROA | Coef. | Std. Err. | P value |
|---|---|---|---|
| LTD | -0.0032366 | 0.001989 | 0.105 |
| DTA | -0.012183 | 0.0028793 | 0.000 |
| CTA | 0.0912526 | 0.0369113 | 0.014 |
| _cons | 0.0209493 | 0.003279 | 0.000 |

Using the Hausman test to see which model is more appropriate (criterion: the residuals do not correlate with independent variables, use random-effects model, but if correlated, use fixed-effects).

**Table 5. Hausman Test Results for the Difference between FEM and REM**

| | Fixed | Random | Difference | S.E. |
|---|---|---|---|---|
| LTD | -0.0032366 | -0.0043729 | 0.0011363 | 0.0005172 |
| DTA | -0.012183 | -0.0129056 | 0.0007226 | 0.0002452 |
| CTA | 0.0912526 | 0.0621757 | 0.0290769 | 0.017426 |
| Test | Ho: difference in coefficients not systematic | | | |
| | chi2(3) = 6.37 | | | |
| | Prob>chi2 = 0.0951 | | | |

Because of P-value = 0.0951 > 0.05, the findings conclude that there is no statistically significant difference between FEM and REM. Therefore, the author will use the model of random effects (REM) in table 3. The result in table 3 revealed that the beta coefficient ($\beta_2$ = -0,0043729) is negatively significant for the Loan-Deposit ratio (LTD) with return on assets (ROA), which indicates that when the Loan-Deposit ratio (LTD) increases, the return on assets of banks will decrease and when LTD increase 1 unit, ROA will decrease by 0,0043729 unit. Furthermore, the beta coefficient ($\beta_3$ = -0,0129056) for the Deposit-Asset ratio (DTA)

is negative with return on assets (ROA) indicating that increasing the Deposit-Asset ratio (DTA) will decrease the return on assets of banks. Or when DTA increases 1 unit, ROA will decrease by 0,0129056 units. Both variables are significant at the five percent level. However, the beta coefficient ($\beta_4$ = 0,0621757) is positive for the Cash-Asset ratio (CTA) with return on assets (ROA) and significant at the ten percent level. This result also indicates that an increase in the Cash-Asset ratio (CTA) raises the return on assets and 8% of the variation in commercial banks' profitability can be explained by a change in 1 unit of the Cash-Asset ratio (CTA).

Therefore, the model can be written as follows:

$$ROA_{it} = LTD_{2it}\ DTA_{3it}\ CTA_{4it} + u_{it}$$

The results from regression analysis show that ROA is positively affected by CTA and negatively affected by the LTD, and DTA. However, this result is different from the result of Sardar Shaker Ibrahim (2017) who investigated the impact of liquidity on the profitability of the private commercial banks in Iraq because they had used the same variables. The reason is that this study just uses one variable (ROA) as a dependent instead of using ROE, NIM, and NOM indicators. Moreover, the result of Abdullah and Jahan (2014) investigating the impact of liquidity on the profitability of the private commercial banks in Bangladesh accepted the null hypothesis in their study which indicated that there is no significant impact of liquidity on profitability.

## 5. CONCLUSION

The trade-off between liquidity and profitability is one of the necessary issues discussed by many researchers and analysts. It is even more important in the case of the banking sector. As a result, the influence of banks' liquidity cannot be negligible when considering the profitability of Vietnamese commercial banks. In the first stages, this study attempted to investigate the impact of liquidity and profitability of Vietnamese listed commercial banks in 14 years. This study is important from the perspective of both shareholders and depositors of commercial banks. The shareholders would like to maximize their wealth through maximization of profit on their investment, while depositors still care about liquidity more and ensure prompt payment of their deposits on demand.

A valuable result of the research was that liquidity ratios have both positive and negative impacts on profitability in the Vietnamese listed commercial banks. Although, this study had still some limitations. Currently, there are more than 19 banks in Vietnam, some commercial banks are listed on Upcom instead of HOSE and HNX on the Vietnam Stock market. However, this study covered only 19 listed banks because annual reports of other banks are not available as well as their transparency. It should be noted that this study has covered only banking sectors. Depending on the above findings, any increase in the cash and equivalents, loans and advances, and total deposits may increase or decrease the net income for the banks. Therefore, commercial banks in Vietnam should adjust the ratios appropriately to achieve the desired profits as well as their profitability. It might be a good idea for Vietnamese banks to keep a balance between liquidity and profitability to avoid any financial risks in the future. Finally, further studies could be conducted on Vietnam banks to investigate the impact of liquidity on the profitability of large samples.

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# REQUIREMENTS ON HUMAN RESOURCE DURING THE PROCESS OF THE FOURTH INDUSTRIAL REVOLUTION AT THE BANKS AND THE ISSUES ASSOCIATED WITH TRAINING AT VIETCOMBANK

**Nguyen Duc Tuan**[1]

***Abstract:*** *Thanks to new technologies, the Fourth Industrial Revolution has changed the production platform, generated many new business lines, this poses a requirement for how human resources can meet the requirements of the Industry 4.0 process at the bank, new requirements on training to improve the capacity of human resources, this challenge is not only posed for the banking industry in general, but also for each bank in particular. Human resource training has always been a key factor determining the quality of human resources of the bank, how to change to catch up with the consequences of the Fourth Industrial Revolution which is the problem that banks are having to find a solution. Human resource training activities of Joint Stock Commercial Bank for Foreign Trade of Vietnam (Vietcombank) in fact still have shortcomings… The article researches on human resource requirements in the process of the Fourth Industrial Revolution, learn about research works, conduct field surveys on human resource training activities at Vietcombank and its challenges, from which to propose some suggestions on training solutions to improve quality of Vietcombank's human resources in the coming time.*

***Keywords:*** *The Fourth Industrial Revolution, training, human resource at bank.*

## 1. INTRODUCTION

Industry 4.0 is also showing great impacts on human resources in the banking and finance sector. While many jobs will be replaced by machines, many new jobs will also be created. The article assesses the impact of Industry 4.0 on human resources in the financial - banking sector in the world, the requirements set for current human resources in the banking sector, how to train them human resources to meet the job requirements, the article takes specific examples of the Joint Stock Commercial Bank for Foreign Trade of Vietnam (Vietcombank), the strategy and goals of Vietcombank's human resources in the digital transformation period,

[1] Vietcombank, Vietnam. Email: nguyenductuanvcb@gmail.com

implementing Conduct a practical investigation on human resource training activities to identify internal issues, the gap between expectations and reality, thereby making some recommendations for human resource training at Vietcombank.

## 2. INDUSTRIAL REVOLUTION 4.0

According to the Encyclopedia, the Fourth Industrial Revolution is called Industry 4.0. Industry 4.0 focuses on digital technology from recent decades to a whole new level with the help of connectivity through the Internet of Things, real-time data access and the introduction of cyber-physical system.

Industry 4.0 (or the Fourth Industrial Revolution) is the birth of a series of new technology combining all knowledge in the fields of physics, digital technique, biology and influence. to all sectors, economies, economic and industrial sectors.

Central to this revolution are emerging technological breakthroughs in areas such as artificial intelligence (AI), robotics, Internet of Things (IoT), Biological technology, self-driving cars, 3D printing, and nano technology.

In particular, the core elements of Digital Technique will be: Artificial Intelligence (AI), Internet of Things (IoT) and big data (Big Data). (https://itgtechnology.vn/, 2020).

### Characteristics of the industrial revolution 4.0

If the first Industrial Revolution used water and steam power to mechanize production, the second one took place thanks to the application of electricity to mass production, the third one uses electronics and information technology to automate production. Now, the Fourth Industrial Revolution is sprouting from the third, which brings together technologies, blurring the lines between physical, digital and biological. Industry 4.0 facilitates the creation of smart factories, the development of the internet of things helps create virtual copies of the physical world, allowing people everywhere in the world to connect to each other through the internet service via mobile devices anytime, anywhere.

Industry 4.0 drives the digital transformation of manufacturing through the integration of previously disparate systems and processes through interconnected computer systems across supply and value chains. Industry 4.0 is heralding a shift in the traditional manufacturing landscape that includes three technology trends driving this transformation: connectivity, intelligence, and flexible automation leading to eradication of all boundaries.

## 3. REVIEW METHODOLOGY

### 3.1. The impact of industrial revolution 4.0 on training

Training has undergone rapid and profound changes under the impact of the Fourth Industrial Revolution. One of the most important functions of training is to prepare workers with the necessary knowledge and skills to integrate and work in the workplace.

In the study of Georg Spoettl and Vidmantas Tūtlys (2020) "Education and training in Industry 4.0" pointed out that Industry 4.0 is an overall change in the model, organization and working process, along with the process. Continuous automation and real-time production control, depending on the level of implementation of Industry 4.0 in enterprises, education and vocational training for the workforce will be closely related. The vocational training system must meet the requirements of new technology, must focus on curriculum development, teacher training and training of skilled workers.

It is necessary to renew training and research programs in training institutions in the direction of developing high-quality human resources, in order to adapt to Industry 4.0. The curriculum needs to be standardized, the training program needs to keep up with the changing trends of society, in order to update the knowledge and skills required for human resources in the era of Industry 4.0, thereby improving the curriculum. training program and content to suit actual requirements. Georg Spoettl1 and Vidmantas Tūtlys (2020), Lars Windelband (2020), Duong Trung Kien (2021), Nguyen Hong Minh (2016).

In the study of Lars Windelband (2020), "Industry 4.0 affects professional skills", shows that although there is much agreement that Industry 4.0 will

have a significant impact on education and training, however, to what extent, to which is still being discussed at educational and training seminars. The study of the impact of Industry 4.0 on vocational education and training requirements initially received special attention because of the importance of the education sector in the strategy of industrial development and employment. (Lee and Pfeiffer, 2019), there will be two main changes in work (i) Changes in the content of work processes, work organization and other factors when applying technology, (ii) Changes in the microstructure of the work Jobs and work processes lead to the disappearance of some professions and the emergence of new ones.

The first type of change is to raise the demand for new competencies and promote the adjustment and updating of new qualifications while the second type of change often leads to the emergence or disappearance of qualifications. Both types of change promote different changes in the structure of qualifications (Tūtlys and Spöttl, 2020).

This direction of development shows that there will be no comprehensive digitization that cuts through everything and replaces people. Therefore, there is an urgent need to clarify how skilled workers must be and what roles work processes in enterprises may play in the future.

That is why the focus of Industry 4.0 discussion should revolve around capacity development, the possibility of obtaining a degree, as well as changing competency requirements of professionals. Although technology development is an important factor in the context of Industry 4.0, people are still the mainstay for successful implementation. (Hirsch-Kreinsen and Itterman, 2019; Bayme, 2016).

The fourth industrial revolution (Industrial Revolution 4.0) has begun since the 2000s, characterized by the unification, without boundaries between the fields of technology, physics, digital and biology. This is the trend of combining virtual and physical systems, Internet of Things (IoT) and Internet-connected systems (IoS).

The speed of development of breakthroughs in this fourth industrial revolution is unexcelled in history. If the previous industrial revolutions took place at an exponential rate, then the development rate of this fourth industrial revolution is exponential.

The scientific progress of the Fourth Industrial Revolution is being strongly applied to the actual activities of enterprises in general and in commercial banks in particular, requiring human resource training in enterprises to ensure sufficient knowledge, skills and professional qualities to be able to complete the tasks in the new context.

### 3.2. The impact of Industry 4.0 on human resources in the banking industry

Finance - banking is currently one of the fields that are highly evaluated in terms of information technology application and affected by the wave of the Fourth Industrial Revolution. Vietnam's banking industry has undergone many changes in organizational structure, operating methods, risk management, and product and service provision to adapt to the digital era. Moreover; thanks to new technologies, the Fourth Industrial Revolution has changed the production platform, generated many new business lines, this poses new requirements on training to improve the capacity of human resources, this challenge is not only posed for the banking industry in general, but also for each bank in particular.

Kusumawati's study (2020) "The changed roles of human resources at the banks in the digital era" aims to find out the position between human resources and digital technology in the banking industry under the current context of technology development. Research results show that the role of digital technology prevails over the role of people in the banking world, the most dominant factor is the increasing number of banking transactions via e-banking, especially e-commerce transactions.

Research by Archita Nur Fitrian (2019) "Talent Management Best Practices and Skills in the Fourth Industrial Revolution: - The case of the banking industry" shows that the needs of employees in the banking industry are undergoing transformation. Employees with technology skills, critical thinking and creative labor are the most favorite ones in the bank today.

In the study by Esha Mehta (2016), "Human resource activities in banks" shows that the competition in the banking industry is very fierce nowadays. Only capable, fast-adapting banks can survive before these rapid changes. The rapid movement and complexity of new techniques & skills have forced the banks to consider and adjust themselves to be

suitable with the changes, demands on capacity improvements including skills, knowledge and communication methods among banking employees to adapt to the changing circumstances.

The study by Fabrizio Campelli (2020) "To transform the banks, we need to change the methods of working" shows that in order for the banks to change the methods of working, a new organizational model shall be required, which needs to use, analyze smart data to improve decision-making and increase employee's skills in the future. In addition to the attachments and commitments of employees to the employers, two factors that determine the success of the banks are good employees and technologies. (i) The bank needs qualified staffs and global leaders, enabling the bank to implement appropriate development measures, the success of the bank is accompanied by the quality of human resources, (ii) Technology has existed for a while, the banks need to identify and take advantage of opportunities given by technology to liberate people, separate from administrative works, create a working environment focusing on growth and accelerating progress, spending more time so that the bankers can meet and advise customers.

In Vietnam, the Research by Do Le (2018) "Banking human resources before the Fourth Industrial Revolution", Minh Khoi (2018), "the bank is "thirsty" for human resources in the 4.0 era", comment that the banks have been struggling with the human resource problem for many years: the shortcomings have not solved, especially in the context that Vietnam is standing on the threshold of the Fourth Industrial Revolution.

According to research by Pham Thi Lam Anh (2021) "Impact of the Fourth Industrial Revolution on human resources in the banking and finance industry", Research by Vo Thi Phuong (2019) "Prospects of human resources in the banking industry in the context of the Fourth Industrial Revolution" shows that the Fourth Industrial Revolution has had a strong impact on the banking and finance industry; the quality of human resources is not only the professional qualification of banking, but also the skills to operate digital technology, compliance with the process of operating and providing banking products and services in IT environment.

One of the major weaknesses of the Finance - Banking industry today is the serious shortage of high-quality resources in many specialized areas

such as development strategy, risk management, international investment, international payment, economics and especially finance and banking experts with international qualifications. (Le Thanh Tam, 2018). Competent personnel in modern digital technology in Vietnamese banks are still weak and thin, and there is a shortage of personnel capable of grasping and deploying modern digital technologies in the world, especially when banks promoting the development of digital banking, application of big data, application of artificial intelligence to customer service in digital banking, application of cloud computing technology and research and application of process automation by robot. According to a survey by IDG (2017), in Vietnam human resources ready for digital technology are not high, university training programs change very slowly compared to the trend.

Moreover, trained human resources lack skills: communication skills, presentation skills, teamwork skills, listening skills, behavioral skills, critical thinking skills, problem solving skills Problem solving, creative skills... of human resources in the banking industry are still weak, especially fresh graduates (Vu Van Thuc, 2015).

Regarding the ethical qualities of staff, currently in each bank, the professional processes are often very clear, but the code of professional ethics is very abstract. The boundary to distinguish what is professional ethics and what is professional manipulation in many cases is very fragile and difficult to define. That's why it happened, there are banks that have been operating for decades in the market, but rarely have cases of violations of professional ethics, but there are also banks that are just famous that have appeared cases of violations of professional ethics. the arising of consequences on professional ethics (Bui Trang, 2021).

Therefore, there is a need for a profound change in the quality of human resources of the bank today, the need to raise awareness of information security and safety, and the professional ethics of bank staff should be enhanced.

Being deeply aware of impact of the Fourth Industrial Revolution, the Party and State have proactively promulgated many strategic guidelines and policies for the development of science and technology to create a premise to improve adaptability and bring achievements of Industry Revolution 4.0 (Industry 4.0) into play in Vietnam. In Resolution No.

23-NQ/TW dated March 22, 2018 on orientation for building national industrial development policy to 2030, vision to 2045, the Party clearly expressed its views and set development orientations. science and technology policy development. In order to catch and take full advantage of opportunities caused by Industry 4.0 for breakthrough and development, the Politburo issued Resolution No. 52-NQ/TW dated September 27, 2019 defining the country's development goals and orientations. The period 2021-2030 is to develop the digital economy on the basis of science and technology, innovate, and accelerate the national digital transformation. To deploy, implementing the Party's guidelines and policies on science and technology development and actively participating in the Fourth Industrial Revolution, the Government also issued Decision 749/QD-TTg of the Prime Minister approving the Program "National digital transformation to 2025, orientation to 2030" and specific documents and regulations such as the Project "Supporting entrepreneurial ecosystem for innovation until 2025"; Directive on "Strengthening accessing capacity to the industrial revolution 4.0".

For banking industry, on August 8, 2018 the Prime Minister issued Decision No. 986/QD-TTg approving the "Strategy to develop the banking industry in Vietnam to 2025, orientation to 2030", in which the Prime Minister directed the objectives of the banking sector to be achieved, especially the development of a system of credit institutions in the direction of being based on advanced and appropriate technology and banking governance with international operating standards.

Issuing an action plan of the banking industry on strengthening accessing capacity to Industry 4.0 in order to implement the Strategy for Development of the Banking Industry in Vietnam to 2025, orientation to 2030.

The plan for digital transformation of the banking industry is built, approached in the direction of people-and-customer-orientation. Although the overall objective of the Plan is divided into groups of the State Bank and credit institutions (Commercial Banks), it is aimed at better serving people and customers.

For commercial banks, the goal is to be able to "develop digital banking models, increase utilities, customer experience and realize the goal of

financial inclusion and sustainable development on the basis of promoting the application of digital banking services." application of new and advanced technologies in management, administration and supply of products and services in the direction of automating processes and optimizing business operations. With this goal, digital transformation activities at commercial banks are associated with the task of increasing utility, customer experience and providing products in the direction of process automation, business optimization, without going into deep specific technical issues such as upgrading the IT system... in order to create initiative and flexibility for commercial banks in the implementation process.

In order to meet the above objectives, human resource training and development activities need to change in quality to build a high-quality human resource team for the Vietnamese banking industry, which is the fundamental determining factor. Competitive advantage for Vietnam's commercial banking system is becoming more and more urgent.

***From the above contents, we can find that:***

The quality of human resources, in current context, is considered as the core issue to determine the success and sustainable development under the changes of the Fourth Industrial Revolution and the integration process of the banking industry. Requirements on human resources quality include:

(i) Knowledge including banking professional qualifications, information technology qualifications, professional qualifications combined with developing new business services such as e-commerce, Esha Mehta (2016), Do Le (2018) Minh Khoi (2018); Fabrizio Campelli (2020);

(ii) Skills including creative thinking skills, critical thinking skills, problem solving skills, digital technology operation skills, compliance with banking product and service supply processes in IT environment, Archita Nur Fitrian (2019), Kusumawati (2020); Pham Thi Lam Anh (2021);

(iii) Qualities including ethical standards in business, awareness of information security of employees in the implementation process in order to secure absolutely the bank's reputation and safety. Brett King (2018), Vo Thi Phuong (2019).

The former Vietnam Bank for Foreign Trade, now the Joint Stock Commercial Bank for Foreign Trade of Vietnam (Vietcombank), was established and officially went into operation on April 1, 1963 with its predecessor the Foreign Exchange Department (under the Bank). Vietnamese State-owned goods).

After more than half a century of operation in the market, Vietcombank (VCB) is now one of the largest commercial banks in Vietnam. VCB currently has more than 600 branches/transaction offices/ representative offices/members at home and abroad including: Head office in Hanoi; 121 branches; 484 transaction offices; 04 subsidiaries in the country (Financial leasing company, securities company, remittance company, VCB Building Company 198); 03 overseas subsidiaries (Hong Kong Vinafico Company, VCB Money Transfer Company in the US, Subsidiary Bank in Laos); 01 Representative office in Ho Chi Minh City; 01 Representative Office in Singapore, 01 Representative Office in the US; 03 non-business units: school of human resource training and development; 01 cash processing center in Hanoi and 01 cash processing center in Ho Chi Minh City. Ho Chi Minh; 03 joint venture and associate companies. Regarding human resources, Vietcombank currently has nearly 22,000 employees (Report VCB 2021).

At VCB, facing the challenge of the Fourth Industrial Revolution's requirements, VCB has a strategic goal of developing human resources of VCB to 2025, vision to 2030 as the leading bank in terms of human resource quality and working environment in Vietnam: (i) Being a learning and creative organization with dynamic emulation movements on learning, innovation, scientific researches, and technology applications; (ii) Having the highest labor productivity in the banking industry; (iii) Maintaining the position of the bank with the best working environment in Vietnam, the top 3 enterprises with the best working environment in Vietnam; (iv) Maintaining the most attractive employer brand in the banking industry; (v) Building and developing top-quality human resources in the banking industry with a reasonable number and structure, strongly adapting to the digital transformation route at VCB; (vi) Building a future team of leading and managerial cadres of high quality, with solid political courage,

with pure ethical qualities, having practical capacity, innovative thinking, strategic vision, business acumen, striving to meet the demand to increase the number of leaders and middle managers from 10 to 15%.

In order to achieve the strategic goals of human resource development of VCB to 2025, with a vision to 2030, it requires synchronous implementation of tasks and solutions through talent recruitment and attraction; strengthening the organizational model; perfecting mechanisms and policies on organization and personnel, including salary, bonus, welfare and remuneration regimes for employees; strongly renovating training and scientific researches; developing a team of good leaders with vision and cohesion; developing corporate culture towards human resource management according to international practices and standards.

In particular, in terms of training activities, VCB is required to train a team of employees with sufficient knowledge and skills to undertake tasks in the modern business environment and international integration. Therefore, VCB's goals in recent years have always focused on improving the quality of staffs in the direction of standardization:

- The leadership team at all levels are capable and skilled in modern banking administration and mastering the most advanced technology;

- Skilled and capable staffs shall perform specialized operations according to each product group, with a professional and classy service style;

- Having a team of leading experts with professional ethics is the core in applying advanced and modern banking technology to meet the increasing demands of the financial - banking market in the fiercely competitive situation of domestic and international markets.

As a result, the establishment of mechanisms and policies in the field of training to encourage as well as compel cadres to be responsible for studying and training to improve their capacity and qualifications to meet the requirements and tasks shall be done urgently and decisively. Training and development of human resources must be strongly and firmly directed by the Board of Directors with "strong" solutions of a "revolutionary" nature, comprehensively and thoroughly, so that training can achieve certain results such as:

- Forming a team of staffs ready to operate a modern financial institution and international integration with a professional and high-class service style;

- Changing the service mindset and strongly implementing the transformation of traditional thinking into a modern, flexible and supportive banking model and maximumly supporting business operations (trade and diversification);

- Training employees to grasp and promptly apply technology according to banking modernization projects.

VCB's training results for the period 2015-2021 have seen a remarkable growth in size and quality, and many training courses on management were organized for leaders and managers of branches, fostering professional techniques, knowledge of products and services, business ethics for thousands of employees. Specifically:

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| Total of classes | 142 | 207 | 248 | 302 | 388 | 258 | 182 |
| Total of students | 12754 | 21601 | 26571 | 33139 | 46041 | 67898 | 69791 |
| Training/staff ratio | 0.91 | 1.53 | 1.78 | 2.13 | 2.44 | 3.55 | 3.41 |

*Report on training activities of VCB,2021.*

Results of the Training Quality Survey of VCB Training School after 3 years of establishment (2019-2021) with two participants in the assessment: managers (as employers and trainees) all Vietcombank staff) has shown that students have a positive attitude change and are able to apply the knowledge and skills learned to work after the courses of the VCB Training School and the staff's work efficiency was improved. Details as follows:

**Report 01**

**STUDENT SURVEY RESULTS**

Survey object: Students

At the head office: Headquarters Department

Branches: All branches

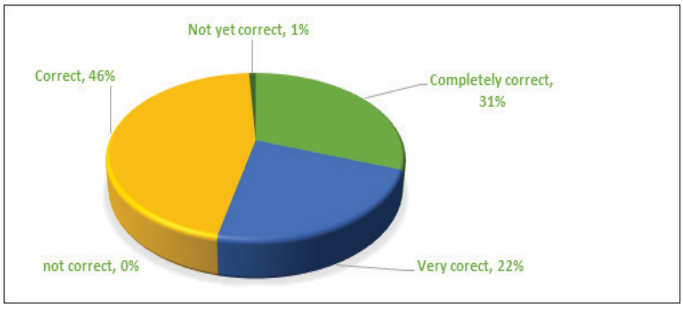
Number of votes issued: 17,924

Number of votes collected: 3,130

**I. Training objectives**

1. Are the objectives of the training courses of the Organizational Training School associated with the development goals of the unit?

99% of the survey respondents answered correctly or more.

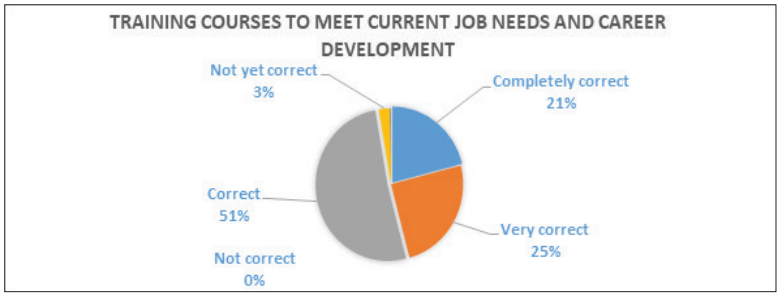



2. Are the objectives of the training courses of the Organizational Training School associated with the individual's development goals?

97% of the survey answers are related to development goals.


3. Do the training courses offered by the Organizational Training School meet the needs of your current job and future career development?

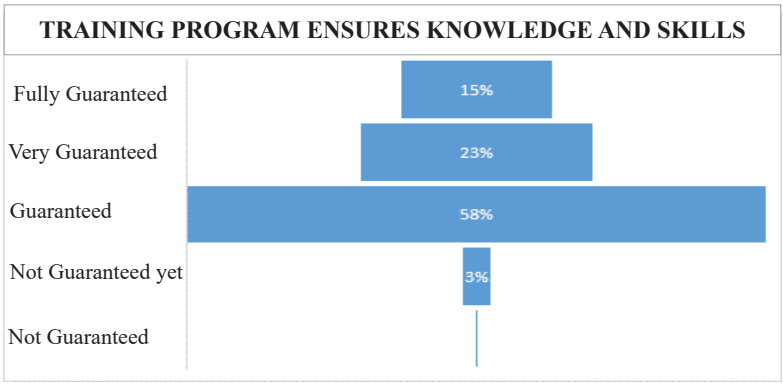
97% of the survey respondents answered that they met the need.




## II. Education program

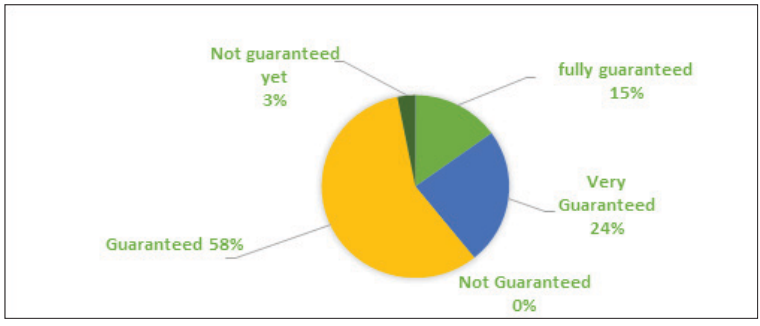
1. Do the training programs of the Training School ensure enough knowledge, skills and attitudes to your job requirements?

97% of the survey respondents answered with sufficient knowledge.



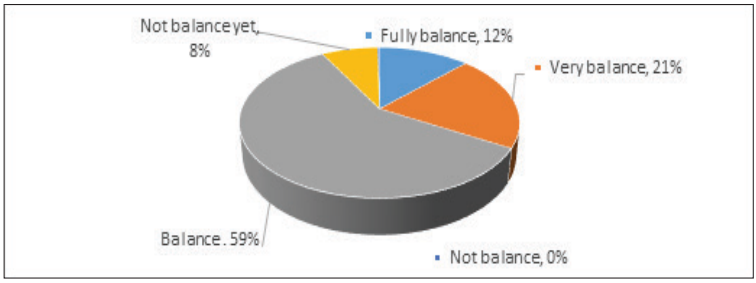

2. Are the training contents of the Organizational Training School guaranteed to be up-to-date and trending to meet job requirements?

97% of the answers to the survey are guaranteed to be up-to-date.



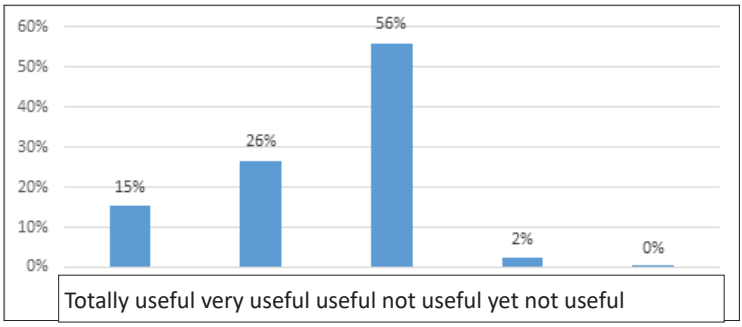
3. Does the training content of the Organizational Training School have a balance between theory and practice?

92% of the survey respondents answered yes



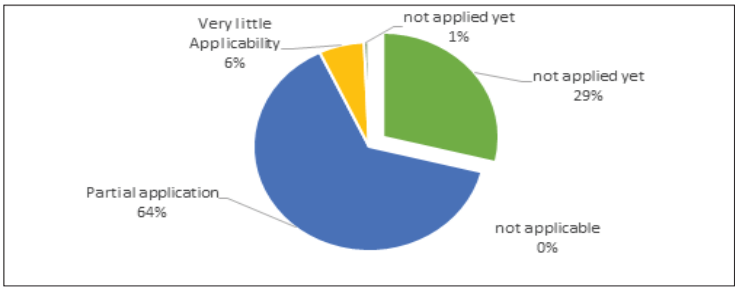

4. Are the training contents organized by the Training School useful and effective?

98% of survey responses are useful.



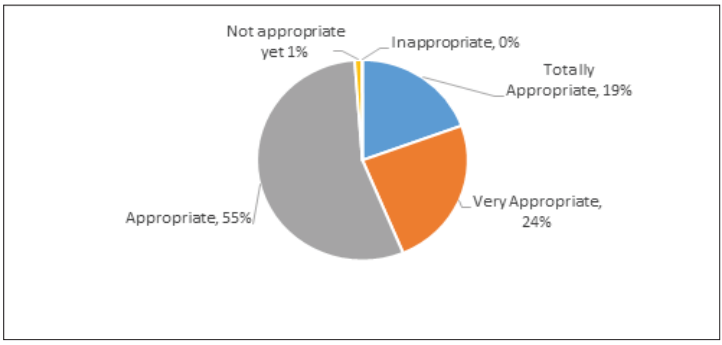

5. The level of knowledge and skills you have acquired are applied to your work?

99% of survey answers are applicable.




6. Do the training contents of the Institutional Training School have the form, content and structure of learning materials consistent with VCB's regulations?

99% of the survey votes answered yes.




7. In your opinion, what training content in the period of 2019-2022 should be enhanced in the coming time?

- In-depth professional training, Improving labor productivity, Digital banking and the application of fintech to banks, Strengthening training in retail operations, focusing on practice more than theory, Should increase Strengthening training on banking skills for employees, social networking skills of staff, avoiding affecting the VCB brand.

8. In your opinion, what training content in the period of 2019-2022 should be reduced in the near future?

- Simple professional instructions, simple tasks should be sent to officers to read and do; Not suitable for the right profession but still have to go to school; Appropriate training time avoid Monday, Friday, pay period or end of month, end of quarter, Content not related to profession; Reduce unnecessary training items, be concise, concise and easy to understand.

9. What new training content do you need to add to meet current job requirements and in the upcoming digital transformation period?

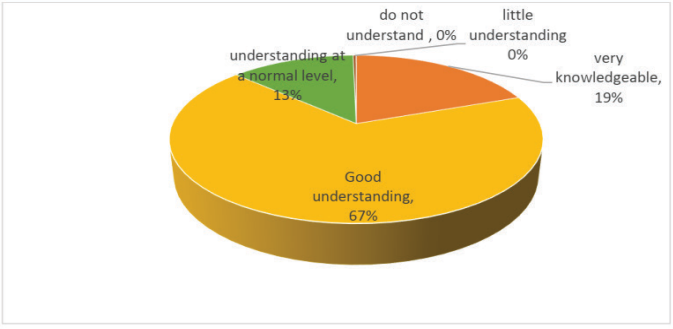
| |
|---|
| - Knowledge of new technologies, big data |
| - Human resource management (work quality) by remote intelligent monitoring system (mobile, laptop...) |
| - Training staff to do collective work in the enterprise |
| - Digital transformation at work… |
| - Selling skills at the counter, selling over the phone, exploiting potential customers, finding customers |

| |
|---|
| - Additional training programs for professional practice certificates and specialized professional certificates |
| - Training on using new versions of digibank/newly developed technology of VCB |
| - How to use online teaching tools Communication skills, customer service |
| - Closer to the reality and development trend of Vietcombank |
| - Organize seminars, talk to exchange experiences of experts with practical experience in banking or related fields Organize training courses on Sales through various forms |
| - Basic skills in using technology equipment for digital transformation |

## III. Lecturer Section

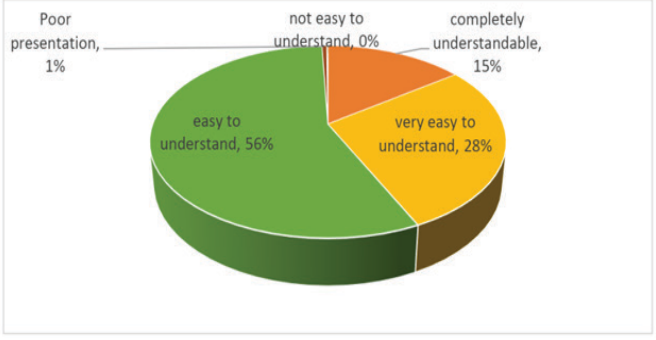
1. Are the trainers knowledgeable about the training topic?

100% of survey respondents answered with understanding.



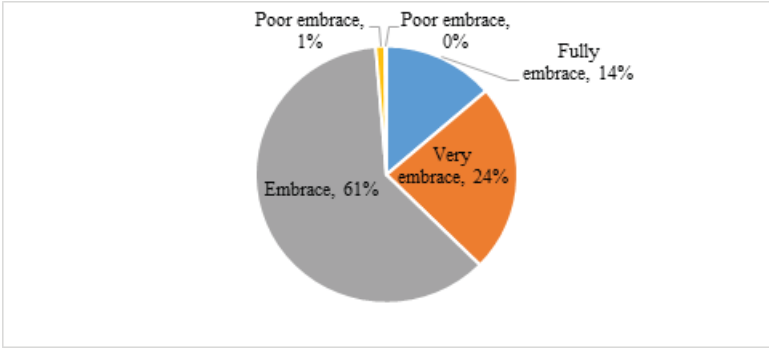

2. Is the presentation clear, easy to understand, suitable for learners?

99% of the survey answers are easy to understand.



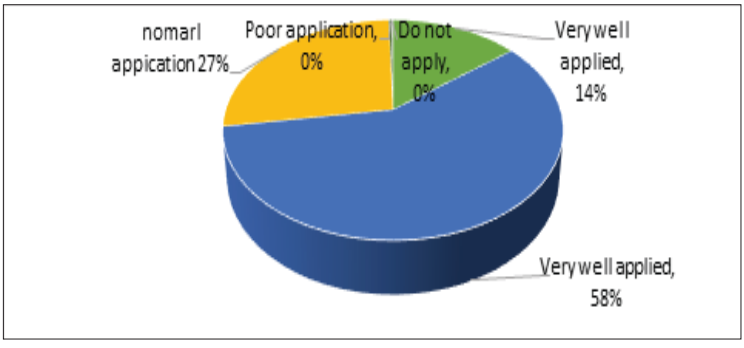
3. The ability to cover the classroom and moderate the instructional process?

99% of survey respondents answered yes.




4. The ability to apply technology in teaching?

100% of questionnaires answered with technology application

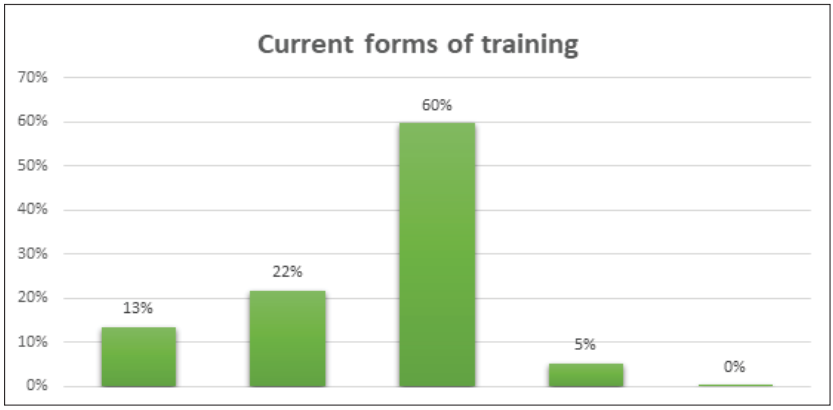



5. Other opinions: Lecturers have not applied many technological factors, most of them are one-way and have little interaction with students

**IV. Form and duration of training:**

1. Are the current forms of training reasonable for learners?

95% of the questionnaires answered reasonably.

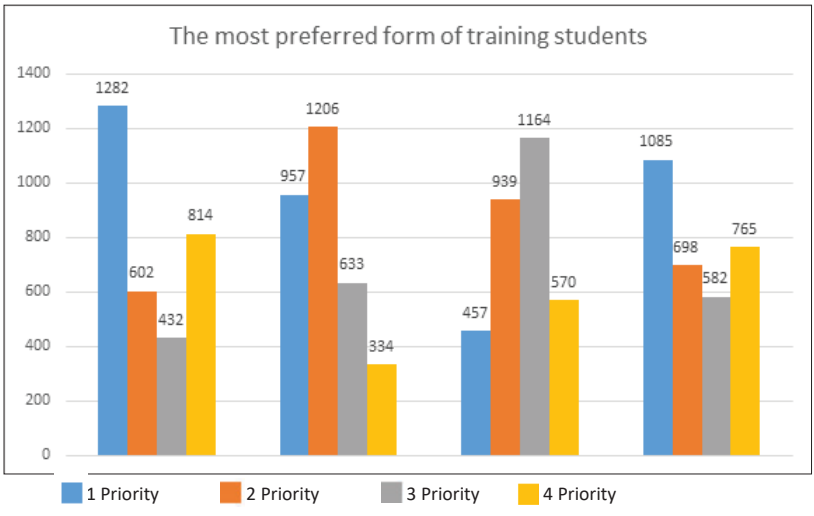



Totally reasonable Very reasonable Reasonable Not reasonable yet Not reasonable

2. What type of training do you like the most? (numbered 1-4 in order of preference)

Surveys answer in order

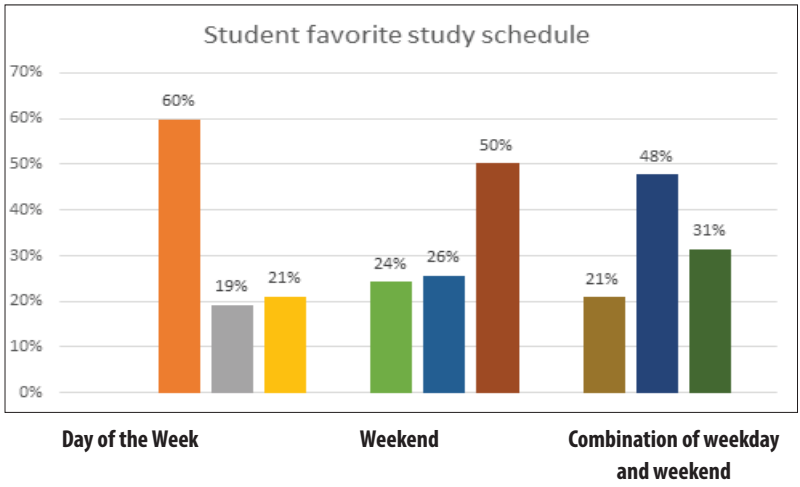
1. Priority focus; 2. Elearning; 3. Online; 4. Videoconference training




3. Your favorite study schedule? (numbered 1-3 in order of priority)

Surveys answer in order

1. In the week; 2 Combination of week and weekend; 3. Weekend



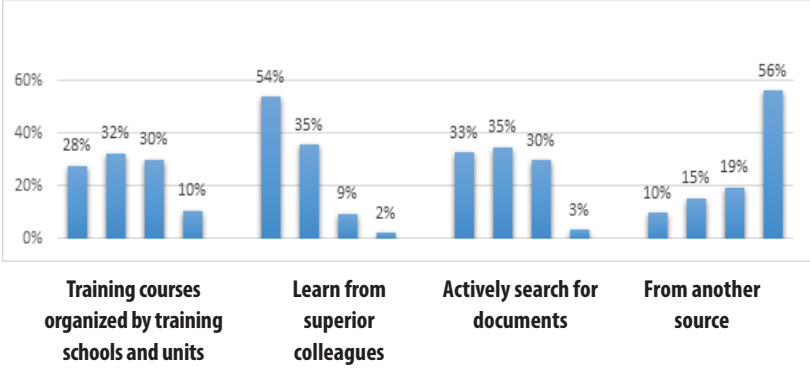

V. Survey of individual's learning ability:

1. Knowledge and working skills of students are accumulated from training sources

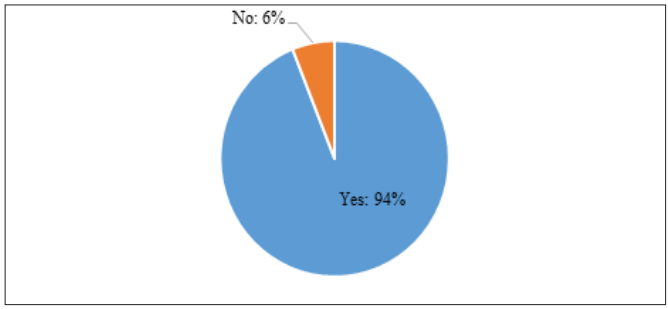
(numbered 1-4 in order of preference)

Surveys answered in order of priority.

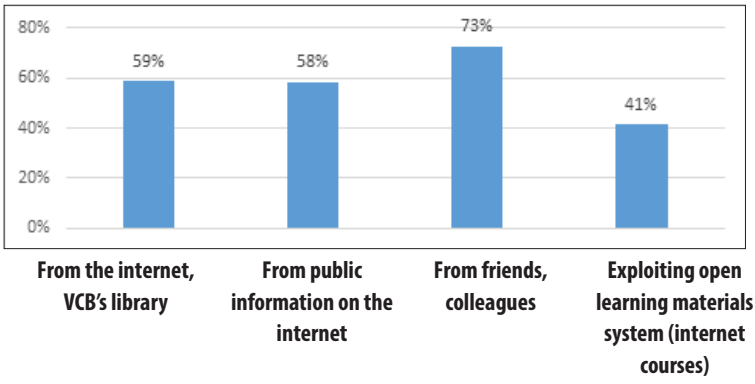
1. Learn from superior colleagues; 2. Actively search for self-study materials; 3. Training courses organized by Training School and units; 4. From another source.




94% of staff have their own learning and development plan and 6% of staff have not.




2. How often do you actively search for learning and self-development materials from the following sources?




69% of the students agreed that it was easy to find learning resources within VCB and the remaining 31% disagreed with the above opinion.

With the view that each individual's active learning plays a decisive role in that individual's success, 98% of the staff agreed with the opinion and only 2% of the staff disagreed.

## Report 02

## LABOR MANAGER SURVEY RESULTS

Survey object: Labor managers

At the head office: Board of Directors, Head of Department / Head Office Center

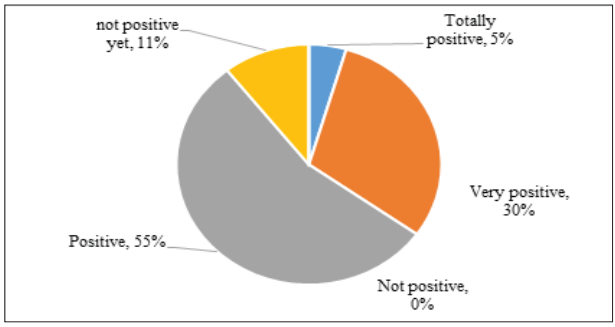
Branches: Branch Managers

Number of votes issued: 194

Number of votes collected: 66

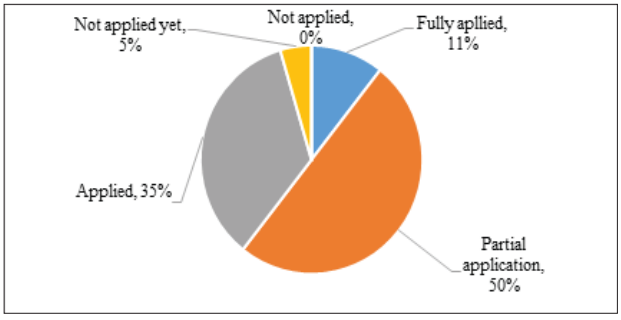
1. After the course, do you see the staff's attitude/behavior changed in a positive direction?

89% of the questionnaires answered positively.



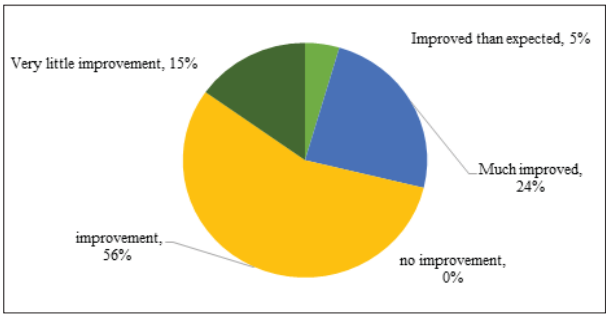

2. The degree of application of knowledge/skills learned by officials to work and handling situations

95% of the survey responses are applicable.



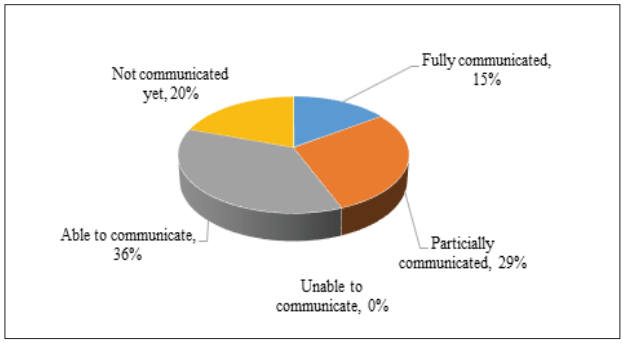

3. Is the staff's work efficiency improved after the course?

100% of the survey answers have improved.



4. Does the officer pass on the knowledge/skills learned to other staff in the unit?

100% of survey responses are communicated.




5. In your opinion, what training content in the period of 2019-2022 should be enhanced in the coming time?

- Professional working skills: project management, professional ethics,

- Culture of working in a financial services environment. Sales skills in the digital age, work management skills, teamwork skills, decision making and problem solving skills, presentation skills, negotiation skills, Multi-thinking skills dimensional and flexible.

- Practical models are being applied at VCB and credit institutions.

- Sales skills, closing sales, customer care, comprehensive training for new employees.

- Professional training according to the characteristics of each department/department/center.

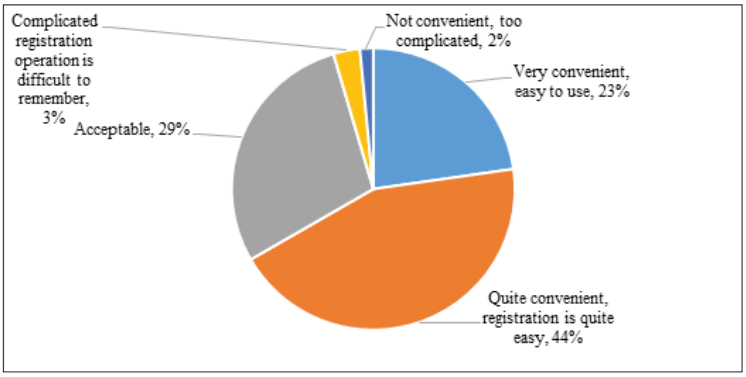
6. In your opinion, what training content in the period of 2019-2022 should be reduced in the near future?

Traditional and outdated training courses should be reduced; Need to reduce courses that are not really close to the actual work; Reduce theory, increase exercises and practice in a real environment; Don't train in one place at a time. Acceptable training content; Basic operations move to elearning; The content is too general, not specific to each block; This

content depends on the needs of each different department; The training content is not in accordance with the user's needs and is not suitable for the actual work performed; Skills that are not directly related to the professional work; New technology because training via videoconference and MS team is not effective, demo is slow due to transmission line, so it takes time; Introducing new products.

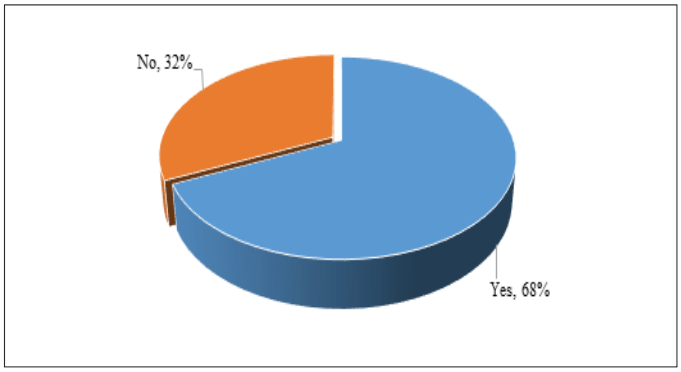
7. How do you feel about how to register training for staff on the system instead of the traditional way of registering before?

95% of survey respondents answered conveniently.




8. Have you ever looked up information about the history of students' training results on the Training Management system (Success Factor)?

68% of the survey respondents answered that they looked up information on Success factors.



**9. What is your reason for not using the SF system?**

- Information on training results will be notified to the branch. After the director's review, it will be transferred to the finance and administration department, and notify the management department.

- I have seen the results emailed by the TDT.

- Didn't know about this system.

- There has not been any specific communication about this content.

10. What new training content does your organization need to add to meet current job requirements and in the upcoming digital transformation period?

- We will search for suitable and quality courses on our own to participate in training or contact the University when necessary.

- Knowledge of new technologies such as big data, automatic connectivity, intelligence.

- Manage and analyze financial statements; post-lending check bad debt handling; corporate culture and VCB culture; Digital conversion

- Training in investment banking, ECA capital structure, international capital arrangement.

- Training to raise awareness of service culture, taking customers as the center for leaders, officers and employees of branches throughout the system.

- Need more leaders to create more HRM courses for Leaders and Employees.

- Products and services related to technology applications, online products and services.

- The branch needs training courses, imparting experience in the field of selling FWD insurance. Especially the training course, imparting to the sales staff the skills and secrets of persuading customers to close the life insurance deal.

- Customer service center is an operational department, so it mainly needs to be trained and retrained in new/changed business processes.

- Communicating to employees that the work they are doing is likely to be reduced and no longer available in the near future, what work will be replaced so that the CB can determine the mindset and feel secure about the work.

- Training on new applications and projects of VCB.

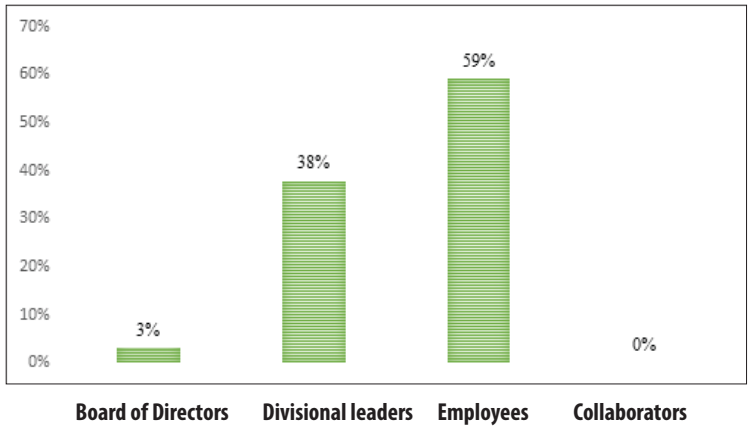
- Applying 4.0 technology in professional work.

11. What kind of personnel do you want to increase training for?

Board of Directors Department-level leaders Employees and collaborators

Survey results in order of priority.

1. Employees; 2. Divisional leaders; 3. Board of Directors




12. Have you received information from students at the unit actively sharing their satisfaction points about the training courses organized by the Training School?

36% of the survey respondents answered that they received information from students.

- The Training School thoughtfully organizes every stage in the learning process.

- Friendly, caring, new knowledge can always be applied to daily work.

- Good lecture, well organized.

- Employees are satisfied with the training course to add supporting knowledge at work.

- Appropriate teaching content.

- You complimented the school's brothers and sisters for being very attentive to the class. Some of the keys are quite interesting.

- Students share from the selection of content, how to design the lesson and how to organize the class, which are all carefully prepared.

- Training time has become more flexible.

- Training content still focuses on traditional content, which needs to be updated according to new fields more.

- Lectures are easy to understand, easy to remember and practical.

13. Did you receive information from students at the unit who actively shared their negative feelings about the training courses organized by the Training School?

9% of the survey respondents answered that they received information from students.

- Working style and skills follow the old, ineffective and professional way.

- The time to organize many courses is not really appropriate.

- The time to study without concentration is a bit long.

- Learning through MSTeam is not really effective.

- Sometimes the training schedule is a bit thick, affecting the work of the staff.

- Due to studying Bridge TV, MS team, I can't hear well and there are teachers who speak fast and mix English and acronyms too much, so they can't keep up.

## 4. RESEARCH GAPS

From the literature review results and Results of the Training Quality Survey of VCB Training School we find that in order to achieve VCB's goals, there are also many difficulties imposed on VCB's training and human resource development in the current period of strong digital transformation to keep up with the trend of domestic market as well as international markets. One of these challenges is:

**Internal problems**

Human resources are "both redundant and insufficient", in which, there is a shortage of high-quality human resources in many specialized fields associated with banking and technology. Specifically, the operations that determine the operational efficiency and safety of a banking organization such as modern banking administration, financial analysis, internal control and audit, project analysis and appraisal investment, risk management; especially new IT applications and financial-banking products.

The mindset of 'getting out of the comfort zone' is a necessary factor when banks enter the development phase of digital transformation, which has many changes and requires change. However, not all staff in the bank have enough mentality and capacity to welcome the above investment. The mentality of being afraid to change, afraid to study and absorb new things still exists quite a lot inside VCB, many officials are still used to the old way of doing things, still adapting to customize, instead of adapting methodically and preparing. theoretically, cognitively and systematically, this leads to change but not comprehensive and sustainable.

The recruitment process and remuneration regime are not flexible, attracting talents in the field of digital transformation. Talents in the field of digital transformation are the key cadres that determine the success of the bank today, however, the current remuneration and benefits for them are still low and not commensurate with the current standards of the bank, their dedication to the bank, leading to a strong impact on the dynamic, creative and enthusiastic working spirit of the employees, and the effectiveness of the work of the staff.

**Market challenges**

Competition for human resources is fierce from commercial banks, Fintech companies, the competition for candidates in this industry is very fierce. Especially for positions in Information Technology (IT), one of the important platforms in digital transformation, there is always a shortage of candidates. Not only banks need to recruit IT positions, but also companies from other fields such as finance, e-commerce, healthcare and education... all want to recruit candidates in this field. In 2019, the number of IT human resources required is 350,000 people, but about 90,000

people are missing. In 2020, the number of human resources required in the IT industry is estimated at 400,000 people and an estimated shortage of 100,000 employees, and in 2021, it needs 500,000 people and a shortage of 190,000 people. (Business and Marketing, 2021).

**Technological Human Resources of Some Commercial Banks in 2021**

| Organization | Total personnel (approx.) | Technology research and deployment personnel (approx.) | Rate |
|---|---|---|---|
| TPBank | 7,000 | 600 | 8.57% |
| MB | 16,000 | 1,200 | 7.50% |
| VIB | 10,000 | 350 | 3.50% |
| Vietinbank | 22,000 | 300 | 1.36% |
| BIDV | 25,000 | 200 | 0.80% |
| Vietcombank | 20,000 | 150 | 0.75% |

*Souree: VCB Report, 2021.*

Recruitment demand is greater than the current supply. The complex traditional core banking system is the biggest barrier to the success of digital banking. Without changes in depth, banks could fall behind in the race to deliver digital experiences to customers. Due to the need to deploy advanced technology products and solutions for digital transformation while domestic candidates have not yet met the requirements, large banks are willing to pay considerable sums to "hunt" applicants from abroad.

Human resources for digital transformation are still "lack and weak": university training programs have not met the requirements, especially highly qualified human resources for specialized fields. According to statistics of the Department of Organization and Personnel of the State Bank (2020) at the training seminar among training units in the bank as of June 1, 2020, the entire banking industry was estimated to have 346,614 people, with qualification structure includes: 569 people with doctorate degrees (accounting for 0.16%), 20,286 people with master's degrees (accounting for 5.85%), 263,927 people with university degrees (accounting for 76.16%), 23,453 people with university degrees (accounting for 76.16%), people with

college degrees (accounting for 6.77%), 20,054 people with intermediate degrees (accounting for 5.79%), 18,325 people with elementary or untrained degrees (accounting for 5.79%). (VCB Report, 2020).

The labor market in the banking industry is changing in the direction of reducing tellers, branch transactions... and increasing high-quality human resources who are good at both financial, banking and IT expertise. The source of candidates in the digital transformation segment in the banking industry is very limited, both in quantity and in quality. In terms of quality, very few candidates have the experience to apply the most advanced technologies. In terms of quantity, the bank has a need to recruit large numbers and in a short time, but the number of qualified candidates is not enough.

## 5. SUGGEST SOME SOLUTIONS MUST BE IMPLEMENTED SYNCHRONOUSLY

First, promoting professional training and retraining courses in line with the strategic direction of digital transformation, creating a premise for innovation in thinking and creativity, helping VCB's officers and employees to be more proactive, gradually getting rid of the fear of change and absorbing new things, training and improving the professional qualifications of VCB's officers and employees.

Second, renovating training programs in the direction of supplementing the contents of banking training in association with digital transformation, development and operation of the digital banking model.

Third, enhancing skills training including creative thinking skills, critical thinking skills, problem solving skills, teamwork skills, data-driven decision making skills, operational skills implementation of digital technology, compliance with the operational process of providing banking products and services in IT environment.

Fourth, developing and implementing training programs to improve staff ethics, awareness of information security and safety in the bank.

Fifth, converting a part of the above training contents into electronic lectures.

Sixth, diversifying training forms including centralized training, online training (Msteam, Zoom...), E-learning;

Seventh, applying leaning management system technology in training from enrollment registration, tests, assessment sheets, synthesizing and managing training data to record students' learning results and managing each individual's training history, serving as a basis for the training implementation according to the individual's training roadmap for each job position to meet the requirements of the training framework and qualification framework of VCB.

Eighth, building an organizational culture of creative learning, innovative and flexible working environment;

Ninth, accelerating the application of results from research products, increasing the efficiency of the bank's business operations.

## 6. CONCLUSION

Training plays an important role in determining the quality of human resources and enhancing the competitiveness of enterprises. Through studying the impact of Industry 4.0 on human resources in the banking sector, the impact on training activities, and using questionnaires to find out about training activities at VCB today, the authors have proposed some solutions on training activities to improve the quality of human resources at VCB to meet Industry 4.0 requirements.

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# RISK MANAGEMENT IN THE ERA OF BIG DATA - THE CASE OF BANKING INDUSTRY IN VIETNAM

**Hien Thi Thu Hoang[1,*], Trung Hai Le[1]**

***Abstract:*** *Contemporary banks operate in a challenging environment, in which banks are constantly influenced by regulatory requirements, new risk types, and high competition from their peers. At the same time banks have on their disposal large datasets from internal and external sources. Therefore a question arises in the banking field is whether commercial banks are using adequate analytics to gain value in their risk management from big data. Big data has been used in banking for some time, mostly in the marketing field, but the usage of big data in banks' risk management has not been a subject of extensive scientific research, especially in developing countries. This paper thus fills the gap by examining how big data is utilized in commercial banks in Vietnam for efficient risk management.*

***Keywords:*** Big data, commercial banks, risk management, Vietnam.

## 1. INTRODUCTION

Since the first bank was introduced, the core question of a bank is risk management as risks are inherent in any bank's activity (Mishkin & Serletis, 2011, Mishkin, 2018). Fortunately, as technology always develops, it could be the help of bank, which makes risk management of banks to be more reliable, visual, and especially, be real time.

In the era of digitization and automation, the banking sector is going through a phase of deep change fuelled by a strong discontinuity from its traditional cultural, social and demographic frameworks (Deloitte, 2017). The redevelopment, digitalization the banking sector is a topic currently receiving huge attention and interest (Battisti, 2019). In this scenario, it is increasingly necessary to ask the following questions: what will be the role of big data on bank risk management?

[1] Banking Academy of Vietnam

* Corresponding author. Email: hienhtt@hvnh.edu.vn

In this time, the challenge for the banking sector is to import non-conventional technologies (Internet of Thing, business intelligence, Big Data and block chain) that allow the processing of huge quantities of data quickly and accurately, which is useful not only in risk management, but also in cyber security, fraud detection and the optimization of decision-making processes. While the technology is fast changing, research on that arena is still scare, especially in developing country. This paper, by interview information from some medium banks in Vietnam is to reveal how big data important in risk management in the country. Before that, the paper discusses the definition of big data, a term that may confuses users, as there are more than just one approach to define it.

## 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

### 2.1. Risks and risk management in banking

There are various definitions of risk in scientific and professional literature, most of which are focused on negative aspects of risk, for example the potential losses that an organization is faced due to certain events. The potential losses can be expressed in the downside effect on expected earnings, cash flow or company value Lackovic (2013).

Banks are faced with various types of risks, depending on their scope of business activities. Banks that are providing innovative financial services or the ones using advanced financial and hedging techniques, may be exposed to higher risks that require more sophisticated risk management methods and techniques. The most basic classification of risks banks is faced with include:

(1) Credit risk: as the institution that focuses on lending, the most common risk that banks are faced is credit risk, which is the potential of losses due to borrowers default or rating worsening.

(2) Market risk: the risk of losses due to changes in instruments, price (interest rates) or exchange rates.

(3) Operational risk: potential of losses due to internal or external events resulting from internal processes, people, systems or external events.

(4) Interest rate risk in the banking book: potential losses due to effects of changed interest rate on banks economic capital.

Facing with various risks that once occurs may bring banks to bankruptcy, under the Basel II and III requirements, banks are obliged to organize three control functions or three lines of defense within organization, namely risk management control, compliance, and internal audit. These three lines involves the tasks of managing risks, performing stress testing, disclosing information to stakeholders; following internal procedures and requirements from the regulators; reviewing and encompassing control of all business segments, activities and processes in a bank. This means special attention needs to be paid to banks' adequate organizational hierarchy, establishment and documentation of internal procedures, development and promotion of organizational risk culture, development and control of risk limits and formulation of business continuity plans in order for risks to be managed adequately.

### 2.2. Big data definition

The term "big data" refers to a vast quantity of data that, in general, requires advanced technologies to be processed and analyzed (so that it can be transcribed into a form that can be extracted, read and applied for business purposes) (Frisk & Bannister, 2017; Rothberg & Scott Erickson, 2017). In the literature, there are many definitions of big data (Ardito et al., 2018; Diebold, 2018); therefore, finding one that is unambiguously accepted is, challenging. In particular, big data definitions have developed rapidly, which, itself, has raised some confusion (Gandomi and Haider, 2014).

However, one of the most widely used definitions is of Gartner, Inc.: "Big data is high-volume, high-velocity and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making" (Gartner IT Glossary). Some scholars (De Mauro et al., 2015; Gandomi and Haider, 2014; Hashem et al., 2014), instead of providing a classic definition, have tried to describe the term big data through its main key characteristics. The first author who defined the term on the basis of its characteristics was Laney (2001), who suggested that volume, variety and velocity (or the Three V's) are the three key dimensions of challenge in data management. As a result, the Three V's

have developed as a common framework for defining big data (Chen et al., 2012). In addition to the traditional Three V's, other dimensions of big data have also been applied by scholars in recent years as a means of defining it (e.g. Chen et al., 2014; Ferraris et al., 2018; Gandomi and Haider, 2014; Intezari and Gressel, 2017; Lugmayr et al., 2017; Moorthy et al., 2015). These include veracity, value, variability, validity, venue, vocabulary and vagueness. Not stopping at that, other researchers consider big data not only data but also the technology to tackle and make the inference of the data (Parsons, 2018), or the negative aspects of reading it (Moorthy et al., 2015). According to Parsons (2018) big data vector the institution to reach the risk management goal.

Table 1. Shows the Features and Definitions Used to Describe Big Data by Various Authors.

**Table 1. Big Data Definition**

| Authors | Features | Definitions |
|---|---|---|
| Ferraris et al. (2018), Gandomi and Haider (2014), Gartner IT Glossary, Hashem et al. (2014), Moorthy et al.(2015) | Volume | Mass quantities of data that are constantly accelerating-expanding |
| Ferraris et al. (2018), Gandomi and Haider (2014), Gartner IT Glossary, Hashem et al. (2014), Moorthy et al. (2015) | Variety | Heterogeneity of data: it is possible to have both a large number of data and a vastness of sources from which information is derived and numerous platforms from which they derive increasing diversity in the types and sources of data requiring management and analysis |
| Ferraris et al. (2018), Gandomi and Haider (2014), Gartner IT Glossary (n.d.), Hashem et al. (2014) | Velocity | Velocity is the speed at which data are created exponentially and the speed of transfer |
| Ferraris et al. (2018), Gandomi and Haider (2014), Moorthy et al. (2015) | Veracity | This term indicates the reliability of the data and understands the data that are not correct or reliable compared to the reliable data |
| De Mauro et al. (2015), Ferraris et al. (2018), | Value | The volume of data can express more important information than that taken |
| Gandomi and Haider (2014), | | individually |
| Gandomi and Haider (2014), Moorthy et al. (2015) | Variability | Variation of data flows is derived from different sources while being connected to each other |
| Moorthy et al. (2015) | Validity | Degree of reliability of the data |

| | | |
|---|---|---|
| Moorthy et al. (2015) | Venue | Difference in platforms and inequality of formats |
| Moorthy et al. (2015) | Vocabulary | Appearance of new notions and terms, and descriptions that did not exist before |
| Moorthy et al. (2015) | Vagueness | Confusion, uncertainty and inaccuracy in reading data |
| Parsons (2018) | Vector | Refers to machine learning and artificial intelligence can sift through massive amounts of data to identify, monitor, and report emerging risk |

*Source: Battisti et al., 2019 and the author.*

Big data can come from two main sources: internal and external sources. Internal sources can bring data from branches, analysts reports, ATMs and POSs, bank call centers, records of customer history transactions, Internet or mobile banking services… External sources are social media data, reports, trading data, information and reports and analyses from the regulators, third parties reports…[1]

### 2.3. Big data and risk management

In the current situation, there has been an union between the physical-tangible world and the virtual world. The Internet has made connection and interaction between everything, that the term "The Internet of things" (IoT) has been coined (Uden and He, 2017). Because of that, huge data have been created at a very high speed. That has changed rapidly the way the business world operates and manage risks (Jin et al., 2015; Kumar et al., 2018). The sector that is heavily impacted by this trend is banking and finance (Battisti et al., 2019).

[1] In 2015, the United Nations Department of Economic and Social Affairs divided big data into three categories according to the different sources from which it comes from: (1) Data from social networks, including information from social media, messages and research conducted on the internet; (2) Data from traditional systems of business, such as that generated by commercial trade transactions, e- commerce, credit cards and medical records; (3) Data from the so-called Internet of Things (IoT), referring to machine-generated data, data from GPS satellites and data from computer-based registers (Dicuonzo et al., 2019; Hasnat, 2018). This is a definition about big data in general, which may pose different aspects compared to big data in the financial field.

In particular, nowadays, IT technologies are changing the structure of the banking industry's risk management into one that is predominantly data driven. Lackovic et al. (2016) and Dicuonzo (2019) develop a framework in which they suggest the use of Big Data in each of the four key risk management activities (identification, assessment, management and control, and reporting). The framework can be described as follows:

(1) **Risk identification:** Identification of new sources for the early identification of risks and in-depth knowledge of customers;

(2) **Risk assessment:** Analysis of underlying information through the calculation of various risk indicators, real-time simulation of risk indicators and predictive analysis for all typologies of risk; (3) Risk management and control: Reputational risk management, operational loss forecasting, compliance management and real-time control of financial risk; and

(3) **Reporting:** Real-time creation of reports, calculation of risk exposure on request, increased transparency and real-time stress tests.

It is obvious that banks increasingly need to use all available data to predict risks, manage them and report them. The quantity and quality of data are essential elements for the formulation and implementation of strategies compatible with the bank's risk appetite. The data that a bank has also needs to be suitable to build effective and reliable processes and procedures for safeguarding the value of bank assets. Many authors support the idea that rapid identification and quantification of new risks and a transparency in reporting activities are essential in risk management (Elgendy and Elragal, 2014; Lackovic et al., 2016).

This has not only required a revision and adaptation of organizational models, but also emphasized the importance of data to a bank. This is because most of the risk management elements (stress testing, real time simulation, risk indicators calculation, etc.) need to utilize big volumes of both regular and irregular data. According to research conducted by Deutsche Bank (2015) and McKinsey and Company (2015), actually the increase in banking tools and transactions, the subsequent explosive growth of data, has played an increasingly central role in the bank's value creation process.

## 3. BIG DATA AND RISK MANAGEMENT IN BANKS IN VIETNAM

### 3.1. Methodology

Based on the objectives of the research and the current phase of the development of Big Data in risk management, the analysis of this study was of an exploratory nature, to provide preliminary explanations for the research questions, which is to explore the current situation of the usage of big data in risk management in banks in Vietnam. A semi-structured interview with open answers was conducted with the credit institutions' head of risk management, to understand the effective use of Big Data in the risk management function. The interview, lasting about 45 minutes, was conducted at the bank's headquarters. The interview was structured based on three survey profiles:

a. Current risk management information technology actually used in risk management;

b. The use of Big Data in the bank's actual risk management;

c. New risk manager skills. Names of the banks and the interviewees are kept anonymous.

This research also uses the content analysis by looking for relevant information regarding the use of big data in risk management via internet based documents such as annual reports, risk management reports. These banks have followed the "Three lines of defense" as instructed by the State Bank of Vietnam, and risk management procedure of Basel II.

**Table 1. List of the interviewees**

| Code of the banks | Position of the interviewee | Whether the bank has a CDO (Chief Data Officer) | Does the bank actually use the word big data in their day to day operation, or any related synonyms |
|---|---|---|---|
| Bank 1 | Vice Director, Risk management | No | No |
| Bank 2 | Manager, Credit Division | No | No, consolidated data instead |
| Bank 3 | Data and Analysis (DnA) Team Head | No, but DnA Division Director | Yes, DnA |
| Bank 4 | Manager, Treasury | No | No |

### 3.2. Current situation of banking in Vietnam

The bank selected for the analysis in the present study is located in Vietnam. These banks operate from 150 up to 300 branches, they are considered medium bank in terms of size (Thuy et al., 2022). The medium size bank is considered being in the group with the fastest speed of technology application (Thuy et al., 2022). The business segmentation of customers ensures the achievement of business objectives, such as improved customer relationships, greater satisfaction of the requirements of customers with suitable products, improved efficiency of the analysis and monitoring process. Within the credit institution, there is a risk management office and an IT development office. These banks follow the instruction from the State Bank of Vietnam to take the "three lines of defense", which is to strengthen risk management operation.

### 3.3. The usage of big data in risk management in banks in Vietnam

#### *3.3.1. The overall picture*

The selected banks, although it has not yet fully adopted big data analysis tools, has created advanced data architecture to gather and analyze a high volume of data that has been utilized to be helpful to the decision-making process. The first implementations ware conducted in the business area and risk management area. The data derives from both internal and external sources, which then stored in the bank's data set.

The risk management function is developed, on the basis of the available information, innovative internal predictive models (predictive analytics) of the evolution of the economy, financial stability and the measures that are characteristic of banking activity, such as default and credit. Such estimations are reported in official documents provided to the supervisory authorities with a detailed indication of the calculation methods. The data analysis tools available to the bank support the decision-making process as they can propose operational and strategic solutions (prescriptive analytics). This data management is more developed than was originally intended and it has a very wide range of uses and is the basis of all the typical quantitative analyses: Risk assessment, forecasting analysis, stress tests and testing and development of models of whatever nature and form. The greatest benefits of such sophisticated data architecture are mainly found in credit, operational and financial risk management.

Three out of four of our interviewees state that big data help with the following curriculums:

**- Big data help the bank "to Know more and more about the Customer":** Customer segmentation and behavior analytics are some of many different ways that banks can know their customer more. The eKYC revolution that banks and financial institutions can employ in order to know what customers are looking for and what their appropriate risk rating is. The eKYC system actually provides a kind of big data.

**- Big data help the bank "to Monitor the Relationship":** Like any business, banks would want to keep their existing customers. Monitoring a relationship is cheaper than trying to get new customers. Sentiment analysis and predictive analytics a reliable data pool can be leveraged to identify clients with different risk ratings.

**- Big data help the bank "to Analyze Nonfinancial Risks"**: Banks are essentially financial consultants of their customers so there is an investment to know as much about the customers as possible and that includes risks associated with the customer's industry, business and management. With big data and advanced IT such as machine learning, one can find possible patterns with customers that can tell the upcoming risk and more importantly, mitigate it.

#### *3.3.2. Bid data in risk management - specific aspects*

During the interviews the managers were asked how bid data contributed to the specific aspects of risk management. The answers were recorded in Table 2.

The results of the table reveal that the selected banks are in the very initial stage of applying big data in their risk management process. Although they are considered the leading banks in Vietnam in terms of IT advanced institutions, the actual application of big data in their banks is not for the all the aspects of risk management. Risk identification and risk assessment are the two aspects that receive the help of big data the most. Risk identification is one of the aspects that big data contribute the most, especially credit risk. One manager said: "Advances in information technology and Big Data have helped us to reduce the cost of acquiring,

managing and analyzing data, and this is vital in credit risk management"[1]. This is because when banks provide credit to a customer, these lenders have to collect different type of information, ranging from financial to non-financial, hard and soft information in order to screen the customer. In general, banks suffer from information asymmetries, which may lead to credit rationing and/or unsound decisions. Conventional information may not provide some kind of "characteristic aspects" of the borrowers that reveal the creditworthiness of the borrower, which big data can instead. However, the manager also states that to produce timely and effective identification of emerging risk, they still have a lot of time to go, as this is the very challenging aspect, as to do this not only big date data are needed but also people, processes, and systems capable of detecting and mitigating risk as it emerges.

In order to identify new risks, the bank uses big data to monitor performance of the customers, as well as the market, and look for outliers. Any unprecedented movement should go into the warning range and later proceeded to subsequent actions.

**Table 2. Big Data Application in Risk Management**

| Category | Specific aspects | Bank 1 | Bank 2 | Bank 3 | Bank 4 |
|---|---|---|---|---|---|
| **Risk identification** | Early identification new of risks | Yes | Yes | Yes | Not yet |
| **Risk assessment** | Data analysis | Yes | Yes | Yes | Yes |
| | Calculating risk indicators | Yes | Not yet | Yes | Yes |
| | Real time simulation of risks | Not yes | Not yes | Not yes | Not yes |
| | Prediction of losses | Not yes | Not yes | Not yes | Yes |

[1] This bank recently uses Big Data and AI in the process of qualifying customers' credit scores and generates credit limits for credit cards users. This process reduces the procedure time to 5 minutes of screening and 24 hours before disbursement, the time was from 3 - 5 weeks previously. (https://thitruongtaichinhtiente.vn/xu-huong-ung-dung-big-data-trong-hoat-dong-ngan-hang- 28556.html)

| | | | | | |
|---|---|---|---|---|---|
| **Risk management and control** | Protection of bank brand via reputational risk management | Not yes | Not yes | Not yes | Not yes |
| | Prevention of operational loss events | Not yes | Not yes | Not yes | Not yes |
| | Compliance management, | Not yes | Not yes | Not yes | Not yes |
| | Real time control of internal and external risk exposure limit | Not yes | Not yes | Not yes | Not yes |
| **Risk reporting** | Real time creation of reports | Not yes | Not yes | Not yes | Not yes |
| | On request risk exposure calculation | Not yes | Not yes | Yes | Not yes |
| | Creation of reporting transparency | Not yes | Not yes | Not yes | Not yes |

For operational risk management, big data and IT also helps to improve the efficiency compared to the traditional way. Specifically, to mitigate the risk of inappropriate sales practices, risk executives should ensure that the first line of defense has constructed a system capable of alerting management to unusual activity. In the traditional approach, it takes time for the manager to get to know the scene, before action could be conducted. Recently, the first step is to make sure the first line (the "control" function) collects daily and reliable sales data at both the banking center and employee levels. Using big data, the first line must monitor the data, employing KPIs that detect unusual activity or performance. Statistical outliers (for example, a salesperson who is reported to produce unequally as many sales as peers could be considered outliers) need a deeper analysis of the superior performance.

Subsequently, risk mitigation managers analyze the reasons for an employee's statistically significant superior or inferior performance. The analysis may reveal that the employee has developed a superior sales process that explains the outlier results. If true, first-line management

should consider testing the process to determine if it should be adopted across the enterprise. On the other hand, the outlier performance could be rooted in inappropriate behavior.

Even though big data have improved significantly the quality and efficiency of risk management in the selected banks, it can be seen that not all of the aspects of risk management have adopted this advanced technology. Risk control and risk reporting has not take this advantage. Vietnamese banks still have some limitations in using big data to produce real time calculation and simulation, as well as generate real time creation of reports.

## 5. CONCLUSIONS

This paper is to support that big data can expand the scope of financial market risk management in banks. The result of this paper is line with others. Big data has the characteristics of large quantity, fast speed and many kinds. In the era of the digital economy, the relationship between big data and risk management is becoming closer and closer. In the financial market, big data records the information of individual and enterprise customers through text, video and other storage media. Through big data, users' portraits can be outlined and clustered, which is conducive to accurate marketing and risk management by banks and other financial institutions. In the era of the digital economy, big data is the core asset of financial institutions (Pfeiffer and Review, 2019; Gong et al., 2020). The data of traditional financial risk management are often scarce, so it is unable to deal with the risk in time and effectively. By means of big data information technology, we can build a digital financial risk management and control system, which will provide solutions for preventing financial risks.

However, in order to put big data as a "vector" to timely and efficiently swift the bank to its risk management goals, the bank needs to have the tools to collect, to interfere it to make it work. That brings the issue of "cost-benefit", if the bank invests in heavy capital projects of advancing IT that may lessen the profit indicators.

Besides, banks need a very strong human resource in order to handle the use of big data. In the era of big data, banks need the following employees: The first, obviously, is the data scientist, who may or may not know much

about banks and banking but master in analyzing massive amounts of data in real time. The second, in contrast, will be true banking experts, who have deep subject-matter expertise in specific business practices and who can interpret the financial jargons to data scientists to design and interpret risk tolerance and implement risk mitigation. The third group represents the most difficult job to fill in the future risk management system. As risk management is the core of any bank since the first bank was formed, the industry must have highly skilled bankers and directors who have remarkable knowledge of how banks work and how they achieve consistent risk-adjusted returns on capital that reliably exceed cost of capital.

With the arrival of the big data wave, the supervision of the banking market has also brought changes. Use big data information technology such as data mining or neural networks to measure the financial market's risk. First, big data can provide technical means for financial market risk supervision. Big data can make financial supervision more credible and visual. Second, in the era of the digital economy, digital financial supervision is more accurate. Therefore, government regulators should introduce rational use of financial risk monitoring tools such as big data, and improve the government supervision system.

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# STATE OWNERSHIP STRUCTURE AND FINANCING DECISIONS OF LISTED COMPANIES ON VIETNAM STOCK MARKET: A BAYESIAN APPROACH

**Duong Thuy Phan[1,*], Thanh Thi Hoang[1], Ngoc Mai Tran[2]**

***Abstract:*** *The article evaluates the influence of state ownership structure on the financing decisions of listed companies in Vietnam stock market between 2010 and 2020. The data used in this study are all obtained from the financial statements of 531 listed companies on the Ho Chi Minh and Hanoi stock exchanges between 2010 and 2020 from the FinPro database. The Bayesian regression method is utilized to analyze the influence of state ownership structure on corporate financing decisions. The analysis result shows that the state ownership ratio has a positive impact on the capital structure of listed companies. Besides, the firm size and the growth rate have positive impacts on the capital structure. The remaining factors have negative impacts on the capital structure including Tangible Assets, Taxes, Cash Flow, Profitability, and Liquidity. Based on empirical results, the study proposes some recommendations to help managers to make appropriate funding decisions in order to develop sustainably.*

***Keywords:*** *State ownership structure, financing decision, Bayesian method.*

## 1. INTRODUCTION

Capital structure studies show that firm-specific, industry-specific, and institutional factors influence corporate capital structure decisions (Jõeveer, 2013; Jaworski and Czerwonka, 2019). Rajan and Zingales (1995) conclude that "a better understanding of the influence of institutions can provide us enough inter-country variation so as to enable us to identify the fundamental determinants of capital structure". Jong et al. (2008) argue that national factors directly or indirectly affect the capital structure of firms. Because of distinct institutional features in emerging countries, Cornelli et al. (1998) argue that it is necessary to have a deeper understanding of the

[1] Faculty of Transport Economics, University of Transport Technology, Hanoi, Vietnam

* Corresponding author. Email: duongpt@utt.edu.vn

[2] Faculty of Finance, Banking Academy, Hanoi, Vietnam

impact of ownership structure on capital structure in those countries. Many other studies also confirm this necessity (Braisford et al., 2002; Driffield et al., 2007; Jiraporn and Liu, 2008; Margaritis and Psillaki, 2010).

In emerging countries, state ownership is a common form of ownership, and it has special attention. Government ownership can motivate companies to borrow more by preferential lending policies, loan guarantees, and an intention to maintain state control (Shailer and Wang, 2015). However, studies of the impact of ownership structure on capital structure often focus on managers' ownership, organizational ownership, and ownership concentration (Chaganti and Damanpour, 1991; Chen et al., 2005; Cho, 1998; Chu, 2011). This study complements existing studies by in-depth analysis of the influence of state ownership on corporate financing decisions.

Vietnam is a typical emerging economy in a group of developing countries[1]. The economic adjustment policy has made the economy of Vietnam a multi-sector economy with rapid and outstanding development since 1986. The equitization of state-owned enterprises was piloted from 1990 to 1991. It officially has implemented in 1992 and accelerated steadily and effectively. The number of state-owned enterprises has gradually decreased, accounting for a low proportion in quantity in the entire enterprise sector. But, the state-owned enterprises still hold substantial resources in terms of capital and assets, generating revenue, and have significant contributions to Vietnam's state budget. State-owned enterprises operate in key industries and fields of the national economy such as electricity, gasoline, etc. In 2019, the state-owned enterprises contributed 28% of GDP and created 1.2 million jobs. The state-owned sector accounts for 29% of the total capital and 22.9% of the profit of the entire enterprise sector (Ministry of Planning and Investment, 2021). It shows that the role of state capital still plays an important role. Therefore, it is necessary to have empirical studies proving the role of state ownership in the financing decisions of Vietnamese companies.

In this paper, the authors assess the impact of state ownership and other factors on the capital structure of listed enterprises in the Vietnam

[1] https://www.worldbank.org/en/country/vietnam/overview#1

stock market between 2010 and 2020. With the more complete data in the study period, the study provides significant empirical evidence on the impact of state ownership on corporate financing decisions. This result will help policymakers and businesses to make more appropriate financing decisions to improve investment efficiency.

## 2. LITERATURE REVIEW

In the study on corporate financing decisions and the role of different ownership classes, Berkman et al. (2002) argue that agency problems between owners and managers tend to be acute when the level of state ownership is high. Because the voting rights and cash flows associated with state ownership are often separated, conflicts between owners and managers are serious (Xu and Wang, 1999). If officials oversee state-owned enterprises with low civil servants, they will find no motivation to control operations well (Berkman et al., 2002; Sun and Tong, 2003).

Researching on the financing behavior of listed firms, Zou and Xiao (2006) expect that state-owned enterprises often have higher debt ratios than other firms. When the Government supports state-owned enterprises in securing bank loans, they will have easier access to loans (Tian, 2001). For listed firms, for fear of diluting state control, the state ownership representative discourages insurance of shares (Xu and Wang, 1999; Du and Dai, 2005).

The empirical research of Li et al. (2009) on firms listed on the Chinese stock market also shows that state ownership has a positive effect on the debt decision of non-listed firms. In the case of high state shareholders, there is usually a tendency to use debt because of the limitations of soft capital and government funding. The agency cost of equity may increase in state-owned enterprises because of the ability of managers to control corporate takeovers. Therefore firms will issue more debt through government guarantees to reduce the agency cost of equity (Huang et al., 2011). However, state-owned enterprises allocate capital less efficiently than private enterprises (Chen et al., 2016). Government ownership reduces investment sensitivity to good projects (Chen et al., 2017). This study is consistent with Jaslowitzer et al. (2016). They examine European data and show that conservatism and stability seeking are characteristics of state-owned enterprises' investment levels.

Nguyen et al. (2012) showed the correlation between state ownership and debt ratio in Vietnam. With government guarantees, state-owned enterprises can easily access loans from banks regardless of operational efficiency and credit guarantees (Okuda and Nhung, 2010). That leads to state-owned enterprises being able to use more debt than other enterprises. Therefore, we believe that it is necessary to have empirical research to verify the relationship between state ownership and corporate financing decisions in Vietnam. In the regression analysis, we use control variables to separate the influence of state ownership on corporate financing decisions. These variables have been confirmed in previous studies to influence corporate financing decisions. They are growth rate (Frank and Goyal, 2009), tangible assets, taxes, cash flow, profitability, and liquidity (Zou and Xiao, 2006; Fan et al., 2012).

Therefore, this study uses the Bayesian method to test the impact of state ownership and other factors on the financing decisions of listed companies on the Vietnam stock market with the research sample between 2010 and 2020. The study uses a random sample applied to non-financial enterprises, aims to study the influence of the state ownership rate and other factors on the financing decisions, thereby providing helpful information for stakeholders in making decisions.

## 3. METHOD AND RESEARCH DATA

### 3.1. Bayes method

Most studies on the relationship between state ownership structure and financing decisions used a traditional frequentist approach. In recent years, scientists have realized the disadvantages of the frequentist method because it leads to many false conclusions in scientific research (Nguyen Van Tuan, 2011). The conclusions of the studies used frequency statistics based on data sets that do not care about known information (Nguyen Ngoc Thach, 2019).

The purpose of the Bayesian Linear Regression is not to find the best unique value for the model parameters. It determines the posterior distribution for the model parameters. It is not only response generated from the probability distribution, but also the model parameters assumed to come from the distribution.

In the Bayesian regression method, the conditional probability distribution rule is used,

$$P(A/B) = \frac{p(A/B)}{p(A/B)}$$

The Bayes' theorem is as follows:

$$P(A/B) = \frac{p(A/B)p(B)}{p(A)}$$

Where:

p(A): Prior probability, the probability of hypothesis A we believe to occur before empirical data collection;

p(B): Constant, the probability of the data;

p(A/B): the posterior probability, need to find the probability that hypothesis A true with the research data;

p(B/A): Likelihood, probability of data collection under the condition that hypothesis A is true;

A, B: Are two random vectors (random vectors).

To study the impact of state ownership structure on financing decisions of 531 listed companies on the Vietnam stock market between 2010 and 2020, we use the Bayesian regression method with the Gibbs sampling algorithm.

Based on the empirical evidence, we propose the following research model:

$$CS_{it} = \beta_1 + \beta_2 SO_{it} + \beta_3 X_{it} + \varepsilon_{it}$$

Where: $CS_{it}$ is the capital structure variable

$SO_{it}$ is the state ownership variable

$X_{it}$ is the vector of control variables. Factors as control variables include size, growth rate, tangible assets, taxes, cash flow, profitability, and liquidity.

The following table describes the variables of the model.

**Table 1. Description of Variables in the Model**

| Name of variables | Code | Method of calculation |
|---|---|---|
| Capital Structure | CS | Liabilities/Assets |
| State ownership | SO | Number of shares held by the state/Number of existing shares |
| Firm size | SZ | The logarithm of total assets |
| Growth rate | GR | Percentage change in sales |
| Tangible assets | TANG | Fixed Assets/Assets |
| Tax | TAX | Tax/Pre-tax profitability |
| Cash flow | CF | Net cash flow normalized by total assets |
| Profitability | PRO | Profit after tax/Average total assets |
| Liquidity | LIQ | Cash and cash equivalents/Current assets |

*Source: Compiled by the authors.*

### 3.2. Research data

This research uses the data collected from the financial statements provided by Finpro of non-financial enterprises listed on the Vietnam stock market from 2010 to 2020.

The research sample includes 531 enterprises listed on Vietnam stock market and 5,841 observations between 2010 and 2020.

## 4. EXPERIMENTAL RESULTS

### 4.1. Descriptive statistics of variables

**Table 2. Descriptive Statistics of Variables**

| Variable | Number of observations | Mean | Standard deviation | Min value | Max value |
|---|---|---|---|---|---|
| CS | 5841 | 0.4952 | 0.2215 | 0.0019 | 1.2945 |
| SO | 5841 | 0.2089 | 0.2509 | 0 | 0.9576 |
| SZ | 5841 | 27.19 | 1.5509 | 22.78 | 33.68 |
| GR | 5841 | 0.6735 | 49.74 | -0.9609 | 379.24 |

| | | | | | |
|---|---|---|---|---|---|
| TANG | 5841 | 0.1949 | 0.1940 | 0 | 0.9627 |
| TAX | 5841 | 0.1675 | 0.6174 | -25.59 | 14.51 |
| CF | 5841 | 0.1434 | 6.4984 | -180.41 | 233.55 |
| PRO | 5841 | 0.5046 | 5.8481 | -8.9743 | 238.26 |
| LIQ | 5841 | 0.0798 | 0.0886 | 0.0001 | 0.9913 |

*Source: Calculation results of the authors.*

Table 2 presents descriptive statistics with mean, standard deviation, minimum, and maximum values of the variables included in the model. The results of descriptive statistical analysis show that there are differences in capital structure, state ownership rate, and other factors affecting the capital structure of listed companies on the Vietnam stock market. The average capital structure of listed companies is 0.4952, the smallest is 0.0019, and the largest is 1.2945. That shows a large difference in the capital structure of listed companies. Some companies do not use debt besides those with too high a debt ratio. The debt level of Vietnamese companies is quite high, especially in the sample of enterprises with negative equity if their total liabilities are greater than the total assets.

The state ownership structure has an average of 0.2089, the minimum value is 0, and the maximum value is 0.9576. It shows many private enterprises besides some enterprises with high state ownership. Factors such as Enterprise Size, Growth Rate, Tangible Assets, Taxes, Cash Flow, Profitability, Liquidity also have large differences among listed companies on the Vietnam stock market.

### 4.2. Results from bayesian regression

**Table 3. Regression Results**

| | Mean | Std. Dev. | MCSE | Median | Equal-tailed [95% Cred. Interval] | |
|---|---|---|---|---|---|---|
| SO | 0.0515 | 0.0063 | 0.0011 | 0.0516 | 0.0381 | 0.0638 |
| SZ | 0.0462 | 0.0003 | 0.0001 | 0.0462 | 0.0456 | 0.0468 |
| GR | 3.62e-07 | 5.49e-07 | 3.7e-08 | 3.49e-07 | -6.2e-07 | 1.54e-06 |
| TANG | -0.0534 | 0.0106 | 0.0015 | -0.0538 | -0.0756 | -0.0314 |

| | | | | | | |
|---|---|---|---|---|---|---|
| TAX | -0.0053 | 0.0017 | 0.0003 | -0.0053 | -0.0086 | -0.0019 |
| CF | -0.0006 | 0.0004 | 0.0001 | 0.0004 | -0.0006 | 0.0012 |
| PRO | -0.0004 | 0.0005 | 0.0001 | -0.0007 | -0.0016 | 0.0002 |
| LIQ | -0.2888 | 0.0088 | 0.0021 | -0.2894 | -0.3066 | -0.2725 |
| _cons | -0.7376 | 0.0069 | 0.0011 | -0.7385 | -0.7506 | -0.7240 |
| sigma2 | 0.0426 | 0.0008 | 0.0001 | 0.0426 | 0.0411 | 0.0441 |

*Source: Calculation results of the authors.*

Table 3 shows the results of the regression model using the Bayesian method. State ownership ratio has a positive impact on the capital structure of listed companies. Firm size and growth rate also affect positively. The others have a negative impact, including Tangible assets, Taxes, Cash Flow, Profitability, and Liquidity.

State ownership ratio (SO) has a positive relationship with the capital structure of listed companies on the Vietnam stock market. In detail, for each percentage increase in state ownership, an increase in capital structure is expected around 0.052%, all else being equal. It shows that if companies have a larger state ownership ratio, the corporate financing decisions will increase debt. The research results are consistent with the studies of Zou and Xiao (2006), Li et al. (2009), Huang et al. (2016), Phan (2016).

Firm size (SZ) and growth rate (GR) have positive relationships with the capital structure of listed companies on the Vietnam stock market. It shows that companies tend to use more debt when they have large scales and high growth rates. The result can be explained by companies with large scales and high revenue growth rates having advantages in production and business activities and therefore need a huge capital to invest in projects. Larger companies often have easier access to loans than smaller companies. Large-scale companies often have good business performance, reputation with suppliers, and creditors than small businesses. At the same time, according to the theory of agency costs, large firms often have more information in the market than small firms.

Tangible assets, Tax, Cash Flow, Profitability, Liquidity are the factors negatively affecting the capital structure of listed companies on the Vietnam stock market. Liquidity is a factor that has a big impact on the

capital structure of listed companies. Meanwhile, fixed assets, taxes, cash flow, and profitability are factors that have a small impact.

Specifically, solvency increases by 1%, capital structure decreases by 0.2888%, other factors unchanged. The Pecking Order Theory shows an inverse relationship between liquidity and debt ratio. If a company maintains a high liquidity ratio, it is more likely to use its capital rather than borrow. Myers and Rajan (1998) also show that firms with high liquidity borrow less.

If fixed assets increase by 1%, the capital structure will decrease by 0.0534%, other things equal. Normally, businesses with high fixed assets will increase their debt because they increase their loan collateral. But in fact, the results show that companies invest mainly in fixed assets with retained earnings or increased equity, without prioritizing the use of borrowed capital.

Taxes, cash flow, and profitability increased by 1%, the capital structure of listed companies decreased by 0.0053%, 0.0006%, and 0.0004%, respectively. The negative relationship between profitability and capital structure can be explained by the Pecking Order Theory. When businesses operate with good profitability, priority will be given to internal capital from retained earnings instead of borrowing to finance investment activities and business operations.

## 5. CONCLUSION AND RECOMMENDATIONS

The study shows empirical evidence on the extent of the impact of state ownership structure and other factors on the capital structure of listed companies on the Vietnam stock market. Using the Bayesian approach, the research shows that the state ownership rate has a positive impact on the capital structure of listed companies. Besides, the size of the company and the growth rate have a positive impact on the capital structure. The remaining factors have negative impacts on the capital structure of the companies, including Tangible assets, Taxes, Cash Flow, Profitability, and Liquidity.

The positive relationship of state ownership ratio and capital structure shows that companies with high state ownership can help them easily

access loans. Companies with a high percentage of state ownership can increase their financial leverage to amplify return on equity. They need to maximize the benefits of using debt. Debts are also known as financial leverage because they will help businesses improve the efficiency of using equity if effectively exploiting borrowed capital. To maximize the benefits of debt, they should use flexibly different forms of debt instead of relying heavily on commercial banks. The larger the size of the assets, the easier borrowing from creditors than the small and medium enterprises. Therefore, when using debt, companies should consider the advantage of asset size to be able to borrow at a low cost of capital.

Liquidity is related to financial leverage. Companies need to balance current assets and short-term liabilities to ensure liquidity at a reasonable level. They need to invest in modern technology because of the major fixed assets. If a company increases its tangible assets ratio, its capital structure will decrease. It is also an effective non-tax shield. Listed companies need to improve profitability because this factor directly relates to capital structures. When companies operate efficiently, they can take advantage of internal capital from retained earnings instead of using debt. That is because this is a lower-cost capital than debt and the issue of new shares.

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# THE DETERMINATION OF PROFESSIONAL SKEPTICISM OF INDEPENDENT AUDITORS IN VIETNAM

**Hoang Ha Anh[1,*], Do Lan Nhi[1]**

***Abstract:*** *Maintaining professional skepticism throughout the audit is of great importance but to what extent the auditor should maintain professional skepticism and how to determine that level, Vietnam Auditing Standard has not yet mentioned. To clarify the role of the professional skepticism in auditing financial statements, this study investigated factors affecting professional skepticism including auditor capacity, personal characteristics of auditors, relationship between auditors and clients, time pressure and audit fee. These base on some models of behaviors such as Theory of Planned Behavior, Model of behavior change COM-B, The Philosophy of Moral Development, Social identity theory. The research is conducted using quantitative method and the database is provided by 163 audit assistants and auditors in Vietnam through questionnaires. The result shows that factors affecting professional skepticism include auditor capacity, personal characteristics of auditors, relationship between auditors and clients, and time pressure. Based on the results, the research makes suggestions for auditors and audit firms to maintain and enhance the professional skepticism of auditors in Vietnam.*

***Keywords:*** *Audit, professional skepticism, Vietnam.*

## 1. INTRODUCTION

Recently, audit services have become increasingly popular in Vietnam, leading to an increasing number of audit firms have emerged. Therefore, the number of users who are interested in audit quality is raising. The International Auditing and Assurance Standards Board (IAASB) states that the purpose of an audit is to increase the level of confidence of intended users in financial statements, which is accomplished by auditors gathering sufficient appropriate audit evidence to express an opinion on whether the financial statements are prepared in all material respects in accordance with the applicable financial reporting framework. The term "audit quality" is

[1] Department of Accounting-Auditing, Foreign Trade University, Hanoi, Vietnam

* Corresponding author. Email: anhhh@ftu.edu.vn

difficult to define; however, for the IAASB, it encompasses a number of key elements that create an environment that maximizes the likelihood of quality audits being performed on a consistent basis of Inputs, Process, Outputs, Key Interactions within the Financial Reporting Supply Chain, Contextual Factors (IAASB, 2014). One of the important factors that have a strong impact on audit quality is professional skepticism of auditors. According to Vietnam Auditing Standard No. 200 issued by the Ministry of Finance together with Circular No. 214/2012/TT-BTC, professional skepticism is always suspicious and wary attitude towards situations which are considered as indications of misstatement by mistake or fraud and a careful assessment of the audit evidence.

Vietnam Auditing Standard No. 200 requires the auditors to exercise professional judgment and always maintain professional skepticism throughout the audit. But to what extent the auditor should maintain professional skepticism and how to determine that level, the standard has not yet mentioned. If the auditor maintains too high a level of skepticism during the audit, it can lead to over-gathering of evidence, which is costly and time-wasting, but maintaining it too low will result in less evidence being collected, affecting the quality of the audit.

Because of the above reasons, the research topic "*The factors affecting professional skepticism of independent auditors in Vietnam*" is necessary. It will contribute to clarifying the role of the professional skepticism in auditing financial statements as well as determining the extent professional skepticism affecting audit quality. From there, suggestions, solutions and recommendations are given to help strengthen and improve professional skepticism of independent auditors in Vietnam.

## 2. LITERATURE REVIEW

### 2.1. Professional skepticism definition

Vietnam Auditing Standard No. 200 has defined professional skepticism as follows: "Professional skepticism is an attitude that is always questionable, alert to specific situations, which may be a sign of error, confusion or fraud, should be carefully assessed for audit evidence."

This paper uses the definition of professional skepticism of Vietnamese Auditing Standard No. 200 combined with the definition of Hurtt (2010); thereby defining professional skepticism as a personality trait of an auditor, expressed through a questioning attitude, being wary of traces that may cause errors in a client's financial statements. According to this definition, the auditor needs to carefully consider and evaluate the evidence about a piece of information that does not match. Professional skepticism is also reflected in the fact that the auditor always asks questions about the interview answers of managements and events that they suspect may be signs of fraud. In addition, people with high professional skepticism are more likely to question one or more audit evidence than others, and conversely, those with low professional skepticism are less likely to question an audit issue than those with high professional skepticism.

### 2.2. Relevant theories used in the research topic

*Theory of Planned Behavior*

Theory of Planned Behavior (TPB) by Ajzen, (1991) is the main theory that explains the entire model of the topic. The theory is a development and improvement of the Theory of Reasoned Action. Theory of Reasoned Action was developed by Ajzen and Fishbein (1975) and is considered a pioneer in the field of social psychology research. According to TPB, three main factors affecting behavior are personal attitude toward behavior, subjective norm, and perceived behavioral control factor. TPB explains two factors affecting professional skepticism which are personal characteristics and the capacity of auditors. The factors of time pressure, audit fees, and the relationship between auditors and clients are social norms that affect professional skepticism and act as subjective standards in the model.

*Social identity theory*

Social identity theory by social psychologists Henri Tajfel and John Turner (2004), describes cognitive processes related to social identity and how social identity impacts behavior between groups and then categorizes individuals based on their perceptions, attitudes, and behaviors. Social identity theory is capable of providing a cognitive explanation related to economic dependence, thereby explaining why clients have such a strong impact on auditors. The theory helps to demonstrate that the relationship

with the client can influence the professional skepticism of the auditor in the audit.

*The Philosophy of Moral Development*

From Kohlberg's theory in 1981, an auditor's ethical awareness can be fostered and developed. First, agencies and sectors need to create a strict legal environment, using sanctions to punish unethical behaviors. For example, it is necessary to introduce strict sanctions for auditors who violate professional ethical standards. Management companies of auditors or departments, audit groups, etc. need to set rules and regulations on rewards and punishments so that they can orient the auditors, which causes auditors to correct their behavior. However, for auditors to be self-aware of what they need to do to conform to the general ethical principles of their surroundings, they should uphold their ethics even when their wrongdoing has not yet occurred. Also, there should be programs to help supplement ethical awareness while focusing on praising and honoring individuals and organizations that meet the criteria of transparency, honesty, and not misleading professional information.

*Model of behavior change COM-B*

Michie, Stralen and West (2011) propose a COM-B model of behavior change with the following general content: Behaviour - B is a result of the interaction among three components. Parts are Capability - C, Opportunity - O and Motivation - M. Capability and opportunity influence the relationship between motivation and behavior. By changing both capability and opportunity, an individual's motivation can be influenced to perform a particular behavior and encourage behavior change. If this change is strong enough, it will backfire on the determinants of behavior (capability, opportunity) and cause the individual to accept the new behavior, thereby reinforcing the behavior change.

### 2.3. Factors affecting auditors' professional skepticism

#### *2.3.1. Auditor's capacity*

International Education Standard No. 8 (IES 8) issued by IFAC in 2008 suggests that auditors' competencies include knowledge requirements; skill requirements; requirements on attitude, professional ethics, and requirements on experience in the audit environment.

Skills and knowledge: Wood (2004) believes that high knowledge and skills will increase the confidence of an auditor. The author also adds that the competence through professional knowledge and skills can improve their professional skepticism.

Attitude and ethics: Professional ethics are standards that prescribe ethical behavior of a profession that every individual practicing must meet and adhere to. Auditors who maintain their sense of professional ethics tend to work more professionally. Enofe et al. (2015) have shown that professional ethics plays an important role in improving the professional skepticism of auditors. In addition, a number of other studies conducted by Oktarini and Ramantha (2016), Winantyadi and Waluyo (2014) all concluded that ethics has a positive impact on the professional skepticism of auditors.

Experience: Auditing experience is the experience that the auditor has in the process of auditing financial statements in terms of both time and volume of completed work (Suraida, 2005). Suraida (2005) and Muiet (2010) have demonstrated that the number of years of audit experience is one of the factors that can increase the professional skepticism of auditor. The more experienced auditor will have higher probability of detecting fraud in financial statements than auditors with less experience. In addition, a number of other studies conducted by Anisme et al (2011), Silalahi (2013), Putra (2017) also concluded that the work experience of auditors has a strong positive impact on professional skepticism.

#### *2.3.2. Personal characteristics of the auditor*

*Carefulness* is focusing on an action or a problem, considering all the factors involved to implement an action the most accurately and successfully. Auditors reduce caution and skepticism in the evaluation process which may jeopardize the validity of the audit opinion (Yustina and Sutarsa, 2020). As a result, the auditor reduces the workload below a reasonable level, reviews the client's documents in a sloppy, preliminary way, accepts the client's weak explanations; does not study accounting principles; does not pursue problematic items and targets, which may affect professional skepticism of auditors.

*Confidence* means believing in the capability of meeting life's challenges and being willing to act on them. Auditors with this trait are

more confidence in their ability to complete audit tasks and develop their own audit judgments and findings. Although self-confidence is regarded as a crucial aspect of professional skepticism that auditors must maintain when performing audit work, it is not currently taken into account by auditing standards.

*Professional ethics* are standards of awareness and behavior suitable to the characteristics of each field of professional activities prescribed by competent agencies and organizations. Circular No. 70/2015/TT-BTC, the Ministry of Finance stipulates that professional auditors must adhere to the basic ethical principles that are integrity, objectivity, professional competence, prudence, confidentiality, and professionalism. Articles provide controversial results on the relationship between ethics and professional skepticism of auditors. Kerler and Killough (2009) argue that there is no relationship between ethics and professional skepticism. Farag and Elias (2012) suggest that there is a statistically significant relationship between the personal characteristics of professional skepticism and moral orientation. In summary, professional ethics (ethical orientation, ethical development) have opposite effects on professional skepticism. In Vietnam, Nguyen Vinh Khuong (2020) suggested that professional ethics have a positive impact on professional skepticism, thereby affecting audit quality.

#### *2.3.3. Relationship between auditors and clients*

The studies on the relationship with clients affecting professional skepticism are still quite modest. Previous publications mainly focused on considering customer attachment and client identification. Bamber and Iyer (2007) and Bauer (2015) suggest that the outcome when the customer engagement is at a good level affects the auditor's judgment and decision-making process. Auditors who have a long relationship with their clients will be able to ignore or accept the client's accounting practices on material matters. In contrast, auditors with a better customer experience and identification are less likely to trust and accept clients.

In addition, the partner of an audit firm always faces a trade-off between the effectiveness and efficiency of the audit. The nature of this trade-off is created by the relationship between profits and litigation in

the audit. When assessing a customer's likelihood of fraud, this trade-off emerges. Auditors must face pressure between protecting the interests of related parties (maintaining independence, protecting the interests of users of financial information) and maintaining relationships with clients (Rich et al., 1997). When an auditor fails to detect a client's wrongdoing, the audit firm can face lawsuits and lose its reputation. Therefore, when performing an audit, the auditor must always carefully balance the interests of the parties. Thereby shows the importance of the relationship with clients with the auditor, when the relationship with the customer is higher, the auditor must develop the orientation of the auditor to be able to retain clients. In summary, client relationships have the potential to influence auditors' decisions as well as their professional skepticism.

#### *2.3.4. Time pressure*

Audit firms and auditors always try to reduce audit fees and provide the best service to clients, which creates pressure on auditors to meet the estimated time budget. Experts say that time pressure can increase auditors' stress levels, which in turn reduces their job performance.

Time pressure also occurs when there is a sudden change in the deadline. Low and Tan (2011) suggest that there is a difference in audit quality between one side completed in the estimated time and the other side is the time of sudden change. When times change suddenly in a negative direction, auditors will tend to take results from the previous year's audits or reduce some audit procedures to speed up the progress. This also reduces the auditor's professional skepticism about potential risks.

Accordingly, time pressures may prevent auditors from performing the work they expect and cause them to behave unprofessionally. Therefore, in response to time pressure, the auditor's behavior tends to reduce professional skepticism in some audit procedures, such as accepting a client's report. Time pressure often has a negative impact on audit performance (Coram et al., 2003).

#### *2.3.5. Audit fees*

Audit fees can be defined as the fees (remunerations) charged by the auditor for an audit performed on the accounts of the entity (audited

party). The determination of the audit fee is based on the contract between the auditor and the enterprise by the time spent on the audit process, the services required, and the number of staff required for the audit process. It should be noted that the audit fee is usually determined before the audit process. According to DeAngelo (1981), a lower fee than the initial audit commitment will weaken the auditor's independence. Asthana and Boone (2012) found that a sharp decrease in extraordinary audit fees will increase the tendency to agree with clients on the auditor's audit opinion. However, some studies give the opposite opinion, that is, the audit fee will not affect the professional skepticism.

## 3. RESEARCH METHODOLOGY AND MODEL

The research applied quantitative method. The factors that are most suitable with the socio-economic characteristics in Vietnam are included in the research model (Nguyen Vinh Khuong, 2020). The model built by the group includes 5 factors affecting professional skepticism, including: auditor's capacity; personal characteristics of auditors; relationship between auditors and clients; time pressure; audit fees. Corresponding with the above literature, the following hypothesis are proposed:

*H1: Auditor's capacity has a positive impact on professional skepticism.*

*H2: Auditor's personal characteristics have a positive impact on professional skepticism.*

*H3: The relationship between auditors and clients has a negative effect on professional skepticism.*

*H4: Time pressure has a negative effect on professional skepticism.*

*H5: Audit fees have a negative effect on professional skepticism.*

Survey object: auditors who have been participating in financial statement audits in Vietnam.

Survey method: send the survey online. Each survey question is measured using a 5-point Likert scale. The survey period is from April to May 2022.

After conducting the survey, the research team obtained 163 valid answers (greater than the minimum sample size 115 (formulated by Hair

et al, 1998), which met the requirements for the research sample size for EFA exploratory factor analysis method

SPSS 26.0 software is used and 163 valid questionnaires are collected to analyze linear regression on professional skepticism based on Linear Regression method.

Regression model:

$$PS = \alpha + \beta_1 * CA + \beta_2 * PC + \beta_3 * CL + \beta_4 * TP + \beta 5 * FE + \varepsilon$$

In which:

PS: Professional skepticism

CA: Auditor's capacity

PC: Personal characteristics of auditors

CL: Relationship between auditors and clients

TP: Time pressure

FE: Audit fee

ε: Indeterminate error

α: constant

β: Standardized Coefficients

## 4. RESEARCH RESULTS

**Table 1. Descriptive Statistics of Observed Variables**

| Factors | Variables | The average values | Standard deviations | Group average |
|---|---|---|---|---|
| Auditor's capacity | CA1 | 3.80 | 0.855 | 3.682 |
| | CA2 | 3.42 | 0.881 | |
| | CA3 | 3.93 | 0.713 | |
| | CA4 | 3.71 | 0.844 | |
| | CA5 | 3.55 | 0.904 | |

| | | | | |
|---|---|---|---|---|
| Personal characteristic | PC1 | 3.78 | 0.882 | 3.958 |
| | PC2 | 3.90 | 0.659 | |
| | PC3 | 3.78 | 0.720 | |
| | PC4 | 4.09 | 0.718 | |
| | PC5 | 4.24 | 0.808 | |
| Relationship between auditors and clients | CL1 | 2.58 | 0.711 | 2.570 |
| | CL2 | 2.48 | 0.977 | |
| | CL3 | 2.61 | 0.842 | |
| | CL4 | 2.61 | 0.857 | |
| Time pressure | TP1 | 2.53 | 1.135 | 2.463 |
| | TP2 | 2.39 | 1.074 | |
| | TP3 | 2.53 | 0.931 | |
| | TP4 | 2.40 | 0.672 | |
| Audit fee | FE1 | 3.23 | 0.850 | 2.968 |
| | FE2 | 2.98 | 0.991 | |
| | FE3 | 3.13 | 1.074 | |
| | FE4 | 2.53 | 0.931 | |
| Professional skepticism | PS1 | 3.71 | 0.735 | 3.875 |
| | PS2 | 4.06 | 0.747 | |
| | PS3 | 3.90 | 0.851 | |
| | PS4 | 3.83 | 0.803 | |

*Source: Authors' calculation.*

Most of the observed variables with average values from 3.7 to 4 belong to the groups CA, PC, PS; observed variables in the FE group have an average value of approximately 2.8; The variables belonging to the other two groups (CL, TP) have an average value of approximately 2.5. Among them, the variable with the highest mean is PC5 (4.24), the variable with the lowest mean is TP2 (2.39).

The above statistical results imply that most of the auditors highly value their competence and personal characteristics. On the contrary, the

auditors hardly agree that they are under time pressure when performing the audit. At the same time, they do not agree that they have a close relationship with the customer. In addition to the "Audit fee" factor, the majority of surveyed auditors expressed their neutral opinion that audit fees create economic constraints and reduce the level of scrutiny in the audit.

Testing the reliability of the scale is testing whether the scale is suitable for the corresponding variables or not. The research measures reliability by Cronbach's Alpha coefficient when performing data analysis. The results show that factor CA5 and FE4 fail to meet Cronbach's Alpha coefficient requirement so they are removed from the model. In addition, there is no Cronbach's Alpha coefficient greater than 0.95 so multi-collinearity does not occur.

In the next stage of analysis, EFA exploratory factor analysis conducted to assess the convergent and discriminant value of the scale. Bartlett's test of sphericity and KMO will be used to assess the appropriateness of exploratory factor analysis. The results of exploratory factor analysis with observed variables all give good results and have high reliability. However, the observed variable PC3 is in the group of CA factors, TP4 is in the group of CL factors, this is not consistent with the proposed scale (PC3 is in the group of PC factors, TP4 is in the group of TP factors). Therefore, the observed variables PC3 and TP4 are removed.

The results of correlation testing show that the variable "Audit fees" has no correlation with the variable "professional skepticism", because the value of Sig > 0.05. Therefore, the variable "Audit fee" is excluded from the model, regression analysis and hypothesis testing will be performed with 4 variables: capacity, personal characteristics, relationship between auditors and clients, time pressure.

**Table 2. Results of Regression Model of Factors**

| Component | R | R Square | Adjusted R Square | Standard error of the Estimate |
|---|---|---|---|---|
| 1 | | 0.570 | 0.559 | 0.39611 |

*Source: Authors' calculation.*

The adjusted R-squared coefficient is used to reflect the degree of influence of the independent variables on the dependent variable. In this research topic, the adjusted R squared is 0.559 which means that the factors in the study contribute 55.9% of the change of the dependent variable "professional skepticism", this value shows the model research is good.

**Table 3. Standardized Coefficients**

| Model | Standardized Coefficients | t | Sig. |
|---|---|---|---|
| | Beta | | |
| (Const) | | | |
| CA | 0.510 | 7.661 | 0.000 |
| PC | 0.163 | 2.574 | 0.011 |
| CL | -0.132 | -2.155 | 0.033 |
| TP | -0.153 | -2.468 | 0.015 |

*Source: Authors' calculation.*

According to the above coefficient table, the regression equation on the factors affecting "professional skepticism" of auditors in Vietnam is formed as follows:

*Professional skepticism = 0.510*Capacity + 0.163*Personal characteristics - 0.132*Relationship between auditors and clients - 0.153*Time pressure*

The value of the standardized Beta coefficient is used to assess the importance of independent variables in order to determine the degree of influence of each variable on "professional skepticism" of auditors in Vietnam. From there, it can be seen that "professional skepticism" is most influenced by the factor "Capacity" ($\beta_1$ = 0.510); followed by "Personal characteristics" ($\beta_2$ = 0.163); then "Time pressure" ($\beta_4$ = -0.153) and finally "Relationship between auditors and clients" ($\beta_3$ = -0.132).

Thus, the results of hypothesis testing accepted all of the original hypotheses. The results shown in the table show that the capacity and personal characteristics of auditors have a positive impact on the professional skepticism of auditors in Vietnam. In particular, Relationship between auditors and clients and Time Pressure have the opposite effect on the professional skepticism of auditors in Vietnam.

Hypothesis H1 states that the auditor's capacity has a positive effect on professional skepticism. The research results show the relationship between the capacity of auditors and the professional skepticism of auditors in Vietnam with Beta coefficient = 0.510 with statistical significance Sig = 0.000 < 0.05. Therefore, hypothesis H1 is accepted. Thereby, it can be seen that the capacity of auditors has a positive influence on the professional skepticism of auditors in Vietnam. The degree of influence is relatively large compared to other factors, implying that the impact of the capacity factor is more important than the other factors. Compared with previous studies, "Capability" has been proven to be a positive impact on career skepticism, which is the same result as Wood's previous studies (2004); Suraida (2005) and Muiet (2010); Oktarini and Ramantha (2016); Nguyen Vinh Khuong (2020).

Hypothesis H2 states that the personal characteristics of auditors have a positive effect on professional skepticism. Hypothesis test results show that Beta = 0.163, significance level Sig = 0.011 < 0.05. Therefore, hypothesis H2 is accepted. From that, it can be realized that the personal characteristics of auditors have a positive impact on the professional skepticism of auditors in Vietnam. This proves that the personal characteristics of an auditor such as confidence, prudence and ethics, the better the degree of skepticism will tend to increase. The factor "Personal characteristics" has a positive impact on professional skepticism, similar to the study of Shaub and Lawrence (1996); Hurtt (2010); Nguyen Vinh Khuong (2020); Phan Thanh Hai (2020).

Hypothesis H3 states that the relationship between auditors and clients has a negative effect on professional skepticism. Hypothesis test results show that Beta coefficient = - 0.132 with statistical significance Sig = 0.033 < 0.05. Therefore, hypothesis H3 is accepted. It can be argued that the stronger the relationship between auditors and clients, the more their professional skepticism tends to decrease. This conclusion has the same results with the study of Bamer and Iyer (2007) and Bauer (2015).

Hypothesis H4 states that Time pressure has a negative effect on professional skepticism. The results of testing the relationship between time pressure and professional skepticism show that Beta coefficient = - 0.153 with statistical significance Sig = 0.015 < 0.05. Therefore, hypothesis H4

is accepted. This has shown that the greater the time pressure of the audit, the more negative impact it will have on the professional skepticism of the auditor. The result is similar to the study of Yustina and Sutarsa (2020).

The audit fee factor is removed when testing the correlation coefficient. Therefore, hypothesis H5: Audit fee has a negative impact on professional skepticism is not considered in the model.

From the test results, this paper has come up with a model of factors affecting the professional skepticism of auditors in Vietnam. However, it is still necessary to use a more objective and representative sample, the survey scales have more practical meaning and better describe the meaning of the factors to have more evidence to prove the above statements.

## 5. CONCLUSION

The interest in professional skepticism has always been a research priority for researchers and professional societies around the world. With many different perspectives on professional skepticism, all views agree that professional skepticism has an important influence on the audit of financial statements. Previous publications all agree with the view that professional skepticism is a factor that has a relatively large influence on audit quality.

The topic used quantitative research methods on sending survey samples to 163 audit assistants and auditors in Vietnam. Thereby, this research has identified 4 main factors affecting professional skepticism including: "Auditors' capacity"; "Personal characteristics of auditors"; "Relationship between auditors and clients"; "Time pressure"; in which "Auditors' capacity" has the strongest impact on professional skepticism.

From that result, the study has provided solutions and recommendations to help not only auditors and auditing firms to improve the professional skepticism of auditors in the process of auditing financial statements, but also bring to many new perspectives for future research.

*For auditors and audit team*: First, ensure that the auditor maintains a reasonable attitude of professional skepticism throughout the audit. Second, auditors must always be highly focused and comply with professional ethical standards and the provisions of the law. Third, the auditors and

audit team need to have a sense of improving professional knowledge in order to maintain their professional reputation as well as the audit quality.

*For audit firms:* First, develop a suitable recruitment policy, set out the requirements for professional skepticism suitable for the company. Second, improve the working conditions of auditors. Third, encourage auditors to obtain international professional certificates. Fourth, train and support auditors to participate in advanced training courses. Fifth, use support programs so that auditors can make decisions. Sixth, build a process to evaluate the work results of auditors. Seventh, building processes for reviewing and reviewing organizations by hierarchical level.

Although the study still has limitations, with the conclusions that are somewhat relevant to the context of Vietnam's auditing activities, this research is expected to be a useful reference source for building solutions and policies and opening up more research directions in the future.

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# THE FEASIBILITY OF CENTRAL BANK DIGITAL CURRENCY (CBDC) IN VIETNAM

**Mai Truong Khanh Linh[1,*], Dang Quang Linh[1], Vu Van Duc[1]**

***Abstract:*** *With the rapid development of technology in banking industry, digital currencies have gained popularity worldwide. In almost all nations, central banks have begun in-depth analysis on the feasibility and suitability of issuing CBDC (central bank digital currency). However, there still remains a controversy about the need of CBDC. In this paper, we discuss the real situation of CBDC in various countries coming from the USA, the Europe, and Asia. Especially, we analyze both merits and demerits brought by CBDC issuance in Vietnam. After that, a few policy implications are proposed for the State Bank of Vietnam. Our findings suggest that it is feasible to launch CBDC in our country. However, the methods and schedule of testing and launching this fiat currency need being more thoroughly researched so as to avoid inverse or unexpected effects. This analysis is up-to-date and can serve as guidelines for the issuance of CBDC in Vietnam.*

***Keywords:*** *CBDC issuance, digital currency, central banks.*

## 1. INTRODUCTION

In recent years, central bank digital currency (CBDC) has been globally researched and developed for its benefits of helping both domestic and cross-border payments become safer and more cost-effective than paper money. According to the Bank for International Settlements (BIS) statistics conducted in 2021, developing and emerging countries are more involved in the promotion of retail CBDC than developed countries. Extant literature shows that in Asia, the leading countries for CBDCs include China, Cambodia, and South Korea (PwC Global CBDC Index report, 2021). Specifically, China's e-CNY, the most advanced CBDC model available today, has been researched since 2014, piloted to the public in April 2020 and put into operation in February 2022 with the organization

1 Foreign Trade University, Vietnam

* Corresponding author. Email: linhmtk@ftu.edu.vn

of the Winter Olympic Games; Cambodia is one of the first two countries (besides Bahamas) in the world to put CBDCs into use with the Bakong Project in 2020; and the Bank of Korea successfully completed the first phase of CBDC test in January 2022.

Unlike developing and emerging economies, developed ones are now focusing more on wholesale CBDCs applied among financial institutions and mainly used for interbank payments. Although no wholesale CBDCs have been completed so far, about 70% of wholesale projects have been piloted. According to the plan, the European Union (EU) is expected to announce the results of the use of CBDCs for international payments in 2022, and will have a conclusion on the digital EUR project in October 2023. In Asia, Hong Kong, Thailand, Singapore and Japan are collaborating on the Inthanon-Lionrock project, which will allow member countries to enhance their internal operations while promoting cross-border payments and transfers. In the US, the Federal Reserve is conducting a number of CBDC-related experiments which take into account a hypothetical CBDC (Federal Reserve, 2022).

As seen from above, a significant number of central banks worldwide have begun in-depth analysis on the feasibility and suitability of issuing CBDC, i.e. European Central Bank, Bank of Korea, the US Federal Reserve. Especially China, not only the world's second largest economy but also Vietnam's second largest export market, has come up with the most advanced CBDC model nowadays. Therefore, the influence of the e-CNY to Vietnam's economy in the long run acts as a motivation for Vietnamese policy-makers to have appropriate preparation to handle various situations.

In Vietnam, there have been certain policies and guidelines in promoting the application digital currency, which will be the premise for the development of CBDCs in Vietnam. In 2021, Decision No. 942 dated June 15, 2021 of the Prime Minister was issued, assigning the State Bank to research, build and pilot a virtual currency based on blockchain technology in the period of 2021-2023. Also in last year, a research group on virtual assets and virtual currencies at the Ministry of Finance was established, studying virtual assets and virtual currencies as well as international experience in related management and supervision activities.

At the same time, the Ministry of Finance is also conducting a study on "Building a legal framework for crypto asset management on Vietnam's stock market". Besides, young population, high Internet coverage, and the popularity of mobile devices in Vietnam are believed to serve as prerequisites for this country to achieve the success of CBDC in the near future. However, without solid legal framework, the feasibility of CBDC in Vietnam is still in question.

The rest of this paper is structured as follows: Section 2 presents some background information about CBDCs, Section 3 reviews the existing literature on the research topic, Section 4 discusses the pros and cons of CBDCs, and Section 5 highlights some concluding remarks.

## 2. BACKGROUND INFORMATION

### 2.1. Definition and classification of CBDC

In many countries nowadays, central banks are issuing a form of fiat currency, known as Central Bank Digital Currency (CBDC). This digital fiat currency or a CBDC is not backed by an underlying asset. It is issued in the form of a token and pegged along the issuing country's domestic currency.

Based on usage scenarios, CBDCs are classified into wholesale and retail CBDC. Retail CBDC is a digital cash equivalent that is primarily used by individuals and businesses when making payments. This type of CBDC can improve accessibility and usability, lower e-commerce and cross-border payment costs, and help to strengthen monetary policy. Wholesale CBDC is a new system for making payments between banks and other institutions directly related to the central bank. This second type of CBDC can enhance inter-bank settlements, mitigate risks and costs associated with cross-border transactions.

### 2.2. Participants

Central bank, commercial banks and end users are three main participants of the CBDC system. Central bank is in charge of setting monetary policy, ensuring smooth currency circulation. Commercial banks are intermediaries that connect central bank and end users. Finally,

end users are individuals or businesses who can make direct transactions in terms of both inter-bank and cross-border payments.

### 2.3. Application scenarios

There are two most popular scenarios where CBDC could be applied, namely domestic payments and cross-border payments. The first scenario's design is customized for domestic users as well as domestic payments, whereas the second is designed for cross-border payment systems.

## 3. LITERATURE REVIEW

### 3.1. CBDC in the USA

The Federal Reserve Bank of New York so far has not endorsed the creation of a CBDC but have put lots of effort into weighing the potential merits and demerits of creating one. On the upside, CBDCs offer faster payment options between nations as well as the provision of a secure, digital payment option for individuals and businesses in the evolving payments system. On the downside, there are concerns revolving around how to guarantee that a CBDC would not disrupt the status quo of the financial system while also providing useful additional payment options. Preserving citizens' privacy and continuing to fight illicit finance are two other vital policy considerations.

Until recently, there have been two opposite opinions on the CBDC development when the Fed asked for public comments in the paper "Money and Payments: The U.S. Dollar in the Age of Digital Transformation" in January 2022. PayPal, a proponent of CBDC issuance, stressed the importance of the United States in "taking a leadership role" in CBDCs and the possibility that "a digital dollar could be a logical next iteration to futureproof the U.S. dollar." Often advocates of CBDCs warn that if countries like China rapidly adopted digital currencies, the United States dollar's status as the world's reserve currency would be threatened. On the other hand, Visa, an opponent of CBDC creation, commented "The decision to introduce a central bank digital currency is not one that needs to be made hastily" and raised questions about the need of CBDCs.

All things considered, there are three major fronts that slow down the future development of a U.S CBDC. First, the policy-makers still debate on why it's needed, what it would do, and how it would look. Second, the technological aspects of implementing a brand new monetary system are extremely difficult to figure out. Third, as nothing happens in a vacuum, there is a controversy about how this fiat currency will affect other banking and payment systems. Despite its role in getting more banks to consider cryptocurrency, Meta's Novi crypto digital wallet will be discontinued in September 2022.

### 3.2. CBDC in the EUROPE

In the research paper "A digital euro for everyone: Can the European System of Central Banks introduce general purpose CBDC as part of its economic mandate?" (Mooij, 2022), the European Central Bank (ECB) has announced plans to launch a Central Bank Digital Currency (CBDC) that will be available to consumers via national central banks (NCB). Given the ECB's monetary mandate, the paper concludes that implementing such a system is not feasible. Direct access's mission is to help the unbanked become economically and socially integrated into mainstream society. It is a matter of economics, not money, that motivates this effort. The ECB's economic mandate necessitates that any such introduction be in line with that mandate. In the first section of this paper, titled "Legal foundation," the paper examines the basis upon which CBDC can be implemented. CBDC is found to be feasible for implementation on the basis of the ECB's legal tender issuing authority. The problem is that this wouldn't be a solid enough basis to guarantee easy access. And the ESCB's own governing document, Article 17, doesn't even provide a legal basis for direct access. To implement a CBDC system that gives consumers direct access, the ECB would need to draft new legislation. The ECB still has to follow its economic mandate, even with this new legal groundwork. In the "Framework" section, the author first assesses the breadth of the economic mandate. The purpose of the economic mandate is then elaborated upon in the subsequent "Aim" section. It concludes that the Treaties support efforts to bring the unbanked into the mainstream economy. Therefore, the goal of general purpose CBDC is in line with the ECB's mandate in economic matters. Next, the paper delves into the criteria for efficient resource

allocation in the "Efficient allocation of resources" section. It concludes that the widespread adoption of CBDC does not meet this requirement. The ECB is directly competing with commercial banks by introducing CBDC with direct access through NCBs. Since the ECB has the sole authority to issue legal tender and NCBs are publicly traded companies, the competition between them is unfair. Providing access to a bank account as a Service of General Economic Interest is not warranted in the European Union (EU) due to the small and shrinking unbanked population there. Therefore, it would be against the law to distribute CBDC for any purpose.

In another study "The Digital Programmable Euro, Libra and CBDC: Implications for European Banks" (Sandner, Schulden, Grale, Groß, 2020), there is a continuing shakeup in the established financial transaction infrastructure. Multiple new payment initiatives have been announced as a direct result of the growing worldwide trend toward digitalizing payments and creating new business models with the help of blockchain-based digital programmable money. Stablecoins, which are designed to be relatively stable, are gaining popularity alongside "traditional" cryptocurrencies. The Facebook-backed Libra stablecoin is widely regarded as a significant development in the financial industry following its announcement. Many governments and central banks are currently debating whether or not to issue their own digital currencies, or CBDCs. Since most initiatives have not yet been implemented, the implications of these new forms of payment have not been adequately discussed and analyzed from the perspectives of various sectors and industries. The effects of these innovations on the financial sector have not been thoroughly explored in the existing literature. By conducting in-depth interviews with more than 50 industry heavyweights, this paper provides valuable insight into how these payment initiatives are generally viewed. The effects of digital programmable Euro initiatives like the Libra stablecoin and CBDCs on financial institutions are examined here. It appears that European financial institutions may feel the effects of both Libra and a Euro CBDC. Financial disintermediation on a massive scale is a major concern for experts, as is the possibility of digital bank runs. Our research shows that despite these dangers, these initiatives may provide banks with a chance to create innovative new lines of business. Because of this, Libra and a CBDC Euro should be viewed as both threats and opportunities.

### 3.3. CBDC in the ASIA

Applying digital currencies, which have the support of central banks, is a new stage in the digital transformation of contemporary society. CBDCs will continue to advance, enhancing the functions of sovereign money and giving it additional capabilities like value storage and measurement as well as free convertibility in place of a single payment tool. The global financial system will unavoidably and profoundly change in many ways as society accepts CBDCs, including how individuals make their everyday payments, how society as a whole pays its debts, how commercial banks are organized, and even how the capital market functions. Countries taking the lead in CBDCs can maintain strong competitive advantages as the world's currencies go digital. CBDCs can strengthen diverse nations' financial software while advancing the internationalization of sovereign money.

In the Asia, some countries also have CBDC. According to Report of PwC (2021), about wholesale CBDC Japan, Hong Kong, Thailand and Singapore are in the top countries that have the most mature project. Meanwhile China, South Korea, and Cambodia stand on top ten most mature CBDC projects.

In between Asia countires, Cambodia has the highest retail project maturity index. Kita, Y et al said that Cambodia issues CBDC (named Bakong) as an action to prevent dollarization process. In this country, dollarization occurred from 1975, and until 2020, dollar was still dominantly used in Cambodia. The issuance of CBDC in Cambodia is an effort of Cambodia gorvernment to de-dollarization. To ensure the use of domestic CBDC, Cambodia has also enacted regulation on using their own CBDC as unit of account to stimulate use of domestic currency. Furthermore, according to Article 7 of the Law on the National Bank of Cambodia, which defined the functions of the central bank: "to oversee payment systems in the Kingdom and to enhance interbank payments". Those action could also be applied to prevent foreign CBDC becoming the main currency domestically used (Kita, Y., et al 2020). In Cambodia, the model of CBDC is indirect CBDC. The central bank of Cambodia issues Bakong through banking system. In this model, the intermediaries will conduct "know your customer" and interact with end-users in every retail

payment. This model could bring the benefit of reaching citizens thanks to the banking system. Consequently, the new CBDC reached about 7.9 million people, that is nearly half the number of country's population (Nikkei Asia 2022). After all, there is a clue that that Cambodia faced the pressure of dollarization and this is a big motivation for them to issue retail Bakong early.

The RMB has come under fire, not only in Cambodia but also in China, for not being able to freely trade and convert on the global market. The digital RMB will become more competitive at the levels of an international or reserve currency as its development is accelerated. Therefore, there is an anticipate that CBDCs will have a substantial local and global impact on the sector's rivalry for payments and fintech in China. According to Martin Chorzempa (2021) for years, the People's Bank of China has been at the forefront of CBDC research, and it was one of the first central banks to announce that it intended to introduce its own CBDC. Following a speculative boom in which Chinese demand for Bitcoin triggered a global increase in its value, it established a specialized research team to concentrate on digital currencies. Due to Bitcoin's popularity there in 2013, many people wondered if China would be the first nation where it may become a widely utilized means of exchange, which was risky for the PBOC given that it would limit its capacity to enact monetary policy. Chinese authorities swiftly recognized the negative effects of unregulated digital currencies, including capital flight, tax evasion, and risks of financial instability due to Bitcoin's wildly fluctuating prices. As a result, in December 2013, they put in place strict regulations to reduce any potential threat Bitcoin might pose to China's financial system or the RMB's status as the country's sole currency. But there was no denying the potential of the technology, which included distributed ledger technology (DLT) and blockchain for money and payments, and it merited more research. A CBDC launch, which the PBOC said would be of "deep historical significance," was publicly announced by the organization less than two years after its study got underway (People's Bank of China, 2016). China assigned its research team the job of getting ready to "launch the CBDC shortly". The statement outlined a long list of benefits that a CBDC would bring, including financial inclusion, more efficient payments, lower costs associated with issuing and managing paper cash, increased control over the money supply for the PBOC, and a decrease

in criminal activity like tax evasion and money laundering. Intriguingly, the statement did not mention a single potential danger or disadvantage of establishing a CBDC, in contrast to comments made shortly after by senior Federal Reserve officials. In 2017, the PBOC increased its research efforts to create the CBDC, eventually referred China as DC/EP for "digital currency/electronic payment", and increased its influence over other digital currencies. Initial Coin Offerings, often known as "ICOs", which promised to sell freshly created digital currencies to speculators, were on the rise at the time, signaling the second big worldwide wave of cryptocurrency speculation. Prices for Bitcoin and Ethereum were skyrocketing. The PBOC and other regulators swiftly outlawed initial coin offerings in one of the strictest regulatory approaches ever, and shortly after, they expelled cryptocurrency exchanges that made digital currencies available to the general public from the nation. This made it clear that only digital currencies issued or effectively regulated by the PBOC could circulate in China. Because it had invested years in research, was committed to developing its own digital currency, and had finished internal experiments, the PBOC was in a far better position to respond to Libra than other central banks. Mu Changchun, then the deputy director of the PBOC's payment and settlement department, declared that DC/EP was "almost ready" at the time, indicating that China was not lagging Facebook in the race for digital currency dominance, while others rushed to form research groups (Mu 2019). In China, the distribution of CBDC is through indirect mechanism. With this mechanism, the PBOC will distribute their CBDC to banking system. Then the commercial banks will re-distribute currency to the citizens. This process could also allow consumers to exchange coins and cashes for digital yuan. This distribution method is like the one that used in Cambodia to distribute CBDC and it also take advantage of banking system to quickly spread CBDC to the citizens.

The Thai government has also made wholesale CBDC available and is getting ready to launch retail CBDC. While conducting Proof-of-Concept Retail CBDC testing with corporations, they also broaden the scope of the project to include a pilot phase in which real-world Retail CBDC applications will be carried out in collaboration with the private sector on a small scale. In order to develop pertinent policies and enhance the CBDC design going forward, the BOT will evaluate the advantages and

associated risks from the Pilot. According to BOT Press Release (2022), the pilot of retail CBDC will be separated into two tracks: foundation track and innovation track. During the foundation track, CBDC will be used to undertake cash-like activities, such as paying for products and services, in constrained spaces and on a small scale with about 10,000 retail customers and three enterprises chosen by the BOT. This phrase is scheduled between the end of 2022 to the middle of 2023. In the innovation track, they will focus on software to put an emphasis on programmability, which will make it easier to create creative use cases for CBDC and lead to new financial services for a variety of consumers. This will assist the BOT in the future as it develops and enhances the CBDC design to fit the Thai context. They also hold a hackathon to stimulate creation and innovation. As they are now in the innovation track, they still have not had the distribution model of their own CBDC as in Cambodia and China. However, they may choose indirect distribution model as Cambodia and China to take advantages of the commercial bank systems.

There is a lot of benefits that CBDC brings to an economic. CBDC, if properly managed, may help to increase macroeconomic stability. According to Shenwei and Hengwang (2021), if managed effectively, CBDC's efforts to integrate digital currencies into the financial system could advance financial inclusion. In order to establish highly focused monetary interventions in a national economy, governments could introduce "new monetary policy levers" and "currency with time limits or other spending requirements (e.g., mandatory expenditure on durable goods)" to address this issue. A CBDC may, depending on how it is created, loosen some restrictions on conventional monetary policy and provide "an official electronic payment system" that all participants in the economy can use. Through CBDC, the PBOC appears to be working to increase the effectiveness of its monetary policy while "drawing out a more comprehensive image of all persons and enterprises throughout China." The design of CBDC's issuance (which incorporates four contingencies of time, sector, loan rate, and return, which are to be set by its issuing institution), activation of CBDC, return of CBDC, and forward determination of CBDC issuance volume, among others, could increase the effectiveness of monetary policy. As previously indicated, it is asserted that the issuing of CBDC, in conjunction with an adequate monetary framework, can provide price stability. Through

more precise calculation of some metrics (such as inflation rate and other macroeconomic indicators) and real-time monetary flow data collecting as the reference for policymaking, China's CBDC may assist the PBOC in designing, implementing, or even optimizing monetary policy.

Besides benefits, CBDC could hide a lot of potential risks. The monetary policy, cash flows, financial stability, and consumer protection in the financial sector are all impacted by the interaction between digital currencies and the banking industry. These are important topics. For instance, central banks pay close attention to risks associated with monetary policy activities. Among the most crucial problems of macroeconomic instability are the effects of digital currencies on banks (such as banking disintermediation and defunding) and monetary control. Financial Market Infrastructures (FMIs) that support clearing, settlement, and recording of financial transactions would be broadly speaking affected by digital currencies. For instance, CBDC is a FMI administered by a central bank. As a result, when a country decide to apply CBDC, it has to base on researches its own conditions.

## 4. DISCUSSION

### 4.1. The current situation of central bank digital currency in Vietnam

While other nations are hurrying to study and test CBDCs, Vietnam appears to be dragging its feet when it comes to studying and legalizing money and digital assets.

The first mention of the development of a legal framework for virtual currencies and cryptocurrencies was in Prime Minister's Decision 1255/QD-TTG on August 21, 2017, approving the project to complete the legal framework for the management and handling of virtual assets, cryptocurrencies, and virtual currencies. However, after that, Vietnam did not take any meaningful move aside from the State Bank's news release on efforts to tighten control over virtual currency transactions and operations (Directive 02/2018/CT) - SBV). The Prime Minister's 15 June Decision No. 942 assigned the State Bank the responsibility of researching, developing, and piloting a virtual currency based on Blockchain technology between 2021 and 2023.

There were some essential points related to the CBDC in this decision. Firstly, the government must build all safe digital policies. Moreover, the operational model must be developed and operated using data and digital technology. The state can deliver better services, make choices promptly, and issue better policies. As a result, resources will be utilized more efficiently to foster development, guide the country's digital transition, and solve significant difficulties in socioeconomic development and management. Secondly, State-driven data is the new source of information. An open governmental institution that offers data in support of the growth of digital government, digital economy, and digital society. State agencies connect and share data so that citizens only need to declare and supply their information once to state agencies and important public service providers. The Prime Minister's 15 June Decision No. 942 aims for some particular results: creating a digital infrastructure based on a system of national scope and enhancing the legal framework about digital assets. A Research Group on digital assets and digital currency was established at the Ministry of Finance last year to study digital assets and digital currencies, as well as worldwide experience with associated management and supervision operations. Simultaneously, the Ministry of Finance has been researching "Building a legislative framework for handling digital assets on the Vietnamese stock exchange".

Besides, a crucial factor promoting the necessity of issuing Central Bank Digital currency is the investment demand in the cryptocurrency market of citizens. Kyros venture's research with 1059 observations who are crypto investors reveals the primary timeframe of respondents engaged in the bitcoin market. In 2020, 19.4% of respondents would have entered the cryptocurrency market, but less than 10% did so before 2020. In particular, approximately 60 percent of respondents joined this market in 2021, when the Ministry of Finance launched the study group on digital assets and digital currency. Specifically, Kyros report also mentions the level of consideration when surveyees tend to invest in crypto market. 61.7 percent of interviewees spent much time on investing in crypto market than in their official job. Just 12.4 percent consider crypto investment as their full-time job. Telegram and Twitter are the two most used social networks to follow the market and acquire crypto knowledge, respectively accounting for 90% and 77% of all the mentioned channels.

Another foundation that promotes the issuing of Central Bank Digital currency is the creation of Vietnam Blockchain Association on May 17th, 2022. The association was founded according to Establishment Decision No. 343/QD-BNV issued by the Ministry of Home Affairs on April 27th, 2022. The Charter and Operational Orientation for the period 2022-2027 were unanimously approved by the General Meeting. Specific objectives include membership expansion, the establishment of membership standards, promotion of collaborative applications, promotion and dissemination of information, policy input, and international cooperation.

### 4.2. The benefits of issuing central bank digital currency in Vietnam

From a management standpoint, CBDC can assist the state in controlling in-depth the spending activities of individuals and enterprises. Because there are numerous parties in agreement, the government may swiftly uncover illegal acts, fraudulent activities, and tax evasion while maintaining the regulatory agency's transparency. Not only does the state earn the public's trust, but it also prevents losses from fraudulent activities, tax evasion, and money laundering.

Central Bank digital currency is also a supportive tool to limit corruption in Vietnam. Particularly, the Blockchain technology base of CBDC makes all money transactions become transparent. Blockchain will essentially enable the government to migrate from centralized to decentralized data storage. The modification resolves the core issue. This right to alter, self-determination, can no longer exist in the "dark." Blockchain data will serve as a single "source of truth." Corruption happens when the system lacks openness and the person in charge has easy access to the records. The data will be distributed by various validators using a distributed ledger paradigm. This helps increase the government's spending transparency. Any revenue can be properly tracked, regardless of size. Thus, informal transfers are immediately identifiable, particularly when data is linked with the banking data system.

CBDC gives a wealth of information regarding the transactional behavior of individuals. And with this information, the government can alter its monetary policies more rapidly. Prevent the effects of waste and loss. The data that CBDCs provide is so crucial that it may be considered "its own secret".

If the CBDC is constructed with a solid infrastructure, it will be possible to encourage synchronous and frictionless transactions not only within the nation but also across nations (as the G20 summit is discussing). In this regard, the CBDC serves as a means for Vietnam to increase its influence. China is conducting CBDC tests in Thailand, Hong Kong, and the UAE. From there, they increase their economic influence to neighboring nations. Additionally, the CBDC will assist Vietnam in escaping the large shadow of foreign currency from major economies.

### 4.3. The drawbacks of issuing central bank digital currency in Vietnam

Along with the advantages of CBDC, there are some cons that need to be considered related to financial failure, systematic risk, and negative effects on citizens.

To completely replace paper currency with CBDCs will require a substantial amount of time. It must be established that CBDC exists alongside paper currency. Perhaps we should not forget the 2003-coin release debacle. On December 7th, 2003, the State Bank (SBV) officially issued coins in 5 denominations 200, 500, 1,000, 2,000, and 5,000 dongs. Coins of 200, 500 dongs are made of nickel-plated steel; types of 1,000, 2,000 copper-plated steel and gold; only 5,000 bronzes made of copper, silver, and nickel alloys. According to the State Bank of Vietnam, the issuance of metal coins aims to perfect the structure of the face value of metal coins in accordance with the requirements of monetary circulation. The reason for issuing coins is towards the goal of installing vending systems such as soft drink vending machines, telephones, ticket vending machines, etc. The failure of the coin issuance policy is caused by the fear of using coins of a part of Vietnamese people because it is easy to lose and lose during use. In addition, the coin also "died prematurely" due to the rapid devaluation of VND from 2003 to 2010, while the coin unit was small and unsuitable for consumption. In 2019, the Vietnamese Labor newspaper published the article: "More than 601 tons of scrap metal coins after destruction were auctioned by the State Bank". With a starting price of over 48 billion VND, the SBV expects to auction scrap metal coins with an average worth of 80,000 VND per kilogram after destruction. The price excludes value-added tax, loading and unloading fees, and seller-provided transportation.

Secondly, the technology factor related to the Blockchain base also needs to take into consideration. A blockchain-based CBDC relies on the design and programming skills of the developer. Therefore, any error that makes a developer vulnerable will also have unforeseeable national repercussions. Besides, the privacy problem of the Blockchain base also creates a barrier to the issuance of CBDC. The fact that anyone may download the full blockchain and mine cryptocurrency is one of the numerous benefits of the public blockchain, which has become synonymous with transparency and democracy. Public blockchains are resistant to hacker assaults. Additionally, blockchain technology can be utilized as a storage media. Implementing a private blockchain is the correct course of action if an organization or corporation does not wish to reveal the complete blockchain's information and wishes to dig out and confirm it on its own. With a private blockchain, a high number of nodes will be private, as opposed to the thousands of nodes in a public blockchain's dispersed network. Therefore, the private blockchain will be more resistant to attacks and fraud. Nonetheless, it lacks the transparency, exposure, and widely distributed benefits of a public blockchain - the fundamental concept that makes blockchain technology so outstanding and innovative. Therefore, to balance between the privacy of users and transparency is a national dilemma.

### 4.4. Recommendations for issuing Central Bank Digital currency in Vietnam

First and foremost, CBDC must be categorized based on the purpose of the Government. CBDC includes two main types: "wholesale CBDC and retail CBDC. Wholesale CBDCs would primarily be utilized by financial institutions such as banks. The use of CBDCs would allow banks to make payments in a quicker and more automated manner. Cross-border transactions may become faster and more reliable. In their current form, payment settlement systems work in single jurisdictions or with a single currency. Utilizing blockchain technology could potentially make transactions quicker, smoother, and more reliable. Retail CBDCs would primarily be utilized by individuals. People could use them essentially as digital cash, with the comfort of knowing that the currency is issued and backed by the country's central bank. This innovation could potentially replace the need to carry physical currency and reduce economic rents associated with transacting in the legacy financial system."

Due to the investment demand and government orientation, the most optimal way is to issue simultaneously wholesale CBDC and retail CBDC. While the former is a helpful tool for the government to control digital assets, the latter supports the citizen interest. To conduct the issuing thoroughly, the process should include two main steps. At first, the Vietnamese government must build and reinforce its own blockchain network. Initially, the foundation of Vietnam blockchain association performs the long-term strategic vision of the authorities. The stabilization of a blockchain network may take several years. The parties that participate in this network are subject to government guidance and decision. Third parties might consist of private companies, individuals, regulatory bodies, and government entities. In other words, the state constructs its own "consensus mechanism" directly in this blockchain. In addition, the government will adopt the international standard so that this blockchain can be connected globally. After that, several educational programs should be implemented so that people may comprehend the significance and benefits of CBDC. All sections of the country must have access to high-speed internet in order to complete this task. Besides, the subjects and knowledge related to Blockchain and Central Bank Digital currency need to be popularized in the universities. This is a vital step for people to simultaneously use CBDCs with ease.

## 5. CONCLUSION

In Vietnam, it is feasible to launch CBDC. Yet, the method and schedule of testing and launching this kind of currency need more carefully researches to avoid inverse effects.

To carefully launch a CBDC, we could separate the path to retail CBDC into smaller paths. First, we need to design the law and technology bases for CBDC. This step has to be carefully done. We need to ensure the domestic CBDC will become the main payment means, not the foreign CBDC. Furthermore, which mechanism to enact and run monetary policy also has to be take in to account. Then we could try to test wholesale CBDC with the small sample to consider the effects of the CBDC. If the results are acceptable, we could continue next steps to approach retail CBDC.

Another method could be used in the path of launching CBDC is sandbox. Sandbox is a framework set up by a regulator that allows new fields, ideas, innovations to be tested live in a controlled real environment under supervision of the authority. These tests, in addition to helping new fields to be practically approached and quickly developed, also help regulators to make reasonable regulations when deciding to allow fields, activities or ideas, only if the new idea is acceptable, it could be put into practice. Applying sandbox could help the authorities to identify the advantages and disadvantages of a new field or idea, thereby making the best regulations for management and at the same time helping for a new field of practical access and faster development.

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# THE IMPACT OF DIVIDEND POLICY ON STOCK PRICE OF COMPANIES LISTED ON THE VIETNAM STOCK MARKET

**Manh Hung Pham[1,*], Nhat Minh Nguyen[1], Van Ha Le[2]**

***Abstract:*** *This paper explores the impact of dividend policy on the stock price of companies listed on the Vietnam stock market. By using the fixed-effect model combined with the panel data of 68 companies in the VN30 group listed on the Ho Chi Minh Stock Exchange (HOSE) from 2012 to 2021, the results show that: the dividend policies do not influence the stock prices of VN30 companies in the HOSE stock market. Whereas, firm size, profitability ratio and consumer price index have a significant impact on stock price. Based on the research results, this paper recommends some policies to improve the dividend payment efficiency of Vietnamese enterprises.*

***Keywords:*** *Dividend policy, stock price, Vietnam.*

## 1. INTRODUCTION

In the context of the current developing economy, the dividend policy needs special attention to contribute to the evaluation of the company's financial performance in Vietnam. Dividend policy is related to shareholders' future earnings growth and shareholders' real asset values. This not only directly affects the interests of shareholders but also requires corporate managers to consider the planning of dividend policies following each specific period. In addition, managers also have to consider the effect of dividend policy on stock price. Changes in market prices are one of the criteria for determining a company's level of risk. Therefore, controlling the dividend policy becomes significant because it can influence the market value of the firm.

The relationship between dividend policy and stock prices has been demonstrated by several scholars around the world. Under efficient

[1] Research & Consulting Division, Banking Research Institute, Banking Academy, Vietnam
* Corresponding author. Email: hungpm@hvnh.edu.vn
[2] International Bachelor Degree Program, National Economics University, Vietnam

financial market conditions, Miller and Modigliani (1961) demonstrated that there is no causal relationship between business value and dividend policy. Meanwhile, Gordon (1959) argues and illustrates that stock prices and dividend policy have a connection. Following that, numerous studies on various market contexts were conducted, such as the reports of Litzenberger and Ramaswamy (1979), Allen and Rachim (1996), and Peixin et al (2013). Nevertheless, each study has reached inconsistent judgments concerning the influence of dividend policy on a company's stock market value. Based on the observations of previous studies, many factors affect stock prices and dividend policies are just one of them. Several factors to consider are the development of the market economy, the political situation, and the psychology of investors.

In addition, in the context of the Vietnamese market, managers' primary concerns are always dividend policy and stock value. Many authors have published analyses that address the relationship between these two aspects, but all the results also show opposite meanings. According to research by Vo (2014), stock price change has a constructive association with dividend payout ratio and inversely with stock return. Consequently, the dividend policy has the opposite sign on the company's stock price. On the other hand, the analyses of Dang and Pham (2015) concluded that dividend policies have a positive relationship with company market value. The results of this paper can provide practical evidence to clarify the unique association between these factors and give some implications for financial management issues with enterprises.

Moreover, while studies in Vietnam only focus on dividend payment policies of separate industries such as banking, construction, and mining, etc. this paper explores the impact of dividend policy on stock price of 68 companies in the VN30 group listed on the Ho Chi Minh Stock Exchange (HOSE) Vietnam. VN30 is a group of 30 stocks listed on HoSE with the highest market capitalization and liquidity. Therefore, the research sample of the paper covers many industry groups and is representative of the Vietnamese stock market. Besides, this paper provides a new contribution to fill the time research gap of Vo (2014), Dang and Pham (2015). Based on the research results, this paper recommends some policies to improve the dividend payment efficiency of Vietnamese enterprises.

## 2. LITERATURE REVIEW

### 2.1. Theoretical background

#### *2.1.1. Overview of Vietnam's stock market*

The stock market is no longer a strange concept today. Stock represents the ownership of a business in this market and is listed on a public stock exchange or shares that are not publicly traded. In this market, buying and selling transactions and each activity plays an important role in the country's economy. There are three main listed financial markets in Vietnam: HOSE, HNX, and UPCOM. As of the end of 2020, the Vietnamese stock market has more than 1600 enterprises listed on all three markets and the total market capitalization is 84% of GDP.

After nearly 25 years of development, Vietnam's stock market has made many great contributions to the country's macroeconomic activities and become an important mobilization source of capital for businesses. It's worth noting that the scale of capital mobilization in Vietnam from 2011 to 2020 was almost 2.9 billion VND, which is nearly ten times greater than the preceding ten years (The Ministry of Finance Vietnam). In addition, the Vietnamese market also shows its strong attraction to potential investors both at home and abroad. According to recent reports, the number of investors participating in the transaction will have increased by one million by 2021. As a result, domestic investors' total assets reached nearly 3.8 million application positions, outnumbering more than 3% of the population.


**Figure 1. Size of Vietnam's Stock Market Capitalization**

Although the Covid-19 pandemic has brought significant challenges to the Vietnamese economy, Vietnam's stock market is still developing continuously and the market's liquidity is still over 1 billion USD per session. The stock market in Vietnam is regarded as one of the ten most resilient in the world. This paper will focus on discussing issues related to stocks and analyzing the increase or decrease in share value before the change of dividend policies at listed companies in the Vietnamese stock market.

### *2.1.2. Dividend and dividend policy*

The dividend is defined as the net profit paid per share in cash or other assets from the company's retained earnings after fulfilling its financial obligations. According to Olimalade et al. (1987), dividends are considered a cumulative cash flow for equity investors. This was created to help to strengthen investors' confidence in the company's future. Dividends are usually paid monthly or quarterly in the form of cash or stock.

The dividend policy represents the decision between distributing profits to shareholders versus retaining profits for further investment in the company. This is considered a rule for a company to use to decide to pay dividends to their shareholders (Nissim and Ziv, 2001). In particular, the balance between paying dividends to shareholders and retaining reinvested profits for the company is always a top concern of managers. These policies not only directly affect the asset value of shareholders, but also show signs of information about the performance of companies to the external market.

Analyzing a business's dividend is through its dividend payout ratio and its dividend-to-share price ratio. The dividend payout ratio is computed as a proportion of a business's net income divided by the total amount of dividends distributed to shareholders. Besides, the dividend yield is a metric that depicts the link between the dividends paid to investors and the market price of the stock they purchased.

There have been many diverse pieces of research related to the factors affecting dividend policies. Aivazian et al (2011) observed and argued that there is a positive relationship between firm size (illustrated by the debt-to-equity ratio) and cash dividend payment. This paper also demonstrates

a positive correlation between profitability and the cash dividend payment ratio. In addition, companies with high profitability tend to boost their dividend payout ratio (Lintner, 1956). The growth rate of the business (represented by the percentage of retained earnings) is also one of the notable factors when companies with high growth rates have lower cash dividend payout ratios than companies with low growth rates. Furthermore, highly liquid companies pay higher cash dividends than illiquid companies (Jensen, 1986). An optimal dividend policy plays a very important role in corporate finance and is the goal of any manager to increase the value of the company. Thus, there have been many different studies in the world that provide factors affecting dividend policy and most of the results are consistent with the proposed hypotheses.

#### *2.1.3. The variation of stock price*

The market price of shares is determined and measured by the share price obtained from the results of trading orders. Stock prices are influenced by many factors from all markets, both micro and macro factors in each specific period. Accordingly, when the demand for a stock is low, its price will fall. Conversely, when the demand for the stock is more than the seller's, the price of the stock will increase. This also means that the higher the stock price tends to move up, the greater the risk, and investors need to estimate future movements. Therefore, one of the main causes of stock price depends on the needs of sellers and buyers. Additionally, the volatility of stock prices is related to the size of changes in the value of a security. For high price change, a security's value is likely to be distributed over a more extensive scope of values.

According to the Fidelity International article, many factors have been discovered to be the driving factors for stock price movements in the current economy. The first is about political and economic factors; any insights from the above activities can greatly influence investors' reactions and share prices in the stock market. Additionally, each industry and field of companies have different changes in each event. This means that stock values can also move in different directions when crashes occur. For businesses, both positive and negative performance is the driving force behind the rise or fall of their stock prices. Moreover, investors' expectations about the performance of a company's business operations

and profitability in the future will be reflected in the market value of the share (Orăștean et al, 2018). As a result, investors can find an option that is right for their needs and expectations for the stock they buy in the future.

### 2.2. Empirical evidence of the relationship between dividend policy and the variation of stock price

Many authors have shown that payouts of companies are unrelated to stock prices. Firms withholding earnings or issuing dividends do not influence the value of their firms (Miller and Modigliani, 1961). This result is based on the assumption that there are no taxes or transaction fees, and the investor is reasonable and certain of future profits. In 1974, Black and Scholes investigated the link between dividend policy and the returns investors received after adjusting for risk and taxes on the New York Stock Exchange for the period 1936 to 1966. As a result, there is no relationship between these two variables when using the research model of asset pricing (Black and Scholes, 1974). Hakansson (1982) also supports Miller and Modigliani's theory on the connection between dividend policy and stock value when investors have homogenous beliefs and fully efficient financial markets.

Another hypothesis supported by many authors is that dividend policy has a universal impact on the change in stock value. Lintner (1956) made his case when representing his model. Accordingly, he presented a model of the yield on special instruments that could have a fixed dividend. In 1962, Gordon further supported this when he proposed a model that assumed a company's stock price was affected by the distribution of profits to dividends and retained earnings for reinvestment. Notably, other authors also believe that the stock policy will maximize the value of the company, they will make suggestions about paying high dividends for that company and vice versa. Dividends outperform retained earnings in terms of investor value (Graham et al, 1962). There are two reasons to support this: cash dividends are less hazardous than capital, and investors appreciate the stock value of companies with high cash dividend policies. On the other hand, dividends also provide information and signals to investors. From the analysis results of persuasive signals, investors can collect information about potential companies in the future and make official decisions that indirectly affect the company's value field (Healy and Palepu, 1988).

Dividend policy has been analyzed for decades but is not widely accepted and explained to companies about dividend behavior. Earnings volatility, firm size, debt, and growth all have a significant influence on the variation of stock price and dividend yield (Baskin, 1989). This means that stock price movement is related to changes in earnings and has an impact on the company's effective dividend policy. Moreover, the stock prices of small firms will be more volatile than large firms because of the diversification of huge firms (Baskin, 1989). In 1996, Allen and Rahim did research on dividend policies in the Australian stock market. They found that stock price changes in this stock market tend to increase as dividend payouts decrease. In addition, they demonstrate that measures of corporate financial leverage and the variation of the stock price in shareholder wealth are positively related to stock value. In particular, this study also shows that the important determinant of stock price variation is the payout ratio. On the other hand, a change in dividends can also be a positive signal for the business in the future (Amihud & Murgiaa, 1997). In other stock markets like China, cash dividends have also been shown to have a positive consequence on firm value, and the opposite is true for stock dividends. It is particularly shown that mixed dividend policies will have a stronger impact than individual policies (Peixin et al, 2013).

In Vietnam, many papers on the impact of dividend behavior on the market price or value of bonds have been published, but studies have not provided details on classical policies and other factors that influence different policies. Vo (2014) analyzed the impact of stock split announcement and trading volume by looking at extraordinary earnings and stock calculations around the announcement date. The results showed that the stock has a lot of volatility, and liquidity also improved after the split announcement. Moreover, the dividend payout ratio has a significant impact on the variation of stock price, while dividend yield has the opposite effect. Dang and Pham (2015) found a positive relationship between dividend yield, dividend payout ratio, and market value performance. Additionally, dividend policy and stock value are analyzed based on some control variables introduced by the authors. In which, firm size hurts stock price, whereas the leverage ratio has a favorable impact on stock price. Phan and Nguyen (2017) found a negative relationship between dividend yield and mineral companies' stock value. However, studies in Vietnam

only focus on dividend payment policies of separate industries such as banking, construction, and mining, etc. this paper researches the impact of dividend policy on stock price of 68 companies in the VN30 group listed on the Ho Chi Minh Stock Exchange (HOSE) Vietnam to provide comprehensive assessments as well as a new contribution to fill the time research gap of previous research.

## 3. DATA AND METHODOLOGY

### 3.1. Data sources

The panel data is collected from the financial statements of 68 companies listed on HOSE in Vietnam. The collected sample includes data for 10 years, from 2012 to 2021 with two periods per year (semi-annual data). The 68 selected companies are in the VN30 group - the group with the highest capitalization index and liquid index in the HOSE market and all information in the company's financial statements has been audited. The companies in this group operate in a wide range of industries and the list of VN30 is updated twice a year, in January and July respectively. As a result, the study's main data collection is updated semiannually with a 10-year interval, commencing in 2012 and ending in 2021. Consequently, some companies will not appear regularly in the group, but instead data from other companies. Besides, the company's stock price is taken from the Viet stock website - the leading reputable securities investment information channel in Vietnam. The GDP growth rate and CPI rate are gathered from the General Statistics Office of Vietnam. Thus, the data is processed through Stata to observe the impact of dependent and control variables on stock prices.

### 3.2. Methodology

The models implemented in the research are the fixed effects model and random effects model accompanied by efficiency test methods. The dependent variable in the model is the logarithm of the stock prices of the companies. Based on previous papers, the independent variables are dividend payout ratio and dividend yield, respectively. Likewise, several control variables are listed to increase the hypothesis's reliability such as firm size (SIZE), asset growth coefficient (GROWTH), profitability

ratio (BEPR), and financial leverage (DEBT). This paper also uses two macroeconomics factors: GDP growth rate and CPI as control variables.

**Table 1. Summary of Variables**

| Independent variables | Unit | Formula | Related studies |
|---|---|---|---|
| Stock price (SP) | | $SP = Log(Share\ price)$ | Lintner (1956); Gordon (1962); Baskin (1989); Peixin et al (2013); Vo (2014); Dang and Pham (2015) |
| Dividend yield (DY) | % | $DY = \frac{Annual\ Dividens\ per\ share}{Current\ share\ price}$ | Baskin (1989); Rashid & Rahman (2008) |
| Dividend payout ratio (DPR) | % | $DPR = \frac{Divident\ per\ share\ (DPS)}{Earning\ per\ share\ (EPS)}$ | Baskin (1989); Shad and Noreen (2016); Wild et al (2007) |
| Firm size (SIZE) | | $SIZE = Log(Total\ Assets)$ | Aivazian et al (2003); Ho (2003); Baskin (1989) |
| Asset Growth (GROWTH) | % | $GROWTH = \frac{Total\ Assets_t - Total\ Assets_{(t-1)}}{Total\ Assets_{(t-1)}}$ | Baskin (1989), Allen and Rachim (1996), Sadiq et al (2013) |
| Profitability Ratio (BEPR) | % | $BEPR = \frac{Profit\ before\ tax}{Total\ Assets}$ | Lintner (1956)' Aivazian et al (2013); Rehman Takumi (2012) |
| Financial leverage (DEBT) | % | $DEBT = \frac{Long-term\ debt}{Total\ Assets}$ | Aivazian et al (2003); Bradley et al (1998) |
| Gross Domestic Product growth rate (GDP) | % | $GDP = \frac{GDP_t - GDP_{(t-1)}}{GDP_{(t-1)}}$ | Adaramola (2011); Eita and Joel Hinaunye (2012) |
| Consumer Price Index (CPI) | % | | Eita and Joel Hinaunye (2012); Nguyen and Nguyen (2013) |

The model is specified as follows:

$$SP_{it} = \beta_0 + \beta_1 DY_{it} + \beta_2 DPR_{it} + \beta_3 SIZE_{it} + \beta_4 GROWTH_{it} + \beta_5 DEPR_{it} + \beta_6 DEBT_{it} + \beta_7 GDP_t + \beta_8 CPI_t + \varepsilon_{it}$$

Where:

$SP_{it}$ is Logarithm stock price of the company i for period t

$DY_{it}$ is Dividend yield of the company i for period t

$DPR_{it}$ is Dividend payout ratio of the company i for period t

$SIZE_{it}$ is Size of the company i for period t

$GROWTH_{it}$ is Assets growth rate of the company i for period t

$BEPR_{it}$ is Profitability ratio of the company i for period t

$DEBT_{it}$ is Financial leverage ratio of the company i for period t

$GDP_{t}$ is Gross Domestic Product growth rate for period t

$CPI_{t}$ is Consumer Price Index for period t

$\varepsilon_{it}$ is the error term

## 4. RESULTS AND DISCUSSION

### 4.1. Descriptive statistics

**Table 2. Descriptive Statistics**

| Variables | Observations | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| SP | 600 | 9.985 | 0.929 | 7.438 | 12.460 |
| DY | 600 | 3.993 | 5.969 | 0 | 43.8 |
| DPR | 600 | 30.528 | 120.418 | 0 | 736.92 |
| SIZE | 600 | 10.531 | 1.678 | 7.43 | 18.47 |
| GROWTH | 600 | 7.144 | 14.754 | -44.9 | 144.5 |
| BEPR | 600 | 1.991 | 2.184 | -1.9 | 10.61 |
| DEBT | 600 | 58.685 | 43.304 | 3.97 | 939.27 |
| GDP | 600 | 5.572 | 1.552 | 2.58 | 7.08 |
| CPI | 600 | 3.824 | 2.181 | 0.19 | 6.81 |

*Source: Authors' calculation.*

The results in table 2 indicate that the logarithm of the average share price of firms in the VN30 group from 2012 to 2021 is 9.985, of which the log of largest price is 12.460 and the log of smallest price is 7.438. The maximum value of the variable P 1.675 times the minimum value has shown a significant difference in stock prices between companies and the trend seems unstable.

Furthermore, the average dividend yield and the average dividend payout ratios are 3,993% and 30.528%, respectively. While the standard deviation of dividend yield is 5.969%, the standard deviation of dividend payout ratio is very high at 120,418%. It can be seen that the difference between the minimum and maximum value of the dividend payout ratio is very large. Some companies have good business results with very high dividend yield (43.8%), the largest dividend payout ratio is also 736.92%. On the contrary, some companies do not pay dividends and do not achieve good business results leading to losses with no dividend payout ratio.

In addition to the large distance between the independent and dependent variables, the descriptive statistics results of the control variables also show a considerable variation trend. Accordingly, the average size of companies in VN30 is about 10,531, in which the largest and smallest values are 7.43 and 18.47 respectively. In particular, the asset growth coefficient and profitability ratio of some companies also reached negative values means that their business performance is not good in several periods. The minimum asset growth and return ratios are -44.9% and -1.9%, respectively. On the other hand, the leverage ratio of companies in 10 years tends to be very volatile. On average, the leverage ratio is 58.685% where the difference between the smallest and the largest ratio is up to 236 times.

Compared with other variables, the control variables related to macroeconomics tend to be more stable when the values do not differ too much. Due to a lot of impacts of the Covid-19 epidemic, the economic growth rate decreased quite a lot. However, the average GDP growth rate in the past 10 years is still 5.572% while the average rate of CPI is 3.824%.

**Table 3. The Pairwise Correlation Matrix for Variables**

| | DY | DPR | SIZE | GROWTH | BEPR | DEBT | GDP | CPI |
|---|---|---|---|---|---|---|---|---|
| DY | 1.0000 | | | | | | | |
| DPR | 0.2398 | 1.0000 | | | | | | |
| SIZE | -0.3137 | -0.0540 | 1.0000 | | | | | |
| GROWTH | -0.0996 | -0.0401 | 0.0521 | 1.0000 | | | | |
| BEPR | 0.1430 | 0.0640 | -0.3440 | 0.0248 | 1.0000 | | | |
| DEBT | -0.1544 | -0.0272 | 0.4520 | 0.0420 | -0.3044 | 1.000 | | |
| GDP | 0.1837 | 0.0249 | -0.2272 | 0.0766 | 0.1026 | -0.0417 | 1.000 | |
| CPI | 0.0157 | -0.0092 | -0.1811 | -0.0416 | 0.0123 | -0.0353 | 0.2719 | 1.000 |

*Source: Authors' calculation.*

The correlation coefficient matrix between the variables in the analysis is presented in table 3. The correlation coefficient between the pairs of variables is less than 0.8, indicating that the independent variables in the model are not multicollinear.

### 4.2. Regression results

Table 4 shows the regression results on the relationship between dividend policy and the market price of VN30 companies under the fixed effect model and random effect model. The P-value of the Hausman test is calculated as 0.0000 means the fixed-effect model is appropriate for the database.

**Table 4. Regression results**

| Variables | FEM | REM |
|---|---|---|
| DY | -0.0063595 | -0.0073108 |
| DPR | 0.0002131 | 0.0002171 |
| SIZE | 0.4881297*** | 0.3794372*** |
| GROWTH | 0.0017832 | 0.0020906 |
| BEPR | 0.0654464*** | 0.0689466*** |
| DEBT | -0.0001602 | -0.0003333 |
| GDP | -0.0205122 | -0.0256218 |
| CPI | -0.0319375*** | -0.0411014*** |
| _cons | 4.949975*** | 6.217507*** |
| Overall R-Square | 0.0897 | 0.1089 |
| F-test | Prob > F = 0.000 | Prob > F = 0.000 |
| Number of observation | 600 | 600 |
| Legend | *p < 0.05; **p < 0.01;***p < 0.001 | |
| P-value of Hausman test | 0.0000 | |

*Source: Authors' calculation.*

First, the regression results do not detect the results of dividend yield on stock prices at VN30 companies because the DY variable is not statistically significant. This means that it is not possible to confirm the negative connection between dividend yield and stock price. Thus, companies with low dividend yields do not mean the stock price will be low and vice versa. This result is similar to the studies of Miller and Modigliani (1961) or

Rashid and Rahman (2008) that there is no proof related to the relationship between stock price and dividend yield. This can also be explained by the recent tendency of some companies not to pay dividends. Moreover, the dividend yield of the companies is not uniform, some companies have high and stable dividend yields while some companies have extremely low dividend yields, even equal to 0.

Second, stock price is also unaffected by companies' dividend payout ratios. The independent variable DPR is also not statistically significant for stock prices with a p-value > 5%. As a result, the higher dividend payout ratio did not lead to a change in stock prices in the VN30 group. Meanwhile, previous studies by Baskin (1989) and Vo (2014) showed a negative relationship between dividend payout ratio and stock prices. The possible reason for this result is the consequences of the Covid-19 pandemic in the last 3 years. Many companies in the data range have decided not to pay dividends but are still in the VN30 basket of the HOSE stock market. This makes it impossible to determine the effect of dividend yield and dividend payout ratio on stock value.

Third, the firm size (SIZE) variable has a positive relationship with the stock price at a 0.1% significance level. It can be concluded that the larger the size of the company, the higher the share price of that company and vice versa. Meanwhile, previous studies by Rashid and Rahman (2008) have concluded that firm size and share price have a negative relationship. Furthermore, the profitability ratio (BEPR) also has a positive estimate of 0.0654 with a p-value of 0.00, indicating a positive effect on the stock price. Therefore, an increase in the share price leads to an increase in the company's share price. In fact, the more the profitability ratio tends to grow over the years, the more it shows the company's business performance and its potential to attract investors. The higher the investor demand, the higher the share price will be.

Fourth, the consumer price index (CPI) has a negative relationship with the stock price and is statistically significant at 0.1% significance level. In the context of good economic signs and a high growth rate, companies receive many investment opportunities and promise many new profit potentials. This will lead to limited dividend payment decisions, especially the rate of cash dividend payments, and instead of the reinvestment of

most of the after-tax profits that the business achieves to find and look for other opportunities in the future.

Finally, other independent variables such as assets growth rate (GROWTH), financial leverage (DEBT) and GDP are not statistically significant in this dataset.

## 5. CONCLUSION AND RECOMMENDATIONS

In conclusion, this study has focused on analyzing and evaluating the impact of dividend policy on the stock price of companies listed on the Vietnam stock market. By using the fixed-effect model combined with the panel data of 68 companies in the VN30 group listed on the Ho Chi Minh Stock Exchange (HOSE) from 2012 to 2021, this paper found no relationship between dividend policy and stock price. Although this result is inconsistent with previous studies in Vietnam, this can be explained by the lack of dividend payments by companies in recent years. In particular, the appearance of the Covid-19 epidemic further reduced business efficiency and economic growth. Many companies have decided not to pay dividends and postponed the scheduled dividend payment schedule. Late payment of dividends and low dividend yield also occurred in the VN30 group in Vietnam.

In addition to the independent variables, other control variables are also used in the model. The analysis consequences represent that there is a positive connection between price and business size as well as with the basic profitability ratio of the company. The CPI is also concluded to have a negative connection with stock price change during the author's research time. Moreover, other independent variables such as assets growth rate (GROWTH), financial leverage (DEBT) and GDP are not statistically significant in this dataset.

Based on the research results, this paper recommends some following policies to improve the dividend payment efficiency of Vietnamese enterprises. First, corporate administrators must make informed and timely decisions regarding dividend policies for their companies because regulating a reasonable dividend policy by investors is still expected to attract investors in the future. In addition, the dividend model needs to remain stable and long-term and not be influenced by any financial

manager. This helps to attract more investors and increases the value of that company's stock as well as improves the performance of companies in the future. Second, shareholders need to be well informed about the balance between a high dividend payout ratio and the company's business performance so that they can be prepared to accept the consequences of a low payout ratio. This also helps them make plans and deal with their losses. Finally, many other factors impact dividend policy, especially those related to macroeconomics. This means that managers need to take these factors into account to come up with a reasonable dividend policy for the company under different economic circumstances.

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# THE IMPACTS OF CAPITAL INFLOWS ON BANK LENDING: EVIDENCE FROM VIETNAM

**Trung H. Le[1,*], Nhung T. Nguyen[1], Minh N.N. Pham[1]**

***Abstract:*** *We explore the role of capital inflows on the bank loan growth and credit risk-taking in Vietnam. We also investigate the heterogeneous impacts of diferent capital inflows components on the bank lending. We find that capital inflows are associated with higher loan growth but also lead to higher credit risk. This positive relationship is mainly driven by the dynamics in OI and FDI components. The amplyfing role of capital inflows is particulary emphasized during the Covid-19 pandemic. Finally, smaller banks seem to more proactive in exploiting the increase in the loanable funds from foreign capital by lessening their lending standards.*

***Keywords:*** *Financial institutions, emerging markets, capital inflows, bank lending.*

## 1. INTRODUCTION

While international capital inflows can benefit the economic growth in developing countries, several studies warn of the potential adverse impacts of foreign capital due to the significant sensitivity to global uncertainty marked by sharp retrenchments during volatile periods (Forbes and Warnock, 2012; Benigno et al., 2015; Igan et al., 2020). Koepke (2019) notes that the impacts of capital inflows to emerging markets depend on country characteristics (Milesi-Ferretti and Tille, 2011) and the level of financial development (Kose et al., 2003). The significant fluctuations of foreign capital can also affect financial stability in emerging markets due to underdeveloped institutions and banking systems (Hlaing and Kakinaka, 2019). Thus, understanding the impacts of capital flows is of particular importance to the policymakers in emerging markets.

In this paper, we examine the impacts of international capital inflows on bank lending in Vietnam. In particular, we explore the effects of foreign capital on the dynamics of both the bank loan volumes and credit risk-taking

[1] Banking Academy of Vietnam, 12 Chua Boc, Hanoi, Vietnam

* Corresponding author. Email: trunglh@hvnh.edu.vn

in thirteen Vietnamese commercial banks from 2005Q1 to 2021Q2. We further decompose the international capital inflows into subcomponents, including the foreign direct investment (FDI), portfolio investment (PI) and other investment (OI) including notable bank flow since different types of capital inflows exhibit different behaviors and nature (Choi and Furceri, 2019). Finally, we check whether the relationship between foreign capital and bank lending in Vietnam is affected by the agency problem and the recent Covid-19 pandemic.

Our study contributes to the literature in several ways. First, we provide a comprehensive analysis of the impacts of international capital inflows to bank lending in Vietnam. Vietnam offers an interesting case study for two reasons. First, Vietnam is a typical emerging country having rapid economic growth with an average of 6.2 per cent Gross Domestic Product (GDP) growth per year in real terms (Tu and Le, 2020). The country has extensively pushed its integration to the global financial markets with the remarkable milestone of joining the World Trade Organisation (WTO) in 2007. The gradual improvement in the business environment, accompanied by a stable political system and supportive policies from the government, has attracted massive international capital inflows to Vietnam and significantly stipulate the output growth (Dao and Ngo, 2022). Second, Dao and Ngo (2022) have shown that Vietnam has a bank-based financial structure in which the banking industry has become the backbone of the economy, contributing approximately 16-18 per cent of the GDP. The country has also undergone significant transformation in the banking sector landscape and competition, leading to rapid growth in the industry. With the increasing entry of foreign banks, bank credit has been playing a key role in fueling the economy with the average loan growth from 2007 to 2019 is 32 per cent and the amount of bank credit as of 2018 being 142 per cent of GDP. However, Vietnamese banks are generally small and weak relative to those internationally, marked by undercapitalization and insufficient expertise (Vo, 2016 ). Thus, the surge of capital inflows can significantly affect the Vietnamese bank's lending and credit risk-taking.

Second, we add evidence on the impacts of different forms of foreign capital. Several papers have highlighted different characteristics of different types of capital inflows. FDI has considered the most stable

due to the long-term consideration nature of the investment (Pagliari and Hannan, 2017), whereas PI and OI are more volatile due to their speculative manner (Baum et al., 2017). As a result, the impact of different capital inflows on bank lending may not identical. Indeed, Ali and Iness (2020) explore different types of capital that provide different impacts on bank-level stability. Similarly, Ghosh and Qureshi (2016) and Mara et al. (2021) show that OI inflows are the main factors driving the relationship between foreign capital and bank lending.

Overall, we find that capital inflows to Vietnam are associated with higher bank loan growth and higher loan loss provisions to net interest income ratios. This result is in line with Ali and Iness (2020) and Dinger and te Kaat (2020). Indeed, the impacts of different types of capital flows on bank lending are not identical. Similar to Mara et al. (2021), we observe that the positive relationship between capital inflows and the bank loan growth is mainly driven by the dynamics in OI and FDI, whereas PI provides opposite effects. The lowering in the loan quality is also main driven by a surge in the OI inflows, while the effects of FDI and PI are not statistically significant.

As a robustness check, we examine the impacts of crisis periods and the agency problem on the association between foreign capital and bank lending. International capital inflows are often marked by large swings during periods of increasing global uncertainty (Hlaing and Kakinaka, 2019). Ali and Iness (2020) note that the benefits of capital flows to the emerging markets can reverse during crisis periods due to macroeconomic instability created by sharp retrenchments in foreign capital. Moreover, the magnitude of the effects of foreign capital on bank lending can also vary between bank characteristics. Dinger and te Kaat (2020) show that the impacts of international capital inflows are more pronounced for banks with higher agency problems as higher bailout probabilities can significantly drive the bank's behavior on increasing loanable funding sources. We find that the relationship between foreign capital and bank lending in Vietnam is exacerbated in the Covid-19 period for both lending volume and credit risk-taking. Finally, we establish that larger banks are less willing to expand their credit portfolio and lower their loan quality as a result of capital inflows than smaller banks. This finding may indicate that

international capital inflows increase the quantity and reduce the price of loanable funds (Martinez-Miera and Repullo, 2017), which smaller banks may try to exploit to improve their market share and relax their lending requirements.

The rest of the paper is organized as follows. Section 2 provides a brief review of the impacts of capital flows on the bank lending in emerging countries. Section 3 presents our dataset and methodology, while the empirical results are discussed in Section 4. Section 5 concludes our study.

## 2. LITERATURE REVIEW

Several studies have been conducted to understand the impact of capital flows on macroeconomics situation in developing countries. Recent years, considerable swings of capital inflows are observed to be mostly affected by the growth of liberalization and integration of these emerging countries to the worldwide financial markets. Koepke (2019) stated that while the inflows of capital are typically considered as a blessing for economic growth, they also bring risks and raise important policy issues to the recipient countries. At the macro-level, earlier documents have addressed the influence of capital inflows to the emerging countries. Foreign capital can bring several benefits to facilitate economic growth, such as the relaxation of credit constraints, enhancing the capital allocation efficiency and productivity of the host countries (Bonfiglioli, 2008). On the other hand, capital inflows can also slow the productivity growth by movements of economic resources from tradable to non-tradable sectors (Benigno et al, 2015), exposing the emerging markets to significant waves in the availability of foreign capital, especially during volatile periods (Obstfeld, 2012). International capital inflows also results to inflationary pressures, which could trigger the asset price bubbles and amplify financial volatility during turbulent periods. For example, the developing countries saw a significant increase in the net international flows, leading to a peak of GDP on average of approximately 4 per cent before the emergence of the global financial crisis following a sharp reduce in the foreign capital (Tillmann, 2013). Moreover, types of capital inflows are found to have impacts on the changes of capital inflows influence on the volatility of developing markets (Igan et al., 2020). Milesi-Ferretti and Tille (2011) also pointed

out that country characteristics or the level of financial growth can pose effects on the influence of capital flows on the financial volatility.

In terms of the effect of capital inflows to financial stability in the emerging markets, despite a large body of literature, a large number of prior studies shows mixed evidence. Some papers stated that rising of capital inflows offers greater access to capital and increases investment resources in firms, which result in lower credit risks and more stable financial system (Kaminsky and Schmukler, 2008; Ahmed and Zlate, 2014). Nevertheless, others believe that financial openness in emerging markets leads to exposure to the global uncertainty (Hlaing and Kakinaka, 2019), increasing competition and risk-taking in the banking system, following by financial instability and crises (Daniel and Jones, 2007). Baum et al. (2017) show that the impacts of capital inflows are not homogeneous across countries, but significantly varies between country-specific financial and macroeconomic characteristics. In particular, it is figured the principal driver of the waves of capital flows in recipient countries can be named as the uncertainty in macroeconomic environment in the research of Forbes and Warnock (2012). Labour and industrial productivity are argued to be the most significant contributor to capital inflows movements in emerging countries by Passari and Rey (2015). Furceri et al. (2012), in addition, investigated the regulations impacts in the host country on the magnitude of capital movements inflow into these developing markets.

Under investigation of international capital inflows impacts in terms of banking sector and given the context of important role of bank lending activities in operation, this background suggests several studies to investigate about the foreign capital in terms of banks' lending capacities in developing countries. Thus, Angelopoulou and Gibson (2009) argue that increasing foreign capital to lower the domestic interest rates and consequently, enhancing the bank lending. Capital flows, particularly in the form of portfolio investments, also boost the price of assets, thereby raising collateral values and thereby increasing bank credit (Kim and Yang, 2011; Furceri et al., 2012). As a results, capital inflows are associated with increasing the bank's financial leverage and foreign currency lending (Ghosh and Qureshi, 2016). Furthermore, capital inflows are linked to stronger market expectations and business creditworthiness, thus, leading

to bank credit expansion via the market confidence channel (Borio and Disyatat, 2010; Igan et al., 2020; Villacorta, 2018). In fact, Dinger and te Kaat (2020) indicates that cross-border capital inflows are associated with higher loan volume and higher loan-to-asset ratios, while Mara et al. (2021) explore that the probability of credit expansion significantly increases by capital inflows. Accordingly, Orhangazi (2014) used a Logit model to examine the link between private capital flows and bank credit to the private sector in Turkey from 2003 to 2013, concluding that net private capital inflows have a positive relationship with fast credit expansion time. Blanchard et al. (2016) use the Mundell-Fleming model to show that capital flows cause currencies to appreciate and tend to lead to cycles of currency expansion and credit booms. Upon findings of prior literature, our paper is conducted and figured out the highly positive link between capital inflows and the bank credit growth or the lending capacity of these institution in the Vietnamese commercial bank environment.

In addition to the bank's lending volume, capital inflows can also affect the bank's credit risk. The empirical evidence from extant literature, however, remains inconclusive. Since international capital inflows are similar to lax monetary policy, increasing in the foreign capital can amplify bank's credit risks as highlighted by the bank risk-taking channel of monetary tranmission as banks could lessen their lending standards as a result of increasing loanable funds at lower price (Acharya and Naqvi, 2012, Bekaert et al., 2013; Ioannidou et al., 2015). Rumondor and Bary (2020) examine the effect of capital flows on banks' risk-taking behavior including 15 Indonesian listed banks and proved to be less risky in mainstream banks when compare with smaller banks. Moreover, the portfolio investment in particular influences risk-taking behavior, which is evidence in the cross-country analyses. Employing GMM estimation method and classical banking risk-taking model in China banking industry context, Zhao and Xu (2021) found the international risk-taking channel effect existing in China's commercial banking system, with the more openness of the capital account, the greater the risk tolerance of the larger banks. Kaminsky and Schmukler (2008) and Ahmed and Zlate (2014), however, indicate that corporate performance channels can reduce the riskiness of bank lending. This is explained by the fact that international capital inflows result in decreasing in interest rates and available capital,

allowing firms to access more capital to enhance their performance and ability to pay interest and principal. Since the findings of previous are still controversial, our study aims clarify the capital inflows influence on bank risk-taking behavior. Thus, we contribute to the existing literature with the findings of positive impact of capital inflows on loan loss provision ratio of banks, indicating the increase of bank's willingness to take risks.

Decomposing capital inflows offers scholars deeper perspectives to explore the heterogeneous impacts of different components of foreign capital due to their differences in nature. FDI inflows, driven by long-term considerations (Paul and Jadhav, 2020), are typically considered the most stable sources, whereas PI and OI flows are considered volatile owing to their speculative nature (Baum et al., 2017). Ghosh and Qureshi (2016) show that PI, especially OI inflows, are associated with higher bank lending, whereas FDI inflows do not reveal any linkages. Similarly, Mara et al. (2021) provided empirical evidence that OI inflows have a greater influence on the dynamics of bank credit to GDP in Indonesia. Calderon and Kubota (2013) further documented that the likelihood of a credit boom increases if capital flows are derived from other investments and weakens if capital flows originate from portfolio investments, as well as the probability of a credit boom ending the financial crisis increases as capital flows come from OI. Ali and Iness (2020) also highlight the importance of incorporating the heterogeneity of capital flows when studying the impact of foreign capital on banks' credit risks. Indeed, in Vietnamese commercial banks context, we confirm the findings of Mara et al. (2021) to observe the positive relationship between capital inflows to the bank loan growth is mainly impacted by the dynamics of OI and FDI, whereas PI provides opposite effects.

Finally, capital flows are well-known for their sensitive responses to uncertainties and risk in global and country-specific level (Choi and Furceri, 2019; Milesi-Ferretti and Tille, 2011; Baum et al., 2017). When banks experience instability, lending in banks will be severely affected in terms of domestic lending and cross-border lending, as well as lending from foreign institutions (Kleimeier et al., 2013; Ivashina and Scharfstein, 2010; Milesi-Ferretti and Tille, 2011; Cetorelli and Goldberg, 2011). During the GFC period, lending at banks mainly depended on the

economic potential of bank and its partners. However, this has changed during the Covid-19 pandemic, the credit changes according to the context of the country in which its bank operates because every activity during the pandemic is managed by the country to hedge and mitigate the risk that Covid-19 may pose to the health of its citizens. Consequently, the impacts of capital inflows to the bank lending and credit risk-taking would be different during crisis periods.

Accordingly, given the context of the Vietnamese financial market which is supposed to be affected intensely by the volatility of capital inflows (Vo, 2016). Being one of the most prevailed emerging markets, a recipient nation like Vietnam, therefore, has been receiving large amount of capital in various types (Dao and Ngo, 2022). Moreover, the Vietnamese banking system has not matured with sufficient resilience in terms of dealing with uncertainty. Although the vitality of banking industry towards the economy in general and the existing defects of banks, to our best knowledge, investigation about capital inflows and bank or bank lending in particular are limited, showing a large gap of research to fill. Thus, we put the issue of capital inflows impacts on bank lending in the context of Vietnamese banking industry.

Interestingly, our paper figured out the contrast influence of capital inflows to the bank lending in Vietnam between the GFC and the Covid-19 outbreak: Both bank loan growth and credit risks improve if there is more capital inflow to Vietnam during the Covid-19 pandemic, whereas the global financial crisis has no significant impact on the effects of foreign capital. Hence, we highlight in this paper the uncommon features of the Covid-19 crisis compared to the GFC (Berger and Demirgüç-Kunt, 2021), since the former has emerged from a medical health crisis in global and becomes an economic crisis rather than resulting form a banking crisis as in the latter.

## 3. RESEARCH METHOD

### 3.1. Data

Our research uses disproportionate quarterly data collected from the first quarter of 2008 and updated to the end of the fourth quarter of 2021 in

Vietnam. Data on capital flows are obtained from the International Monetary Fund's database. In addition, nominal GDP growth and domestic credit to the private sector are also sourced from the World Bank's website. Other macro data and bank-level data for 13 joint-stock commercial banks listed in Vietnam (Appendix A), with total assets accounting for approximately 70 per cent of the total assets of the banking sector. These data are collected from the S&P Capital IQ platform and website cafef.vn.

### 3.2. Econometric specification

To evaluate the impact of capital inflows on credit activities of Vietnamese commercial banks, the research team proposes the following regression equation:

$$Y_{i,t} = \alpha + \beta Y_{i,t-1} + \gamma CAPINFLOWS_t + \theta BANK_{i,t-1} + \eta MACRO_{t-1} + \tau_i + \varepsilon_{i,t} \quad (1)$$

Where refers to dependent variables: loan growth rate ($loanGrowth_{i,t-1}$) and the ratio of loan loss provisions to net interest income ($llpRatio_{i,t-1}$) of bank i, in quarter t; are capital inflows to GDP ratios, including total capital inflows ($CAPINFLOWS_t$), foreign direct investment ($Cl_t$), portfolio investment ($FDI_t$) and other investment ($PI_t$); $BANK_{i,t-1}$ and $MARCO_{t-1}$ are vectors representing the control variables for bank characteristics and macroeconomic variables; $\tau_i$ is unobservable individual effect; $\varepsilon_{i,t}$ is the errors term.

Our research selected the credit growth rate and the credit risk provision ratio to reflect the lending activities of commercial banks, including both development aspects according to the volume of loans, as well as the quality of the bank's credit portfolio. Previous studies by Zhao and Xu (2021), Orhangazi (2014), Blanchard et al. (2016) and Davis (2015) have shown the relationship and impact of capital flows on the expansion of bank credit. Along with that, the research of Rumondor and Bary (2020), Zhao and Xu (2021), Miranda-Agrippino and Rey (2020) have also shown a potential relationship between capital flows the bank's risk-taking behaviors.

We also decompose the total capital inflows into its components including foreign direct investment ($FDI_t$), portfolio investment ($PI_t$) and

other investment ($OI_t$) according to the nature of capital flows from the background study of Calvo et al. (1993). Similar to previous studies, we scale capital inflows by the current GDP (see, e.g., Dinger and te Kaat, 2020; Samarina and Bezemer, 2016). The research team expect to find a positive relationship of capital flow on credit growth and negative relationship risk provision ratio of banks in Vietnam in this study.

In addition, for bank-level variables, the authors use the logarithm of total asset (TA). We also add income diversification (incDiver), equity to assets ratio (ETA) and return on assets (ROA) due to the degree of income diversification and the return on assets ratio reflect financial performance through lending activities and the level of risk as well as the credit quality of the bank reflect through the ratio of capital to total assets. The macro variables consist of standard covariates including the real GDP Growth (GDPG) to proxy for the economic growth, the ratio of domestic bank redit to GDP (CreditGDP) to proxy for the structure of financial system the ratio of international trade to GDP (tradeGDP) to proxy for the financial openness (Dinger and von Hagen, 2009; Ioannidou et al., 2015) and the consumer price index reflecting the country's inflation rate (CPI). These indicators that reflect the general situation of the Vietnamese economy are used to research more universally and meaningfully.

We employ the dynamic General Method of Moments (GMM) of Arellano and Bond (1991) and Blundell and Bond (1998) to estimate our regression. This approach addresses the potential endogeneity issue and is more suitable for panel data with relatively low time dimensions, as in our work. To ensure the robustness of our regression, we apply the Hansen-Sagan test to validate the instrument variables and the Arellano-Bond test for the second-order serial autocorrelation in the regression residuals.

### 3.3. Summary statistics

Table 1 provides the descriptive statistics of the data used in this paper. The loan growth has a mean value of 0.04, indicating that Vietnamese commercial banks generally expanded their loan volumes over sample period. However, the loan growth varies considerably between banks, with the standard deviation of 0.12. The ratio of the loan loss provision to net interest income has a mean value of 0.29, but the standard deviation of this

variable is 52 per cent, suggesting significant difference in the credit risk tolerance of commercial banks. Total capital inflows to Vietnam fluctuates significantly when standard deviation, minimum and maximum values of variable CI are 0.89; 0.9 and 5.76, respectively. The component of other investment (OI) fluctuates the most with standard deviation of 0.77, while FDI inflows constitute to the largest proportion of international capital. Finally, Vietnam has high GDP growth rate, with the mean value of 0.06, while the value of CreditGDP and TradeGDP clearly illustrate the bank-based financial structure and the increasing integration to the international market of Vietnam.

**Table 1. Descriptive Statistics**

| Variable | Mean | Std.dev | Min | Max |
|---|---|---|---|---|
| loanGrowth | 0.04 | 0.12 | -2.17 | 0.52 |
| llpRatio | 0.29 | 0.55 | -6.96 | 2.84 |
| CI | 2.41 | 0.89 | 0.9 | 5.76 |
| FDI | 1.5 | 0.27 | 0.85 | 1.99 |
| PI | 0.16 | 0.27 | -0.54 | 1.11 |
| OI | 0.75 | 0.77 | -0.44 | 3.74 |
| TA | 19.18 | 1 | 16.39 | 21.25 |
| IncDiver | 0.09 | 0.07 | -0.25 | 0.42 |
| ETA | 0.08 | 0.03 | 0.03 | 0.26 |
| ROA | 0 | 0 | -0.02 | 0.02 |
| GDPG | 0.06 | 0.02 | -0.06 | 0.08 |
| CPI | 0.06 | 0.05 | 0 | 0.23 |
| CreditGDP | 1.16 | 0.17 | 0.95 | 1.48 |
| TradeGDP | 0.41 | 0.07 | 0.26 | 0.57 |

The table shows the summary statistics of all variables employed in our analysis. The dependent variables are credit growth and the ratio of loan loss provisions to net interest income. The main regressors are total capital inflows and its components, including foreign direct investment (FDI), portfolio investment (PI), and other investment (OI). Macro-economic variables include real GDP growth (GDPG), consumer price index (CPI), the ratio of domestic credit to GDP (CreditGDP), and level of international trade to GDP (TradeGDP). Bank-specific variables include the log of total assets (TA), ratio of non-interest income to total income (IncDiver), the equity-to-asset ratio (ETA) and return on assets (ROA).

*Source: Authors' own calculation*

## 4. RESULTS AND DISCUSSION

### 4.1. Baseline results

The baseline results about the general relationship between international capital inflows and the bank lendings in Vietnam is reported in table 2. Column (1) presents the results for loanGrowth, while the ratio of loan loss provision to net income is shown in Column (2). The regression is estimated with the sys-GMM method, and standard errors are clustered by banks and reported in parentheses. All explanatory variables are lagged one period to account for potential delayed impacts of the bank-specific variables on bank performance. In both models, the Hansen-Sagan test statistics and p-value in the Arellano and Bond AR(2) test indicate that there is no overidentification problem in the instrument variables and no existence of the second-order autocorrelation in the errors. Thus, our empirical models are correctly specified and consistent.

We find that the higher capital inflows is significantly related to higher credit expansion and increased riskiness of bank loans. In economic terms, at 1 per cent significance level, a 1-pp increase in total capital inflows to GDP increases loan growth rate by 1.435 pp and loan loss provisions relative to net interest income by 2.15 pp. This finding is consistent with the literature and state that international capitals can enhance the bank lending capacity (Kim and Yang, 2011; Borio and Disyatat, 2010), but also raise the risk of the loan portfolios in Vietnamese banking system (Dinger and te Kaat, 2020).

Our results for the bank-specific variables are generally in line with the previous literature. We observe that the higher capital-to-asset ratio is associated with the faster bank credit growth while the increase in ROA will lead to the decrease in loan growth and increase in the ratio of loan loss provisions over net interest income. From the set of macroeconomic variables, we observe that the bank lending will be improved with higher growth rate and lower credit risk-taking if the economy has high GDPG, which is in the line with Borio and Disyatat (2010). The findings also indicates that the bank risk- taking exposures by the higher rate of financial openness TradeGDP and can be reduced by the higher CPI (Daniel and Jones, 2007).

**Table 2. Baseline Results**

| | loanGrowth | llpRatio |
|---|---|---|
| | | |
| Y t-1 | -0.267*** | 0.007 |
| | (0.099) | (0.017) |
| CI | 1.435*** | 2.315*** |
| | (0.497) | (0.806) |
| TAt-1 | 0.001 | 0.015 |
| | (0.002) | (0.012) |
| incDiver t-1 | 0.040 | -0.750 |
| | (0.065) | (0.481) |
| ETA t-1 | 0.472* | -1.601 |
| | (0.270) | (0.981) |
| ROA t-1 | -3.044* | 45.726* |
| | (1.611) | (23.630) |
| GDPG t-1 | 0.368*** | -5.514*** |
| | (0.104) | (1.220) |
| CreditGDP t-1 | 0.016 | -0.231 |
| | (0.026) | (0.151) |
| CPI t-1 | -0.073 | -1.061*** |
| | (0.078) | (0.326) |
| TradeGDP t-1 | -0.167 | 1.381*** |
| | (0.110) | (0.235) |
| N | 1025 | 1025 |
| Sargan test | 4.872 | 2.254 |
| AR test (2) | 0.275 | 0.671 |

Table 2 presents the sys-GMM estimation results of the base equation (1). The dependent variable ares the credit growth rate (loanGrowth) and credit risk provision ratio to net interest income (llpRatio). The main regressor is the total capital inflows over the nominal GDP (CI). Bank- level variables include log of total assets (TA), ratio of non-interest income to total income (incDiver), the equity-to-asset ratio (ETA), and return on assets (ROA). Macroeconomic cotrol variables include real GDP growth (GDPG), the ratio of domestic credit to GDP (CreditGDP), consumer price index (CPI), and level of international trade to GDP (TradeGDP). The Sargan test is used to determine the appropriateness of the instrumental variables in the GMM estimator. AR (2) is the p-value of Arrelano and Bond (1991) for first-order series autocorrelation of errors. The number in parentheses is the standard error.

* $p < 0.10$, ** $p < 0.05$, ***$p < 0.01$.

*Source: Authors' own calculation.*

### 4.2. Heterogenous impacts of different type of capital inflows

We further decompose the capital inflows into the foreign direct investment (FDI), the portfolio investment (PI) and other investment (OI) inflows and report the regression results in Table 3. The first three columns cover results for the bank lending growth rate and the last three columns provide results for the loan loss provision ratio.

In terms of bank lending growth, FDI and OI are positively associate with higher loan growth, whereas PI leads to a reduction in the banks' lending. This is of expectations since FDI enterprises has been playing a key role in Vietnam's economy, while OI flows would naturally lead to an increase in the lending capacity of Vietnamese commercial banks.[1] This finding is also consistent with the results of Mara et al. (2021) in Indonesia. Regarding the ratio of loan loss provision to net income, we find that OI inflows is positively associated with higher bank's credit risk, whereas FDI and PI inflows are not statistically significant. This observation is similar to the results of Zhao and Xu (2021) and suggest the international risk-taking channel as the openness of the capital account and increasing in the lending capacity from cross-border bank lending may lead to greater the risk tolerance in the bank lending

**Table 3. Impacts of Different Capital Inflows**

| | **loanGrowth (1)** | | | **llpRatio (2)** | | |
|---|---|---|---|---|---|---|
| | FDI | PI | OI | FDI | PI | OI |
| Y t-1 | -0.269*** | -0.270*** | -0.266*** | 0.008 | 0.009 | 0.007 |
| | (0.100) | (0.102) | (0.100) | (0.016) | (0.016) | (0.016) |
| Capital inflows | 4.959*** | -2.970*** | 1.538*** | 3.591 | -11.122 | 3.466*** |
| | (1.524) | (0.869) | (0.545) | (8.472) | (9.867) | (0.943) |
| TAt-1 | -0.0001 | 0.002 | 0.002 | 0.014 | 0.016 | 0.016 |
| | (0.002) | (0.002) | (0.002) | (0.014) | (0.012) | (0.012) |

[1] As of 2021, the FDI sector accounted for 72 per cent of total export turnover and 63 per cent of import turnoverin Vietnam.

| | | | | | | |
|---|---|---|---|---|---|---|
| incDiver t-1 | 0.060 | 0.044 | 0.04 | -0.739 | -0.732 | -0.757 |
| | (0.063) | (0.062) | (0.066) | (0.473) | (0.467) | (0.482) |
| ETA t-1 | 0.432 | 0.485* | 0.484* | -1.619 | -1.590 | -1.579 |
| | (0.264) | (0.261) | (0.267) | (0.984) | (0.996) | (0.980) |
| ROA t-1 | -2.984* | -2.586 | -2.806* | 46.032** | 46.478** | 45.870* |
| | (1.597) | (1.748) | (1.629) | (23.437) | (23.584) | (23.641) |
| GDPG t-1 | 0.555*** | 0.883*** | 0.490*** | -5.093*** | -4.252*** | -5.442*** |
| | (0.159) | (0.180) | (0.124) | (1.183) | (1.617) | (1.155) |
| CreditGDP t-1 | -0.007 | 0.051* | 0.037 | -0.236 | -0.137 | -0.193 |
| | (0.030) | (0.027) | (0.030) | (0.155) | (0.173) | (0.154) |
| CPI t-1 | 0.003 | -0.013 | -0.077 | -0.979*** | -0.917*** | -1.088*** |
| | (0.074) | (0.077) | (0.076) | (0.306) | (0.299) | (0.328) |
| TradeGDP t-1 | -0.144 | -0.283** | -0.221* | 1.369*** | 1.062*** | 1.283*** |
| | (0.114) | (0.116) | (0.125) | (0.285) | (0.282) | (0.225) |
| N | 1025 | 1025 | 1025 | 1025 | 1025 | 1025 |
| Sargan test | 3.937 | 6.477 | 2.068 | 3.417 | 3.161 | 2.094 |
| AR test (2) | 0.186 | 0.836 | 0.153 | 0.855 | 0.867 | 0.682 |

Table 3 presents the results regarding the relationship between different types of capital inflows and the bank lending in Vietnam, including foreign direct investment (FDI), portfolio investment (PI) and other investmnet (OI). The dependent variable ares the credit growth rate (loanGrowth) and credit risk provision ratio to net interest income (IlpRatio). The main regressor is the coponents of capital inflows over the nominal GDP. Bank- level variables include log of total assets (TA), ratio of non-interest income to total income (incDiver), the equity-to-asset ratio (ETA), and return on assets (ROA). Macroeconomic cotrol variables include real GDP growth (GDPG), the ratio of domestic credit to GDP (CreditGDP), consumer price index (CPI), and level of international trade to GDP (TradeGDP). The Sargan test is used to determine the appropriateness of the instrumental variables in the sys-GMM estimator. AR (2) is the p-value of Arrelano and Bond (1991) for first-order series autocorrelation of errors. The number in parentheses is the standard error.

* $p < 0.10$, ** $p < 0.05$, ***$p < 0.01$.

*Source: Authors' own calculation*

## 5. ROBUSTNESS TEST

### 5.1. The impacts of Covid-19 pandemic

Since foreign capital is highly sensitive to global uncertainty, its impact on capital inflows to bank lending and credit risk-taking would differ during crisis periods. The Covid-19 pandemic, which broke out at the end of 2019, is a crisis for the world's health, thereby greatly affecting the economies of countries. To this end, we incorporate interactive variables between capital inflows and the dummy variable representing the Covid-19 pandemic to explore the impact of capital flows on Vietnamese bank lending activities during the crisis as follows:

$$Y_{i,t} = a + b\ Y_{i,t-1} + g\ CAPINFLOWS_t + j\ CAPINFOWS * Covid + q\ BANK_{i,t-1} + h\ MACRO_{t-1} + t_i + e_{i,t}$$

Where Covid is a dummy variable, taking a value of 1 during the recent Covid-19 pandemic (from 2020Q1 to 2021Q2), and 0 otherwise. Table 4 reports the regression results, with the first four columns corresponding to bank lending growth and the last four columns accounting for the loan loss provision ratio.

The test results of Sargan and AR (2) show that the research model sys-GMM is reliable. It can be seen that the coefficients of the stand-alone variables of capital inflows are consistent with the baseline results. Higher international capital inflows are associated with higher growth rate but also raise the average riskiness of bank loans. The coefficients of interactive terms yield some interesting results. The coefficients of *CI * Covid* are positive and statistically significant for loan growth, indicating that capital inflows during the Covid-19 period have favorable impacts on credit growth at Vietnamese commercial banks, especially those with FDI inflows. A possible explanation is that the commercial banks are less willing to expand their credit portfolio during the Covid-19 period since domestic enterprises were heavily affected by the epidemic. Thus, an increase in the international capital inflows would significantly drive the credit expansion, especially to those with the FDI enterprises. Regarding the loan loss provision ratio, the coefficient of *CI * Covid* indicates that the amplyfing role of capital inflows in bank's credit risk is mainly resulted from the Covid-19 period, since the coefficient of CI becomes insignificant. Especially, we find that the FDI inflows significantly increase the bank

credit risk, whereas it has mediating role in normal periods. FDI inflows, driven by long-term considerations (Paul and Jadhav, 2020), are typically considered the most stable sources. Similar to Ali and Iness (2020), our result highlights the destructive role of crisis periods, the Covid-19 pandemic in particular, by preventing emerging countries from reaping the financial stability of this source of capital inflows.

**Table 4. Impacts of Covid-19 Pandemic**

| | **loanGrowth** | | | | **IlpRatio** | | | |
|---|---|---|---|---|---|---|---|---|
| | **(1)** | | | | **(2)** | | | |
| | CI | FDI | PI | OI | CI | FDI | PI | OI |
| Loan t-1 | -0.267*** | -0.274*** | -0.267*** | -0.263*** | 0.006 | 0.004 | 0.009 | 0.003 |
| | (0.099) | (0.099) | (0.103) | (0.101) | (0.018) | (0.019) | (0.017) | (0.017) |
| Capital inflows | 1.292** | 4.015** | -0.468*** | 1.456*** | 0.705 | -3.266 | -12.385 | 2.667*** |
| | (0.586) | (1.865) | (1.555) | (0.563) | (0.730) | (9.007) | (12.600) | (1.015) |
| CI*Covid | 2.256*** | 10.668*** | 4.069* | 4.863*** | 41.614*** | 124.497*** | 25.284 | 77.577*** |
| | (0.776) | (3.149) | (2.393) | (1.452) | (8.163) | (25.204) | (19.642) | (14.743) |
| TAt-1 | 0.002 | 0.00001 | 0.001 | 0.002 | 0.019* | 0.019 | 0.016 | 0.023** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.012) | (0.013) | (0.013) | (0.012) |
| incDiver t-1 | 0.044 | 0.062 | 0.055 | 0.039 | -0.725 | -0.737 | -0.729 | -0.742 |
| | (0.067) | (0.065) | (0.066) | (0.068) | (0.466) | (0.459) | (0.446) | (0.480) |
| ETA t-1 | 0.471* | 0.437 | 0.481* | 0.486* | -1.615 | -1.581 | -1.603 | -1.570 |
| | (0.270) | (0.271) | (0.256) | (0.265) | (0.985) | (0.980) | (1.001) | (0.974) |
| ROA t-1 | -3.051* | -3.186** | -2.343 | -2.783* | 44.978* | 43.883* | 46.813** | 44.416* |
| | (1.598) | (1.611) | (1.762) | (1.619) | (23.584) | (23.273) | (23.440) | (23.927) |
| GDPG t-1 | 0.454* | 1.115*** | 0.574** | 0.151 | -1.230 | 2.700 | -2.808 | -5.552*** |
| | (0.256) | (0.424) | (0.269) | (0.263) | (1.257) | (1.761) | (1.849) | (1.425) |
| CreditGDP t-1 | 0.019 | -0.002 | 0.077*** | 0.054** | -0.301** | -0.271* | -0.198 | -0.13 |
| | (0.021) | (0.029) | (0.019) | (0.025) | (0.154) | (0.155) | (0.182) | (0.153) |
| CPI t-1 | -0.072 | -0.006 | 0.011 | -0.078 | -1.112*** | -1.076*** | -0.914*** | -1.208*** |
| | (0.080) | (0.075) | (0.081) | (0.078) | (0.317) | (0.299) | (0.275) | (0.322) |
| TradeGDP t-1 | -0.183 | -0.223* | -0.268** | -0.220 | 0.837*** | 0.326 | 1.016*** | 0.860*** |
| | (0.122) | (0.132) | (0.119) | (0.138) | (0.184) | (0.263) | (0.277) | (0.199) |
| N | 1025 | 1025 | 1025 | 1025 | 1025 | 1025 | 1025 | 1025 |
| Sargan test | 1.346 | 3.220 | 5.162 | 1.225 | 1.349 | 0.160 | 1.553 | 0.128 |
| AR test (2) | 0.113 | 0.132 | 0.363 | 0.467 | 0.696 | 0.636 | 0.755 | 0.232 |

The robustness test results report in table 4 regarding the effect of capital flows on a bank's lending during Covid-19 in Vietnam. The dependent variable ares the credit growth rate (loanGrowth) and credit risk provision ratio to net interest income (llpRatio). The main regressor is the capital inflows over the nominal GDP. Bank- level variables include log of total assets (TA), ratio of non-interest income to total income (incDiver), the equity-to-asset ratio (ETA), and return on assets (ROA). Macroeconomic cotrol variables include real GDP growth (GDPG), the ratio of domestic credit to GDP (CreditGDP), consumer price index (CPI), and level of international trade to GDP (TradeGDP). Covid is a dummy variable, taking value of 1 during the Covid-19 pandemic (from 2020Q1 to 2021Q2) and 0 otherwise. The Sargan test is used to determine the appropriateness of the instrumental variables in the sys-GMM estimator. AR (2) is the p-value of Arrelano and Bond (1991) for first-order series autocorrelation of errors. The number in parentheses is the standard error.

* p < 0.10, ** p < 0.05, ***p < 0.01.

*Source: Authors' own calculation*

### 5.2. The impacts of bank size

Larger banks may be better connected to international financial markets and receive more surplus loanable funds from foreign capital. Consequently, they might increase their lending volume and relax their lending standards by increasing the amount of loanable funds (Dinger and te Kaat, 2020). To test this hypothesis, we ran the following regression:

$$Y_{i,t} = a + b\ Y_{i,t-1} + g\ CAPINFLOWS_t + j\ CAPINFOWS * BigBank + q\ BANK_{i,t-1} + h\ MACRO_{t-1} + t_i + e_{i,t}$$

where  is a dummy variable that takes the value of 1 if the bank belongs to the top quartile of bank size in Vietnam and 0 otherwise. Table 5 presents the regression results, with the first four columns corresponding to bank lending growth and the last four columns accounting for the loan loss provision to net interest income ratio.

We find that, while the coefficients of the stand-alone variables of capital inflows to bank loan growth are in line with the baseline results, those of the interactive terms are significantly negative. This observation indicates that larger banks lower their lending growth rate when capital inflows increase. In other words, the positive impact of foreign capital on bank lending volume is mainly due to the expansion of the lending portfolio of smaller banks. One possible reason is that smaller banks might also benefit from the availability of foreign capital via interbank borrowing. Baskaya et al. (2017) argues that non-industry debt (interbank debt) is the main factor in capital inflows that increase total credit. Compared with larger banks, small banks have less competitive advantage in retail deposits, so

they have to depend on the interbank market. Thus, the increase in lending capital in the interbank market will help these banks expand their lending capacity. Regarding the ratio of loan loss provision to net income, we also find that applying role of capital inflows on bank's credit risk is mainly resulted from the smaller banks' lending portfolio. In other words, smaller banks tend to lessen their lending standards since foreign capital could help increase loanable funds at a lower price (Ioannidou et al., 2015).

**Table 5. Impacts of Bank Size**

| | **loanGrowth** | | | | **llpRatio** | | | |
|---|---|---|---|---|---|---|---|---|
| | **(1)** | | | | **(2)** | | | |
| | CI | FDI | PI | OI | CI | FDI | PI | OI |
| Loan t-1 | -0.267*** | -0.265*** | -0.269*** | -0.266*** | -0.009 | -0.007 | -0.007 | -0.008 |
| | (0.095) | (0.097) | (0.098) | (0.096) | (0.017) | (0.018) | (0.016) | (0.016) |
| Capital inflows | 1.891*** | 5.948*** | -2.139* | 1.983*** | 2.983*** | 14.239* | -11.717 | 3.211*** |
| | (0.559) | (1.680) | (1.182) | (0.619) | (1.087) | (7.504) | (12.056) | (0.973) |
| CI*BigBank | -1.892** | -4.164* | -3.333 | -1.832** | -2.234* | -34.232* | 1.421 | 0.696 |
| | (0.861) | (2.391) | (2.467) | (0.888) | (1.346) | (18.014) | (11.102) | (0.277) |
| TAt-1 | 0.002 | 0.0001 | 0.003 | 0.003 | -0.005 | -0.012 | -0.004 | -0.003 |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.016) | (0.019) | (0.016) | (0.016) |
| incDiver t-1 | 0.043 | 0.060 | 0.049 | 0.043 | -0.956* | -0.959* | -0.931* | -0.955* |
| | (0.058) | (0.058) | (0.055) | (0.058) | (0.570) | (0.561) | (0.553) | (0.568) |
| ETA t-1 | 0.400 | 0.368 | 0.416 | 0.418 | -0.671 | -0.808 | -0.659 | -0.648 |
| | (0.276) | (0.268) | (0.260) | (0.269) | (0.802) | (0.827) | (0.824) | (0.806) |
| ROA t-1 | -2.692* | -2.506 | -2.208 | -2.598 | 44.381* | 44.685* | 45.254** | 44.561* |
| | (1.596) | (1.661) | (1.852) | (1.599) | (23.087) | (23.047) | (23.082) | (23.136) |
| GDPG t-1 | 0.310*** | 0.504*** | 0.828*** | 0.436*** | -4.849*** | -4.556*** | -3.550** | -4.751*** |
| | (0.120) | (0.175) | (0.199) | (0.136) | (1.267) | (1.227) | (1.685) | (1.197) |
| CreditGDP t-1 | 0.007 | -0.014 | 0.041 | 0.027 | -0.098 | -0.118 | -0.004 | -0.062 |
| | (0.027) | (0.031) | (0.028) | (0.031) | (0.174) | (0.172) | (0.197) | (0.177) |
| CPI t-1 | -0.084 | -0.012 | -0.020 | -0.084 | -0.980*** | -0.914*** | -0.829*** | -0.997*** |
| | (0.077) | (0.075) | (0.075) | (0.075) | (0.305) | (0.287) | (0.283) | (0.307) |
| TradeGDP t-1 | -0.174 | -0.148 | -0.287** | -0.231* | 1.557*** | 1.583*** | 1.228*** | 1.456*** |
| | (0.114) | (0.118) | (0.121) | (0.129) | (0.199) | (0.269) | (0.227) | (0.194) |
| N | 1025 | 1025 | 1025 | 1025 | 1025 | 1025 | 1025 | 1025 |
| Sargan test | 0.151 | 0.689 | 0.467 | 0.157 | 1.671 | 0.832 | 0.626 | 1.420 |
| AR test (2) | 0.411 | 0.305 | 0.547 | 0.829 | 0.522 | 0.763 | 0.510 | 0.489 |

The robustness test results report in table 5 illustrating the relationship between capital inflows and bank lending in Vietnam in terms of different bank sizes. The dependent variable ares the credit growth rate (loanGrowth) and credit risk provision ratio to net interest income (llpRatio). The main regressor is the capital inflows over the nominal GDP. Bank-level variables include log of total assets (TA), ratio of non-interest income to total income (incDiver), the equity-to-asset ratio (ETA), and return on assets (ROA). Macroeconomic cotrol variables include real GDP growth (GDPG), the ratio of domestic credit to GDP (CreditGDP), consumer price index (CPI), and level of international trade to GDP (TradeGDP). BigBank is a dummy variable, taking value of 1 if the bank belongs to the group of 25 per cent banks with the largest assets and 0 otherwise. The Sargan test is used to determine the appropriateness of the instrumental variables in the sys-GMM estimator. AR (2) is the p-value of Arrelano and Bond (1991) for first-order series autocorrelation of errors. The number in parentheses is the standard error.

* $p < 0.10$, ** $p < 0.05$, ***$p < 0.01$.

## 6. CONCLUSION

We investigate the impact of capital inflows on bank lending in Vietnam in the period 2008Q1-2021Q4 through two criteria: loan growth rate and credit risk-taking behavior. Furthermore, we investigate the heterogeneous influences of the different components of capital inflows on bank lending because of their differences in nature, including foreign direct investment (FDI), portfolio investment (PI), and other investment flows (OI). Finally, we investigate the impact of Covid-19 and bank size on the documented association between foreign capital and bank lending.

Our findings provide useful contributions for researchers and policymakers, especially in the context of an emerging market. First, capital inflows lead to a higher growth rate of bank loans and increased provision for loan losses relative to net interest income. This finding is consistent with the hypothesis that international capitals can enhance the bank lending capacity (Kim and Yang, 2011), but also raises the risk of the loan portfolios in emerging markets (Dinger and te Kaat, 2020). Second, we observe that the effects of components of foreign capital flows on bank credit are heterogeneous due to their differences in nature. FDI and OI are found to be the two main factors that help expand lending activities and increase credit risk, while PI inflows slow down the credit growth of Vietnamese banks. Third, we find that the capital inflows are significantly driving the credit expansion during the Covid-19 pandemic, but also lead to higher level of bank's credit risk. Finally, we find that smaller banks seem to be more proactive in exploiting the increase in the loanable funds from

foreign capital by lessening their lending standards, which subsequently increasing their credit risk-taking.

Some limitations in our paper provide vendors for future research. First, while we focus on the impact of capital inflows on bank-level lending activities, future research can also explore the role of foreign capital on bank efficiency and financial stability (see, for example, Martinez-Miera and Repullo, 2017; Ali and Iness, 2020). Second, although foreign capital fluctuates the most during crisis periods, the movement of capital inflows is also sensitive to other periods of heightened global uncertainty. Thus, rather than focus on the behavior of foreign capital during crisis periods, future research can examine and explore the impacts of capital inflows in different periods of "stop" and "surge" for sudden contraction and boom in capital inflows to emerging countries (see, for example, Hlaing and Kakinaka, 2019). Furthermore, the scope of investigation can be expanded to other countries and regions, employing the methodology and research direction of our paper to investigate for each case (see, for example, Zhao and Xu, 2021; Rumondor and Bary; 2020).

## Appendix A. List of Vietnamese Banks in the Research

| STT | Bank names | Stock codes |
|---|---|---|
| 1 | Asia Commercial Joint Stock Bank | ACB |
| 2 | Joint stock Commercial Bank for Investment and Development of Vietnam | BID |
| 3 | Vietnam Joint Stock Commercial Bank for Industry and Trade | CTG |
| 4 | Vietnam Export Import Bank | EIB |
| 5 | Ho Chi Minh City Development Joint Stock Commercial Bank | HDB |
| 6 | Military Commercial Joint Stock Bank | MBB |
| 7 | National Citizen Commercial Joint Stock Bank | NVB |
| 8 | Saigon-Hanoi Commercial Joint Stock Bank | SHB |
| 9 | Saigon Thuong Tin Commercial Joint Stock Bank | STB |
| 10 | Technological and Commercial Join-stock Bank | TCB |
| 11 | Tien Phong Commercial Joint Stock Bank. | TPB |
| 12 | Joint Stock Commercial Bank for Foreign Trade of Vietnam | VCB |
| 13 | Vietnam Prosperity Joint-Stock Commercial Bank | VPB |

**Appendix B. Correlation Matrix**

| | CI | FDI | PI | OI | loanGrowth | llpRatio | TA | ETA | incDiver | ROA | GDPG | CPI | creditGDP | tradeGDP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CI | 1.000 | | | | | | | | | | | | | |
| FDI | 0.461 | 1.000 | | | | | | | | | | | | |
| PI | 0.274 | 0.017 | 1.000 | | | | | | | | | | | |
| OI | 0.905 | 0.182 | -0.037 | 1.000 | | | | | | | | | | |
| loanGrowth | 0.147 | 0.121 | -0.029 | 0.137 | 1.000 | | | | | | | | | |
| llpRatio | 0.017 | 0.084 | -0.093 | 0.021 | -0.174 | 1.000 | | | | | | | | |
| TA | -0.030 | 0.093 | -0.040 | -0.053 | -0.166 | 0.279 | 1.000 | | | | | | | |
| ETA | -0.031 | -0.050 | -0.010 | -0.015 | 0.068 | -0.085 | -0.401 | 1.000 | | | | | | |
| incDiver | 0.079 | 0.179 | -0.001 | 0.031 | 0.073 | 0.079 | 0.291 | 0.205 | 1.000 | | | | | |
| ROA | 0.052 | 0.097 | 0.071 | 0.004 | 0.078 | -0.184 | 0.134 | 0.354 | 0.470 | 1.000 | | | | |
| GDPG | 0.412 | 0.232 | 0.255 | 0.309 | 0.246 | -0.247 | -0.086 | -0.102 | 0.006 | -0.089 | 1.000 | | | |
| CPI | 0.025 | -0.114 | 0.139 | 0.021 | 0.011 | -0.170 | -0.290 | 0.089 | -0.240 | 0.074 | -0.010 | 1.000 | | |
| creditGDP | -0.066 | 0.207 | -0.030 | -0.138 | -0.103 | 0.151 | 0.430 | -0.167 | 0.285 | 0.145 | -0.042 | -0.430 | 1.000 | |
| tradeGDP | 0.051 | 0.170 | -0.118 | 0.041 | -0.044 | 0.159 | 0.400 | -0.192 | 0.219 | -0.010 | 0.238 | -0.485 | 0.701 | 1.000 |

*Source: Authors' own calculation*

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# THE RELATIONSHIPS BETWEEN FIRM-SPECIFIC CHARACTERISTICS AND SHORT-TERM PROFITABILITY FORECASTING OF VIETNAMESE LISTED COMPANIES

**Pham Van Tue Nha**[1]

***Abstract:*** *The purpose of this research is to examine the relationship between firm-specific financial characteristics and short-term profitability forecasting of listed companies in Vietnam. The data are collected from 705 listed companies on HNX and HoSE in 10 years from 2010 to 2019, which constructs balanced panel data of 7050 observations. Fixed effects model (FEM) with Robust estimation is applied as the empirical testing method in this research. Several explanatory variables which represent firm-specific characteristics, including assets' size and structure, capital structure, past earnings' changes, structure and distribution and losses, are documented to have statistically significant relationships with short-term profitability forecasting. The research has contributions to both the literature of financial forecasting and policy implications for firms' financial planning.*

***Keywords:*** *Financial forecasting, financial planning, profitability.*

## 1. INTRODUCTION

As an integral part of financial planning, profitability forecasting is helpful to firms as it improves the activeness in dealing with the uncertainty of future situations and the efficiency of financial and business strategies. Profitability forecasting requires firms to be aware of the roles of their own financial characteristics in profitability forecasting, based on the knowledge of their relationships with future profitability. Particularly, they can have strong effects right on the following period's profitability, or short-term profitability forecasting. Therefore, these firm-specific characteristics or "internal factors" need to be managed or controlled appropriately to assure successful business performance in near future.

[1] School of Banking and Finance, National Economics University, Hanoi, Vietnam. Email: nhapvt@neu.edu.vn

Such issue becomes even more significant as firms operate in developing markets as Vietnam since these markets are usually assumed to have more unstable environment with more uncertainty and fluctuations. Particularly, over the last two years, under the influences of Covid-19 pandemic, the whole economy of Vietnam and the business activities of almost every firm are heavily and negatively affected. The consequences are so serious that until now, the economy has not completely recovered yet. Such situation requires a lot more efforts from firms to improve their financial forecasting as the basis to predict and deal with future adversities and assure profitability even in short term. However, publicized research of financial forecasting for business enterprises in Vietnam is still substantially limited. Most studies do not provide a systematic and comprehensive analysis of the relationships between past financial factors and future performance, of which future profitability is an important aspect. Even in developed countries, although there are a lot more relevant studies, not all aspects of profitability forecasting have yet to be examined thoroughly, especially short-term profitability forecasting. In other words, despite their importance, studies of short-term profitability forecasting and its influential factors are apparently underdeveloped and underappreciated in the literature.

Consequently, the relationships between firm-specific characteristics and short-term profitability forecasting of Vietnamese business enterprises are selected as the research subject of this study.

## 2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

Profitability is usually measured as the ratio of earnings to consumed resources to generate such earnings over a period of time. Earnings from business activities are basically generated from selling goods and providing services which are created by combining various inputs including operating assets, labors and other non-financial elements following the firm's manufacturing technology and business method. Those resources all need certain types of financing. To put it simply, from finance and accounting perspective, earnings are the result of a continuous and organic process from raising funds, investment in assets to business operations. Besides, earnings retained from previous periods or "past earnings" can take part in such process as the internally generated funds. Therefore, aspects of assets,

funds (capital) and past earnings should have effects on future profitability and have key roles in profitability forecasting.

For assets, their increases can initially help to reduce average manufacturing cost to a minimum level and thus increase profitability, which is referred to as economies of scale. However, as assets' size continues to increase thereafter, at some point it will become too big in comparison with other inputs, which causes average manufacturing cost to revert and gradually increase, which is referred to as diseconomies of scale. Empirically, the role of assets' size in profitability forecasting was found to be positive (Evans, Njoroge, & Yong, 2017), negative (Yoo & Kim, 2015; Czarnitzki & Kraft, 2010) or statistically insignificant (Espinosa, 2015; Kotsina & Hazak, 2012), depending on the research situation.

Furthermore, assets' structure, which is shown in the proportions of current and fixed assets, may influence future profitability. Current assets' management is associated with several types of carrying and shortage costs, which respectively rise and fall with the level of current assets and thus affect the firm's profitability. The management of current assets must be combined with the management of current liabilities to assure a rational level of net working capital (NWC) which balances risk and cost of capital. Financing policy with low level of NWC has higher risk but lower cost capital while it is the opposite for financing policy with high level of NWC. No matter which policy the firm follows, it definitely influences the firm's future profitability, especially the forecasted profitability of the following period. Meanwhile, fixed assets are utilized for many more periods so their effects on the firm's profitability may last for more periods in the future. Hence, in theory, the role of current assets and net working capital in profitability forecasting is more short-term-oriented while that of fixed assets is more long-term-oriented. Nonetheless, empirical studies of profitability forecasting have not provided adaquate analysis of assets' structure on future profitability, as most of them just examined the influences of current assets or net working capital on profitability of the same period (Bieniasz & Gołaś, 2011; Mwangi & Nyambura, 2015). In these works, the relationship between them was confirmed to be positive.

For capital, its structure can affect future profitability in different ways. On one side, debt creates tax savings or tax shield and also reducecs

agency cost (as manager of a leveraged firm has to be more careful with their spending in order to ensure that the firm's cash budget be sufficient to cover fixed financing cost incurred from debt). On the other side, more debt means higher fixed financing cost, higher bankruptcy risk and higher financial distress cost. Whether the net profitability effect of debt is positive or negative depends on which effect outweighs the other. Empirical researches have reached different conclusions about the role of capital structure (which is often measured as the ratio of debt to assets) in profitability forecasting: It can be positive (Dickinson & Sommers, 2012), negative (Yoo & Kim, 2015), reverse-U-shaped (Nissim & Penman, Financial Statement Analysis of Leverage and How It Informs About Profitability and Price-to-Book Ratios, 2003) or even statistically insignificant (Evans, Njoroge, & Yong, 2017; Espinosa, 2015).

For past earnings, economists for long have proposed a hypothesis of mean reversion, which means that firms' profitability tends to revert to the industry average over time (Stigler, 1963) due to competition among firms in the same industry. Specifically, in a competitive business environment, firms with lower profitability can learn from their more lucrative rivals to improve their profitability. At the same time, the market shares are partly taken away from firms with higher profitability. As a result, the profitability of the two groups tends to move closer to each other's and to the industry average. Another possible reason is temporary abnormal accounting items which cause dramatic changes of current profitability but are not maintained in the following periods, hence profitability of the following periods will revert to the "normal" level. Due to mean reversion, past earnings should have a relationship with future profitability and thus be integrated into profitability forecasting. Fama and French (Forecasting Profitability and Earnings, 2000) empirically proved the existence of mean reversion and also discovered that such phenomenon was more significant for firms with losses (such result does not mean losses always have positive effect on firms' future profitability though. If accumulated losses are not fully covered soon, they may last for too long and negatively influence future profitability). Studies by Allen and Salim (Forecasting profitability and earnings: A study of the UK market (1982-2000), 2005), Altunbas et al., (Mean reversion of profitability: Evidence from the European-listed firms, 2008) again confirm the existence of mean reversion in reality.

Earnings structure is another factor to be considered. Past earnings can be disaggregated into cash component and accruals, which basically are already collected in cash and not yet collected in the same period of reported earnings, respectively. The cash component is argued to be more persistent and have positive effect on future profitability (Graham, Dodd, & Cottle, 1962). Empirical researches also confirm positive relationships between these earnings component and following periods' profitability (Ball, Gerakos, Linnainmaa, & Nikolaev, 2016; Richardson, Sloan, Soliman, & Tuna, 2005; Sloan, 1996), which indicates their positive role in profitability forecasting, but the cash component's influence is more persistent as it has higher statistical significance. Earnings structure is also one of the very few studied influential factors of future profitability in Vietnam (Đỗ Hồng Nhung, Phạm Văn Tuệ Nhã, Trần Mạnh Dũng, & Lê Thu Thủy, 2020), where its effect is proven to be the same as it is in previous studies.

The distribution of past earnings is also a potential influential factor of future profitability. On one side, the signaling theory suggests dividend payment and especially increases of dividend payment as positive signal of future profitability (Lintner, 1956; Miller & Modigliani, 1961): Managers are reluctant to reduce dividend payments in future because such action may cause investors to make negative inferrences about the firm's business result. Therefore, increases of dividend are considered as a sign of management's confidence about the firm's business perspective. On the other side, higher dividend payment means lower retained earnings, so the firm has to rely more on external financing in future, which causes expected cost of capital to rise and expected profitability to fall. Besides, higher dividend payment is interpreted as a result of less NPV-positive investment opportunities in future, which leads to lower future profitability. Hence, the relationship between dividend and future profitability as well as dividend's role in profitability forecasting can be either positive or negative, depending on which effect is more significant. Most empirical researches find this relationship to be positive (Ham, Kaplan, & Leary, 2020; Khan, Lamrani, & Khalid, 2019; Evans, Njoroge, & Yong, 2017; Gou, Maung, & Wilson, 2015; Nissim & Ziv, Dividend Changes and Future Profitability, 2001). However, a few studies confirm it to be negative (Grullon, Michaely, Benartzi, & Thaler, 2005; Penman, 1983) or statistically insignificant (Dhakal & Shah, 2018).

In other words, previous studies suggest assets' size and structure, capital structure and past earnings' changes, structure and distribution as firm-specific characteristics capable of influencing future profitability, thus they should have a role in profitability forecasting.

## 3. METHODOLOGY

To study the roles of firm-specific financial characteristics in profitability forecasting of Vietnamese listed companies, empirical testing of their influences on the following business period's profitability is conducted, using econometrical method. The variables which are confirmed to be statistically significant indicate the characteristics which have practical roles in profitability forecasting of these firms.

### 3.1. Data

The data are collected from audited annual financial statements of 705 companies listed on Vietnamese Stock Exchanges (HNX and HoSE) of 10 years from 2010 to 2019, which constructs the sample of 7050 observations (balanced panel data). Finance-and-banking firms are excluded as their business operations' characteristics are different.

### 3.2. Research model and variables

The research model is developed based on the above theoretical framework and literature review as follows:

$$dROA_{i,t+1} = \alpha_0 + \alpha_1 \times SIZE_{i,t} + \alpha_2 \times NWC_{i,t} + \alpha_3 \times D_{i,t} + \alpha_4 \times dROA_{i,t} + \alpha_5 \times ACCR_{i,t} + \alpha_6 \times DIV_{i,t} + \alpha_7 \times LOSS_{i,t} + u_{it} \quad (1)$$

$$dROE_{i,t+1} = \beta_0 + \beta_1 \times SIZE_{i,t} + \beta_2 \times NWC_{i,t} + \beta_3 \times D_{i,t} + \beta_4 \times dROE_{i,t} + \beta_5 \times ACCR_{i,t} + \beta_6 \times DIV_{i,t} + \beta_7 \times LOSS_{i,t} + u_{it} \quad (2)$$

The measures of model's variables are adapted from previous typical researches, considering the financial and accounting dataset of Vietnamese firms (Table 1).

**Table 1. Explanation of Variables in Research Model**

| | Variables | Formula | Represented characteristic | References |
|---|---|---|---|---|
| Dependent variable | $dROA_{i,t+1}$ | $dROA_{i,t+1} = ROA_{i,t+1} - ROA_{i,t}$ ($ROA_{i,t}$ = Operating $profit_{i,t}$/ Total $assets_{i,t}$) | Future profitability changes | Fama & French (Forecasting Profitability and Earnings, 2000), Allen & Salim (Forecasting profitability and earnings: A study of the UK market (1982-2000), 2005), Altunbas, et al. (Mean reversion of profitability: Evidence from the European-listed firms, 2008) |
| | $dROE_{i,t+1}$ | $dROE_{i,t+1} = ROE_{i,t+1} - ROEi,t$ ($ROE_{i,t}$ = Net $profit_{i,t}$/ $Equity_{i,t}$) | | |
| Independent variable | $SIZE_{i,t}$ | $SIZE_{i,t} = ln(Total\ assets_{i,t})$ | Assets' size | Evans, et al. (An Examination of the Statistical Significance and Economic Relevance of Profitability and Earnings Forecasts from Models and Analysts, 2017), Yoo & Kim (The Dynamic Relationship between Growth and Profitability under Long-Term Recession: The Case of Korean Construction Companies, 2015), Espinosa (Financial Constraints, Corporate Investment and Future Profitability (PhD. dissertation, 2015) |
| | $NWC_{i,t}$ | $NWC_{i,t}$ = Net working $capital_{i,t}$/$Total\ assets_{i,t}$ (Net working capital = Current assets – Current liabilities) | Assets' structure | Bieniasz & Gołaś (The Influence of Working Capital Management on the Food Industry Enterprises Profitability, 2011), Mwangi & Nyambura (The role of inventory management on performance of food processing companies: A case study of crown foods limited Kenya, 2015) |
| | $D_{i,t}$ | $D_{i,t} = Debt_{i,t}$/$Total\ assets_{i,t}$ | Capital structure | Yoo & Kim (The Dynamic Relationship between Growth and Profitability under Long-Term Recession: The Case of Korean Construction Companies, 2015), Evans, et al. (An Examination of the Statistical Significance and Economic Relevance of Profitability and Earnings Forecasts from Models and Analysts, 2017) |
| | $dROA_{i,t}$ | $dROA_{i,t} = ROA_{i,t} - ROA_{i,t-1}$ | Past earnings changes | Fama & French (Forecasting Profitability and Earnings, 2000), Allen & Salim (Forecasting profitability and earnings: A study of the UK market (1982-2000), 2005), Altunbas, et al. (Mean reversion of profitability: Evidence from the European-listed firms, 2008) |
| | $dROE_{i,t}$ | $dROE_{i,t} = ROE_{i,t} - ROE_{i,t-1}$ | | |
| | $ACCR_{i,t}$ | $ACCR_{i,t}$ = $Accruals_{i,t}$/Total $assets_{i,t}$ (Accruals = Operating profit – Net cash flow from operating activities) | Earnings structure | Ball, et al. (Accruals, cash flows, and operating profitability in the cross section of stock returns, 2016), Richardson, et al. (Accrual Reliability, Earnings Persistence and Stock Prices, 2005), Sloan (Do Stock Prices Fully Reflect Information in Accruals and Cash Flows about Future Earnings?, 1996) |

| | | | | |
|---|---|---|---|---|
| | $DIV_{i,t}$ | $DIV_{i,t}$ = $Dividend_{i,t}$/Total $assets_{i,t}$ | Earnings distribution | Ham, et al. (Do dividends convey information about future earnings?, 2020), Khan, et al. (The impact of dividend policy on firm performance: A case study of the industrial sector., 2019), Grullon, et al. (Dividend Changes Do Not Signal Changes in Future Profitability, 2005) |
| | $LOSS_{i,t}$ | $LOSS_{i,t}$ = 0 if firm i has positive net profit in year t, = 1 if it has negative net profit in year t | Losses | Fama & French (Forecasting Profitability and Earnings, 2000) |

*Source: Developed by the author based on theoretical framework and literature review.*

*Note:*

*- Balance sheet items including total assets, debt, equity, current assets and current liabilities in the above formulas are measured in average annual values, which are calculated as the average of their beginning balance and ending balance in each year.*

*- i and t respectively indicate firm i in year t in the sample.*

### 3.3. Estimation method, diagnostic method and solutions for assumption violations

Models (1) and (2) are estimated by applying linear regression for panel data. Two methods are tried out: Fixed effects model (FEM) and Random effects model (REM). Hausman is then used to determine which model is more suitable for the dataset.

Some technical issues may arise if assumptions of classical regression model are violated, which causes the estimation results to be unreliable. The and solution for each of them are presented in table 2.

**Table 2. Diagnostic Methods and Solutions**

| Assumption violations | Diagnostic methods | Solutions |
|---|---|---|
| Multicollinearity | Correlation matrix | Modifying the measurement of variables which have high correlations without reducing their representativeness of firm-specific characteristics in the models |
| Heteroskedasticity | Modified Wald test | Robust estimation |
| Autocorrelation | Wooldridge test | |

| | | |
|---|---|---|
| Absence of variables representing external influential factors | (This violation is assumed to be present in the model) | Using regression model with two-way error term, where the error term uit is disaggregated as follows: $u_{it} = \gamma_i + \delta_t + \varepsilon_{it}$. γi represents factors which vary among cross-section units but are unchanged over time for each unit, δt represents factors which change over time but have the effect on all cross-section units in the same period. εit vary among cross-section units and over years and are assumed to satisfy the assumptions of random error term in classical regression model. |

*Source: Developed by the author based on previous relevant studies.*

## 4. RESULTS AND DISCUSSION

### 4.1. Descriptive statistics

**Table 3. Descriptive Statistics of Variables in the Models**

| Variables | Number of observations | Mean | Standard deviations | Min | Max |
|---|---|---|---|---|---|
| SIZE | 7050 | 27,4955 | 1,5068 | 21,8499 | 32,9225 |
| NWC | 7050 | 0,1784 | 0,2224 | -0,3986 | 0,6659 |
| D | 7050 | 0,2731 | 0,1939 | 0,0000 | 0,8412 |
| dROA | 7050 | -0,0060 | 0,1214 | -0,5798 | 0,5135 |
| dROE | 7050 | -0,0161 | 0,2436 | -1,0969 | 0,8509 |
| ACCR | 7050 | 0,0335 | 0,1994 | -0,7054 | 0,6964 |
| DIV | 7050 | 0,1462 | 0,1528 | 0,0000 | 0,4921 |
| LOSS | 7050 | 0,1288 | 0,3350 | 0,0000 | 1,0000 |

*Source: Calculated by the author on Stata software*

The above descriptive statistics somehow show the fluctuations of the variables representing firm-specific characteristics in the sample, notably NWC, ACCR, dROA and dROE.

NWC ranges from -0,3986 to 0,6659 with the standard deviation of 0,2224, showing the considerable differences in assets' structure among firms. While many firms choose conservative financing policy with positive NWC, current assets sufficient to cover current liabilities, long-term funds sufficient to finance fixed assets and ensured liquidity but higher cost of capital, other firms follow riskier financing policy with negative NWC and the opposite advantages and disadvantages. However, the mean value of

NWC is 0,1784 > 0, indicating conservative financing policy as probably the more common choice.

Similarly, ACCR ranges from -0,7054 to 0,6964 0,1994 with the standard deviation of 0,1994, showing the substantial differences in earnings structure among firms and its changes over time. There are cases in which the operating profit is a lot lower than operating activities' net cash flow, resulting in negative accruals (which is not necessarily a negative indicator of profitability). Meanwhile, for some other cases, the net cash flow of operating activities only makes up for a relatively small proportion of operating profit, resulting in high value of ACCR and indicating that the current period's earnings are largely uncollected and earnings quality may be negatively affected. However, the mean value of ACCR is 0,0335 > 0, showing that the operating profit is higher than operating activities' net cash flow in most observations.

The ranges of dROA and dROE are respectively (-0,5798, 0,5135) and (-1,0969, 0,8509), demonstrating the instability of profitability changes among firms and over years. Firms may experience sudden and dramatic profitability deterioration during difficult times but they also may recover quickly and have strong growth afterwards, as evidenced by their ROA and ROE changing by dozens of percentage points from year to year. The range of ROE changes is wider than that of ROA as changes of ROE are magnified by financial leverage. The mean values of both ROA and dROE are negative, indicating the commonness of ROA and ROE decreases in the sample.

### 4.2. Correlation matrix

**Table 4. Correlation Matrix of Variables in the Models**

| | SIZE | NWC | D | dROA | dROE | ACCR | DIV | LOSS |
|---|---|---|---|---|---|---|---|---|
| SIZE | 1,0000 | | | | | | | |
| NWC | -0,2810 | 1,0000 | | | | | | |
| D | 0,3221 | -0,4235 | 1,0000 | | | | | |
| dROA | 0,0400 | 0,0124 | -0,0303 | 1,0000 | | | | |
| dROE | 0,0395 | 0,0157 | -0,0544 | 0,8244 | 1,0000 | | | |
| ACCR | 0,0175 | 0,0595 | -0,0717 | 0,2426 | 0,2061 | 1,0000 | | |
| DIV | -0,1612 | 0,0819 | 0,0018 | -0,0380 | -0,0579 | -0,0470 | 1,0000 | |
| LOSS | 0,0614 | -0,1346 | 0,1673 | -0,3997 | -0,4387 | -0,2232 | 0,1416 | 1,0000 |

*Source: Calculated by the author on Stata software.*

The correlation matrix shows low level of correlation between each pair of variables in the models, with all of the correlation coefficients' absolute values being lower than 0,5 (except for the correlation coefficient between dROA and dROE but these two variables are not included in the same model). Therefore, multicollinearity is not a problem for these models.

### 4.3. Regression results

Firstly, models (1) and (2) are estimated by both FEM and REM. The result of Hausman test afterwards shows that FEM is the better choice. Besides, the results of modified Wald test and Wooldridge test respectively indicate heteroskedasticity and autocorrelation in the models so the coefficients need to be reestimated using Robust estimation. The results of these tests are presented in the Appendix.

The estimation results of coefficients in models (1) and (2) are summarized and compared with expectation of coefficients' signs in table 5 and presented in detail in the Appendix.

**Table 5. Estimation Results of Coefficients in Models (1) and (2)**

| Variable | Expectation of coefficients' signs | Model (1) | | Model (2) | |
|---|---|---|---|---|---|
| | | Coefficient | SE | Coefficient | SE |
| SIZE | +/- | 0,0201*** | 0,0028 | 0,0420*** | 0,0057 |
| NWC | +/- | 0,0552*** | 0,0133 | 0,1276*** | 0,0253 |
| D | +/- | -0,0100 | 0,0193 | -0,0848** | 0,0367 |
| dROA | - | -0,4209*** | 0,0258 | | |
| dROE | | | | -0,4124*** | 0,0224 |
| ACCR | + | -0,0778*** | 0,0189 | -0,1223*** | 0,0299 |
| DIV | +/- | -0,0427*** | 0,0128 | -0,0876*** | 0,0243 |
| LOSS | +/- | 0,0952*** | 0,0075 | 0,2066*** | 0,0167 |

*** and *** respectively imply the significance levels of 5% and 1%.*

*Source: Calculated by the author on Stata software.*

### 4.4. Discussion

Variable SIZE is statistically significant in both models and has positive sign, which demonstrates the positive effect of assets' size on

profitability changes of the following period. This result is similar to the findings of Evans, et al. (An Examination of the Statistical Significance and Economic Relevance of Profitability and Earnings Forecasts from Models and Analysts, 2017) but different from those of Yoo and Kim (The Dynamic Relationship between Growth and Profitability under Long-Term Recession: The Case of Korean Construction Companies, 2015), Czarnitzki and Kraft (On the Profitability of Innovative Assets, 2010). For Vietnamese listed companies, the economies of scale are more dominant than diseconomies of scale. In other words, for a majority of these firms, their assets' size has not grown beyond the optimal level so the average manufacturing cost is still on the trend of going down as assets increase. As long as this is the case, assets' size has a positive role in short-term profitability forecasting: The increase of assets' size can help to improve profitability changes of the following period.

Similarly, variable NWC has positive sign and is statistically significant in both models, showing the positive relationship between the ratio of net working capital, which represents assets' structure, and the following period's profitability. In general, for Vietnamese listed companies, the level of NWC compared to total assets is probably still lower than the optimal level where the total cost of managing NWC is minimized and profitability is maximized accordingly, ceteris paribus. Specifically, when the level of NWC is lower than the optimal level, a gradual increase in NWC towards the optimal level will cause shortage costs to fall more than it will cause carrying costs to rise and the total cost will go down consequently. Therefore, assets' structure has a positive role in short-term profitability forecasting: The increase of the ratio of NWC to total assets can help to improve profitability changes of the following period.

Variable D is only statistically significant in model (2). The fact that it is not statistically significant in model (1) can be explained by the measurement of future profitability changes in that model. To be specific, in model (1), future profitability changes are measured by changes in ROA, which is in turn computed as the ratio of operating profit to average total assets. According to static theory of capital structure, operating profit and total assets are not directly affected by changes of capital structure so ROA and its changes do not vary directly with changes of capital structure

either. Meanwhile, in model (2), profitability changes are measured by changes in ROE, which is in turn calculated as the ratio of net profit to average equity. Assuming that operating profit and total assets stay the same, as debt ratio increases, both net profit and equity will surely decrease due to the increases of interest expenses and debt respectively, and ROE may change accordingly. In model (2), the sign of D is negative, which is similar to the findings of Yoo and Kim (The Dynamic Relationship between Growth and Profitability under Long-Term Recession: The Case of Korean Construction Companies, 2015) but different from Dickinson and Sommers (Which competitive efforts lead to future abnormal economic rents? Using accounting ratios to assess competitive advantage, 2012), displaying the negative relationship between debt ratio, which is widely used to represent capital structure, and future profitability changes. This result indicates that Vietnamese listed firms' debt ratio is generally higher than the optimal level so the negative effect of high financing cost outweighs the benefit of tax shield. Hence, capital structure has a negative role in short-term profitability forecasting: The increase of debt ratio tends to worsen profitability changes of the following period.

Variables dROA and dROE representing past earnings changes in models (1) and (2) are both statistically significant and both have negative signs, which is similar to the expectation of coefficients' signs and the conclusion of Fama and French (Forecasting Profitability and Earnings, 2000), Allen and Salim (Forecasting profitability and earnings: A study of the UK market (1982-2000), 2005) and Altunbas, et al. (Mean reversion of profitability: Evidence from the European-listed firms, 2008), proving the negative relationship between profitability changes of the previous period and those of the following period. If profitability changes a lot in the previous period then it will tend to have less changes in the following period, and vice versa. For example, if profitability increases sharply in year t compared to year (t-1), which is demonstrated by high dROA and dROE of year t, then according to the above relationship, the forecasted of dROA and dROE for year (t+1) should be low or even negative, implying that ROA and ROE of year (t+1) will tend to move in the opposite way to ROA and ROE of year t to balance the firm's profitability over time. Even if the forecasted dROA and dROE of year (t+1) are positive, they should not be too high compared to those of year t, meaning that even if

the firm's profitability can still go up in year t, such increase should be significantly lower than that of year t. In other words, the improvement of profitability will slow down. On the contrary, if dROA and dROE of year t are low, the forecasted profitability changes of year (t+1) should be high. This relationship can somehow be considered as a "rule" to balance firms' profitability over time. It helps to adjust the extreme fluctuations of profitability and prevent them from lasting for too long. This can be referred to as a preliminary evidence of mean reversion of profitability of Vietnamese firms.

Variable ACCR is statistically significant in both models but its sign is negative, which is opposite to the expectation and the conclusion of previous studies. For Vietnamese listed companies, the proportion of accruals in operating profit, which represents past earnings structure, has negative relationship with future profitability changes. Firstly, such result does not mean that when accruals' proportion increases, the forecasted profitability of the following period will decrease. It actually means that the change of profitability in the following period will tend to be lower (Being lower does not necessarily mean being negative though. Such change of profitability can still be positive, implying that profitability can still go up but by a smaller degree in the following period). It is hypothesized that some of the accruals are difficult to be collected (or "transformed" into cash flow). When the proportion of accruals in operating profit increases, the amount of these low-quality accruals increases accordingly, which negatively influences the change of profitability in the following period. Therefore, earnings structure has a negative role in short-term profitability forecasting: The increase of accruals' proportion tends to lower profitability changes in the following period.

Variable DIV is statistically significant in both models. Its sign is negative, which is similar to the findings of Grullon, et al. (Dividend Changes Do Not Signal Changes in Future Profitability, 2005), Penman (The Predictive Content of Earnings Forecasts and Dividends, 1983) but different from Ham, et al. (Do dividends convey information about future earnings?, 2020), Khan, et al. (The impact of dividend policy on firm performance: A case study of the industrial sector., 2019), Evans, et al. (An Examination of the Statistical Significance and Economic Relevance

of Profitability and Earnings Forecasts from Models and Analysts, 2017). Based on this result, it can be inferred that the negative effect of increasing cost of capital as firms pay more dividends, retain less earnings and consequently have to rely more on external financing outweighs the positive signaling effect of dividend payment, which causes the net effect of previous period's dividend payment on the following period's profitability to be negative. Hence, dividend has a negative role in short-term profitability forecasting: The increase of dividend tends to lower profitability changes in the following period.

Variable LOSS is statistically significant and has positive sign in both models, which is similar to the findings of Fama and French (Forecasting Profitability and Earnings, 2000), illustrating the positive relationship between losses and the changes of profitability of the following period. This result implies that Vietnamese listed companies generally had successful attempts to cover losses and did not let negative business result of previous period affect the profitability of following period. Another hypothesis is that these losses are just the consequence of unusual incidents which do not last for long or do not necessarily recur in future so when the indicents are over, the firm's profitability will return to the former level before those events. Therefore, although losses are usually assumed to be a negative phenomenon for business enterprises, they actually have a positive role in short-term profitability forecasting: Losses of the previous period motivate the firm to make an effort to improve their business performance and the forecased change of profitability in the following period tends to be higher to cover those losses.

## 5. CONCLUSION

This research clarifies the roles of firm-specific financial characteristics in short-term profitability forecasting of Vietnamese listed companies: The size and structure of assets and losses have positive roles while capital structure, past earnings' changes and structure and dividend have negative roles. Firms need to integrate these characteristics in their short-term profitability forecasting and financial forecasting models as a part of financial planning. Besides, they should consider increasing assets' size and NWC proportion as well as decreasing debt ratio and accruals' proportion, paying attention to mean reversion of profitability to enhance short-term profitability.

In this research, only the short-term effects of firm-specific characteristics on future profitability are examined so the research's contribution is more short-term oriented. There should be more studies in future to expand the research objects by covering their long-term effects as well in order to enrich the literature of influential factors of profitability forecasting in both short term and long term.

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## Appendix

**Model (1)**

➢ Hausman test's result

---- Coefficients ----

| (b) (B) (b-B) sqrt(diag(V_b-V_B))

| fixed random Difference S.E.

---+---

SIZE | .0201204 .006956 .0131644 .0017667

NWC | .055185 .0306654 .0245196 .0065368

D | -.0100302 -.0114432 .001413 .0094438

dROA | -.4209456 -.3908759 -.0300698 .0056649

ACCR | -.0778373 -.0803153 .002478 .0034582

DIV | -.04271 -.0504452 .0077353 .0049123

LOSS | .0952205 .0819289 .0132916 .0027741

t |

1 | -.0131039 -.0125602 -.0005438 .0011463

2 | -.011673 -.0103853 -.0012876 .0011634

3 | -.002174 -.0013263 -.0008477 .0011693

4 | .0090932 .010368 -.0012748 .0011942

5 | -.000838 .0009665 -.0018045 .0012269

6 | -.0228904 -.0194288 -.0034617 .0012647

7 | -.0549464 -.0420748 -.0128716 .0022338

8 | -.0510826 -.0301481 -.0209345 .0028949

---

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(15) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 189.00

Prob>chi2 = 0.0000

➢ Modified Wald test's result

Modified Wald test for groupwise heteroskedasticity

in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (705) = 2.0e+05
Prob>chi2 = 0.0000

➢ Wooldridge test's result

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F( 1, 704) = 2490.229
Prob > F = 0.0000

➢ The regression result of FEM Robust estimation

---

| Robust
dROA1 | Coef. Std. Err. t P>|t| [95% Conf. Interval]
---+---
SIZE | .0201204 .0027677 7.27 0.000 .0146864 .0255543
NWC | .055185 .0133134 4.15 0.000 .0290463 .0813237
D | -.0100302 .0193259 -0.52 0.604 -.0479735 .027913
dROA | -.4209456 .0257999 -16.32 0.000 -.4715996 -.3702917
ACCR | -.0778373 .0189475 -4.11 0.000 -.1150376 -.0406369
DIV | -.04271 .0127981 -3.34 0.001 -.0678371 -.0175829
LOSS | .0952205 .0075067 12.68 0.000 .0804822 .1099587
|
t |
1 | -.0131039 .0048926 -2.68 0.008 -.0227097 -.0034981
2 | -.011673 .005301 -2.20 0.028 -.0220806 -.0012653
3 | -.002174 .0047392 -0.46 0.647 -.0114787 .0071307
4 | .0090932 .0044306 2.05 0.041 .0003944 .0177919
5 | -.000838 .0043902 -0.19 0.849 -.0094575 .0077815
6 | -.0228904 .0045147 -5.07 0.000 -.0317544 -.0140265
7 | -.0549464 .0096625 -5.69 0.000 -.0739172 -.0359757
8 | -.0510826 .0092313 -5.53 0.000 -.0692068 -.0329585
|
_cons | -.5536277 .0739061 -7.49 0.000 -.6987303 -.408525
---+---
sigma_u | .03633616
sigma_e | .11322464
rho | .09337369 (fraction of variance due to u_i)

---

**Model (2)**

➢ Hausman test's result

---- Coefficients ----

| (b) (B) (b-B) sqrt(diag(V_b-V_B))

| fixed random Difference S.E.

---+---

SIZE | .0420358 .0162731 .0257627 .0035202

NWC | .1275507 .0812709 .0462798 .0130315

D | -.0848337 -.0781419 -.0066918 .0188079

dROE | -.4123981 -.3833225 -.0290757 .005771

ACCR | -.1223374 -.1189589 -.0033784 .0066991

DIV | -.0875743 -.0966249 .0090506 .0097636

LOSS | .2066124 .182373 .0242395 .0058283

t |

1 | -.0372694 -.0362759 -.0009935 .0022894

2 | -.0338688 -.0311585 -.0027103 .0023187

3 | -.007732 -.0058646 -.0018674 .0023344

4 | .0133976 .0162106 -.002813 .0023849

5 | -.0032362 .0006536 -.0038898 .0024508

6 | -.0429035 -.0358342 -.0070693 .0025224

7 | -.1193126 -.093496 -.0258166 .0044498

8 | -.112404 -.0718263 -.0405778 .0057595

---

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(15) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 194.72

Prob>chi2 = 0.0000

➢ Modified Wald test's result

Modified Wald test for groupwise heteroskedasticity

in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (705) = 68533.68

Prob>chi2 = 0.0000

➢ Wooldridge test's result

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F( 1, 704) = 2341.349

Prob > F = 0.0000

➢ The regression result of FEM Robust estimation

---

| Robust

dROE1 | Coef. Std. Err. t P>|t| [95% Conf. Interval]

---+---

SIZE | .0420358 .0057283 7.34 0.000 .0307892 .0532824

NWC | .1275507 .0253453 5.03 0.000 .0777893 .1773122

D | -.0848337 .0366698 -2.31 0.021 -.1568288 -.0128385

dROE | -.4123981 .0224436 -18.37 0.000 -.4564626 -.3683337

ACCR | -.1223374 .0299274 -4.09 0.000 -.1810949 -.0635798

DIV | -.0875743 .0243241 -3.60 0.000 -.1353307 -.0398179

LOSS | .2066124 .0166771 12.39 0.000 .1738696 .2393552

|

t |

1 | -.0372694 .0102779 -3.63 0.000 -.0574484 -.0170904

2 | -.0338688 .0117007 -2.89 0.004 -.0568413 -.0108963

3 | -.007732 .010471 -0.74 0.461 -.02829 .0128261

4 | .0133976 .0093627 1.43 0.153 -.0049845 .0317798

5 | -.0032362 .0094143 -0.34 0.731 -.0217198 .0152473

6 | -.0429035 .009596 -4.47 0.000 -.0617437 -.0240633

7 | -.1193126 .0196821 -6.06 0.000 -.1579552 -.08067

8 | -.112404 .0187007 -6.01 0.000 -.1491199 -.0756882

|

_cons | -1.145355 .1518384 -7.54 0.000 -1.443465 -.8472447

---+---

sigma_u | .07177992

sigma_e | .22549384

rho | .09200665 (fraction of variance due to u_i)

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# THE ROLE OF THE CENTRAL BANK IN PROMOTING CARBON FINANCE POLICY AND REGULATION

**Tran Nguyen Phuoc Thong**[1]

***Abstract:*** *The change of the international economic system will contribute to promoting each country more opportunities to combat global climate change. Carbon fiscal policy is one of the important orientations that each country needs to consider, especially the role of the central bank in each country in the low-carbon economy is trending of the world. Each central bank needs to have an appropriate assessment of climate risks to economic and financial markets, and then seek effective solutions to reduce those risks. This article presents some of the shortcomings of central banks around the world in lending to businesses in the carbon-intensive sector. From there, the article provides a policy orientation for the central bank when lending finance and credit to low-carbon business activities.*

***Keywords:*** *Carbon finance, low-carbon economy, carbon-intensive activities.*

## 1. INTRODUCTION

Greenhouse gas emissions are considered as one of the main causes of global climate change (IPCC, 2014). With commitments in The Paris Agreement (2015), countries have increasingly worked to keep global temperatures from rising above pre-industrial levels. For this reason, each country needs to proactively re-direct investment flows into carbon finance because the dramatic transformation from the international economic system will contribute to the realization of the common goal in The Paris Agreement. Financial flows must be compatible with the roadmap to reduce carbon commitments is extremely important mentioned in The Paris Agreement. The question for central banks is to what extent these institutions in each country will implement and contribute to the shared commitment. The role of central banks was evident during the global recessions of the 2007s. "*The Federal Reserve, The European Central*

[1] University of Economics and Law, Vietnam National University Ho Chi Minh City. Email: thongtnp20610@sdh.uel.edu.vn

*Bank and The Bank of Japan pushed more than $10 trillion into financial markets between 2007 and 2017*" (Yardeni Research Inc., 2018). This shows that the major central banks have created a significant amount of money to stabilize the financial system with the aim of recovering the economy in crisis. The world's major central banks have also realized their important role, so they are always looking to improve their macro-financial protections to strengthen the current system and provide contingency in the future.

However, for the carbon finance market, the mandate and effective implementation of policies by central banks are still unclear. This article focuses on analyzing the contributions and shortcomings of central banks in the process of promoting low-carbon finance. At the same time, the author also mentions the alternatives that central banks can implement to control the current risks within their jurisdiction and obligations to ensure the regulations and policies of the central bank in accordance with the commitments in The Paris Agreement.

## 2. THE RISKS OF CLIMATE CHANGE AFFECT THE STABILITY OF FINANCIAL MARKETS

Central banks and monetary and financial regulators, as well as academic researches over the years, have increasingly looked at the risks to financial markets posed by climate change (Regelink, Reinders, Vleeschhouwer and van de Wiel, 2017). The costs of climate change adaptation and the costs of transitioning to a low-carbon economy will expose carbon-intensive businesses to more risk than others because they will have the high level of debt and increased leverage also lead to financial instability of the business.

Conversion risk, liability risk and physical risk are the three main types of risks that climate change poses to the financial system (see Batten, Sowerbutts and Tanaka, 2016). Transition risk is the risk of financial imbalances and economic loss associated with the transition to a low-carbon fiscal policy. This could be a regulation on emission restriction (also known as a carbon policy risk) or a process of increasing the price of carbon to match the requirements of the policy. With respect to physical risk, this type of risk is potential when it comes to climate-induced hazards that can affect the financial economy. Related to liability risk, also known

as liability risk because this type of risk forces companies that have committed acts of loss to be responsible for indemnifying other individuals and organizations. Liability risk is often associated with physical risk or conversion risk or both because when the company causes physical damage or damage occurs in the process of conversion, they, at the same time, also bear the risk of liability.

On the other hand, climate change poses risks not only to individual market participants but also to the financial system. This is known as systemic risk because individual decisions on the market will be affected by climate change, from these local effects leading to the effects of the entire financial system (Acharya, 2009). Therefore, the individual risks of financial institutions are not taken into account, instead, central banks will focus on systemic risks to find ways to ensure the stability of financial markets. by mitigating these risks. Objectively, businesses will face many climate-related risks when they have many carbon-intensive business activities.

Production technologies that cause a lot of emissions will often face climate-related physical risks. At the same time, because they are not environmentally friendly, these technologies will often become obsolete quickly and incur many of the costs of carbon reduction required by law. From there, a way of compensating, businesses using high-emission technology will have to bear high switching costs to meet the requirements and standards set by each country to move towards the low-carbon economy. At the same time, if they cause damage, they must be legally responsible for compensating a third party as a remedy for their illegal behavior. In general, companies with businesses based on high carbon technology will incur more costs in facing global climate-related risks. This level of risk is related to financial activities because the cost of switching and the cost of legal liability will be higher, which also partly affects the implementation of financial activities. loans, payments and corporate bonds. These things, invisibly, will make businesses more exposed to credit risk in the financial - banking sector.

The magnitude of the impact of risks related to climate change is not yet clearly assessed. There is a view that carbon risks should play an important role in a pattern where these risks are a strong impulse to stimulate stock price swings (Görgen, Jacob, Nerlinger, Rohleder and

Wilkens, 2017). Reputable rating agencies in the world have not yet fully ranked climate-related risks (long-term, medium-term risks) but only focused on short-term risks (Campiglio et al. al., 2017). The reason these ratings are important is because they affect the valuation of assets like loans and bonds, if the ratings are undervalued and don't consider medium- and long-term risks. The effects of climate change can cause deviations in the valuation process. For firms conducting business in fossil fuels, for example, one study found that as of 2015, new banks assess the risk of loans to these businesses; for the period 2015 and earlier, valuing risk to charge higher prices on loans does not appear to be a trend for the assessment of fossil fuel reserves of each enterprise causing environmental pollution (Delis, de Greiff and Ongena, 2017).

However, even if a country has transitioned to a low-carbon economy, the risks to financial markets from climate change still exist to a certain extent. Crucial to a successful transition is a pollution-free and sustainable infrastructure (Global Commission on the Economy and Climate, 2014). In order to have this important component, debt instruments are one of the important investment methods that need to be applied. Loans that require future growth to pay for the costs of reducing pollution and transitioning to a low-carbon economy; at the same time, loans also help respond to climate-related physical risks (Giraud, Mc Isaac and Bovari, 2017). Thus, each country's policy goals for debt instruments need to be appropriate for timely and effective implementation and to be able to contain loans at a sustainable level in the long term. An increase in total debt in the short and medium term is necessary, but a boom in borrowing in the long term will affect the price of carbon and production output due to the risks of climate change. It is important to note that the policy enacted should encourage businesses to take advantage of debt to offset the conversion costs and loss costs from climate change.

High levels of debt are often associated with higher leverage, leading to higher risk taking and higher losses for banks due to the impact of more aggressive and non-performing loans, and the effect of default rates on bonds is also heavier. If these factors increase to a serious degree, it will lead to instability of the financial system. The correlation between interbank crisis and high debt ratio has been documented in several studies (see Borio and Lowe, 2002). When market prices do not accurately reflect

financial risks and when the risks cause losses that the bank's capitalization cannot afford, the risk of increased debt and financial instability can take place. Therefore, regarding the risks from climate change, to avoid the above uncertainties requires a comprehensive assessment of the risks of the entire financial system. Supervisors such as central banks must correctly recognize the climate risks associated with the value of liabilities and the ability of financial institutions to fully capitalize (organizations that could potentially bear climate risks). When systemic risks related to climate change are accurately and comprehensively assessed, capitalization conditions and bad debt ratios can be controlled.

In fact, many central banks around the world have carried out a systematic risk assessment process to control the above factors, however, there is still no bank that has carried out a comprehensive assessment to control the risks. financial risks associated with climate change (Rogers, J. H., Scotti, C. and Wright, J. H, 2014). Therefore, central banks in each country need to have a more in-depth look at the powerful driving forces and linkages between the environment, finance and economy to conduct research and implementation. The author believes that the lack of systematic risk assessment seems to be because there are currently no specific standards on how to create specific factors, criteria and tests to apply to systemic risks related to climate change.

In addition, gaps in finding criteria for assessing systemic risks also need to consider the resilience of the financial system to the effects of climate change. Information on market recovery as well as the return of financial instruments in specific periods is not only useful for the management of each country but also important for individuals and organizations participating in the market so that they can make the right investment decisions. For this reason, detailing a comprehensive assessment of systemic risk (including all three types of risk: physical, convertible, and liability) will be an important obligation of banks in the process of transforming financial markets into compliance with climate change commitments.

## 3. ROLE OF THE CENTRAL BANK

In Europe, central banks play a key role in the transition to a low-carbon economy because the main central bank is not only a collection

of specialized knowledge, intermediaries transformation, the provision of capital but also the effective use of financial instruments to encourage the development of low-carbon businesses. From that, it can be seen that the central bank's study of legal policy, financial mechanism, capitalization measures, connection with the government, governance structure of green lending models and investment portfolio is very important urgent and useful.

### 3.1. Take advantage of legal policy

KfW, Caisse des Depots or EIB are prime examples of banks established through legislation enacted by parliament on their success in helping the country transition to a low carbon economy. When there is a legal advantage, banks will have many advantages to ensure their important role in realizing the common environmental goal. First, a bank with a legal advantage will ensure stability and sustainability in its operations to support the transition to a low-carbon economy (Green Investment Bank Commission, 2010). In addition, when a country's laws are geared towards sustainable development, towards the common goal of economic development accompanied by environmental protection, then central bank investments are forced to follow general policy (Matthew, E., 2011). Thus, the legal policy of a country is both a mechanism and an opportunity for banks to follow and take advantage of towards a common environmental goal. Therefore, the bank's decisions and explanations will have to respond accordingly in relation to government policy.

Every investment decision of the bank must be transparent and compliant with the law to move towards a low carbon economy. Thus, within the regulatory framework, the central bank can establish appropriate lending and investment policies to encourage companies that are using a lot of carbon to switch to low-carbon activities, and at the same time, also create green mechanisms to support low-carbon companies. For example, KfW is a bank that always aligns its activities with the sustainable development goals of the German federal government. KfW has taken advantage of legal policy to promote as a renewable energy investment in Germany. As of 2009, KfW had over 40% market share in the eco-friendly electricity generation sector in the country (Principles for Responsible Investing, 2011).

### 3.2. Autonomy and independence in decision making and operations

As discussed above, banks will be subject to general legal policies on sustainable economic development and environmental protection. However, when creating its own policies or mechanisms, the central bank still has certain autonomy, especially in decisions related to the lending mechanism as long as the general policy is still met. This independence exists because each bank will be responsible for its own investment and reputation, not a state agency. Therefore, from an independent perspective, the bank needs to have the autonomy to not get involved with any political goals. It should be clearly recognized that besides the goal of helping the country transition to a low-carbon economy, the basic function of a bank is to ensure the safety and stability of investors' money. Especially for depositors who are insurance funds, pension funds, banks must demonstrate the role of a safe place of money with stable returns and low risks in the long term (Environmental Audit Committee, 2011). For example, the EIB is a bank with independent legal status. According to The EC Treaty, the EIB has the freedom to enter into transactions without government interference, as long as the exercise of the bank's rights remains within the general framework (Macsik, Z., 2003). The general framework covered here is the directives and guidelines of The European Commission. The independence of the EIB in exercising its rights is to ensure that the operations of the central bank will not be interfered with and distorted by the claims of the member states of the union.

Independence can also be expressed through the bank's governance structure. The bank may have an advisory council that focuses solely on advising the bank on public policy areas to meet national goals. At the same time, to ensure independence, the bank will need an additional board of directors or an advisory board consisting of financial experts, investment experts and business leaders to perform the advisory function. on financial mechanisms and policies for the benefit of the bank. The condition for this advisory board is not to have interests in conflict with the bank.

### 3.3. Diverse ownership structure

The ownership structure of central banks is also diverse, and each type of structure can significantly contribute to supporting the transition to

a low-carbon economy. There are four types of ownership structures that central banks around the world choose from:

(i) 100% capital from the government of a country

(ii) common ownership of nations

(iii) joint federal and state ownership

(iv) 100% capital from the government of a country but has subsidiaries, branches to perform other functions (perform economic and commercial functions and do not support the general policy of the country)

Public banks in Spain are a good example of (i) when the national government owns 100% of the bank's capital. In case (ii), the European Investment Bank and The Nordic Investment Bank are typical banks for example when many countries are shareholders of these banks. Specifically, there are 24 member countries that are shareholders of the European Investment Bank, while there are 8 Nordic countries holding shares in The Nordic Investment Bank (European Investment Bank Group, 2010).

Germany's KfW is one of the banks in case (iii) where 80% is owned by the federal government but the remaining 20% is owned by the cantons (Davies, S. & Holmes, I., 2011). Case (iv) can be seen in Caisse des Dépôts when this bank has subsidiaries to carry out investment and business activities in the market according to the rules of private law, while the Caisse des Dépôts itself is not merely an institutional place to carry out activities in terms of national policy. The Caisse des Dépôts secretariat and communications department will take over policy operations as the bank is still wholly state-owned (Cassa Depositi e Prestiti (CDP), 2012).

### 3.4. Initial capitalization and diversified funding sources

The transition to a low-carbon economy requires sustainable financing and infrastructure. Thus, with its diversified initial capitalization and capital mobilization capabilities, the central bank can contribute to the function of a facilitator for the overall environmental policy implementation process. A public bank can do initial capitalization with a variety of financial instruments such as: (i) share issuance; (ii) bond issuance; (iii) sale of assets and liabilities; (iv) auction of emissions permits or carbon taxes; (v) high allocation of fossil fuel tax revenues (Hewett, C., 2009).

The initial capitalization will generate a certain amount of profit, which the bank can keep for reinvestment. Capital market financing is a popular way to accomplish the dual goal of financing low-carbon infrastructures and reinvesting. For example, KfW has raised more than 70 billion Euros through capital markets both domestically and internationally. Issuing bonds will also ensure a stable and long-term return on investment for the bank (Raingold, A., 2010).

## 4. FINANCIAL INSTRUMENTS FOR THE TRANSITION TO A LOW CARBON ECONOMY

### 4.1. Green bonds

Green bonds (also known as climate bonds) are traded by mostly central banks and are characterized by long-term stability and reliability. The difference of this type of bond compared to traditional bonds is that the profits earned from green bonds will be transferred to environmentally friendly investment projects (Reichelt, H., 2010). With the three advantages of simplicity, transparency and large scale, green bonds hold the promise of attracting many investors to channel large amounts of capital into low-carbon technologies and businesses. Proof of this prospect is more than 1 billion USD that the World Bank has received from the issuance of green bonds. The European Investment Bank (EIB) has also successfully issued green bonds called "*Climate Awareness Bonds*". Instead of focusing solely on repayable loans, the EIB has shifted its focus to financial instruments that can be supportive of environmental projects. Funding for social and renewable energy projects through the release of "*Climate Awareness Bonds*" in 2007 proved a great success as EIB was able to raise more than 1.3 billion Euros (Kane-Janus, C. & Patel, S., 2010).

Green bonds can be seen as an effective fundraising tool to support the transition to a low carbon economy as the amount of capital raised will be dedicated to climate protection projects. Renewable energy projects such as wind power, hydroelectricity, photovoltaic, geothermal; and environment-friendly projects such as products produced with low-emission technology, products with natural materials, energy-saving products, etc. will be supported by the money raised from green bonds.

The International Finance Corporation (IFC) has also aimed to finance renewable energy projects through the issuance of green bonds. IFC issued green bonds with maturities of 4 years between 2010-2014, then fully used the money to support low carbon projects in developing countries. This trend is also observed in The Asian Development Bank and The African Development Bank when these two banks conducted their first green bond issuance in 2010 (see Clements-Hunt, P., 2011).

### 4.2. Investment fund for green projects

Banks can participate or use investment funds to generate a high amount of capital from the community, which is then invested in low carbon projects.

There are many types of investment funds that banks can create or participate in to raise capital such as carbon funds, venture capital funds, energy service companies (ESCOs) or green infrastructure sustainable development funds. The structure, funding source, rate of return, and capital allocation of each fund are different. The sharing of capital and risk among investors, equity funds, and debt-receiving firms is different (van der Veen, G., & van Giessel, J., 2004). Investments in low carbon projects often encourage the creation of funds with large investments from the public with the purpose of sharing big risks, raising awareness about the community, environment and distributed profit rate to avoid being too focused on profit goals. Public institutions such as central banks, if they participate in climate-focused investment funds, can activate public confidence, thereby gaining a large capital to invest in projects for the environment.

Startups in general and low-carbon companies often lack the capital to undertake low-emission projects. Therefore, the potential to use venture capital funds of public banks to provide capital for startups is immense. This is seen as a form of venture funding for the low carbon energy sector. Prestige and appeal from the central bank or other state agencies will remove bottlenecks in transaction flows and attract private investment for environmental projects. Encouraging participation in a bank's investment fund so that later, using this money to buy shares and capital contributions of low carbon companies can promote the development of companies

that are environmentally friendly. It also makes it easier for the bank to control these companies because when undertaking a climate project or using any low-carbon technology, the company's administrators must also explain the effectiveness of low-carbon business because the bank is now a shareholder (representing many investors who have joined the fund to buy shares in the company) (Crespo, J., Guo, T., & Greenwood, C., 2008).

A clear example of using mutual funds to buy shares in low-carbon companies is the Caisse des Dépôts. The Caisse des Dépôts bank in France has invested in a fund called the "Investment Fund for Environment and Energy Management" (FIDEME). This investment fund focuses on the technology sector using renewable energy, especially wind power, and makes convertible stock purchases. Under the auspices and management of The French Environment and Energy Management Agency (ADEME) with low interest rates, banks (including Caisse des Dépôts) have boldly invested. Besides buying convertible shares, FIDEME's mission is to invest in convertible bonds and invest in activities and projects that are beneficial to the environment (Mostert, W., 2010).

### 4.3. PREFERENTIAL LOAN

Preferential loans from banks for low-carbon projects will facilitate and attract startups to raise capital from this financial instrument. Concessional bank loans are low-interest or even zero-interest loans with high conversion rates.

The German bank for reconstruction and development (KfW) has implemented preferential lending mechanisms for low carbon companies through programs called "*Promotion of Renewables Energies*", "*Energy Efficient Rehabilitation*". "*Programme for the Promotion of Renewables Energies*" targets renewable energy projects and offers them preferential credit lines up to €5 million, loan term up to 3 years, interest-free interest rates and debt reduction in difficult times. The goal of this program is to help low-carbon projects achieve profitability before debt maturity; If the project is still not successful by the maturity date, the bank will partially reduce the debt and extend the time - a relatively high credit risk tolerance (Makinson, S., 2005). The "*Programme Energy Efficient Rehabilitation*" focuses on energy efficient projects. Preferential loans will be applied

to projects using modern and energy-saving technologies, especially measured through the $CO_2$ emission index. This program in the period from 2006 to 2008 has shown success when achieving a $CO_2$ reduction rate of more than 2 million tons (KfW Bankengruppe, 2009).

### 4.4. Public guarantee

Public guarantee is a central or public bank guaranteeing a loan from a low carbon company. In other words, low carbon companies can borrow from private credit institutions and public banks can provide guarantees to ensure the implementation of projects of social and environmental value. Public guarantees are considered useful where other financial instruments are not able to reduce investment risk, especially during periods of inefficient market performance and ongoing political turmoil (Brown, J., & Jacobs, M., 2011).

Public guarantee is a type of financial instrument used in France through the existence of a fund with a special function of guaranteeing loans from energy efficiency projects. The French Development Bank (BDPME) established this special fund as the Fonds de Garantie des Investissements de Maîtrise de l'Energie (FOGIME). Projects using energy efficiency and saving can be BDPME loans up to 70% (EuroAce., 2009). The reason for such a high loan guarantee is because FOGIME has effectively combined both private and public funds through its high leverage efficiency stemming from its own reputation and investors' trust.

## 5. SOLUTIONS THAT BANKS CAN TAKE TO CONTRIBUTE TO THE FORMATION OF CARBON FINANCE

### 5.1. Lending policy measures to mitigate climate-related risks

To reduce the risks that financial markets are exposed to related to climate requires the existence of macro-prudential policies. Macro-protection tools to address systemic risks will be implemented by supervisory authorities. A countercyclical capital buffer was introduced in The Basel III framework with the aim of reducing the risk of excess credit. Measures similar to this tool have also shown that slightly higher requirements for loans, and tighter controls on systemic risk, will reduce financial instability. In particular, macro-assurance policies can be selected for appropriate application in each specific industry. This depends on the

judgment of the authorities when they consider and study specific debt markets. For example, the authorities in Switzerland, when aiming to ensure the balance of the housing market, have asked banks to set higher loan criteria for residential mortgage loans. This regulatory behavior is intended to help banks increase profits when they are exposed to risks from an imbalanced market; At the same time, this also helps to reduce the growth rate of residential mortgages in this country to an appropriate level according to the government's policy.

In general, setting higher standards, criteria and requirements for capital loans is a possible solution that can reduce business activities that use too much carbon. As banks target specific segments of the credit market, it creates a common practice for a range of companies in that sector to consider reducing emissions in order to enjoy a better lending policy. However, it is worth noting that setting up lending policies with high requirements for carbon-intensive companies can have side effects because if you set up a lending regime with high requirements. If the interest rate is too high, in terms of loan conditions, it will most likely lead to a shortage in the number of loans at banks because businesses will seek other sources of support. Therefore, the central bank should include appropriate lending requirements in its own policy to ensure that the requirement is not so high that it hinders the bank's own lending purposes. Even so, setting the right loan requirements is not easy (see Van Tilburg and Boot, 2017). Banks need to carefully study and adjust their loan portfolios to meet their climate targets. An important goal for this type of policy is for the bank to create a loan portfolio that benefits all parties. First, banks need to have experts, technology, and effective capital buffers to figure out climate change risks. Next, the allocation of loans and loan transparency requirements should be presented in a reasonable manner. For example, higher requirements for carbon-intensive companies must be balanced with preferential policies for low-carbon companies. The shift in incentives must be done slowly, there cannot be too big changes right at the initial stage so that the bank can still guarantee its own loan transaction volume.

### 5.2. Quantitative easing in the transition to a low-carbon economy

Quantitative easing (also known as large-scale corporate asset acquisition) is one of the special policies that central banks around the

world have implemented to trigger behaviors consistent with intended to respond to the financial crises of 2007.

### *5.2.1. The impact of quantitative easing measures on the transition to a low-carbon economy*

European Central Bank (ECB) implemented a program to buy corporate bonds in the region in the period from mid-2016 to the end of 2017 for more than 100 billion euros, equivalent to nearly 6% of the ECB's shares in the fund. asset acquisition programs (Andrade, P., Breckenfelder, J., De Fiore, F., Karadi, P. and Tristani, O., 2016). The Bank of England (BoE) also started implementing its corporate bond purchase scheme in 2016 and has secured GBP 10 billion (more than 2% of assets purchased) in bonds by the size of the program (Scott, M., van Huizen, J. and Junf, C., 2017). The asset repurchase plans of these two banks are often targeted at businesses in the emission-intensive sectors because according to data, bond purchases from power generation enterprises account for more than 60% and almost 50% of the total transaction volume of the ECB and BoE (Matikainen, Campiglio and Zenghelis, 2017). Power generation and manufacturing businesses have generated more than 50% of greenhouse gas emissions in the United Kingdom and almost 60% in the European region. There are also no transactions involving companies in the renewable energy sector in the ECB and BoE securities purchases. As a result, the extent to which it causes greenhouse gas emissions will also affect the direction of the bond market and the choice of banks in investment and securities buying programs.

In addition, when it comes to the power generation sector, which is inherently an area where debt capital plays an important role, it will be more suitable for the central bank's allocation policy than low-carbon sectors with small balance. With the goal of maintaining a balanced and neutral market, central banks typically strive to maintain an investment portfolio that will fully reflect the structure of the debt capital market. This bias is offset by firms with high debt balances that are often associated with carbon-intensive activities. However, whether this offset is enough to balance the bias in the central bank's bond-buying policies remains an open question. For portfolio balance, perhaps some central banks could buy asset classes instead of just focusing on the bonds of carbon-intensive businesses. Case in point, The Bank of Japan has allocated its investments

to equities rather than focusing exclusively on corporate bonds (Abidi and Flores, 2017).

The author argues that the bias in the quantitative easing programs of the ECB and BoE could lead to conflicts with the goal of transitioning to a low-carbon economy because if conducting corporate bond buying programs in on a large scale, it will significantly support carbon-intensive businesses while the offset of this process is not enough. Even if these programs are only temporary in response to the financial crisis, their effects can still be long-term. At the same time, this will also encourage businesses with many carbon-intensive activities to actively increase debt issuance, thereby making the financial system more vulnerable to risks arising from climate change. climate. Thus, in a dilemma, central banks are both unable to achieve their goal of stabilizing financial markets and also unable to meet the requirements of their commitments to a low-carbon economy.

#### *5.2.2. Approach to quantitative easing for low-carbon companies*

The analysis above shows that over-emphasizing corporate bond purchases in the high-carbon sector can run counter to the goal of transitioning to a low-carbon economy. This section will take the opposite approach by focusing on the application of quantitative easing measures in low-carbon use areas.

Bonds of low-carbon businesses are often referred to as green bonds. A major and consistent driver of this approach to the bond line is environmental friendliness. There is a view that a model that focuses on buying green bonds will create policies that benefit not only the environment but also the economy, financial markets and income distribution. (Monasterolo and Raberto, 2017). The model that focuses on buying green bonds will have four main requirements: (i) Focus on low-carbon production; (ii) Focusing on green bonds and ignoring two other investment sources: stocks and loans; (iii) Recognizing the impact of inequality of interests in the implementation of monetary policy; (vi) Consider endogenous money sources, i.e. green investments, green loans arising as a benefit from the model.

Approaching quantitative easing in this way will help accelerate the transition to a low carbon economy because overall green loans, green investments in bonds will be issued on a large scale., thereby providing

a strong impetus to develop both the green bond market and the loans to businesses in the eco-friendly sector. In another aspect, the central bank's policy of buying green bonds will help reduce the unemployment rate because the use of clean labor is increased instead of machines and technologies that cause a lot of emissions.

However, a drawback of this model is that it can create greater systemic risk than the traditional approach. This is because green quantitative easing will bring in more investments, which include more loans to eco-friendly companies, more bond issuance programs from this company and its equity also increased. The systemic risk to the central bank will increase due to the rise of green loans. Therefore, this model still needs to continue to improve and banks must consider carefully when applying it to assess its impact on their financial policies. Currently, there is no specific research with the combination of the traditional model and the green model, that is, the combination of buying green bonds and buying bonds of carbon-intensive businesses. If the quantitative easing approach follows both models, central banks may have to delve into the speed of the transition to a low-carbon economy, the impact on prices, the equilibrium activities in the market, and the impact on prices, balancing activities in financial markets and many other factors.

### 5.3. Other measures to shape carbon financial markets

In the framework of collateral, the central bank should consider the measure of risk related to climate change. The collateral framework is a list of assets that have been pledged by businesses to borrow from banks. The eligibility of a collateral is the bank's desirability for the value of the property (Mésonnier, O'Donnell and Toutain, 2017). One of the key criteria for a property to qualify for a mortgage is the high credit quality for each property-related option. When an asset is included in the collateral framework, i.e. qualified according to the bank's list, businesses will have more incentive to produce these types of assets in larger volumes. This will really affect the production of goods in the market because if the bank's collateral list mentions a lot of green products, environmentally friendly products, and other types of assets, it will have an impact on the production of goods in the market. Products and machinery that cause less greenhouse gas emissions will certainly stimulate more businesses to produce these

products because they have more opportunities to find sources of support from banks through mortgage loans. In addition, on the other hand, when the central bank excludes carbon-intensive assets from its mortgage policy, it will certainly make businesses that have many activities that cause gas emissions must be reconsidered because they are facing the risk of lack of support from banks to expand production and investment.

Another solution is that central banks need to come up with policies to encourage organizations and businesses in the financial sector to disclose appropriate information to limit risks related to climate change. More specifically, the central bank could set up a committee dedicated to carbon financial disclosure. This task force will regularly contact businesses to make recommendations on disclosing the climate risks they are facing. Of course, corporate disclosure is voluntary, but these companies will benefit from some small gains from trying to be transparent about their own behavior. Recommending businesses to disclose information on climate risks can help better support linkages in financial markets because credit institutions, insurance companies, investors can information and find ways to reduce these types of risks. An example of a policy that requires businesses to disclose information about climate risks is in France. In 2015, France passed The French Energy Transition law with a prominent requirement that listed companies disclose information about climate risks that would affect financial markets. According to the author, this legal policy of France is a progressive policy and is in line with the shared commitment to the transition to a low carbon economy. Central banks can take this regulatory approach to require businesses in certain sectors to disclose important information about financial risks related to climate change.

## 6. CONCLUSION

The transition to a low-carbon economy is both a shared commitment and a major challenge facing each country. The risks posed by climate change need to be clearly recognized by the central bank. Central banks must both meet their goals of stabilizing financial markets and implement appropriate policies to fulfill their shared commitment to reducing emissions. The measures that this article covers that focus on supporting central banks will provide more support for low-carbon businesses.

From assessing the systemic risks associated with climate change of the financial system to devising environmentally-friendly corporate lending and quantitative easing policies. These proposed measures will contribute to the central bank's role in implementing policies in line with the goal of transition to a low-carbon economy in each country under The Paris Agreement.

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# TOTAL FACTOR PRODUCTIVITY: EMPIRICAL STUDY FROM VIETNAMESE SMES

**Trang Ngo Hoang Thao**[1]

***Abstract:*** *The study investigates the dynamic of the total factor productivity (TFP) in SMEs in Vietnam by using four main methods including OLS regression, GMM method, Olley and Pakes method, Levinsohn and Petrin method. The results indicate that TFP of SMEs have a upward trend from 2005 to 2009; however this figure experienced the upward trend in the period from 2009 to 2013. Furthermore, the results show that there had differences in the value of TFP according to industries, regions, size, the innovation of SMEs.*

***Keywords:*** *Total factor productivity, SMEs, Vietnam.*

## 1. INTRODUCTION

Productivity growth plays an important role in economic growth. Therefore, a lot of theoretical research and empirical research under the perspective of macroeconomics to analyze the factors affecting the total factor productivity (abbreviated as TFP). However, the analysis of growth factors from a macro perspective (countries) also has certain limitations such as: (1) measurement error due to inconsistent data quality differences between countries (Del Gatto et al., 2011); (2) difficulty in controlling institutional factors and national characteristics (Ozler and Yilmaz, 2009); and (3) limitations in determining the mechanism of impact on productivity (Lopex, 2005) [quoted in Tran, 2014]. Therefore, the theoretical and experimental studies focus on analyzing the factors affecting the total factor productivity under the microscopic perspective in recent trend. The argument of the micro-factor analysis of productivity factors is that firm's TFP affects the existence, growth and development of the firm, and ultimately leads to influence the growth and prosperity of a country (Hulten, 2001; Iqbal, 2001; Isaksson, 2007). In addition, the productivity

[1] University of Economics Ho Chi Minh City, Vietnam. Email: trangnht@ueh.edu.vn

approach from an enterprise perspective has additional advantages such as availability of data sets; suggest better policy to the government on the issue of high total productivity of countries in which business plays a key role in the economy.

According to the micro approach, total productivity is also understood in many different ways. According to Solow's understanding, the enterprise's TFP is technological level or technological progress and total productivity growth is due to technological progress. According to Collie et al. (2005), the TFP of enterprises is classified into four components: technological progress, technical efficiency, economies of scale and effective input distribution.

Total factor productivity (TFP) is the decisive factor to the long-term growth of the firm and ultimately the growth of the economy. Therefore, a systematic study in theory and empirical research on estimating total factor productivity, productivity difference by time, by industries, and by regions is necessary to propose development patterns which are suitable for SMEs.

The objective of the paper is to (1) estimating the total factor productivity of SMEs in Vietnam by new methods such as GMM method, Olley and Pakes method and Levinsohn and Petrin method which are currently popular methods in estimating total productivity of SMEs in Vietnam; (2) analyzing productivity differences over time, industries, regions, and other factors such as exports, innovation process.

The structure of the study includes the following sections. Part one is an overview of the research. Part two deals with the theoretical basis of total factor productivity and the sources of productivity differences. Part three introduces data and research methodology. Part four discusses the results and part five draws conclusion.

## 2. LITERATURE REVIEW

### 2.1. The concept of total productivity

According to Coelli et al. (2005), productivity is defined as *"how much output is produced from given inputs"*. If we measure output per unit of input (capital or labor) then we have either labor productivity

or capital productivity. When combining all the inputs to calculate the production output, we have the target of total factor productivity (Total Factor Productivity is abbreviated as TFP).

The concept of total factor productivity (TFP) was first developed by Tinbergen (1942). However, the best known definition of TFP is that of Solow (1957). According to Solow (1957), TFP is the level of technology or technological knowledge. Solow's (1957) classical growth model is shown as follows:

$$Y = A(t) \times F(K, L)$$

Where Y is the output of the firm; K is the input capital; L is labor input and A (t) is technological level or total factor productivity (TFP) and A (t) is a function of time

### 2.2 The Origin of total factor productivity Difference

According to Coelli et al (2005), the sources of TFP differences and growth are due to: (1) technological progress, (2) technical efficiency, (3) economies of scale, (4) efficient input allocation.

**Technological progress**

Classical economists such as (Swan, 1956; Solow, 1957) argued that the source of that output growth is the growth of factors such as capital; labor and total productivity factors. Classic growth models are shown as follows:

$$Y = A(t) \times F(K, L)$$

Where Y is the output of the firm; K is the input capital; L is the input labor and A (t) is the technological level and A (t) is the function of time. According to the classical growth model, A (t) is assumed to be exogenous and grows at a given rate. Labor force is also assumed to grow steadily. Classic growth theory recognizes that technical progress is the source of variation in output and a key factor in production growth in the long run. However, the classical growth theory viewed technological progress as exogenous and did not explain the origin of technological progress.

According to classical growth theory, TFP growth over time is the expansion of the production function. However, the limitation of the

classical growth model is the assumption that firms are technically efficient and that TFP growth is only due to technological progress. However, the reality is that firms are not technically efficient all the time, meaning differentiation and productivity growth could be due to an improvement in technical efficiency or an improvement in productivity. The economies of scale or the efficient allocation of resources make the difference and growth of TFP over time.

**Technically efficient**

Nishimizu and Page (1982) are pioneers in explaining the origins of difference and TFP growth not only due to technological progress but also technical efficiency. According to these two studies, the assumption that producers are technically efficient is impractical, and he argues that in fact, firms that produce output below efficiency level. Therefore, there is a discrepancy between output that firms produce relative to the optimal output that producers can generate from given inputs. If a firm narrows the gap between the actual output and the optimal output that can be produced, differences and growth in TFP will be happened.

**Economical by scale**

According to Colelli and O'Donnel (2005), economies of scale are understood as "the long-term average cost reduction of a product is due to production expansion. As the business expands production scale, the average cost per unit will decrease and then production output increases. According to Gomulka (2006), the dynamics of economies of scale are a combination of three factors: (1) cost reduction due to the work-learning process of workers and managers, (2) increasing demand at a given price due to product improvement, (3) reduction of unit cost due to increased scale of output. Therefore, according to Gomulka (2006) and Colelli et al. (2005), the change in economies of scale is also one of the factors affecting TFP difference and growth.

**Distributed efficiency**

According to Farel (1957), it is argued that firm's efficiency is one of the sources leading to the difference and growth of TFP. Farel divides firm efficiency into two components: (1) technical efficiency (reflecting the ability of the firm to achieve maximum output from given inputs) and (2)

efficient input allocation (reflecting the ability of firms to use inputs at an optimal rate assuming constant prices of inputs and technologies). Hence, an enterprise is called efficient resource allocation when they can minimize production costs by choosing an optimal ratio of inputs to produce goods. A decrease in production costs can lead to an increase in production output (while inputs and costs remain constant) or a decrease in the level of inputs (while output is fixed). Both of these situations lead to an increase in TFP.

## 3. DATA AND RESEARCH METHOD

### 3.1. Research data

Sources of SME survey data are from Central Institute of Economic Management (CIEM) under the Ministry of Planning and Investment (MPI), Institute of Labor Science and Social Affairs (ILSSA) under the Ministry of Labor, Invalids and Social Affairs (MOLISA) and Faculty of Economics (DoE) of the University of Copenhagen, together with the Danish Embassy in Vietnam planned and implemented in 2005, 2007, 2009, 2011 and 2013.

The subject of this survey is the non-state SMEs in the manufacturing sector in ten provinces and cities. The purpose of the survey is to collect information on non-state SMEs in the manufacturing sector. Information collected SMEs includes general information about the enterprise, economic accounts of enterprises, history of SMEs, characteristics of the head of the enterprise, production characteristics and technology, sales structure, indirect costs, materials and services, fees, taxes and indirect charges, job, export credit, business environment, net working, economic environment, obstacles and development potential of SMEs.

### 3.2. Method of estimating total factor productivity

#### *3.2.1. Form of TFP estimation production function*

In empirical research on estimating TFP at firm levels, the Cobb-Douglas production function is often selected to estimate TFP. The advantages of using the Cobb-Douglas production function are simpler, fewer variables included in the model, and therefore less prone to multicollinearity problems than the translog production function (Boisvert,

1982; Murthy, 2002). In addition, economists' techniques to overcome endogenous and choice problems also begin with the use of the Cobb-Douglas production function in estimating yield. (See Olley and Pake, 1996; Petrin and Levinsohn, 2003; 2004; Yasar et al., 2008).

In this study, to estimate research productivity, this study selects the Cobb-Douglas production function according to Solow's model (1957) as follows:

$$Y_{it} = A_{it} K_{it}^{\beta_k} L_{it}^{\beta_l} \qquad (1)$$

Accordingly, Yit is the output of firm i at time t; Kit is the input including capital, labor and Ait is the efficiency of firm i at time i. Although Yit, Kit is observed by economists, Ait is the unobserved part. Taking logs base e of (1) will have a linear production function:

$$\hat{y}_{it} = \hat{\beta}_0 + \hat{\beta}_k k_{it} + \hat{\beta}_l l_{it} + \hat{\varepsilon}_{it} \qquad (2)$$

Inside $\ln(A_{it}) = \hat{\beta}_0 + \hat{\varepsilon}_{it}$ ; $\hat{\beta}_0$ measure a company's average performance over time; εit is the deviation from the mean value of producer properties over time. According to Van Beveren (2012), εit can be decomposed into a separate yield shock ($\hat{\upsilon}_{it}^{q}$) that is observed by the business owner, not by the economist and the error component of the equation($\hat{\mu}_{it}^{q}$) (ingredients not observed by business owners as well as economists). Hence equation (2) is rewritten as follows:

$$\hat{y}_{it} = \hat{\beta}_0 + \hat{\beta}_k k_{it} + \hat{\beta}_l l_{it} + \hat{\upsilon}_{it} + \hat{\mu}_{it}^{q} \qquad (3)$$

We have $\hat{\omega}_{it} = \hat{\beta}_0 + \hat{\upsilon}_{it}$ is defined as the productivity of firm I at time t and $\mu_{it}^{q}$ is the component that represents the error of equation (3)

Next, estimate equation (3) and solve to find ωit. Total factor productivity is estimated using the following equation:

$$\widehat{\omega} = \widehat{\beta_0} + \widehat{\vartheta_{it}} = y_{it} - \widehat{\beta_k} k_{it} - \widehat{\beta_l} l_{it} \qquad (4)$$

Finally, to estimate TFP coefficient we take $e^{\widehat{w_{it}}}$ . Total factor productivity $\widehat{\omega}_{it}$ estimated from equation (4) is used to evaluate the effect of the various policy variables on TFP.

#### *3.2.2 TFP estimation techniques*

SME productivity is estimated based on a production function. However, according to Van Beveren (2012), Tran (2014), Valmari (2016),

the estimation of productivity by production function has some problems in econometrics. (1) endogenous problem, (2) choice problem, (3) lack of input and output factor prices (4) production function selection problem. Next, the research will present the TFP estimation techniques to overcome the above limitations in TFP estimation. This section presents some main estimation techniques and advantages and disadvantages of each technique including: OLS regression method, Generalized Method of Moment (GMM method), Olley and Pakes method (OP method), Levinsohn and Petrin method (LP method).

Productivity estimation technique according to the OLS regression method is technically simple and easy to estimate the regression coefficients. The OLS regression method assumes that the inputs are exogenous but in practice they are endogenous (Olley and Pakes, 1996; Levinsohn and Petrin, 2003). As a result, the TFP estimate is biased.

To solve problems with productivity estimation techniques such as GMM, OP, and LP are used to estimate productivity to limit biased coefficients. GMM estimation technique was developed by Hasen (1982). This GMM technique helps to solve endogenous problems (Blundell and Bond, 1998, 2000). Van Biesebroeck (2007) suggests that this technique will give a correct estimate of TFP. However, the disadvantage of this technique is that it requires a data sheet that is at least 5 years long. The semi-parametric technique was developed by Olley and Pakes (1996) and Levinsohn and Petrin (2003). The semi-parametric technique solves endogenous problems by using variables representing unobserved productivity shocks such as the Olley and Pakes (1996) technique investment variable or the technical intermediate variable by Levinsohn and Petrin (2003).

In this study, the study used the TFP estimation results technically estimated TFP according to Levinsohn and Petrin (2003, 2004) to make comparisons on TFP over time. The TFP estimation results from the regression techniques OLS, GMM, OP are also calculated to check robustness with the technique of Levinsohn and Petrin (2003, 2004). According to Van Biesebroeck (2003), the results of different estimation techniques have similar levels. Therefore, the choice of technique depends on the availability of data and the research objective. In this study, the study uses the technical TFP estimation results to estimate TFP according

to Levinsohn and Petrin (2003, 2004) to conduct a picture analysis of total factor productivity of SMEs in Vietnam.

Accordingly, total factor productivity calculation techniques according to Levinsohn and Petrin (2003, 2004) conducted as follows:

Starting from equation (3): $\hat{y}_{it} = \hat{\beta}_0 + \hat{\beta}_k k_{it} + \hat{\beta}_l l_{it} + \hat{\upsilon}_{it} + \hat{\mu}_{it}^q$

Put: $f(k_t, m_t) = \hat{\beta}_0 + \hat{\beta}_k k_{it} + \hat{\upsilon}_t(k_t, m_t)$ (4)

Then get (4) into (3) we have: $y_{it} = \hat{\beta}_l l_{it} + \hat{\phi}(k_t, m_t) + \hat{\mu}_{it}^q$ (5)

Next, the approximation $\hat{\phi}(k_t, m_t)$ is a cubic polynomial of three

Accordingly (5) is transformed into

$$\hat{y}_{it} = \hat{\delta}_0 + \hat{\beta}_l l_{it} + \sum_{i=0}^{3}\sum_{j=0}^{3-i} \hat{\delta}_{ij} k_t^i m_t^j + \hat{\mu}_{it}^q \quad (6)$$

Estimate equation (6) according to the OLS we can estimate $b_1$ and f

The next step is to estimate the coefficients $b_k$ . To estimate $b_k$ we begin by calculating the estimated value of f

We have: $\hat{\phi} = \hat{y} - \hat{\beta}_l l_t = \hat{\delta}_0 + \sum_{i=0}^{3}\sum_{j=0}^{3-i} \hat{\delta}_{ij} k_t^i m_t^j - \hat{\beta}_l l_t$

Corresponding $\beta_k^*$ value, we estimate the value $\hat{\upsilon}_t$ as follows:

$$\hat{\upsilon}_t = \hat{\phi}_t - \beta_k^* k_t$$

Using this value, a given approximation $E[\upsilon_t | \upsilon_{t-1}]$ is estimated from the forecasted value from the following regression function:

$$\hat{\upsilon}_t = \hat{\gamma}_0 + \hat{\gamma}_1 \upsilon_{t-1} + \hat{\gamma}_2 \upsilon^2{}_{t-1} + \hat{\gamma}_3 \upsilon^3{}_{t-1} + \hat{\tau}_t \quad (*)$$

With $\hat{\beta}_l$, $\beta_k^*$, $\hat{\upsilon}_t$ is given, Petrin and Levinsohn write a production function's residual estimate as follows:

$$\mu_t + \tau_t = y_t - \hat{\beta}_l l_t - \beta_k^* k_t - E[\upsilon_t | \upsilon_{t-1}]$$

The $\hat{\beta}_k$ estimated coefficient is determined when solving the equation

$$\min_{\beta_k^*} \sum_t \left( y_t - \hat{\beta}_l l_t - \beta_k^* k_t - E\left[\upsilon_t | \upsilon_{t-1}\right] \right)^2$$

#### *3.2.3 Measurement of TFP coefficients by sector*

To compare TFP among different manufacturing industries, we calculated TFP index according to Pavcnik (2002) and Wong (2009).

Accordingly, the TFP of firm i in industry j at time t is estimated by taking the actual value (y) at time t minus the forecast value (y^) then comparing it with reference firm in the base year. The reference firm r in the study is defined as the mean input and output value in the base year (2005).

$$TFP_{it}^{j} = y_{it} - \widehat{\beta}_k k_{it}^{j} - \widehat{\beta}_l l_{it}^{j} - (y_r - \widehat{y}_r)$$

Inside:

$y_r = \overline{y}_r$: the mean is the output of all firms in the base year (2005)

$\widehat{y}_r^{l} = \widehat{\beta}_k \overline{k_{it}^{l}} + \widehat{\beta}_l \overline{l_{it}^{l}}$: average predicted value of production of all firms in the base year (2005)

The formula for calculating total factor productivity (TFP) by sector of level 2 according to VSIC is as follows:

$$TFP_t^j = \sum_{it} S_{it}^j \times TFP_{it}^j$$

Which $TFP_t^j$ is the productivity index of industry j at time t; $TFP_{it}^j$ Productivity index of firm i industry j at time t; $S_{it}^j$: percentage of output of firm i in industry j at time t.

#### *3.2.4. Variables in measuring productivity estimates*

As discussed above, the central concept of TFP is the relationship between input and output. Hence, estimating research productivity begins by describing how to calculation the input and output variables of the firm.

**a. Output variable**

For output, there are two common variables to measure the output: Gross output and value added. Each of them has different advantages and disadvantages. Output variables based on gross gross output are seen as a more comprehensive measure of value added. Cobbold (2003) suggested that measuring productivity based on gross product would be appropriate and represent technological change. Furthermore, this method recognizes intermediate inputs as the source of growth and therefore less distorts the variation in productivity over time. For the output variable as value added, it is easy to measure as it is inevitably related to intra-industry flows of goods and services (Cobbold, 2003). Therefore, the added value will reduce the duplicate calculation. Furthermore, estimating output in terms

of value-added is easier to measure than the gross product-gross method (OECD, 2001).

In this study, the study uses the added value to estimate the total factor productivity. Value added data are available in SME survey data sets. The following table describes how to extract value added for SMEs in the study data set. The output variables are taken log base e (ln) to estimate TFP in the Cobb-Douglas production function and adjusted for the GDP deflator index.

**Table 1. Output Variables in the TFP Estimation Model**

| Variable | Measurement |
|---|---|
| Ln_real value added | The added value is equal to the value of output minus the total indirect cost-value of the materials used<br>Ln_real value added equals g ln (value added / GDP deflator) |

### b. Variable input

This section describes how to measure the input variables used to measure in the production function including capital, labor, and intermediate raw material costs.

First, capital input is considered to be the most difficult to measure. Actual value of capital over a period of time required in measuring productivity. Inventory valuation method is often used to measure capital inputs. This method requires estimators and assumptions based on three parameters: utilization time, end time and depreciation method. However, information related to the above parameters is not available, so in this study the total assets of the firm at the end of the year are used to represent the firm's capital reserves. Capital variable of the enterprise is taken log base e and adjusted for the GDP deflator index.

Labor has many variables that are used to measure. Ideally, labor input measurement is to use the company's total labor hours. However, working hours were not collected in the data set. Another way to measure labor input is to use the firm's number of full-time employees. In this study, the number of full-time employees used to measure input was labor and was log base e.

Third, for the intermediate variable required in estimating the TFP by the method of Levinsohn and Petrin (2003), the intermediate input variable

was used to represent the unobservable yields for treatment of problems between inputs and productivity in the production function. Intermediate input value is estimated from production costs including costs of raw materials, fuel, electricity and other costs serving the production process. The intermediate value variable is also taken log base e and adjusted for the GDP deflator index.

**Table 2. Description of Measurement Input Variables to Estimate Total Factor Productivity**

| Variables | Measurement |
|---|---|
| Ln_capital | Ln (total assets of the business at the end of the year / GDP deflator) |
| Ln_employees | Ln (number of employees at the enterprise) |
| Ln_intermediate value | Ln (intermediate value / GDP deflator) |

## 4. EMPIRICAL RESEARCH RESULTS

The results of productivity and total factor productivity (TFP) are presented in Table 3. Both capital variable and labor variable have positive effects on firm output value and have statistically significant according to OLS regression, OP regression, LP regression and GMM regression. Research results show that average TFP by different methods ranged from 1.6 to 1.72 times (Table 3). The TFP estimation results by these different techniques are consistent with the study of Van Biesebroeck (2003) which shows that the results of different estimation techniques have the same degree of similarity. In this study, we use the results of TFP estimation according to Levinsohn and Petrin (2003). According to Table 4.1, the estimated result of average TFP according to technique by Levinsohn and Petrin (2003) is 1.72. The significance of 1.72 is that when the capital and labor factors remain constant, thanks to technological advancement that increases the output value by 1.72 times.

**Table 3. Estimated Results of Production Function and TFP Estimation**

| | OLS regression | LP regression | OP regression | GMM regression |
|---|---|---|---|---|
| Ln Employee | 0.944*** | 0.620*** | 0.802*** | 0.704*** |
| | (113.33) | (48.53) | (112.04) | (41.13) |
| Ln Capital | 0.259*** | 0.215*** | 0.237*** | 0.183*** |
| | (46.19) | (11.23) | (25.68) | (19.34) |
| TFP | 1.592 | 1.721 | 1.592 | 1.705 |
| Note: ***p<0,01 | | | | |

*Source: Research calculation according to section 4.2.1.*

According to Table 4, the analysis results show that the TFP of SMEs has changed over time, accordingly, in the period from 2005 to 2009, the TFP of SMEs in Vietnam tended to increase from 1.43 to 2.16. However, in the period 2011-2013, the TFP of SMEs tends to decrease (from 1.84 in 2011 to 1.64 in 2013). As for the industry, the analysis shows that most of the sectors that tend to increase TFP in the period 2005 to 2011, a number of industries that tend to increase much are the garment industry (1.14 in 2005 to 2.27 2007), printing industry (1.55 in 2005 to 2.64), chemical industry (1.24 in 2005 to 2.75 in 2011); rubber industry (1.45 in 2005 to 2.57 in 2011); machinery industry (1.32 in 2005 to 2.68 in 2011). Most industries tend to decrease TFP in the period 2011-2013, in which there are a number of industries with a sharp decline such as beverage industry (1.87 in 2011 to 1.24 in 2013), garment industry (2.27 in 2011 to 1.73 in 2013); printing industry (2.64 in 2011 to 2.06 in 2013) (Table 4).

**Table 4. Total Factor Productivity (TFP) by Industry and by Time**

| Year | 2005 | 2007 | 2009 | 2011 | 2013 |
|---|---|---|---|---|---|
| Food industry | 3.39 | 1.13 | 1.26 | 1.47 | 1.34 |
| Beverage industry | 1.86 | 1.56 | 1.68 | 1.87 | 1.24 |
| Garment industry | 1.14 | 1.70 | 1.73 | 2.27 | 1.73 |
| Wood industry | 1.34 | 1.34 | 1.33 | 1.53 | 1.48 |
| Printing industry | 1.55 | 2.32 | 2.42 | 2.64 | 2.06 |
| Chemistry industry | 1.24 | 2.69 | 2.08 | 2.75 | 2.01 |
| Rubber industry | 1.45 | 2.23 | 2.57 | 2.57 | 2.19 |
| Metal industry | 1.82 | 1.47 | 1.65 | 1.76 | 1.69 |
| Machinery industry | 1.32 | 1.83 | 2.72 | 2.68 | 2.47 |
| Other industry | 1.99 | 1.75 | 1.77 | 1.88 | 2.74 |
| Total | 1.43 | 1.53 | 2.16 | 1.84 | 1.64 |

*Source: Calculation of the author (2021).*

Next, the study presents t-tests on productivity differences by firm size, between firms engaged in exporting and firms not engaged in export activities, and between firms which have innovation activities and firms do not conduct innovation, productivity differences by industry and by region.

Research results show that there is a productivity difference between micro and small and medium firms. Specifically, the Ho hypothesis of higher productivity of micro firms is rejected and statistically significant

(p-value is 0.000 <5%). Likewise, the results suggest that firms in micro size are less productive than firms in medium size (p value of 0.000 <5%) and that small firms are less productive than firms in medium size ( p-value is 0.0259 <5%) (Table 5).

**Table 5. Testing Productivity Differences by Scale**

| Groups | Observations | Medium | Standard errors | p values |
|---|---|---|---|---|
| **Comparing productivity differences between micro and small firms** | | | | |
| Micro firms | 8704 | 1.167 | 0.011 | 0.000 |
| Small firms | 3524 | 2.651 | 0.378 | 1.000 |
| Total | 12228 | 1.594 | 0.1096 | 0.000 |
| **Comparing productivity differences between micro and medium firms** | | | | |
| Micro firms | 8704 | 1.167 | 0.0113 | 0.000 |
| Small firms | 894 | 3.457 | 0.1685 | 1.000 |
| Total | 9598 | 1.380 | 0.0199 | 0.000 |
| **Comparing productivity differences between SMEs and SMEs** | | | | |
| Micro firms | 3524 | 2.651 | 0.378 | 0.025 |
| Small firms | 894 | 3.457 | 0.168 | 0.974 |
| Total | 4418 | 2.814 | 0.304 | 0.051 |

*Source: Calculation of the author (2021).*

Tests of differences between firms engaged in export activities and firms not engaged in export activities showed that there is a difference in productivity between exporters and non-exporters. Specifically, for the Ho hypothesis of higher productivity than exporters is unacceptable and statistically significant (p-value is 0,000 <5%) (table 6).

**Table 6. Testing of Productivity Differences Between Exporters and Non-Exporters**

| Groups | Observation | Medium | Standard Errors | p values |
|---|---|---|---|---|
| **Comparing of productivity between non-exporting versus exporting firms** | | | | |
| Non exporting firms | 12307 | 1.614 | 0.109 | 0.00 |
| Exporting firms | 791 | 3.338 | 0.122 | 1.00 |
| Total | 13098 | 1.718 | 0.103 | 0.00 |

*Source: Calculation of the author (2021).*

Test results of the difference between firms engaged in innovation activities (introducing new products, improving new products, introducing new manufacturing processes) and firms not engaged in innovation activities, shows no productivity difference between innovative and non-innovative firms (significance level 0.1618). Testing each type of

innovation activity, the study found no difference in productivity between enterprises introducing new products and new processes (p-value equal to 0.0934 > 5%). However, specifically for the hypothesis that Ho is the firm introducing new products has higher productivity than the firm that innovates new products is rejected and statistically significant (p is 0.04). Similarly, research shows a productivity difference between firms introducing new products and introducing new production processes (p-value equals 0.0156 < 5%). More specifically, the hypothesis that the firm introduces a new product with higher productivity than the firm introduces a new production process is rejected and statistically significant (p-value is 0.0078. < 5%). However, the results do not show that there is a difference in productivity between firms that innovate products and firms that innovate in new production processes (p-value is 0.1019 > 5%). However, for the Ho hypothesis about enterprises conducting product improvement activities, the high productivity that firms innovate in new production processes is rejected and statistically significant (p-value). P-value is 0.05.

**Table 7. Test Productivity Differences Between Innovative and Non-Innovative Firms**

| Groups | Observation | Medium | Standard Errors | p values |
|---|---|---|---|---|
| **Comparing productivity differences between firms that do not innovate and firms that do not engage in innovation** | | | | |
| Enterprises do not innovate | 7217 | 1.602 | 0.182 | 0.080 |
| Enterprises innovate | 5905 | 1.867 | 0.051 | 0.919 |
| Total | 13122 | 1.721 | 0.102 | 0.161 |
| **Comparing productivity differences between firms introducing new products and improving products** | | | | |
| Firms introducing new products | 193 | 1.473 | 0.133 | 0.046 |
| Firms improving products | 3047 | 1.705 | 0.036 | 0.953 |
| Total | 3240 | 1.691 | 0.035 | 0.093 |
| **Comparing the productivity difference between new product introduction firms and new manufacturing process** | | | | |
| Firms introducing new products | 193 | 1.473 | 0.133 | 0.007 |
| Firms introducing new process | 389 | 1.857 | 0.085 | 0.992 |
| Total | 582 | 1.729 | .0722 | 0.015 |
| **Comparing of productivity between product innovation firms and new manufacturing process** | | | | |

| | | | | |
|---|---|---|---|---|
| Firms improving products | 3047 | 1.705 | 0.036 | 0.050 |
| Firms introducing new process | 389 | 1.8574 | 0.085 | 0.949 |
| Total | 3436 | 1.722 | 0.033 | 0.101 |

*Source: Calculation of the author (2021)*

Productivity differences in the studied sector also show that there is a productivity difference between the North, Central and the South and is statistically significant at the 5% level. Specifically, for the hypothesis that Ho is a Northern firm with higher productivity than the central one is acceptable and statistically significant (p is 0.0098 < 5%). For the hypothesis that Ho is a central enterprise with higher productivity than a southern firm, it is rejected and statistically significant (p is 0.0000 < 5%). For the hypothesis that Ho is a Northern enterprise with higher productivity than a Southern enterprise, it is rejected and statistically significant (p-value is 0.0162 <5%) (Table 8).

**Table 8. Testing Productivity Differences Across Regions**

| Group | Observation | Medium | Standard Error | p value |
|---|---|---|---|---|
| **Comparing productivity differences between North region and Central region** | | | | |
| North region | 5710 | 1.715 | 0.229 | 0.990 |
| Central region | 3570 | 1.178 | 0.017 | 0.009 |
| Total | 9280 | 1.508 | 0.1412356 | 0.019 |
| **Compare productivity differences between Central region and South region** | | | | |
| Central region | 3570 | 1.178 | 0.017 | 0.000 |
| South region | 3836 | 2.237 | 0.083 | 1.000 |
| Total | 7406 | 1.727 | 0.0445 | 0.000 |
| **Compare productivity difference between the North region and the South region** | | | | |
| North region | 5710 | 1.715 | 0.229 | 0.016 |
| South region | 3836 | 2.237 | 0.083 | 0.983 |
| Total | 9546 | 1.925 | 0.141 | 0.032 |

*Source: Calculation of the author (2021)*

## 5. CONCLUSION AND POLICY IMPLICATIONS

Total factor productivity (TFP) is the decisive factor to the long-term growth of the firm and ultimately the growth of the economy. The objective

of this study is to estimate the total productivity of firm factors from a micro perspective and analyze the picture of productivity over time, industry, region, and some other factors of SMEs in Vietnam. The research results show that in the period from 2005 to 2009, the TFP of SMEs in Vietnam tended to increase, but in the period from 2009 to 2013, the TFP tended to decrease. The analysis also shows that there is a productivity gap between the enterprise industry, the types of enterprises, enterprises engaged in export activities, enterprises engaged in innovation activities, and regions. Research also put some suggestions to the government to help increase the total productivity of SMEs in Vietnam such as: (1) the government should create a good business environment for businesses. Studies show that a good business environment facilitates business activities and directs enterprise efforts towards productive activities (Baumol, 1990); (2) government needs policies to improve internal capacity of SMEs such as investment in innovation activities (product innovation, process innovation, product improvement), increasing quality of human resources and encouraging businesses to participate in export activities.

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# EARLY WARNING MODEL FOR COMMERCIAL BANKS IN VIETNAM

**Nguyen Thi Nhung[1], Do Quyen[1], Nguyen Hoang Mai Lan[1], Luu Khanh Linh[1]**

***Abstract:*** *By using the data of 26 commercial banks, 3 banks acquired for 0 dong and 8 banks required to be mandatorily merged, as well as logit regression model, the study proposed the early warning model to commercial banks in Vietnam. Accordingly, research has shown that the higher the bad debt ratio and credit balance, the greater the risk of bank failure. In other words, the risk of failure of Vietnamese commercial banks is closely related to credit risks, which is the reference for policymakers and owners of commercial banks.*

***Keywords:*** *Bank failure, bank distress, risks in financial institutions, early warning system.*

[1] Faculty of Finance and Banking, VNU University of Economics and Business

# EFFECT OF INTANGIBLE ASSETS ON THE VALUE RELEVANCE OF ACCOUNTING INFORMATION: EVIDENCE FROM VIETNAM

**Nguyen Hoang[1], Do Song Huong[1], Ha Ngoc Long[1]**

***Abstract:*** *This study aims to examine the value relevance of intangible assets and their influence on the value relevance of accounting information in the Vietnamese listed non-financial firms. Data used in the study are panel data collected from audited financial statements of 618 non-financial firms from 2015 to 2020. We test four models, including accounting information (earnings per share and book value per share) without intangible assets model, intangible assets model, accounting information (earnings per share and book value per share) with intangible assets model, and accounting information (earnings per share and book value per share) with an interaction term of intangible assets model. Empirical analyses show that intangible assets and traditional accounting measures (earnings per share and book value per share) are positively associated with stock prices. The study reveals that the value relevance of earnings per share is higher for firms that own intangible assets than for firms that do not. In other words, intangible assets can improve the value relevance of accounting information.*

***Keywords:*** *Intangible assets, value relevance, accounting measures, emerging market, Vietnam.*

[1] University of Economics, Hue University

# EMPIRICAL TESTS ON THE ASSET PRICING MODELS WITH STOCK MARKET LIQUIDITY IN A FRONTIER MARKET

**Pham Quoc Khang[1], Katarzyna Kuziak[2], Marcin Hernes[3]**

***Abstract:*** *The study investigates the relationship between liquidity and returns on a stock exchange in a frontier market. The paper applies three asset pricing models, including Capital Asset Pricing Model (CAPM), the Fama-French three-factor model, liquidity-augmented three-factor model. To measure the liquidity in the study, five measures: quoted spread, trading volume, trading value, Amihud measure, and turnover ratio were applied. The empirical research is carried out in 179 non-financial companies on the Ho Chi Minh Stock Exchange in Vietnam from 2011 to 2019. The study documents that liquidity is an essential source of effect on stock returns on the Ho Chi Minh stock exchange. Using the GRS-test, the models were compared and assessed. The result shows that the liquidity-augmented three-factor model with liquidity factor is the most significant model to capture the impact of liquidity on stock returns on the Ho Chi Minh Stock Exchange.*

***Keywords:*** *Asset pricing models, stock market liquidity, stock returns, Ho Chi Minh Stock Exchange.*

[1] Department of Finance, University of Economics, Hue University, Hue City, Vietnam
* Corresponding author. Email: pqkhang@hce.edu.vn

[2] Department of Financial Investments and Risk Management, Wroclaw University of Economics and Business, Wroclaw City, Poland

[3] Department of Process Management, Wroclaw University of Economics and Business, Wroclaw City, Poland

# FACTORS AFFECTING THE POSSIBILITY OF ADOPTING IFRS ON FINANCIAL INSTRUMENTS: THE CASE OF COMMERCIAL BANKS IN VIETNAM

**Nguyen Quynh Trang**[1]

***Abstract:*** *The study used the Exploratory Factor Analysis method (EFA) to analyze 236 questionnaires collected from experts in the fields of Accounting, Auditing, Banking and Finance to investigate the micro factors that influence the possibility of adopting the International Financial Reporting Standards (IFRS) on financial instruments in commercial banks in Vietnam. The factors that are studied in this research include: the perception of commercial banks about the benefits of adopting IFRS on financial instruments, accountants' competence, managers' participation and advice from the accounting - auditing community. From the results, the authors have given some recommendations for commercial banks, law and policy-makers when promoting the adoption of IFRS. This implication could be applied for other firms in Vietnam and enterprises in other countries, which are in the same stage of IFRS adoption*

***Keywords:*** *Commercial banks, financial instruments, IFRS adoption, International Financial Reporting Standards.*

[1] Faculty of Accounting and Auditing, Thuongmai University, Ha Noi, Vietnam
Email: quynhtrangnguyen2408@gmail.co

# HOW DOES FIRM LOCATION AFFECT CASH HOLDINGS?

**Duc Kien Vu**[1]

***Abstract:*** *Using the sample of Vietnamese listed companies, this study finds a statistically significant relationship between geographical location and cash holdings. Companies located in the two biggest financial centers, Hanoi and Ho Chi Minh City, have about two percent higher cash over assets ratio than companies located in other regions. In addition, the average enterprises in five cities under the jurisdiction of the central government (Hanoi, Ho Chi Minh City, Da Nang, Can Tho, and Hai Phong) also have higher cash-over-assets ratio of about two percent than their counterparts in provinces. If geographical location is measured as the distance from the firms' headquarters to Hanoi and Ho Chi Minh City, the analysis still shows robust evidence.*

***Keywords:*** *Cash holdings, firm location, listed companies, Vietnam.*

[1] Department of Corporate Finance, Academy of Finance, Hanoi, Vietnam. Email: vuduckien@hvtc.edu.vn

# IMPACTS OF COVID-19 ON VIETNAMESE BANK PERFORMANCE: THE ROLE OF BANK DIVERSIFICATION

**Thao Thi Minh Giang**[1]

***Abstract:*** *Although Covid-19 pandemic is undisputedly found to exert negative impacts on overall bank performance and their traditional lending activities in specific, the strategy from banks to deal with such problems is still an open question. The author attempts to answer that question through an empirical analysis on the impacts of Covid-19 on bank performance and the role of bank diversification. The study deploys data of all listed commercial banks in Vietnam for the 2015-2021 period and estimates two-step GMM models. Covid-19 is confirmed to have negative impacts on bank profitability. Bank diversification is found to increase bank profitability over the entire study period. Moreover, the study contributes to the extant literature by offering evidence that bank diversification helps preserve bank profitability during Covid-19. It is suggested that to deal with the worsened traditional lending activities, diversification towards non-interest activities is an effective strategy for banks to improve their performance.*

***Keywords:*** *Covid-19, bank diversification, bank performance.*

[1] VNU University of Economics and Business, Vietnam National University, Hanoi, Vietnam. Email: thaogtm@gmail.com

# IMPRESSIVE EMPIRICAL EVIDENCE ON THE RELATION BETWEEN BOARD CHARACTERISTICS AND ASYMMETRIC INFORMATION

**Thuy Gia Phan Bui[1,*], Khanh Thuy Hong Thai[1], Phuc Tran Nguyen[2], Trong Vi Ngo[3]**

***Abstract:*** *This study aims to determine the effect of independent directors, education level of board members, and directorial shareholding on asymmetric information. Analyzing 161 firms listed on HOSE between 2009 and 2015 with 1019 observations, we find that the effects of independence and educational qualifications of directors on asymmetric information depend on the moderating of types of firms, state-owned and non-state-owned firms. Specifically, independent directors and board members with postgraduate education in non-state-owned firms negatively and significantly impact asymmetric information. In contrast, these characteristics in state-owned firms have no relationship with asymmetric information. Moreover, our findings denote a non-monotonic relationship between the shareholding of board members and asymmetric information.*

***Keywords:*** *Board characteristics, directorial shareholdings, independent directors, adverse selection component, asymmetric information.*

[1] Nguyen Tat Thanh University, Vietnam
* Corresponding author. Email: pbgthuy@ntt.edu.vn
[2] Banking University Ho Chi Minh City, Vietnam
[3] Ho Chi Minh City Open University, Vietnam

# OIL PRICE AND STOCK INDEX CORRELATION: EMPIRICAL EVIDENCE FROM VIETNAM'S STOCK MARKET

**Pham Xuan Truong[1,*], Le Phuong Thao Quynh[1]**

***Abstract****: Oil has always been one of the main materials to operate the economy. The rise and fall of oil prices, which directly affect gasoline prices, vitally affects the economy. As a barometer of the economy, the stock market responds immediately and even anticipates future oil prices impacts on the prices of stocks. Therefore, the relationship between oil prices and stock market indexes has been studied for a long time. This research will examine the relationship between oil prices and Vietnam's stock market in the economic context described by other control variables such as interest rates, exchange rates, and the Covid-19 epidemic during the research period from the beginning of 2018 to July 2022. Using the VAR model demonstrates that there exists only the impact of the oil price on the Vietnamese stock market represented by the Vnindex. The variables of interest rate, exchange rate, and Covid-19 surprisingly do not show a statistically significant impact, while the oil price shows a positive impact on Vnindex. However, the long-run relationship between these two variables is not clear. This once again confirms the positive impact of oil prices on Vietnam's stock market, similar to the results of previous studies.*

***Keywords:*** *Oil price, VNINDEX, stock market.*

[1] Faculty of International Economics, Foreign Trade University, Vietnam
* Corresponding author. Email: truongpx@ftu.edu.vn

# THE APPLICATION OF RESPONSIBILITY ACCOUNTING TOWARDS THE SUSTAINABLE DEVELOPMENT OF VIETNAMESE ENTERPRISES IN INTEGRATION STATE

**Thi Huyen Chu**[1]

***Abstract:*** *Many studies have proved that the good practice of RA is vital for sustainability development of businesses. In Vietnam, the application of RA is still a relatively new issue and is increasingly attracting the attention of businesses, especially large-scale enterprises. The article clarifies the different definitions of RA to see the conceptual development of RA. Especially, the study shed more light on the current practices of RA in Vietnam. To realize the research goals, the researcher employed a qualitative research method which is done through ground theory method (GT) and expert interviewing method. The findings show that the application of RA in local enterprises has been implemented, but the manifestation of RA is not clear. Based on the research results, the author gives discussions and recommendations to improve and further promote the adoption of RA in Vietnamese companies towards the sustainable development in integration period.*

***Keywords****: Vietnamese enterprises, responsibility accounting, sustainable development.*

[1] Thuongmai University. Email: huyenchudhtm@tmu.edu.vn

# THE EFFECT OF MOBILE BANKING APPLICATIONS' DESIGN FEATURE ON PERCEIVED AESTHETICS, PSYCHOLOGICAL ENGAGEMENT, AND BEHAVIORAL INTENTION

**Loan Pham Thi Be[1], Quyen Nguyen Hoang Diem[1], An Nguyen Ngoc Ha[1], Anh Hoang Thi Van[1], Tung Nguyen Huu[1]**

***Abstract:*** This paper aims at investigating the relationship between aesthetic design features and perceived visual aesthetics along with psychological engagement, and the effect of perceived visual aesthetics on psychological engagement, and ultimately influence on adopters' behavioral intention toward mobile banking applications. Design versions adapted the pattern of bi-dimensional aesthetics were conducted by authors and presented in the questionnaire to collect feedback and evaluate the influence of aesthetic design features among users. This study took a quantitative approach. 540 participants' data were gathered by a survey with questionnaires. The research used PLS-SEM and IBM SPSS version 20. The results show that perceived aesthetics and psychological engagement partially mediate the impact of design features on behavioral intention. A significant positive relationship between design features and behavioral intention has also been affirmed in this study. In addition, the results further support the hypothesis that perceived visual aesthetics positively influences psychological engagement. There is a dearth of literature addressing mobile banking applications in terms of aesthetics and their influence in Vietnam. Consequently, this research fills in the gap by expanding and formulating a deeper understanding of the certain aesthetic design features that influence perception and emotion, which eventually impact users' behavioral intention toward mobile banking applications.

***Keywords:*** *Aesthetic design features, behavioral intention, mobile banking applications, perceived visual aesthetics, psychological engagement.*

[1] Faculty of International Business, Danang University of Economics, Danang, Vietnam

# THE IMPACT OF DEVELOPED STOCK MARKETS ON VIETNAM STOCK MARKET DURING THE COVID-19 PANDEMIC

**Nguyen Thanh Dat[1], Nguyen Ha Hoang Long[1]**

***Abstract:*** *This article investigates whether the Covid-19 pandemic has some impacts on the relationship between the developed stock markets, such as US and China, and Vietnam stock market. This paper uses a sample period from 1 July 2019 to 31 December 2021 and the data is splitted into pre-pandemic and during-pandemic periods in order to examine the impact of the Covid-19 pandemic on the correlation between three markets. Our findings suggest that during the Covid-19 pandemic the impacts of US and China stock markets on Vietnam stock market have been strengthened. Moreover, the analysis shows that the US stock market does not Granger cause Vietnam stock market during the Covid-19 pandemic, but China stock market does. The results indicates that a health pandemic such as Covid-19 can also be considered a source of financial contagion to not only global equity markets but also other developing nations such as Vietnam. New regulatory capital rules should be proposed to ensure that bank capital can withstand unforeseen large shocks induced by a pandemic.*

***Keywords:*** *Vietnam, stock market, US, China, Covid-19, contagion.*

[1] Banking Faculty, University of Economics, The University of Danang, Vietnam

# Theme 4
# Information Management and Information System

# CONCEPTUALIZATION OF MOBILE AUGMENTED REALITY APPLICATIONS -ENHANCED CUSTOMERS' IMMERSIVE EXPERIENCE

**Vo Kim Nhan[1,*], Doan Minh Nguyet[2]**

***Abstract:*** *Immersive experience lies at the center of the advancements in emerging technologies such as augmented reality and virtual reality and has gained increasing attention from both academics and practices in the field of digital business. Previous researches pay attention to the significant role of AR experiences, particularly immersive experiences, on exerting/eliciting either customers' relational outcomes such as customer satisfaction and loyalty (Hudson et al., 2019) or their purchase intention (Wang et al., 2021; Yim et al., 2017). However, there is still limited specific research on how customers' immersive experience with try-on AR apps can engender positive responses that are beneficial to online retailers. By addressing these research gaps, our research can contribute depth knowledge to the emerging literature regarding the experiential effect of advanced technologies (i.e., AR) in the era of digital retailing business. Mobile augmented reality applications (MAR apps) have been considered technological advancement in recent decades, especially in developing countries such as Vietnam. This study revealed some trends of doing business in a virtual environment in the post-Covid-pandemic period. Moreover, the research background was to review mobile augmented reality applications on smartphones. Besides, this study conceptualized some gaps in studying customers' immersive experiences using MAR apps in recent years.*

***Keywords:*** *MAR apps, customer immersive experience, customer responses.*

## 1. INTRODUCTION

### 1.1. Trends of doing business in the virtual environment

Recently, emerging technologies such as augmented reality (AR, hereafter) and virtual reality (VR, hereafter), exist widely in virtual environments and are considered immersive technologies, which have paid attention to scholars and practitioners because of their advantages

[1] University of Economics Ho Chi Minh City, Vietnam

* Corresponding author. Email: vokimnhan@gmail.com

[2] Tien Giang University, Vietnam

in enhancing user experience (Fan et al., 2022; Wedel et al., 2020). AR is considered as "a variation of virtual environments", and can be used to assist customers' pre-experience before purchasing decision and engage customers dynamically with diversified products/services (Fan et al., 2020; Vieira et al., 2022), then to enhance the in-store experience. Thus, companies use AR technology in their marketing campaigns to allow their customers have immersed and more interactive experience than traditional forms. In fact, the AR market size worldwide is expected to gain from USD 12.0 billion in 2021 to USD 72.8 billion in 2024(Fan et al., 2022). In particular, the market growth rate was expected by 31% annually (Rauschnabel et al., 2019). AR is described as one of the "next generation" technologies (Javornik, 2016; Sağkaya & Ozansoy, 2022). AR can be used in fields such as industry, tourism, entertainment, education, retailing, etc. because of these dominant benefits (Hilken et al., 2018). The development of AR has been leading to various channels, thereby bringing an enormous change in retailing sector (Frishammar et al., 2018). Moreover, mobile devices are crucial for almost most because of their convenience. There are more than five billion phone users in the world, most of them using smartphone, and about 218 billion mobile applications were downloaded in 2020 (Oyman et al., 2022). Mobile phones-phone-based actions having AR functions (e.g., MAR apps) allow users to try on in a virtual environment, thus can stimulate users' experience. This calls for more studies and provides a new direction to capture customers' attention by stimulating them to interact with virtual products on their mobile phones. It is obvious that AR is a potential and effective marketing tool that companies should take advantages of to suit customers' demand. Companies can come up with loyal customers for the launch of new product strategies. It is clear that MAR apps have been having spidered as technological advancement in recent decades, thus businesbusinesseske advantage of these virtual technologies to enhance customers'immersive experience.

### 1.2. Research background related to augmented reality technology

Technology has been changing our daily lives ever since it first invention. It is obvious that, nowadays, technology is a big part of our lives, and we have been attracted to adapt to all the technological changes. Retail companies have been to adapt to the most recent technology to fully

capture consumers' attention. Technology innovation is upon the interaction between producers and users of innovation (Lundvall et al., 2009). Up to now, companies has been aware that having no logical innovation is essential phrase in the development of society. Before making a decision for purchasing products, customers have to consider how to collect information in related to these products such as price, functions, etc. In recent years, augmented reality is considered an emerging technology that companies have applied to creating their virtual products via mobile applications or trying on virtual websites (Nikhashemi et al., 2021).

One of the most recent advancements in technology is the use of AR. The development of AR has been leading to various channels, thereby bringing an enormous change in retailing sector (Frishammar et al., 2018). Therefore, consumers are more knowledgeable, searching tools and interactitoolskills to choose best products or services. So, the services have prioritized their customers by thinking of the box by boosting their customer explorations. Having been immersed in their exexperiences in companies will fully led customers to usleadheir products. In branded companies, Research and Development department has carried out their experiments with the latest technology the AR. So, with the application of modern technology, marketers and retailers may not only target new customers, but also assist their customers to make informative decisions. According to Chylinski et al. (2020), AR is a promising and emerge ing technology in some fields such as industry, tourism, entertainment, education, retailing, etc. because of augmented reality technology's dominant benefits (Hilken et al., 2018). In particular, that figure was anticipated at 200 billion dollars by 2025 and the market growth rate was expected by 31% annually (Rauschnabel, Felix, & Hinsch, 2019).

From above MAR apps, it is obviously that AR obvious and effective marketing tool which companies should be take their advantages to suit customers' demand. Marketers can come up with loyal customers for the launch of the new products and strategies. Thus, AR technology has been considered as technological advancement in recent decades, especially in developing countries as Vietnam.

According to Moorhouse, tom Dieck, and Jung (2018), emerging technologies such as AR is the latest technological innovations that may

reform consumers behavior. Some authors also mentioned about the application of AR/VR in their studies in tourism sectors (Linaza et al., 2013; Jung et al., 2016; Chung et al., 2018; Kim and Hall, 2019; Tsai, 2020, Blumenthal, 2020), in entertainment (Fu, Su, & Yu, 2009), etc.

Using MAR apps, customers have been impressive positively in their emotions, cognitive responses and behavioral responses (Alexandra Rese et al., 2016). The immersive technologies such as AR have been applying to hold very diverse areas in marketing (Guttentag, 2010). Applying technological innovations to getting consumer in immersion is the key method of helping corporations to achieve better goals and changing customers' behaviors (Heller, Chylinski, de Ruyter, Mahr, & Keeling, 2019; Hilken, de Ruyter, Chylinski, Mahr, & Keeling, 2017; Novak, Hoffman, & Yung, 2000).

### 1.3. Potentail applications of augmented reality technology in Vietnam

There are some empirical studies that have been implemented in observing how technology traits connect with customer satisfaction in hotel's website (Thinh et al., 2019), online bookstore (Nguyen et al., 2019), online hotel ratings (Tran et al., 2019). Additionally, few empirical studies have also been conducted in Vietnam to measure intention to adopt mobile commerce (Khoi et al., 2018; Phong et al., 2018). Paving the way for useful devices such as computer and smartphone, modern technology plays an important role in shaping our future and making life easier. The application of new technologies in our daily life is leading in altering of human behaviors, which have become more convenient by supporting functions in various fields such as marketing, tourism, retailing, etc.

While MAR apps have attracted researchers' attention in developed countries; studies on that topic in developing countries, Vietnam for instance, is limited. Despite the importance of immersive experience in a meaningful relation with customers' positive responses, as well as with embodiment and mental imagery, there is an absence from empirical investigation into the conceptualized framework and its implication for Vietnam businesses. MAR apps is latest advanced the technology and their upgrading keeps on changing every day, however, this is not popular use in Vietnam.

## 2. LITERATURE REVIEW

### 2.1. Mobile augmented reality applications (MAR apps)

Augmented reality (AR) is a type of interactive and emerging technology which able to add an extra layer with virtual information on the real word in real time by overlaying virtual objects onto user "bodies or real surroundings"(Loijens et al., 2017). AR is considered as a digital device, which is used to overlay "overlay supplementary sensory information" on the real context (Wedel et al., 2020). In other words, AR is used in both real and virtual features which describes virtual contents on real objects such as face, body of human in user's perception (Giglioli et al, 2015). Unlike virtual reality, AR allows the user to experience the real world with virtual objects superimposed upon through computer or smartphone' camera (Kipper and Rampolla, 2013). AR is a source of technology, which connects virtual objects directly into certain circumstances via computer or smartphone (Scholz and Smith, 2016; Javornik, 2016).

Mobile applications is one of impressive tools in mobile commerce with more than 49% of business receiving order in Vietnam (Tuu et al., 2021). In addition, AR is one of the nine egerging technologies that can support the digital transformation in different fields (Evangelista et al., 2020; Hajirasouli et al., 2022), thus it is expected to give a new opportunities in retail and marketing sectors. During the Covid-19 pandemic, AR has become an crucial technology for virtual try-on in retail settings, such as clothing, footwear, assceesaries and cosmetics as well as furniture in customers 'home (e.g. IKEA, Dulux) (Chen et al., 2021). There have some benefits using AR technology such as reducing uncertainty in decision-making, increasing shopping intention, enhancing customer loyalty and building the relationships between customers and business brand (Chen et al., 2021). Recent studies have provided evidences that MAR apps can support customer to understand more about virtual products (Dacko 2017). Besides, Huang and Liao (2015) stated that augmented reality technology provides customers richer experiences and more enjoyment. Hence, experiencing try-on virtually in AR technology is so enjoyable that customers are willing to experience, even at great cost (Shin, 2019). From the short review above focused on developed countries, AR technology

need to study whether user accept to use this technology to get more information about products before making purchasing decisions.

### 2.2. Customers'immersive experience

There are some ways to explain the concept of customer immersion in different ways in different fields such as education (Radianti et al., 2020), tourism (Tsai, 2019), (Hudson et al., 2019), retailing (Peukert et al., 2019; Song et al., 2019). In recent year, the concept of customer immersion has been paid attention by researchers (Daniel & Berinyuy, 2010; Hilken et al., 2018). In a technological view, immersion is understood as "level of media' quality" (Flavián et al., 2019). According to Suh and Prophet (2018), immersive technology is technology that offers technology-enhanced immersive experience. In the psychological view, Brown and Cairns (2004) argued that immersion is human psychological state with multi-dimensions consisting of engagement, engrossment, and total immersion. In addition, Carù and Cova (2006) also stated that there are multi-dimensions of customer immersion consisting of engagement, engrossment, total immersion. Hilken et al. (2018b) argued that user personality traits have an impact on user immersion. According to Weibel et al., (2010) also argued that immersion is considered as a psychological state, which can be engaged in, engrossed in certain activities. Yim, Chu, and Sauer (2017) also explained that customer immersion as user feeling which was absorbed in, involved with, and engrossed in a certain virtual environment as augmented reality applications. In a social point, Carù and Cova (2007) stated that immersion is an experiential process by being immersed in a certain environment. In experience economy view, (Pine et al., 1999) that immersion is considered as an experience 's physical or virtual apart. Agarwal and Karahanna (2000) argued that user immersion is a part of cognitive absorption which can enhance user attitude and behavioral intention. User immersion is psychological states consisting of engagement, engrossment, and total immersion (Georgiou & Kyza, 2017). According to Hansen and Mossberg (2013) and Hudson et al., (2019), customer immersion was explained as an immersive experience in virtual context. Song et al. (2019a) also showed that immersion is a human psychological state of deep involvement with technological devices. In

addition, Blumenthal and Jensen (2019) stated that there are three levels of involvement including involvement worlds, involvement triggers and a state of immersion.

Common to all these explanation, customer immersion refers a customer' immersive experience described by user's deep involvement in the present (Georgiou & Kyza, 2017; Hansen & Mossberg, 2013; Yim et al., 2017). In this study, immersion can be understood as user immersive experiences which were "absorbed in, involved with, and engrossed in" a virtual environment (Georgiou & Kyza, 2017; Song et al., 2019a; Yim et al., 2017). In the next part, this study aims to summarize the definitions of immersion and related concepts in previous studies.

Figure 1 and Figure 2 following show the number of papers published yearly from 2010 to 2020 on Web of Science and Scopus websites. These figures illustrate the growing interest in customer immersion in the recent period. The number of papers related to immersion has increased sharply since 2017, emphasizing the fact that augmented reality has received tremendous attention from academic researchers and retailers.

The current study consists of browsing the databases by utilizing the keyword of 'Augmented Reality' AND 'Immersion' AND 'Marketing'. The word 'AND' is used to search for accurate screening. The search started on 31 December 2020. From the search, it was found that documents were on Web of Science and Scopus databases.

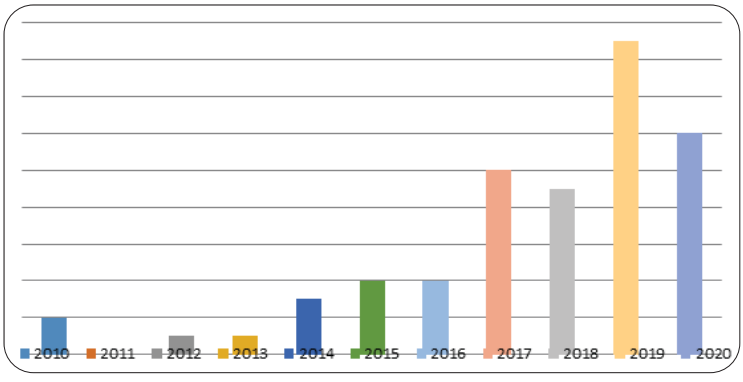


**Figure 1. Papers Related Immersive Experience on Web of Science in the Period 2010-2020**

*(Source: Web of Science)*

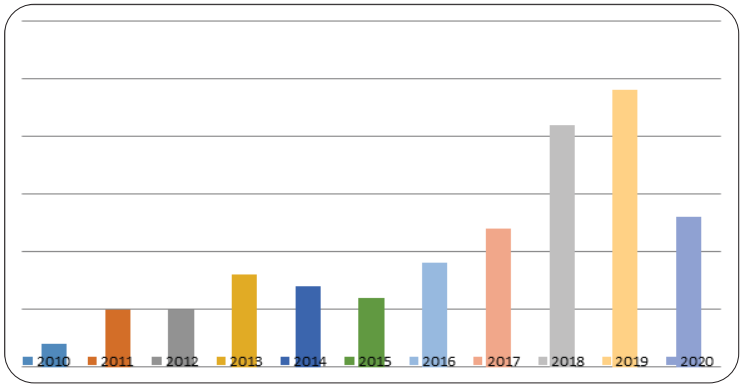


**Figure 2. Papers of Immersive Experience on Scopus Web in the Period 2010-2020**

*(Source: Website of Scopus)*

Previous studies stated immersion as a global concept Mazzoni, Cannata, and Baiocco (2017) and a multi-dimensional concept (Adams, 2004; Parvinen et al., 2015); (Georgiou & Kyza, 2018), thereby need to study deeply customer immersion in augmented reality. An extensive review shows that immersion is an important part of digital technologies-users interactions and that immersion plays a mediating role in generating an array of cognitive responses, affective responses, and behavioral responses. Technologies such as AR enable users to experience a state of immersion and deep focus free from distraction within these virtual environments (Slater, Linakis, Usoh, & Kooper, 1996). Based on the definition of immersion.

In keyword analysis, VOSviewer software is used as a text-mining technique to analyze the content of titles, keywords, and abstracts. The current study use VOSviewer tools to find a bibliometric mapping, and research gap, and review previous studies more clearly as shown in Figure 3.

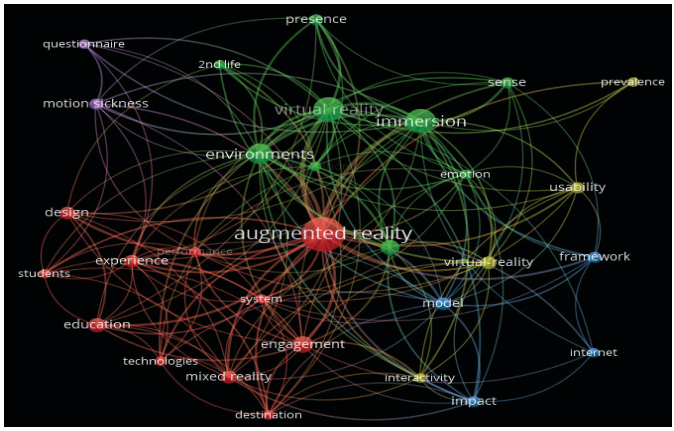


**Figure 3. Bibliometric mapping related to immersion in augmented reality**

*(Source: calculation from WOS and Scopus website)*

## 3. DISCUSSIONS

Consistent with the study of Hilken et al., (2022), we find that MAR apps as one of the emerging technological advancements have an impact on customers' immersive experience and their responses. AR apps were utilized in the study and also used in recent studies such as the YouCam Makeup app (Hsu et al., 2021), Formex watches app (Song et al., 2019), IKEA furniture app (Kowalczuk et al., 2021; Ozturkcan, 2021). Thus, augmented reality technology is considered one of the most emerging technologies which were mentioned in current studies, especially in mobile augmented reality applications. This study has explained the importance and the reasons why these AR apps were chosen, so firms and retailers can enhance their customer experience by attaching more information through AR apps on smartphones or tablets. Moreover, the authors intended to express the importance of augmented reality technology in the retail sector. AR technology gives emerging potential for marketers and creates a challenge for marketing practice (Yuan et al., 2021). MAR apps are applied for getting informative products and shopping anywhere, anytime through customers' smartphones, then enhancing MAR apps-enhanced immersive experience. Customers feel more attached to MAR apps, getting their positive evaluations without visiting directly physical stores. Customers can interact with MAR

applications installed on their devices such as smartphones, tablets, etc. (Rauschnabel et al., 2018).

In addition, this study has highlighted the importance of customers' immersive experiences. Immersive experience has been consistently conceptualized in a complex and multi-dimensional manner that refers to "a psychological state in which individuals are involved in, absorbed by their activities and fully engrossed in the computer-mediated environment" (Song et al., 2019), the literature review surprisingly reveals that immersive experience is usually delineated as the state of deep involvement (Song et al., 2019) or different degree of involvement(Blumenthal & Jensen, 2019; Weibel et al., 2010) and frequently studied as a uni-dimension construct (Hudson et al., 2019; Yim et al., 2017). The comprehensive understanding on the nature of such a specific and multi-dimensional experience as well as its impacts on attitudinal and behavioral responses towards try-on AR apps is thus inhibited. In the retail setting, MAR apps have been used to try-on beauty or brand fashion products (Huang & Liao, 2017; Song et al., 2019; Yuan et al., 2021; Chen et al., 2022), such as shoes, clothes, eyeglasses, lip-sticks, watches, etc. Most of the recent studies (Yim et al., 2017; Jessen et al., 2020; Qin, Osatuyi, et al., 2021; Plotkina et al., 2021) were investigated in developed countries (e.g. United States, European Unions, French). The literature review of customer experience revealed AR technology based-customer experience (e.g. presence, flow, involvement, engagement, etc.), MAR apps-enhanced customer immersive experience still remains limited in recent research (Yim & Park, 2019; Yuan et al., 2021; Orús et al., 2021; Arghashi & Yuksel, 2022, etc.). In addition, students samples are utilized in the experiment method (Yim et al., 2017; Jessen et al., 2020; Kowalczuk et al., 2021); and customers are often used in the survey method (McLean & Wilson, 2019; Y. Wang et al., 2021; Chen et al., 2022). Thus, customers from 15 years are the sampling framework of this study in the survey method. Moreover, recent research has tested the moderating of personality traits such as user motivation (Perannagari & Chakrabarti, 2019), assessment orientation (Jessen et al., 2020), technology anxiety (Dogra et al., 2022) or prior experience (Song et al., 2019), most of them used to moderate the relationship between customer experience (e.g. engagement) and its outcomes. Personal innovativeness is one of the crucial individual traits in adopting new technology, it can

be a key conditional factor in moderating between customers' immersive experience and its two precusors and thus be integrated in the current study. By addressing these research gaps, this study can contribute depth knowledge to the emerging literature regarding immersive experience using MAR apps in the era of digital retailing business.

## 4. CONCLUSION

In conclusion, marketers can use MAR apps to establish marketing strategies to increase their effectiveness. AR-based- marketing approaches can shape customer behavior by interacting digital information into customers' perceptions to support sales (Hinsch et al., 2020). In the era of the Covid-19 pandemic, consumer behavior has changed and impacted not only retailers but also their suppliers (Laato et al., 2020). In the past, customers tried on the products through physical stores before having purchase decisions. Recently, they tend to digital technologies in their online shopping process instead of offline shopping. In the post-Covid-pandemic period, customers are more interested in online shopping via mobile applications in retail settings. Thus, firms and retailers should provide their customers with "easy-to-use" MAR apps to enhance their customer immersive experience as one of the dominant marketing strategies in the digital era of the post-Covid-19 pandemic.

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# EFFECTS OF TECHNICAL INFRASTRUCTURE AND HUMAN CAPITAL ON ICT APPLICATION OF LOCAL AGENCIES IN VIETNAM

**Nguyen Thi Ngoc Mai[1], Pham Ngoc Huong Quynh[2,*]**

***Abstract:*** *Applying Information and Communication Technology (ICT) to public service delivery brings many benefits such as transparency, accountability, and cost-saving to improve administrative efficiency (Tangi et al., 2021). The application of ICT in public service delivery is influenced by many factors, including economic, social, and institutional aspects (Guijarro, 2009). In which, the technical and human infrastructure factors play a huge role in promoting ICT application (Ominde et al., 2021). Recently, the Vietnamese Government has created a thoroughly legal foundation to develop information infrastructure and human resources for public service delivery in order to encourage citizens to use online public services (Vu et al., 2018). However, online public service delivery results are still lower than expected (Vu et al., 2018). Therefore, evaluating the effects of technical infrastructure and human capital on the ICT application of local agencies is important to propose strategies to develop ICT in public service delivery in Vietnam.*

***Keywords:*** *Information and communication technology, the Vietnamese government, online public service.*

## 1. INTRODUCTION

The scientific and technological revolution has greatly influenced public agencies' operations. According to Gupta, applying ICT in providing public services brings many benefits such as increasing the efficiency of government operations, creating publicity, and transparency of administrative procedures (Gupta et al., 2008). Applying ICT also helps individuals and businesses to reduce their effort and moving time when using public services (Pontones-Rosa et al., 2021 & Gasovaa et al., 2017).

Recently, E-government has been very prevalent in most worldwide countries, both developed and developing countries. Therefore, the

[1] National Academy of Public Administration, Hanoi, Vietnam

[2] VNU University of Economics and Business, Vietnam National University, Hanoi, Vietnam

* Corresponding author. Email: quynhpnh@gmail.com

application of ICT in public administrative services with technological breakthroughs has created opportunities for millions of people to be connected to mobile devices with high speed and unprecedented capacity. This helps citizens to engage in the government's activities more openly and transparently (Bertot et al., 2010). The United Nations shows an uptrend in using online public services globally because the world average Online Service Index (OSI) increased from 0.4178 in 2010 to 0.562 in 2020 (United Nations, 2020). The United Nations report also illustrates the success of improving online public services use in most countries due to the rising investment in technical infrastructure and human capital. Actually, the majority of local government portals can be accessed via mobile devices to raise the local governments' awareness of the importance of mobile technologies in multichannel service delivery (Gupta et al., 2008). Consequently, in order to enhance the application of ICT in providing online public services, many countries have promoted to invest in technical infrastructure and human resources. According to the UNDP report, the global average E-Government Development Index (EGDI) value increased from 0.55 in 2018 to 0.6 in 2020 (United Nations, 2020). The report also shows that the Technical Infrastructure Index and the Human Capital Index both raised in most countries (United Nations, 2020). Obviously, these are two indispensable factors (technical infrastructure and human capital) to help improve the ICT application in online public service delivery.

In Vietnam, the application of ICT in state's administrative management aiming to build a modern and effective administration is one of the key points to strengthening the government apparatus at all levels (Hanafizadeha et al., 2019). ICT application has been making appliances and devices smarter, creating many new services. This is a chance for state agencies to apply new technologies to optimize management processes and methods in online public service delivery, increase operational efficiency, reduce administrative costs and meet the public and businesses' requierment. By 2020, the Vietnamese government approved a plan to apply ICT in state agencies and paid more attention to investment in technical infrastructure and human infrastructure. Thanks to that, the EGDI of Vietnam improved significantly. In 2020, Vietnam's EGDI was 0.667; while in 2018 this index was lower at 0.593 (United Nations, 2020). However, there are many challenges to providing better public services to people and businesses.

For example, equipment and technical infrastructure for local agencies' operations are not properly invested because there is a lack of funding for ICT applications at grassroots levels (Hanafizadeha et al., 2019). Besides, there is low awareness among some civil servants about the importance of applying ICT, they passively study and improve their skills to apply information technology in their work, or there are some inactive agencies to exploit and use the ICT application systems (Palviaa et al., 2018).

Obviously, the government needs to more focus on technology infrastructure and human capital and implement synchronous measures to apply ICT to deliver online public services in Vietnam. This paper aims to evaluate the effects of technical infrastructure and human capital on the ICT application of local agencies in Vietnam, shows how two of these factors impact ICT application and the quality of public services in Vietnam, and proposes feasible solutions for the government to invest in technical infrastructure and human capital to improve ICT application of local agencies. The structure of the paper includes (i) The literature review on the importance of technical infrastructure and human capital on ICT application towards higher effectiveness and efficiency in governmental tasks; (ii) The impact of technical infrastructure and human capital on ICT application of local agencies in Vietnam; (iii) The proposal to improve the technical infrastructure and human capital to promote ICT application in Vietnam in the future.

## 2. LITERATURE REVIEW

Due to a new E-government trend from the beginning of the twenty-first century, ICT applications in public service delivery get much research attention. There are many publications on the information technology application in state agencies in developed countries, while the number of working papers focusing on this field in developing countries is limited. Studies show that online public services are more common in developed countries than in developing or undeveloped countries that have many financial, technological, and even cognitive difficulties in improving online public services (Reggia et al., 2021). For example, African countries have failed to develop online services because of the political challenge, low economic environment, and poor civil recognition (Schuppan, 2009). In contrast, in developed countries, the government's application of ICT in

public service delivery has become more popular and has brought efficiency to the state administration as well as the citizens. For instance, in the EU countries, the growth in the application of information technology brings the government closer to its citizens (Pina et al., 2009 & Lupua et al., 2015).

However, thanks to the advantages that are brought by online public services, ICT applications in public service delivery are a trend taking place in most countries, not only in developed countries but also in developing and less developed countries. Many authors agree that online public service significantly benefits economic development in both developing and developed countries. Fakhourya argues that ICT has raised many expectations about management activities within state agencies (Fakhourya et al., 2015). It is recognized as a powerful tool for increasing government accountability and transparency. This is because information and communication technology can improve transparency by providing information access and increasing accountability by closely monitoring government activities (Hamner et al., 2009 & Stoker et al., 2006). In most developed countries, E-government continuously becomes a foundation for modern administration systems because applying ICT in public service delivery has offered ample benefits for citizens and the government (Vrabie, 2015). In developing countries and underdeveloped countries, according to the United Nations' E-government Survey (United Nations, 2020), more and more countries and municipalities are pursuing digital government strategies, some radically different from those guiding earlier E-government initiatives. The data from this report also shows that the global provision of online government services has improved significantly. More than 84% of worldwide countries now offer at least one online transactional service (United Nations, 2020).

Many researchers analyze the factors that impact the application of ICT in providing public service. It can be considered in two aspects involving technical infrastructure and human capital. The first factor is the technology and technical infrastructure. Actually, technology has changed the methods of communication with people leading citizens to require quicker and more precise information from the government. Therefore, the high technology creates more pressure on traditional administration systems to deliver transparent and efficient public service (Pieterson et al.,

2020 & Ebbers et al., 2016) and avoid corruption (Bannistera et al., 2020). The second factor is social and human factor involves awareness of the network, gender, interests, age, education, and digital gap. In undeveloped and developing countries, the government and citizens have a limited understanding of applying technology to slow down online public services development.

Specifically, the technical infrastructure factor represents equipment and software necessary to implement and operate systems and networks for communications services as well as support applications, digital content, and e-commerce. Technical infrastructure in ICT applications contributes to improving people's ability to access and use online public services (Lin, 2018). Due to the improvement of the technical infrastructure system and the interconnection between agencies and units has been ensured, the traditional form of sending and receiving documents has been replaced by an electronic form. Therefore, the quality of online public service delivery has improved. Modern and synchronous development of technical infrastructure will improve the productivity and efficiency of IT applications, which has changed the consumer experience of customers (Čorejováa et al., 2019). On the other hand, an underdeveloped infrastructure system is a major obstacle to development. Actually, most developed countries today have synchronous and modern developed infrastructure systems, while in many developing countries today, the lack and weak infrastructure have caused stagnation in the circulation of resources, making it difficult to absorb and invest capital (Fana et al., 2019). Therefore, investment in infrastructure development becomes a priority for many developing countries. Moreover, even in developed countries, technical infrastructure also plays a decisive role in the quality of IT applications. Such as, research by Noriko Igari shows that Japan is the country that ranks highest in terms of broadband infrastructure in terms of quality, price, and speed, but the percentage of Japanese people using online public services routes is less than in Denmark (Igari, 2014). This is because Denmark perfectly emphasizes technical infrastructure, including a national strategy on ICT application, a mechanism to promote ICT application, a system of personal identification and digital signatures, and user-oriented services.

Besides, the human factor involves awareness of the network, gender, interests, age, education, and a digital gap those influences the use of technological infrastructures. According to Schuppan, African countries have failed to develop online public services due to differences in politics, economy, and people's perceptions (Schuppan, 2009). Nevertheless, undeveloped countries will overcome challenges to developing online public services for the long-time, regardless of their skills or sophisticated use. Ebbers, Jansen, and Deursen argue that in the long term, citizens will prefer to use e-government no matter how skilled they are or how sophisticated the service is (Ebbers et al., 2016). The adaptation or acceptance of using online public services also depends on other factors such as gender, age, education, income, and people's understanding of the Internet (Larson et al., 2014). The digital gap is represented by digital knowledge, which is a major influencing factor in to use of online public services because digital knowledge helps people use online public services more easily. The larger the digital gap, the more difficult it will be to develop online public services (Weber et al., 2010 & Hidalgo et al., 2020). In addition, Tangi suggest that in order to improve online public service delivery, the government should replace all traditional public service delivery, such as via telephone or the front desk, and develop the only online method (Tangi et al., 2021). If the government provides both online and conventional administration systems, E-government development may be slower. The traditional techniques are familiar to many citizens; thus, they often prefer the former. For instance, in Netherland, formal administration is still preferred over online administration despite increasing the online transaction channel (Weber et al., 2010 & Hidalgo et al., 2020). However, in the undeveloped country where many poor people do not know how to use technology and have very little opportunity to use technology, they will be restricted from using public services if the government only provides online public services. Therefore, some authors argue that undeveloped countries should invest in education to improve citizens' online public service use before investing in information and communication technology systems (Larson et al., 2014). Similarly, Vrabie believes that before investing in information and communication technology systems, it is necessary to invest in education first (Ebbers et al., 2015).

To conclude, recently, there has lack of research on the influence of technical infrastructure and human infrastructure on the application of ICT

in the locality in Vietnam, as well as there has been no research finding out which above factor is contributing more to the online public service delivery of state agencies in Vietnam in the current digital transformation context. This is such a theoretical gap. Reviewing the literature leads to the question that how do technical infrastructure and human capital influence the ICT application in providing public service in Vietnam, and how should the Vietnamese Government promote technical infrastructure and human capital in ICT application to improve public service delivery? Therefore, this article examines the effects of technical infrastructure and human capital on the ICT application of local agencies in Vietnam in order to propose suggestions to promote online public services for the Vietnamese Government.

## 3. THE APPLICATION OF ICT TO ONLINE PUBLIC SERVICE IN VIETNAM

### 3.1. In the period from 2005 to 2019

From 2005 to 2009, the Vietnamese government did not pay attention to invest in ICT application in state agencies. In 2010, the Vietnamese government started the plan to apply information technology in state agencies (NSCICT, 2011). This is a significant change in the administrative reform process, and the establishment of ICT in public services delivery. The government's regulations on online public service delivery are implemented in all state offices in the whole country. Decree 43/2011/ND-CP in 2011 required all local and central officials to deliver public services on the state websites following the government's instructions. In 2016, the Circular 10/2016/TT-BTTTT issued was a national technical regulation on identifiers structure and packet data format for connection of document management systems.

Actually, state institutions promulgated and implemented many legal regulations on applying ICT in providing online public services. There were digital signatures, online security, and digital documents. For example, in 2017, the Vietnamese government issued regulations on using digital signatures in Circular No. 41/2017/TT-BTTTT. The digital signature was one of the essential issues in online public services because it contributes to better security, and shortens the time to approve and send documents for state agencies, saving much time requesting records for citizens. It is

a turning point in online public service delivery in Vietnam. Continually, Decision No. 28/2018/QD-TTg 2018 on sending and receiving digital documents between state officials marked a critical step in the reform of the administrative system was approved. Since then, the legality of digital documents was recognized by the government to allow the interchange between different state agencies simultaneously, save a lot of time and costs, and create the first premise of using ICT to improve the efficiency of public administration work.

### 3.2. In the period from 2019 to 2021

The Covid-19 pandemic was widespread and negatively impacted all countries, excluding Vietnam. Global trade and investment declined because many countries had used social distancing measures to prevent the further spread of the disease. The pandemic accelerated existing trends in remote work, E-commerce, and automation. Working online to maintain day-to-day activity became the only method for all people during the pandemic, all countries, therefore, were forced to promote online public services.

Vietnam's government has accelerated the application of ICT in state agencies to improve the quality of public service delivery and issued many legal and guiding documents for central and local agencies to switch to online public service delivery quickly (Vu et al. 2019). Immediately, the unique system of digital transaction portals was created to help citizens and public managers doing works easier. The text connection system among government, individual, and business was also used. These included the text connection from the government to government (G-to-G), government to the individual (G-to-I), and government to business (G-to-B). This strategy became a strong foundation for delivering online public service because state agencies at all levels could get the most updated text information at the fastest speed by online sharing. Similarly, businesses and individuals could easily access the central or local website addresses to get administrative procedures and data instead of former desk activities. It saved a lot of costs and time for both public servants and individuals to have more time to focus on their professional tasks.

In addition, on August 1st, 2019, the government approved the important project which was The National Document Linking Axis, No. 626/QD-VPCP, and operated the national public service portal via the website link

dichvucong.gov.vn. This was noticed as one of the significant steps in providing online public services in the country. Accordingly, The National Document Linking Axis contributed to saving time costs and reducing working time in state agencies, leading to speeding up administrative procedures reform; meanwhile, the national public service portal became a positive tool for government, ministries, and localities to evaluate and supervise the administrative procedures and improve transparency and accountability in the implementation of administrative processes, leading to avoiding corruption.

The government also improved the infrastructure quality of public service delivery. Although building a good infrastructure system for developing online public services creates a state budget burden, this is necessary for e-government in the long term. Therefore, the government significantly invested in infrastructure development by upgrading the Digital Government Architecture Framework (the document No. 11757/ VPCP-KSTT version 2 in 2019).

In 2020, the government issued Decree No. 20/2020/ND-CP on digital identifiers for state agencies to quickly share data between central and local agencies. Digital identification numbers are used to identify citizen information data on the national population database system. When performing administrative procedures, agencies and individuals can easily search for personal information by scanning the QR code. Therefore, personal identifiers play an important role in connecting and communicating the national database on population with national databases and specialized databases, in which the population management system Residence is the main information system that connects with other specialized information systems of ministries and branches through personal identification numbers.

Moreover, the government also established the Digital Task Force, which vigorously promoted e-government strategies. Digital Task Force created the spider network, including horizontal and vertical connections among the central government, regions, and municipalities. This network could be cooperated with private-sector companies in necessary cases and encouraged all entities to coordinate and involve in E-government. It helps agencies and individuals to identify, prevent, detect, resolve and protect from threats, crimes, frauds, and acts of terrorism arising due to the

vast proliferation and usage of digital, communication applications and artifacts in our personal and professional activities.

Generally, from 2010, the Vietnamese government actively issued legal conditions for online service provision. However, in the period 2010-2019, there was a lack of detailed documents on applying ICT in public service delivery, except for some regulations on digital signatures and documents. Only since 2019, the government has promoted online service provision and launched the national public service portal. The government has also heavily invested in developing information technology infrastructure through Vietnam E-Government Architecture Framework.

As a result, the online service use in Vietnam improved from 2010. Figure 1 compares Vietnam's online service index (OSI) and the world average index from 2005 to 2020. In general trend, it can be seen the up trend in both the world's average OSI and Vietnam's OSI from the period 2010 to 2020. The OSI of Vietnam increased from 0.30476 to 0.6529; meanwhile, the world's index improved from 0.4178 to 0.562 in this period (United Nations, 2020). However, the Vietnamese online public service improved between 2014 and 2016, as the index came from 0.41732 to 0.57246, respectively. In contrast, the world's index fell 0.0089 points, from 0.4712 in 2014 to 0.4623 in 2016 (United Nations, 2020). This improvement in public service delivery in Vietnam resulted from a strategy to promote E-government by the Vietnamese government. Accordingly, the government designed clear objectives and implementation solutions to promote ICT in public service delivery.

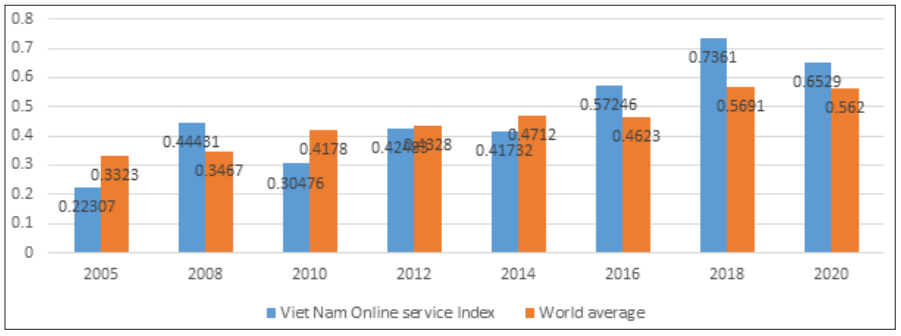



**Fig. 1. Vietnam's Online Service Index in the Period of 2005-2020**

*Source: United Nations, E-Government survey 2020 - Digital Government in the Decade of Action for Sustainable Development*

## 4. METHODOLOGY AND MATERIALS

Technical infrastructure and human resources are two important factors for the development of online public administrative services. The author uses the Fixed-Effect Model and Random-Effect Model to calculate the relationship between technical infrastructure and human infrastructure for ICT applications of state agencies. In order to examine the influence of these factors on online public administrative services, the author uses the Fixed-Effect and Random-Effect models. The data source is the survey results of 63 provinces in Vietnam by the Ministry of Information and Communication Technology of Vietnam in the period of 2005 to 2020.

The regression model is shown below:

$$ICT = \alpha Infras + \beta Human + \delta$$

In there:

- ICT is the application of information technology by state agencies to public administration in 63 provinces and cities of Vietnam. This index shows the implementation of information technology application of state agencies in 63 provinces and cities in Vietnam in handling internal affairs and providing online public administrative services to the people.

- Infras is the information technology infrastructure of 63 provinces in Vietnam. This index is calculated from the following sub-indices: The rate of fixed telephone/100 people; The rate of mobile phone/100 people; The rate of internet subscribers/100 people; The rate of broadband subscription/100 people; Percentage of households with landline phones; Percentage of households with television; The percentage of households with computers; The percentage of households with broadband internet connection; The ratio of computers/cadres and civil servants in provincial state agencies; The percentage of computers in provincial government offices with broadband internet connections; The percentage of provincial government agencies connected to the province's mobile network; The percentage of provincial state agencies connected to the provincial wide area network; The proportion of computers in provincial government offices connected to the government's dedicated network; The ratio of computers/officers in enterprises; The percentage of businesses with broadband Internet connection; The implementation of information security and data security systems.

- Human is the human resource infrastructure of 63 provinces and cities in Vietnam. This index is calculated from the following sub-indices: The percentage of primary schools that teach informatics; The percentage of lower secondary schools that teach informatics; The percentage of upper secondary schools that teach informatics; The proportion of universities and graduate schools in the province that have specialized training in information technology; The percentage of staff in charge of information technology in state agencies of the province; The percentage of cadres and civil servants in state agencies who know how to use computers in their work; The percentage of civil servants who are trained and guided in the use of popular open-source software.

## 5. RESULTS AND DISCUSSION

Using STATA software to quantify research results, Table 1 gives the results P-value = 0 showing the model has statistical significance.

**Table 1. Random-Effect Model**

| ICT | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Infras | .527 | .042 | 12.55 | 0 | .445 | .61 | *** |
| Human | .316 | .031 | 10.23 | 0 | .255 | .376 | *** |
| Constant | .028 | .013 | 2.22 | .027 | .003 | .053 | ** |
| Mean dependent var | | 0.353 | SD dependent var | | | 0.187 | |
| Overall r-squared | | 0.508 | Number of obs | | | 1003 | |
| Chi-square | | 817.958 | Prob > chi2 | | | 0.000 | |
| R-squared within | | 0.335 | R-squared between | | | 0.858 | |
| *** p<.01, ** p<.05, * p<.1 | | | | | | | |

Table 2 illustrates the Fixed-Effect Model results, showing that P-value = 0 for the model results is statistically significant.

**Table 2. Fixed-Effect Model**

| ICT | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Infras | .39 | .052 | 7.56 | 0 | .289 | .492 | *** |
| Human | .346 | .033 | 10.55 | 0 | .281 | .41 | *** |
| Constant | .057 | .014 | 4.04 | 0 | .029 | .085 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 0.353 | SD dependent var | 0.187 |
| R-squared | 0.338 | Number of obs | 1003 |
| F-test | 239.259 | Prob > F | 0.000 |
| Akaike crit. (AIC) | -1354.017 | Bayesian crit. (BIC) | -1339.284 |
| *** p<.01, ** p<.05, * p<.1 | | | |

Hausman test gives the result P. value = 0 < 0.05. means that the Fixed-Effect Model is consistent with the research results.

**Table 3. Hausman (1978) specification test**

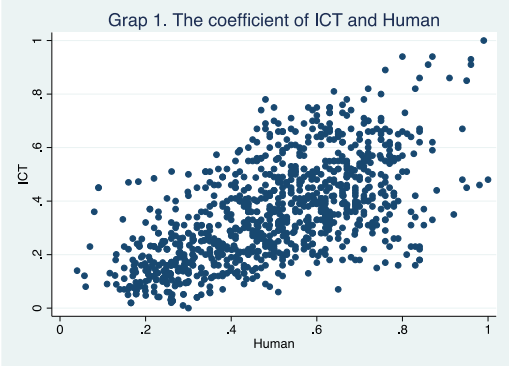
| | Coef. |
|---|---|
| Chi-square test value | 20.989 |
| P-value | 0 |

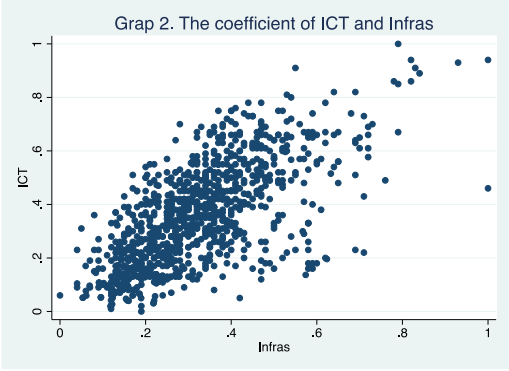
Table 4 shows the test of the correlation between two variables Infras and Human, the results show that there is no correlation between the two variables.

**Table 4. Correlations between Infras and Human**

| Variables | (1) | (2) |
|---|---|---|
| (1) Infras | 1.000 | |
| (2) Human | 0.699 | 1.000 |

Graph 1 illustrates the coefficient of Human and ICT while Graph 2 shows the coefficient of Infras and ICT. The results show uptrend plots between ICT and Humans; uptrend plots between ICT and Infras. This result indicates the statistical relationship between ICT and other variables.






From the research results of the Fixed-effect Model, it is shown that Infras and Human have a positive effect on the ICT of state officials in Vietnam. The coefficient of Infras and ICT is 0.39, which means Infras increases by 1 unit, and the ICT of localities in Vietnam increases by 0.39 units. Likewise, the coefficient of Human and ICT is 0.346, which means Human increase by 1 unit, and ICT increases by 0.346.

The results of this study are completely consistent with the practice in Vietnam. The Vietnamese Government has recently implemented many measures to invest in information technology infrastructure in Vietnam. In July 2020, the Government issued Decree No. 20/2020/ND-CP on electronic identifiers of agencies and organizations serving data connection and sharing with local ministries. The Government of Vietnam also has made great efforts to promote infrastructure development by upgrading the E-Government Architecture Framework in Document No. 11757/VPCP-KSTT on approving the Vietnam E-Government Architecture Framework version 2.0 dated December 26, 2019. In addition, the provision of public services in Vietnam is uniformly regulated in all localities and state agencies, which is clearly reflected in legal documents as well as regulatory documents. onion. For example, Decree No. 43/2011/ND-CP was issued on June 13, 2011, providing specific regulations on requesting the provision of information and public services online on the website or portals of state agencies. Similarly, Circular No. 10/2016/TT-BTTTT issued in April 2016, stipulates "National technical regulation on the structure of identifiers and format of packet data serving connection of systems in the world. document management and operating system". The year 2019 is an important milestone when the Government approved the

National Document Linkage Axis project in Document No. 626/QD-VPCP dated August 1, 2019, and put into operation the national public service portal via the website dichvucong.gov.vn.

The results of this study also completely coincide with Denmark, a country that invests heavily in technical infrastructures such as digital signatures, document communication axis, and personal identifiers.

## 6. CONCLUSIONS AND SUGGESTIONS

Delivering online public service is important to enhance transparency and the administration system's efficiency in the process of administrative reform in worldwide countries. Recently, the Vietnamese government has issued and implemented many legal regulations and spent the state budget to apply ICT to public service delivery. The result of the paper shows that technical infrastructure and human capital positively affect the ICT of state agencies in Vietnam.

Therefore, in order to accelerate the implementation of E-government, the government of Vietnam needs to pay more attention to improving the quality of technical infrastructure, as well as human capital with the following solutions:

Firstly, the government should design a specific and feasible strategy to improve technology infrastructure and human capital and facilitate both state agencies and citizens to involve in the implementation process. This strategy should be a comprehensive strategy instead of just focusing on public service delivery or the government sector. Accordingly, this strategy should focus on improving the connection within government agencies first, and then extending the connection between government institutions, businesses, and citizens. The connection within the government is essential for the interaction between different state agencies helps to share information and documents and saves working time compared to the traditional sharing of documents. Besides, the quick and smooth connection between state agencies, businesses, and citizens also helps to reduce social working time and transaction costs.

Secondly, digital signatures and certificates should be used more widely because these contribute to the safety and reliability of electronic transactions and the administrative operation of state agencies. Therefore, the government should establish and formalize an institution to provide

the services of electronic signature certification. This organization takes responsibility to provide electronic signature authentication for state agencies, businesses, and individuals to use in public administrative and daily civil activities. All state agencies, businesses, and individuals should use electronic signatures when using electronic transactions in general and online public services in particular. Besides, the government should build a cross-validation mechanism between digital signatures for state agencies and digital signatures for businesses, and expand the number of digital certificates and signatures for ministries and localities. In order to well deploy digital signature applying, the government should invest in ICT technical infrastructure to ensure stable, and high-speed connection with the data transmission network or the Internet. Thereupon, specialized ICT staff or divisions also should be fully capable to support users and customers in the process of digital signature application.

Thirdly, the government should encourage and enforce the use of online public administrative services to accelerate the national digital transformation. Typically, cash payments should be replaced by online payments on the Public Service Portal and the Ministry of Finance Public Service Portal. Businesses and individuals should be encouraged to pay fees, charges, taxes, administrative fines, and other financial obligations online instead of paying in cash. Therefore, in order to facilitate users, the portal or local website should be designed in a friendly and convenient manner based on regular surveys of citizens and businesses. In addition, digital signatures should be not only used more widely but also connected with bank payments to increase security and make customers be easy and convenient to pay administrative procedures fees and charges.

Fourthly, the government should launch a training program to propagate and mobilize businesses and citizens to understand the usefulness and how to use online public services. It is necessary to make regulations and gradually increase the number of mandatory online transactions between businesses and citizens and state agencies. Besides, the government should support digital transformation in businesses, especially small and medium-sized enterprises, to promote business model reform to improve labor productivity, expand markets, increase productivity competitiveness, and reduce the administrative burden of digital technology. Creating tax and fee incentives for businesses in using digital services is also important to encourage enterprises to promote ICT applications.

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# TESTING MODERATING ROLE OF SOFTWARE TYPE IN THE RELATIONSHIP BETWEEN ORGANIZATIONAL COMMITMENT FACTOR TO ACCOUNTING INFORMATION QUALITY IN THE ENTERPRISES IN VIETNAM

**Luong Duc Thuan[1,*], Truong Thi Thu Huong[2]**

***Abstract:*** *The study was conducted with the aim of reviewing and evaluating the moderating role of software including accounting software and enterprise resource planning software (ERP) in the relationship between the organizational commitment to the quality of accounting information in Vietnamese enterprises. The research sample includes 208 subjects, working in different positions in enterprises, including accountants and employees in other parts of the business. Research data was collected through questionnaire survey (from March 2021 to June 2021), then used for descriptive statistical analysis and hypothesis testing. The research result showed that there was a moderating impact of the type of software on the relationship between the quality of the accounting information system (AIS) and the quality of the accounting information (AI).*

***Keywords:*** *Accounting information system quality, accounting information quality, accounting software, enterprise resource planning, organizational commitment.*

## 1. INTRODUCTON

In the context of the industrial revolution 4.0, the strong development of information technology has profoundly affected all areas of life, economy and society, which has brought to Vietnamese enterprises with many advantages, but they also face many challenges and difficulties, including challenges related to how to apply information technology, how to manage and organize businesses to for the development of businesses. The development of the enterprise is one of the strong influences on the development of AIS besides the influencing factors in the process of

[1] College of Business, UEH University, Ho Chi Minh City, Vietnam

* Corresponding author. Email: thuanluongktkt@ueh.edu.vn

[2] Department of Quality Assurance Curriculum Development, UEH University, Ho Chi Minh City, Vietnam

operating AIS such as requirements on control and management of the administrator, requirements on relevant laws in the field of accounting and the increasing development of information technology.

The AIS provides accounting information, performs data collection to obtain necessary information for decision-makers inside or outside the organization (Bodnar & Hopwood, 2010). The use of accounting information is very important in the management activities of a company, based on quantitative information about various activities. Accounting information is useful in making economic decisions, accounting information is needed not only by management but also by shareholders, who need periodic financial data to evaluate the performance of a company's management (Nnenna, 2012). The quality of the accounting information comes from the implementation of a quality AIS, and the quality of AIS is a combination of hardware, software, computer networks, databases, and the quality of work and user satisfaction (Sacer et al, 2006). Thus, the quality of AIS will create a good and useful accounting information. The quality of AIS is a very necessary and useful factor for the effective and efficient operation of the enterprise, a solid foundation for the quality management of AI, the quality of AIS is the basis for enterprises to improve the management activities throughout the enterprise, helping the decision-making process of managers and ensuring the enterprise in achieving its business goals. Information technology, specifically accounting software, plays an important role in creating more appropriate, timely and useful accounting information. In the context of the rapidly growing use of IT in accounting today, in order to create an AI, it is necessary to have the support of software tools and information technology is factor which can improve the quality of AIS and quality of AI (Susanto, 2018). Thus, this is the basis for the author to study and consider that there is indeed a moderating of the type of software in the relationship between organizational factor and the quality of AI in Vietnamese enterprises in order to solve the important theoretical and practical issues for providing quality accounting information in the current IT application environment.

Therefore, this study is conducted to provide more empirical evidence on the moderating role of software including accounting software and

ERP on the relationship between organizational factor and the quality of accounting information through the quality of accounting information system in Vietnamese enterprises.

## 2. LITERATURE REVIEW

### 2.1. Overview of research concepts

#### *2.1.1. Quality of Accounting Information System*

The views on the quality of AIS are mainly based on the views on the quality of information system (IS), carried out in the studies and analyzed from the quality point of view according to the successful information system model of DeLone & McLean. According to DeLone & McLean (2016), system quality is associated with success and the information system quality scales are consistent with the developed model, including: ease of use, ease of research and understanding, and satisfying user's requirements, system features: flexibility, sophistication of the system; integration; customization and security of the information system. In successful information system model, DeLone & McLean (2016) propose that the success of information system is considered through six factors, which are: (1) quality of system, (2) quality of information, (3) service quality, (4) system usage, (5) user satisfaction, (6) net effects.

Based on the concept of the quality of the information system, there have been some views on the quality of AIS, because in terms of the essential relationship, the AIS is also an information system and also has all the characteristics of an information system. Specifically:

• The quality of AI comes from the implementation of the AIS quality. The quality of the AIS is the integration of the quality of hardware, software, people, technical networks, databases and user satisfaction (Sacer et al, 2006).

• Some authors have described the quality of AIS through the following characteristics: effectiveness, usefulness, effeciency, user satisfaction. The effectiveness of AIS is a measure of success in meeting established goals, or user satisfaction (Stair & Reynolds, 2010).

### *2.1.2. Quality of Accounting Information*

According to Laudon & Laudon (2013), the quality of AI is created by the quality of AIS, information quality will be used by users to plan, control and operate the company (Salehi & Abdipour, 2011). In addition, in the integrated system, quality information will help managers understand the organization well to see changes happening both inside and outside the organization, through which managers will react quickly and exactly with those changes (Susanto, 2013). Users need high quality information because it will increase the value of decisions made by the company (O'Brien & Marakas, 2011). According to Stair & Reynolds, 2010, information quality is information that is accurate, reliable, timely, complete, and provided in an appropriate format.

According to Vietnam Accounting Standards, basic requirements for the quality of AI are also set out, including truthful, objective, complete, timely, understandable and comparable.

### *2.1.3. Organizational commitment*

Organizational commitment as defined by Porter et al (1974) has three main components: (1) strong belief in and acceptance of the organization's goals, and (2) willingness to considerable effort for the organization, and (3) a desire to maintain the membership of the organization. Accordingly, commitment is not only a predictor of employee retention but can be a predictor of employee efforts and achievements (Mowday et al, 1979).

Robbins (2009) defines organizational commitment as a stage in which employees recognize a certain set of goals and hope to maintain membership in the organization. Organizational commitment is the extent to which employees identify with the organization, its goals, and the desire to retain membership in the organization (Robbins & Judge, 2010). According to Robbins & Coulter (2009), organizational commitment is an employee's orientation towards the organization in terms of loyalty and participation. According to Luthans (2008), organizational commitment is: (1) a strong desire to maintain membership in the organization; (2) willingness to make efforts on behalf of the organization; and (3) belief and acceptance of the organization's values and goals. Therefore, it can be said that organizational commitment is the loyalty and participation of

employees to achieve goals, and to survive in the organization, members of the organization show an interest in the organization, success, and further development.

### 2.2. Research model and research hypotheses

#### *2.2.1. The relationship between organizational commitment and quality of accounting information system*

Organizational commitment is a state in which an employee identifies with the organization for goals and wants to remain a member of the organization. Therefore, organizational commitment can be defined as the attitudes and beliefs of employees who are engaged and loyal to their organization in achieving the objectives. Luthans (2008) explains about aspects of organizational commitment, including affective commitment, continuing commitment, and normative commitment, he explained that there is a positive relationship between organizational commitment and desired outcomes such as high corporate performance and low turnover. According to Koskosas et al (2011), organizational commitment is positively related to the enactment of information security behaviors such as security policies and new technologies that have effect on the business objectives of the organization.

One of the factors affecting the development of an information system is the support and commitment of the organization, not only the administrator's support, but all employees are required to adjust to the system to ensure a smooth transition within the organization. The purpose of implementing an information system can be achieved more effectively when people in the organization make the commitment (Lucey, 2005). According to Lucey, when employees are committed, they are motivated, and managers strive to promote that motivation through their leadership style. Organizational commitment and information system have an inseparable relationship, the strength of organizational commitment can be seen from the support and acceptance of the goals and values of the organization. Strong organizational commitment is characterized by strong belief in and acceptance of the organization's goals and values, willingness

to work, and a strong desire to remain a member of the organization (Kusluvan, 2003).

Organizational commitment has a strong and positive relationship with job performance (Ahmad et al, 2010, Hettiarachchi & Jayaeathua, 2014). In another study, Shahab & Nisa (2014) suggested that there is a positive and significant effect of job satisfaction on organizational commitment, and the impact of organizational commitment on job performance through the accounting information system, therefore, the study assumes that:

*H1: Organizational commitment has an impact on the quality of accounting information system.*

#### *2.2.2. The relationship between quality of Accounting Information System and quality of Accounting Information*

According to Whitten & Bentley (2008), information systems in organizations have the goal of processing data to generate useful information in supporting economic transactions. Information systems provide information in the form of reports and can be used by parties inside and outside the enterprise (O'Brien & Marakas, 2008). Wongsim & Gao (2011) argue that the quality aspects of AI have a positive relationship with the process of AIS. In the study of Onaolapo & Odetayo (2012) explains that the benefits of AIS can be assessed by its effects on improving decision-making process, quality of AI, performance evaluation, internal control and facilitate economic transactions. The objective of AIS is to produce financial reports that are available to both external and internal users (Scott, 2005), this view is supported by the results of research showing that AIS enhances reliability of financial statements (Salehi & Abdipour, 2011). Therefore, it is concluded that there is a relationship between AIS to provide quality information characteristics (Sacer et al, 2006). According to Nicolaou (2000), the effectiveness of AIS is measured by the satisfaction of decision makers about the quality of information generated by the quality of AIS. Based on the above arguments, the author assumes that:

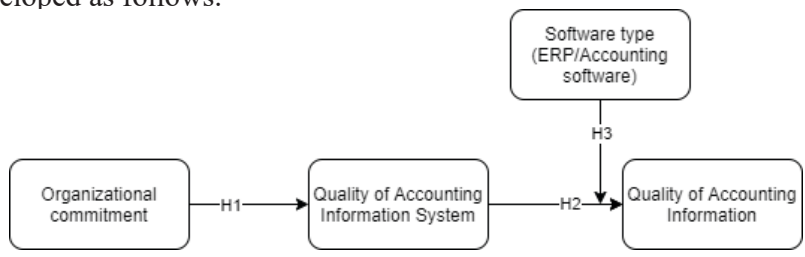
*H2: The quality of accounting information system has an impact on the quality of accounting information.*

### *2.2.3. The moderating role of software type on the relationship between the quality of accounting information system and quality of accounting information*

The development of information technology has a huge impact on accounting. According to Al-Rahmi et al (2019), the role of accounting information can be moderated by accounting software to facilitate all financial reporting processes for the purpose of making decisions based on the information provided. The technology used in the accounting information system can be computer technology, communication technology and any technology used that can provide information and added value to the organization. To meet the increased and accurate demand for AI, it is impossible not to mention the role of accounting software. It is very common to use information technology to obtain timely and accurate quality information. Advances and applications of information technology provide AIS the opportunity to meet the needs of users, especially to save costs when collecting data, processing data and providing useful, easily accessible and widely disseminated information. According to Doktoralina & Apollo (2019), information technology refers to the range of available technologies that facilitate the creation, change, storage, communication, and delivery of information. Information technology is used to process data and information useful for decision making to make work more comfortable, increase productivity, improve efficiency and improve job performance through providing information (Avgerou & Walsham, 2017; Vasarhelyi et al, 2015). Thus, it can be seen that information technology can affect the quality of AI in the relationship between the quality of AIS and the quality of AI. Therefore, it can be assumed that:

*H3: The type of software (ERP/Accounting software) has a moderating effect on the relationship between the quality of accounting information system and quality of accounting information.*

In summary, from the developed hypotheses, the research model is developed as follows.




**Figures 1. Research model**

## 3. RESEARCH METHOD

### 3.1. Measurement instrument

The data collection tool in the study is a detailed questionnaire. The author conducts a direct survey of accountants and employees in other parts of the business via email from March to June 2021. Content in the detailed questionnaire includes information about the respondents, detailed information about the company and information about the scales related to the measurement of organizational commitment (OCO) concepts including 7 observed variables (OCO1 to OCO7) according to the scale of Porter et al (1974); the scale of the quality of accounting information system (ASQ) according to DeLone & McLean (2016) includes 9 observed variables (ASQ1 to ASQ9), the scale of the quality of accounting information (AIQ) using the scale of Romney & Steinbart (2018) includes 6 variables observation (AIQ1 to AIQ6) and variable type of software including accounting software and ERP software. These observed variables are measured using a 5-point Likert scale (1: Strongly disagree; 5: Strongly agree).

The unit of analysis is an individual, the author selected samples by nonprobability methods, namely convenience sampling and sprout development method. The sample size used in PLS-SEM linear structural model analysis is 208.

### 3.2. Data collection

The statistical sample includes 208 individuals who participated in the survey from 171 enterprises, including 77 (37%) men and 131 (63%) women. The majority of respondents aged less than 30 years old accounted for 119 people (57.2%). The highest percentage of professional qualifications is university (84.1%), followed by college (12%) and postgraduate at 3.8%, these employees work in many businesses including 67 limited liability enterprises (32.2%), 59 joint-stock enterprises (28.4%), 32 private enterprises (15.4%), the remaining 13 enterprises including state-owned enterprises, enterprises joint ventures (6.4%). There are also differences in the size of enterprises in the sample, focusing mainly on large enterprises with the rate of 48%, medium enterprises with the rate of 29.2%, and small enterprises with the rate of 22.8%.

## 4. DATA ANALYSIS AND RESULTS

The analysis results are presented in 3 parts: (1) Evaluation of the measurement model; (2) Evaluation of the structural model and (3) Evaluation of the effect of the moderator variable.

### 4.1. The measurement model

To achieve the research objectives, the study used partial least squares (PLS) technique on SmartPLS 3.2.7 software in data analysis. As suggested by Hair et al (2016), the two-stage analysis process in PLS includes measurement model testing and structural model testing. We evaluated the reliability and validity of constructs in the measurement model by testing internal consistency reliability, convergent validity, and discriminant validity.

Table 1 presents two evaluation criteria for the internal consistency of the scale including composite reliability (CR) and Cronbach's alpha. According to Hair et al (2016), all structures have Cronbach's alpha coefficient above 0.60. The composite reliability (CR) of all constructs is also higher than 0.7, indicating high internal consistency (Fornell & Larcker, 1981). At the same time, all factor loading factors exceed the recommended value of 0.6.

Discriminant validity was tested using HTMT criteria, Fornell-Larcker criteria and cross loadings (Hair et al, 2016). Table 3 shows that the square root of the AVE of each construct is higher than its highest correlation with any other constructs (Fornell & Larcker, 1981). Table 4 shows that all the HTMT indexes of the constructs are less than 1 (Henseler et al, 2015). In addition, the load factor of the respective structures is higher than the other cross-load coefficient (Table 2). These indicators imply that the scale of concepts has reached discriminant validity.

**Table 1. Measurement Model**

| | Items | Loadingsa | AVEb | CRc | Rho_Ad |
|---|---|---|---|---|---|
| Organizational | OCO1 | 0.728 | 0.608 | 0.915 | 0.908 |
| Commitment | OCO2 | 0.782 | | | |
| | OCO3 | 0.776 | | | |
| | OCO4 | 0.835 | | | |

| | | | | | |
|---|---|---|---|---|---|
| | OCO5 | 0.795 | | | |
| | OCO6 | 0.706 | | | |
| | OCO7 | 0.828 | | | |
| Accounting | ASQ1 | 0.820 | 0.609 | 0.933 | 0.922 |
| System | ASQ2 | 0.737 | | | |
| Quality | ASQ3 | 0.783 | | | |
| | ASQ4 | 0.788 | | | |
| | ASQ5 | 0.761 | | | |
| | ASQ6 | 0.763 | | | |
| | ASQ7 | 0.717 | | | |
| | ASQ8 | 0.790 | | | |
| | ASQ9 | 0.855 | | | |
| Accounting | AIQ1 | 0.757 | 0.602 | 0.913 | 0.897 |
| Information | AIQ2 | 0.859 | | | |
| Quality | AIQ3 | 0.839 | | | |
| | AIQ4 | 0.722 | | | |
| | AIQ5 | 0.781 | | | |
| | AIQ6 | 0.779 | | | |
| | AIQ7 | 0.681 | | | |

a. All item loadings > 0.5 Indicates indicator Reliability (Hulland, 1999)

b. All Average Variance Extracted (AVE) > 0.5 as Indicates Convergent Reliability (Bagozzi & Yi (1998); Fornell & Larcker (1981))

c. All Composite reliability (CR) > 0.7 indicates Internal consistency (Gefen et al, 2000)

d. All Cronbach's alpha > 0.7 indicates Indicator Reliability (Nunnally, 1978)

**Table 2. Indicator Item Cross Loading**

| | Accounting information quality | Accounting system quality | Organizational commitment |
|---|---|---|---|
| AIQ1 | **0.757** | 0.368 | 0.208 |
| AIQ2 | **0.859** | 0.410 | 0.258 |
| AIQ3 | **0.839** | 0.363 | 0.262 |
| AIQ4 | **0.722** | 0.289 | 0.075 |
| AIQ5 | **0.781** | 0.369 | 0.166 |
| AIQ6 | **0.779** | 0.343 | 0.220 |
| AIQ7 | **0.681** | 0.273 | 0.131 |

| | | | |
|---|---|---|---|
| ASQ1 | 0.392 | **0.820** | 0.298 |
| ASQ2 | 0.432 | **0.737** | 0.293 |
| ASQ3 | 0.347 | **0.783** | 0.338 |
| ASQ4 | 0.398 | **0.788** | 0.321 |
| ASQ5 | 0.296 | **0.761** | 0.303 |
| ASQ6 | 0.189 | **0.763** | 0.293 |
| ASQ7 | 0.301 | **0.717** | 0.325 |
| ASQ8 | 0.344 | **0.790** | 0.303 |
| ASQ9 | 0.388 | **0.855** | 0.316 |
| OCO1 | 0.149 | 0.283 | **0.728** |
| OCO2 | 0.121 | 0.212 | **0.782** |
| OCO3 | 0.249 | 0.331 | **0.776** |
| OCO4 | 0.235 | 0.362 | **0.835** |
| OCO5 | 0.157 | 0.297 | **0.795** |
| OCO6 | 0.160 | 0.224 | **0.706** |
| OCO7 | 0.242 | 0.390 | **0.828** |

**Table 3. Discriminant Validity (Fornell-Larcker criteria)**

| | Accounting information quality | Accounting system quality | Organizational commitment |
|---|---|---|---|
| Accounting Information quality | **0.776** | | |
| Accounting system quality | 0.450 | **0.780** | |
| Organizational commitment | 0.250 | 0.398 | **0.780** |

**Table 4. Discriminant Validity (HTMT)**

| | Accounting information quality | Accounting system quality | Organizational commitment |
|---|---|---|---|
| Accounting Information quality | | | |
| Accounting system quality | 0.482 | | |
| Organizational commitment | 0.262 | 0.424 | |

### 4.2. The structural model

The results of PLS analysis demonstrate that the structural model can explain the impact of the quality of accounting information system on quality of accounting information in the enterprise by the coefficient

of determination ($R^2$) is close to 20%. At the same time, organizational commitment has the average ability to explain the variation of the quality of AIS, with a coefficient of determination of 15.4%. The path model results are shown in Figure 2.

The structural paths are shown in Figure 2. In structural modeling, the bootstrap technique was used with sample of repeated 5,000 times to estimate the magnitude and significance of the path coefficient (β) at the 95% confidence level. Organizational commitment ($\beta = 0.39$, $p < 0.001$) significantly affects the quality of AIS, the quality of AIS ($\beta = 0.45$, $p < 0.001$) has a significant influence on the quality of AI. The results show that hypothesis H1 and H2 are accepted.

**Table 5. Hypothesis Test Results**

| Hypothesis | Relationship | Std Beta | Std Error | t-value | P-value | f2 | Result |
|---|---|---|---|---|---|---|---|
| H2 | ASQ à AIQ | 0.459 | 0.056 | 8.086 | 0 | 0.253 | Accepted |
| H1 | OCO à ASQ | 0.407 | 0.06 | 6.675 | 0 | 0.188 | Accepted |

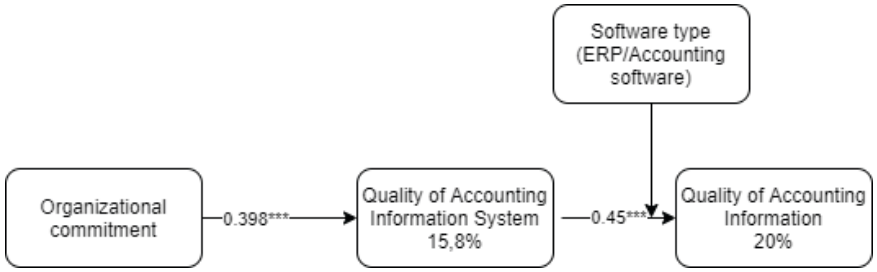



**Figure 2. Structural Model Test Result** (Note: *** $p < 0.001$)

### 4.3. The moderating role of software type

Multi-group analysis technique was performed to test the moderating role of software type on the relationship between the quality of accounting information system and the quality of accounting information. With a sample of 81 ERP software and 127 accounting software, the analysis results show that the type of software has a moderating influence on the relationship between the quality of accounting information system and the quality of accounting information (p-value < 0.05).

**Table 6. Parametric Test**

| | Path Coefficients-diff (ERP - Accounting software) | t-Value (ERP vs Accounting software) | p-Value (ERP vs Accounting software) |
|---|---|---|---|
| ASQ -> AIQ | 0.236 | 2.098 | 0.037 |
| OCO -> ASQ | 0.156 | 1.345 | 0.18 |

**Table 7. Welch-Satterthwait Test**

| | Path Coefficients-diff (ERP - Accounting software) | t-Value (ERP vs Accounting software) | p-Value (ERP vs Accounting software) |
|---|---|---|---|
| ASQ -> AIQ | 0.236 | 2.162 | 0.033 |
| OCO -> ASQ | 0.156 | 1.306 | 0.195 |

## 5. CONCLUSION AND IMPLICATION

### 5.1. Conclusion

From previous studies on the quality of accounting information system and the relationship with the quality of accounting information, the combined application of the theory of accounting information system, the relationship between the accounting information system and the internal control system in the enterprise, along with the factors in the organization includes organizational commitment, the author has built a model of the relationship between organizational commitment, quality of accounting information system and quality of accounting information. The results show that the scales of research concepts have high reliability. In addition, the relationships in the model are meaningful, specifically: organizational commitment directly affects the quality of accounting information system, the quality of accounting information system directly affects the quality of accounting information, and the type of software plays moderating role in the relationship between the quality of accounting information system and the quality of accounting information.

### 5.2. Research implication

The results of this study also have some implications for enterprises in paying attention to and improving the quality of accounting information system as well as paying attention to the organizational factor in the process of operating the accounting information system to help managers

have better orientations for the development of the accounting information system in the process of international economic integration. Recognizing the importance of an accounting information system in adding value to the company and improving the quality of the accounting information is an important task in a competitive environment. Specifically, businesses need to focus on promoting the following issues:

- Promote an increase in organizational commitment among employees, organizational commitment shows that employees are wholeheartedly for the company, they are ready to devote and are loyal to the direction and strategy of the operation in the company. In addition, the commitment also shows the efforts and determination of employees because they are proud that they are an integral part of this company. Therefore, the greater the employee's organizational commitment, the stronger the impact on the employee's work and performance through their performance at work, thereby the better job performance. Thus, to have a strong organizational commitment among employees, businesses need to fully support employees during their work, the company needs to have policy and strategic commitments on employee training, especially for accountants, nowadays, besides accounting knowledge, they need knowledge and skills in using information technology, foreign language skills and ability to analyze financial statement analysis, accounting information analysis to support managers in making economic decisions. In addition, it is necessary to fully support employees with necessary conditions in the working process such as support for the working environment, communication with employees and other physical and mental conditions for employees to feel enterprise is a place where they can stick around for a long time and are ready to dedicate themselves to their work, when employees are goal-oriented and dedicate themselves, the quality of work will improve and certainly the accounting information system with key components is the person, will improve the quality of work, thereby contributing to the quality of accounting information.

- Continue to improve processes and procedures in the collecting, processing, storing data and providing information to different users, creating ease of access and use of the system. These procedures should be documented and stored in the system with system documentation tools such as data flow diagrams and flowchart for each process, but with the approval of the administrator.

- Regularly identify, update and analyze the information requirements of different subjects, mainly internal information needs, in order to improve the information responsiveness of accounting information system.

- Further improve the data quality of the enterprise and its business activities, create a diverse and large-scale data warehouse to serve the needs of data mining and analysis to support more useful information for administrators. Regularly updating the features of the processing software contributes to creating a lot of useful and diverse information for users.

- Improve the quality of IT infrastructure, regularly monitor and manage computer systems, peripheral devices, and communications to promptly detect problems, risks and take suitable remedial measures. Strengthen network security solutions, especially in the case of information transfer on computer networks. When the computer-based accounting information system operates stably and effectively, the quality of accounting information system will be improved.

### 5.3. Limitations and future research

Although the initial purpose has been achieved to consider and evaluate the impact of organizational commitment on the quality of accounting information system through the relationship with the quality of accounting information system and to test the moderating role of the type of software. However, this study also has certain limitations:

Firstly, the author conducted a survey in an area Ho Chi Minh City, so the generalizability of the study is not high and may be limited. In addition, the study uses convenient sampling method by emailing of survey subjects. Therefore, further studies should conduct more surveys in different areas to get a more complete picture of the influence of factors on the quality of accounting information.

Second, the analysis results show that the explanatory level of the independent variables for the dependent variable is not high, the structural model is basically consistent with market data but not as expected, that may be because there are many other factors affecting the quality of accounting information or the quality of the collected samples is not good. Therefore, further studies should be carried out with a larger sample size and consider other factors that may affect the quality of accounting information.

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# FACTORS AFFECTING TO THE PROBABILITY OF BIGTECH EXPANDING TO CREDIT SEGMENT

**Dao My Hang[1], Trinh Thuy Trang[1]**

***Abstract:*** *BigTech has been involved in many financial services in the financial market all over the world, including providing credit. This exerts a lot of pressures on the economy in general and commercial banks in particular. Therefore, this study explored the factors affecting the ability of BigTech in expanding its financial activities into the credit sector in a country, thereby analyzing the possibility of BigTech expanding into this field in Vietnam. The study applied a linear probability model with a sample of observing data from 43 countries, including 12 countries where BigTech has been involved in the credit sector. Data are collected in 2016. It is concluded that there are 5 factors that affect BigTech's ability to expand into the credit sector, including: (i) Bank's monopoly capacity index (the Lerner Index); (ii) Credit to Private non-financial sector from Banks; (iii) Mobile phone usage rate; (iv) GDP growth rate; and (v) GDP growth rate squared. Specifically, the Lerner Index, Credit to Private non-financial sector from Banks, Mobile phone usage rate and GDP growth rate squared have positive impacts on the possibility of BigTech expanding into the credit sector while GDP growth rate has a negative impact on this possibility. From the above research results, the authors have related to the status of influencing factors in Vietnam and proposed some recommendations to encourage BigTech to develop as well as limit the risks they bring to Vietnamese commercial banks.*

***Keywords:*** *BigTech, credit, commercial bank, probability BigTech, factors.*

[1] Banking Academy, Vietnam

# ORGANIZATIONAL INFLUENCES ON THE APPLICATION OF BLOCKCHAIN - A NEW TECHNOLOGY IN TOURISM

**Vi C. Le[1], Phuong Anh Tran Le[2]**

***Abstract:*** *The purpose of this paper is to inquire the improvements in the governance and management for tourism businesses when adopting blockchain technology and denote the opportunities, risks and advantages in putting into practice this technology in order to create new marketplaces. There have been many great arguments amongst scholars about identifying variables and models of innovation adoption within tourism organizations. Cryptocurrencies, smart contracts, and decentralized applications are directly impacting tourism sector despite the early- age of development of blockchain. Intermediaries play the vital role in tourism sector, the transactions between the parties will be still upheld professional figures to accelerate the development. This paper intends to bring out the proposals on the potentiality of the adoption of blockchain in the tourism field. Via this, the inadequate investigations of some of the research directions have also been analysed.*

***Keywords:*** *Blockchain technology, innovation adoption, organizational influences, tourism sector, cryptocurrencies, decentralized applications.*

[1] University of Economics and Law, Vietnam National University, Ho Chi Minh City, Vietnam
[2] School of Hospitality and Tourism - Hue University, Vietnam

# PRIVACY RISK AWARENESS AND INTENT TO DISCLOSE PERSONAL INFORMATION OF USERS USING TWO SOCIAL NETWORKS: FACEBOOK AND INSTAGRAM

**Nguyen Thi Ngoc Duyen[1], Pham Thi Truc Ly[1], Dinh Tien Minh[1]**

***Abstract:*** *Today, with the rapid development of technology 4.0, more people are heading to a second life: the digital world. Everyone now is faced with concerns about information privacy on social network sites. Although there are increasing threats such as privacy issues, people continue to expose large amounts of personal information on social media online, most notably: Facebook and Instagram. The research on the perception and awareness of privacy risks to disclose users' personal information on two social networking platforms, Facebook and Instagram. From the research results, it is possible to make suggestions on solutions to overcome the perceived problem of users in disclosing personal information on social networks in general. And it clearly shows that the factors that motivate online social media users to disclose personal information are extremely different.*

***Keywords:*** *Facebook, Instagram, personal information disclosure, social networks, user awareness, user consciousness.*

[1] School of International Business and Marketing, University of Economics Ho Chi Minh City (UEH)

# Theme 5
# Regional Studies, Planning and Environment

# ANALYSIS OF FACTORS AFFECTING PEOPLE'S SATISFACTION ON THE NATIONAL TARGET PROGRAM FOR NEW RURAL CONSTRUCTION IN VIETNAM: A CASE STUDY IN TIEN GIANG PROVINCE

**Ngo Thanh Phong[1*], Nguyen Anh Tuan[1]**

***Abstract:*** *The article assesses people's satisfaction about the National Target Program on New Rural Construction in Tien Giang province (Vietnam). The data used in the article was collected in 2022, conducted a household survey according to a predesigned questionnaire, with a total of 371 surveyed households. The information collected is processed using SPSS software and use the method of regression analysis to build models of the main factors affecting people's satisfaction with the results of the program. Values of variables in the model are build according to Likert scale with 5 levels (very dissatisfied = 1; dissatisfied = 2; neutral = 3; satisfied = 4; very satisfied = 5). The regression results show that the main factors affecting the satisfaction of the people as the "transport system", "organization of production", "market access", "irrigation system" and "job change".*

***Keywords:*** *Affect, satisfaction, new rural.*

## 1. INTRODUCTION

The National Target Program on New Rural Development is an overall program for economic, social, cultural, security and defense development in localities. New rural construction is the core of the implementation of the Central Resolution 26, dated August 5, 2008, of the 10th Central Committee on agriculture, rural areas and farmers, showing concern and care of the Party and State to develop rural areas. With the motto "The State and the people work together", building a new countryside is a revolution that promotes the synergy of the whole political system, the participation of the people, and helps people to realize responsibilities and rights in order to actively participate in and actively implement new rural

[1] Department of Economics and Law, Tien Giang University, My Tho City, Vietnam

* Corresponding author. Email: ngothanhphong@tgu.edu.vn

construction in order to contribute to improving the material and spiritual life of rural people.

In order to realize the Central Resolution 26 on agriculture, rural areas and farmers, Tien Giang province issued Resolution No. 3608 on December 31, 2012, on Promulgating the target program on building new rural areas in Tien Giang province until 2020. One of the highlights in the construction of new rural areas of Tien Giang is that it has low starting point compared to the general level of the whole country as well as the Mekong Delta region. At the end of 2015, the number of communes meeting the standard accounted for only 8.7%, lower than the general average of the Mekong Delta and much lower than the whole country at 22%. After 6 years (2016-2022) of implementing the National Target Program on building new rural areas, up to now, Tien Giang province has had 97 out of 143 communes meet the standard (an increase of 85 communes compared to 2015). The goal is to have 50% of communes meet the standard. New rural construction has become a far-reaching movement throughout the province, actively participating by the people, the role of the people in the construction of new rural areas has been gradually established, contributing to improving the material and spiritual life of the rural people. The objective of the article is to evaluate the factors affecting people's satisfaction with the program's results after 6 years of implementation and to propose some recommendations to improve people's satisfaction with the national target program for building new rural areas in Tien Giang province.

## 2. THEORETICAL BASIS

### 2.1. Introduction of the National Target Program for New Rural Construction

In the spirit of Resolution 26 - NQ/TW of the Central Government, new rural areas are rural areas with gradually modern socio-economic infrastructure; economic structure and forms of production organization rationally, linking agriculture with rapid development of industry and services; linking rural development with urban planning according to planning; democratic, stable rural society, rich in national cultural identity; ecological environment is protected; security and order are maintained; people's material and spiritual life is increasingly improved; socialist orientation.

With that spirit, the new countryside has five basic contents. Firstly, rural areas have civilized, clean and beautiful villages with modern

infrastructure. The second is sustainable, commodity-oriented production. Third, the material and spiritual life of the people be increasingly improved. Fourth, the national cultural identity is preserved and developed. A five is a well-managed and democratic rural society.

To build rural areas with the above five contents, the Prime Minister signed Decision No. 491 dated April 16, 2009, promulgating a set of national criteria for new rural areas including19 counter-criteria, reflect all aspects of economy, culture, politics, security, and defense.

### 2.2. Definition of satisfaction

According to Fornell (1995), satisfaction or disappointment is the consumer's response to the perceived difference between expectations before use and the actual perception of the product after consuming it.

According to Hoyer and MacInnis (2001), satisfaction can be associated with feelings of acceptance, happiness, help, excitement, joy.

Kotler (2000) defines satisfaction as a person's feeling of satisfaction or disappointment stemming from the comparison of actual results received after using a product (or results) in relation to their expectations.

In this article, the people's satisfaction with the National Target Program on building new rural areas is understood that when the criteria for building new rural areas are completed, people in rural areas will be the beneficiaries of those results. People's satisfaction with the criteria shows different levels (from very dissatisfied to very satisfied), depending on people's evaluation and feelings when enjoying those results.

### 2.3. Analytical method

The study surveyed 371 households using convenient sampling method. The survey subjects are farmers who benefit from the results of the national target program on building new rural areas. The information collected is processed using SPSS software and use the method of regression analysis to build models of the main factors affecting people's satisfaction with the results of the program. Values of variables in the model are build according to Likert scale with 5 levels (very dissatisfied = 1; dissatisfied = 2; neutral = 3; satisfied = 4; very satisfied = 5). The survey was conducted in the first and second quarters of 2022.

### 2.4. Model of Factors Affecting People's Satisfaction about the Results of the Project

The results of the article interview identified 7 scales representing the results of the implementation of the pilot project on new rural construction and a scale for the general satisfaction of the people described in Figure 1.

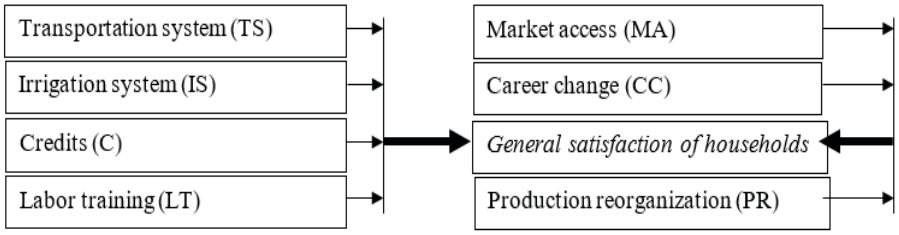


**Figure 1. Model of Factors Affecting the General Satisfaction of People about the Results of the Project**

Due to the limitation of the article, 7 representative scales are considered as standardized variables to be included in the citizen interview questionnaire with a sample size of 371 households.

From the survey results, the article will summarize the regression analysis according to the overall correlation model of the form:

SH = f(TS, IS, C, LT, MA, CC, PR)

Note: SH: is the dependent variable (Satisfaction of households); TS, IS, C, LT, MA, CC, PR: are independent variables.

The consideration of the factors from the traffic system to the production line, which factor really affects the overall satisfaction of the people directly will be done by linear regression equation:

$$SH = b_0 + b_1TS + b_2IS + b_3C + b_4LT + b_5MA + b_6CC + b_7PR + e_1$$

Note: b is the coefficient of regression and $e_1$ is the remainder.

## 3. RESEARCH RESULTS AND DISCUSSION

### 3.1. Characteristics of surveyed households

Through the actual survey results of 371 households in the communes where the new rural area is built in Tien Giang province, we get the basic characteristics of the surveyed households as follows:

### *3.1.1. Age of household head*

**Table 1. Age Structure of Household Head**

| Age | Number of household | Ratio (%) |
|---|---|---|
| < 35 | 46 | 12.40 |
| 35 - 50 | 215 | 57.95 |
| > 50 | 110 | 29.65 |
| **Total** | **371** | **100** |

*Source: General investigation and calculation.*

The head of the household is the head of the family, the one who decides the important things in the house and has a lot of influence on all members. When the household head is interested in the new rural Construction program, the family members will more or less know about the program. The group of household heads under the age of 35 accounted for 12.4%, are young people, have the ability to grasp information very quickly, have good health, dare to think and dare, boldly participate in socio-economic development movements local association. The group of household heads between the ages of 35 and 50 accounted for the majority with 57.95%, who are both healthy and experienced, so they actively absorb and support the guidelines and policies of the State. The group of household heads older than 50-year-old accounts for 29.65%, in this group, there are elderly people who have a lot of experience and time who will be interested in the new rural program; There are also people who cannot keep up with information about the program for reasons of age.

### *3.1.2. Education level of household head*

**Table 2. Education Level of Household Head**

| Education | Number of household | Ratio (%) |
|---|---|---|
| Primary school | 117 | 31.54 |
| Junior high school | 151 | 40.70 |
| High school | 79 | 21.29 |
| College, university | 24 | 6.47 |
| Total | 371 | 100 |

*Source: General investigation and calculation.*

In general, education level of the household head is average. Among the 371 interviewed households, 117 people have primary education level, accounting for 31.54%, 151 people have lower secondary education level, accounting for 40.7%, 79 people have upper secondary education level, accounting for 21.29% and there are 24 people with intermediate, college and university degrees, accounting for 6.47%. The low education levels of the majority can be one of the major obstacles in the implementation of new rural construction in the locality, because the program requires the application of technical advances to production, contributing to promoting the development of new rural areas, and implement industrialization and modernization of agriculture and rural areas.

#### *3.1.3. Information channel for people to know the local new rural construction program*

Through survey results in the locality, people know about the program through the information channels shown in the table below.

**Table 3. Information Channels to Know about the New Rural Construction Program**

| Information channel | Number of household | Ratio (%) |
|---|---|---|
| Meetings of hamlets and communes | 282 | 76.01 |
| Communal loudspeakers | 330 | 88.95 |
| Panels, posters | 205 | 55.26 |
| Newspaper, radio, television | 67 | 18.06 |
| Relatives | 129 | 34.77 |

*Source: General investigation and calculation.*

Table 3 shows that people know the program of building new countryside in the locality through meetings of hamlets and communes is the highest, with 282 households, equivalent to 76.01%; know the program through loudspeakers in the commune has 330 households, accounting for 88.95%; know through billboards and posters that there are 205 households, accounting for 55.26%; 67 households knew through newspapers, radio and television, accounting for 18.06%, and knowing through family members accounted for 34.77%. Thus, there are three channels of information that people know about the new rural Construction program in the locality the most, which are through loudspeakers, meetings and panels, posters.

### *3.1.4. People's Understanding of the New Rural Construction Program*

The results of the survey on the people's understanding of the new rural construction program in the selected communes in Tien Giang province are shown in Table 4.

**Table 4. People's Understanding of the New Rural Construction Program**

| Level of understanding | Number of household | Ratio (%) |
|---|---|---|
| Very complete understanding | 25 | 6.74 |
| Understading only some of the content | 63 | 16.98 |
| General understanding | 283 | 76.28 |
| Do not care | 0 | 0.00 |
| Total | 371 | 100 |

*Source: General investigation and calculation.*

Table 4 shows that only 6.74% of the surveyed households have a very complete understanding of the local new rural Construction program; only understanding some contents of the program, there are 63 households, accounting for 16.98%; General understanding of the program has 283 households, accounting for 76.28%. The above results show that the number of households with only general knowledge and understanding of some contents of the program is still very high, accounting for 76.28%, thereby showing that policy acquisition and policy implementation have There is a certain delay and the propaganda of guidelines and policies in the locality are not really close to the people.

### *3.1.5. The Importance of Capital Sources for New Rural Construction*

Surveying people's opinions on the role of investment capital for the new rural construction program, the study obtained the following results through Table 5:

**Table 5. Percentage of People Who Rate the Importance of Investment Capital Sources for New Rural Construction**

| Capital | Very unimportant | Not important | Mid-level | Important | Very important |
|---|---|---|---|---|---|
| State budget source | 0.00 | 0.00 | 0.00 | 14.82 | 85.16 |
| People's contributions | 0.00 | 6.74 | 42.05 | 39.08 | 12.13 |
| Investments of businesses | 0.00 | 4.04 | 39.35 | 41.17 | 9.43 |
| Borrowing from credit institutions | 0.00 | 4.58 | 46.63 | 45.28 | 3.50 |

*Source: General investigation and calculation.*

Table 5 shows that people consider the role of capital from the state budget to invest in the program as very important, accounting for 85.16%. With the capital contributed by the people, 12.13% of the people surveyed consider it very important. This shows that: firstly, local people still have self-reliance, looking forward to the support and investment of the State; Secondly, the propaganda and dissemination of the policies and laws of the local government are not really close to the people, the people are unaware of the importance of their role in the process building a new countryside in the locality.

### 3.2. Evaluation of people's satisfaction with the results of the new rural construction program in Tien Giang province

After 5 years of implementing the new rural development program, some positive results have been achieved. Tables 6 and 7 present the model outputs of the people's satisfaction with the results of the new rural construction program. All are summarized as follows:

**Table 6. Regression Results**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | Beta | Std. Error | Beta | | | Tolerance | VIF |
| (Constant) | 0,120 | 0,176 | | | | | |
| TS | 0,274(***) | 0,049 | 0,271 | 5,338 | 0,000 | 0,435 | 1,738 |
| IS | 0,210(***) | 0,044 | 0,015 | 3,811 | 0,089 | 0,519 | 1,703 |
| C | 0,078 | 0,029 | 0,014 | 0,305 | 0,799 | 0,650 | 1,460 |
| LT | 0,071(*) | 0,048 | 0,068 | 2,069 | 0,091 | 0,576 | 1,672 |
| MA | 0,217(***) | 0,053 | 0,254 | 4,960 | 0,000 | 0,531 | 2,332 |
| CC | 0,118(*) | 0,041 | 0,137 | 3,845 | 0,081 | 0,511 | 1,971 |
| PR | 0,248(***) | 0,043 | 0,270 | 4,911 | 0,001 | 0,408 | 2,576 |

*(***), (*) at the 1% and 10% significance levels, respective.*

*Source: Extracted from SPSS.*

**Table 7. Factor of Determination**

| Mo del | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|
| | | | | R Square Change | F Change | df1 | df 2 | Sig. F Change | |
| 1 | 0,693 | 0,677 | 0,412 | 0,713 | 108,025 | 7 | 371 | 0,000 | 1,712 |

*Source: Extracted from SPSS*

This model has an adjusted coefficient of determination (Adjust R - Squared) of 0.677. Thus, through statistically significant independent variables, this model explained 67.7% of the variation in the general satisfaction of people about the pilot program to build new rural areas in the locality.

Table 6 shows, which independent variables have the corresponding value in the column of significance level (Sig) less than the allowable significance level of 1% and 10%, then that independent variable will be statistically significant. These independent variables all have a positive effect on the change of the dependent variable because the signs of the estimators are all positive and are arranged in descending order of the beta estimators as follows: TS, PR, MA, IS, CC and LT.

Specifically, when people evaluate the traffic system factor (TS) increased by 1 point, the people's satisfaction with the new rural. Construction

program increased by 0.274 points (corresponding to a beta coefficient 0.274); when people evaluate the production reorganization factor (PR) by 1 point, their overall satisfaction with the program will increase by 0.248 points (corresponding to a beta coefficient of 0.248); when people evaluate the market access factor (MA) increased by 1 point, their overall satisfaction with the program will increase by 0.217 points; when people evaluate the irrigation factor (IS) increased by 1 point, their overall satisfaction with the program will increase by 0.21 points; when people evaluate the job change factor (CC) by 1 point, their overall satisfaction with the program will increase by 0.118 points; and when people evaluate the training factor (LT) that helps people improve their professional knowledge through seminars, training, and vocational training increases by 1 point, their overall satisfaction with the program will increase by 0.071 points.

## 4. CONCLUSION AND POLICY IMPLICATIONS

### 4.1. Conclusions

After 6 years of active implementation, with the high efforts of the Party Committee, administration and people of the district, the district has basically completed the set goals and tasks, obtained many encouraging results, initially created a new face in agriculture and rural areas. In which, the transport system, production organization, market access, irrigation system, the ability to change jobs and the problem of training rural labor are the factors that great affect the satisfaction of the people about the National Target Program on building new rural areas in Tien Giang province. Besides, an issue that needs to be concerned is that people's awareness of the new rural Construction program is not high. Therefore, to be able to carry out the construction of new rural areas with better results, local authorities need to do a good job of propagating, disseminating, mastering, and creating a high level of awareness in the system politics and the entire people about the views, contents, methods, ways of doing things, mechanisms and policies of the State, so that each person can clearly understand, from there agree, join hands, voluntarily actively participate, promote maximize the role and power of the masses in the construction of new rural areas in order to meet the criteria of advanced rural areas and future models.

### 4.2. Policy implications

When State's investment capital is limited, in order to further promote the effectiveness of the project, the following policies should be considered in the process of building new countryside in Tien Giang province:

Firstly, the state should focus on supporting people to reorganize their production by forming models of cooperative groups and economic cooperatives to help farmers produce large quantities of high quality agricultural products, low cost, to improve the competitiveness of local agricultural products in the market.

Secondly, the state needs to focus on supporting farmers in accessing the market so that people can stabilize their output for products, help them feel secure to invest, and improve the output and quality of agricultural products.

Thirdly, in the context of serious saltwater intrusion in the Mekong Delta the general and Tien Giang in particular in recent years the government needs a synchronous solution to build a system of dikes and sluices to prevent saline intrusion into the interior, helping people feel secure in production.

Finally, vocational training, job change for rural workers and strengthening of job fair promotion after workers have been trained, help rural workers have more opportunities to find jobs and change careers, thereby contributing to improving the material and spiritual life of rural people.

Improving people's living standards in rural areas is one of the most important tasks of government at all levels from central to local. Therefore, in recent years there have been many programs/projects aimed at improving the lives of people in rural areas. This article only assesses the level of satisfaction of the people about the National Target Program on New Rural Construction but is not satisfied with other programs/projects. The limitation of the article is also suggesting trends for further studies./.

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# THE IMPACT OF CLIMATE CHANGE ON AGRICULTURE IN VIETNAM

**Ho Ngoc Khuong**[1]

***Abstract:*** *Over the past 30 years, the agricultural sector's contributions have contributed to changing the socio-economic status of Vietnam such as improving food security, boosting agricultural exports, and creating livelihoods for people. The value of the entire agricultural sector is estimated to increase by 2.9% in 2021 but is an important sector in Vietnam's economy, accounting for 20% of total GDP and employing up to half of the country's labor force (Shrestha and et al., 2016). However, the agricultural sector has been impacted by climate change, and projections over the next few decades suggest that the warming trend of the climate is likely to accelerate. Climate change has been having a strong impact on the crop and livestock industry, most obviously reducing arable land, causing drought and pests, putting great pressure on the development of the agricultural sector. Therefore, the author has studied and assessed the impact of climate change on the agricultural sector and made some recommendations to adapt to climate change in the agricultural sector.*

***Keywords:*** *Climate change, agriculture, $CO_2$ eq, Vietnam.*

## 1. INTRODUCTION

Climate change is a change in climate that is attributed directly or indirectly to human activities that alter the composition of the global atmosphere and contribute to natural climate variability over time. comparable time. This variation often results in significant adverse effects on the composition, resilience or reproduction of natural ecosystems or on the functioning of socio-economic systems or on the health and human welfare (Bodansky, 1993).

Agriculture adapts to climate change with sustainable agricultural production in terms of productivity increase, resilience (adaptation), reduction or elimination, increased ability to absorb greenhouse gases (mitigation) whenever possible, and increase the likelihood of achieving

[1] Of Political Science and Law, Ho Chi Minh City University of Technology and Education, Ho Chi Minh City, Vietnam. Corresponding author. Email: khuonghn@hcmute.edu.vn

national food security and sustainable development goals (FAO, 2010). The essence of the approach helps to transform and reorient agricultural systems. Climate change-responsive agricultural development aims at (i) sustainable food security through production growth food production and increase income and economic efficiency; (ii) increase the resilience of agricultural production systems to climate change; and (iii) reducing greenhouse gas emissions from agricultural activities (FAO, 2013).

Certain environmental risks have expected effects on some food security dimensions. For instance, Mendelsohn et al. (1994) found a nonlinear effect of temperature and precipitation on agricultural production in the USA. Furthermore, extreme weather events worsen rural household poverty, limiting their access to a diverse and high-quality diet (Arouri et al., 2015).

## 2. RESEARCH METHODS

Climate change impact assessment has been studied and applied in many countries around the world with different approaches and methods depending on the affected objects. According to IPCC (2001) in the third assessment report, a group of methods for assessing impacts of climate change have been identified: (i) Detection through indicators of ecosystems; (ii) Anticipate impact; (ii) Integrated Assessment; (iv) Price and value (evaluate). In particular, the valuation method of determining economic value depends on the view of prices as the opportunity cost of resources. Prices may also depend on whether the market is competitive or monopolistic and on external factors that have been internationalized. Prices are also subject to different rates of devaluation from country to country in the future and over time. The impact of uncertainties should also be assessed if the probability of different outcomes is known in advance.

## 3. SITUATION OF CLIMATE CHANGE IN VIETNAM

The impacts of climate change are manifold and diverse. Climate change impacts all levels from society - from communities to businesses to individuals. And while climate change may sometimes seem far away, we are surrounded by its consequences. Climate change can be caused by natural processes and can also be caused by human impacts. Human-

induced climate change includes greenhouse effect, human activities and warming of global. Climate change will influence food production in the agricultural sector via direct and indirect effects. Direct effects include alterations to carbon dioxide availability, precipitation and temperatures. Direct effects include changes in carbon dioxide, precipitation, and temperature. Meanwhile, indirect impacts include impacts on availability and seasonality of water resources, changes in soil organic matter, soil erosion, changes in pest and disease composition, and occurrence of species, and decline in arable areas due to the submergence of coastal lands and desertification. Vietnam's climate influences monsoonal circulation, and drives complex shifts in rainfall and temperature patterns which vary spatially at a sub-national level.

The average temperature in the region of Vietnam in the period 1991 -2020 is 0.3 -1.0°C higher than the average temperature of the years before 1961-1990, according to WBG calculations based on updated data of 60 years ago. Tay Ninh province is the province with the highest temperature in the country and the lowest is Cao Bang province in the period 1991-2020. The temperature increases in summer about 31°C, higher than other months of the year. According to the World Bank forecast by 2030, the average temperature will increase by 0.5-1.2°C compared to the period 1980-1999, depending on each scenario and in each specific region. Warming will be more pronounced in the summer, possibly causing unusual heat waves in the 2030s and 2040s.

**Table 1. Observed Average Seasonal Maximum Temperature**

| **The identified sub-national units with the highest and lowest maximum temperatures reflect the latest climatology, 1961-2020.** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1991-2020 | | | | 1961-1990 | | | |
| Units: °C | *DJF | MAM | JJA | SON | DJF | MAM | JJA | SON |
| Country: Vietnam | 24.76 | 29.69 | 31.00 | 28.67 | 24.35 | 29.39 | 30.70 | 28.15 |
| Highest: Tay Ninh | 31.72 | 34.27 | 32.08 | 31.32 | 31.129 | 33.90 | 31.53 | 30.69 |
| Lowest: Cao Bang | 18.04 | 26.17 | 30.67 | 26.22 | 17.74 | 25.88 | 30.58 | 25.75 |

*DJF - December, January and February; MAM - March, April and May

JJA - June, July and August; SON - September, October and November

*Source: WBG Climate Change Knowledge Portal (2020).*

Rainfall tends to increase in most areas of the country in the period 1961-2020. In which, the most obvious increasing trend is in Quang Tri province; The trend of low rainfall is most obvious in Cao Bang province. Drought does not have a clear trend due to limited monitoring and evaluation data. Rainfall in rainy and dry seasons tends to increase over most of the country. The trend in storm frequency is unclear, but it is almost certain that the number of strong storms as well as the intensity of strong storms have increased (IPCC, 2013).

**Table 2. Observed Seasonal Precipitation**

| **The identified sub-national units with the highest and lowest precipitation sums reflect the latest climatology, 1961-2020.** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1991-2020 | | | | 1961-1990 | | | |
| Units: mm | DJF | MAM | JJA | SON | DJF | MAM | JJA | SON |
| Country: Vietnam | 149.37 | 274.96 | 747.37 | 670.93 | 138.60 | 280.73 | 740.28 | 678.39 |
| Highest: Quang Tri | 470.60 | 268.50 | 500.29 | 1289.85 | 380.88 | 261.18 | 508.87 | 1234.13 |
| Lowest: Cao Bang | 74.49 | 280.24 | 683.54 | 243.52 | 64.56 | 308.27 | 674.32 | 273.50 |

*Source: WBG Climate Change Knowledge Portal (2020).*

$CO_2$ emissions in Vietnam are very high, reaching more than 250 million tons/year. In which, the field of agricultural production with a large amount of emissions has been recorded including: (i) wet rice production emits about 49.7 million tons of $CO_2$, accounting for 50% of the total emissions in agriculture; (ii) livestock emits 18.5 million tons of $CO_2$, about 19% of the total emissions in agriculture; (iii) fertilizer use and land management emit about 13.2 million tons of $CO_2$, accounting for 13% of total emissions in agriculture; (iv) burning plant residues emits 1.6 million tons of $CO_2$, accounting for about 1.6% of total emissions in agriculture (Ministry of Natural Resources and Environment, 2016).

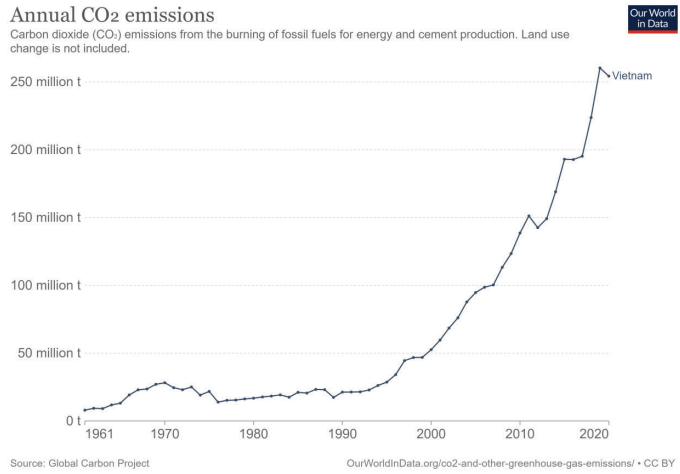


**Figure 1. Annual $CO_2$ Emissions**

*Source: OWD, 2020.*

**Table 3. Sea level Rise Scenario for the Entire East Sea Region (cm)**

| Scenario | Timelines of the 21st century | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RCP | 2030 | 2040 | 2050 | 2060 | 2070 | 2080 | 2090 | 2100 |
| *RCP2.6 | 14 (8÷19) | 20 (11÷26) | 25 (14÷33) | 30 (17÷41) | 34 (20÷48) | 38 (23÷55) | 42 (25÷62) | 46 (28÷70) |
| RCP4.5 | 12 (8÷18) | 18 (11÷25) | 23 (14÷33) | 29 (18÷42) | 35 (22÷51) | 42 (26÷61) | 48 (30÷71) | 55 (34÷81) |
| RCP8.5 | 14 (10÷19) | 20 (14÷27) | 28 (20÷37) | 34 (23÷47) | 43 (28÷59) | 52 (35÷72) | 64 (42÷88) | 77 (51÷106) |

** RCP 2.6: Low greenhouse gas concentration scenario*

*RCP4.5: Low average greenhouse gas concentration scenario*

*RCP8.5: High greenhouse gas concentration scenario*

*Source: Ministry of Natural Resources and Environment, 2021*

At the end of the century, sea level rise in the East Sea region (Figure 4) is summarized as follows:

- Under the RCP2.6 scenario, sea level rise is about 46 cm (28 cm ÷ 70 cm);

- Under the RCP4.5 scenario, sea level rise is about 55 cm (34 cm ÷ 81 cm);

-According to the RCP8.5 scenario, sea level rise is about 77cm (51 cm ÷ 106 cm).

The spatial distribution of sea level rise in the East Sea shows that the area in the middle of the East Sea has a significantly higher sea level rise than other areas. The area with the lowest sea level rise is the Gulf of Tonkin and the North East Sea. If considering the coastal strip of Vietnam alone, the coastal area from Da Nang to Kien Giang has a higher sea level rise than the northern region. This result is consistent with the trend of sea level change calculated according to real data measured at stations in the past.

Study suggests that climate change may damage rice yields in the Mekong River Delta in the long term. The outlook reported for rain-fed rice is particularly poor across all time horizons with yield declines potentially over 50% on higher emissions pathways by 2040. Irrigated rice fares better in the shorter-term showing some yield improvements up to 2030. By the 2040s irrigated rice could also be facing yield reductions of up to 23% under higher emissions pathways (Jiang, Z. and et al., 2018).

Agriculture is both a cause and a solution to climate change. Because of the flooded fields and aquaculture, they both produce $CH_4$ from rotting organic matter and use a lot of $N_2O$ fertilizers. In addition, animals also emit $CH_4$, machinery and equipment used in agriculture using fossil agriculture also contribute to increased greenhouse gas emissions that cause climate change. In addition, deforestation causes loss of carbon sequestration sites; at the same time, causing landslides and soil erosion that affect the climate. But from the perspective of the article, the author analyzes the impact of climate change on the agricultural sector.

## 4. IMPACT OF CLIMATE CHANGE ON THE AGRICULTURAL SECTOR

Climate change has been having a strong impact on the crop industry, most obviously reducing the area of arable land, especially due to sea level rise, salinization of the lowlands, a prerequisite for degradation. non-reversible on natural resources; causing drought and pests, putting great pressure on the development of crop production. Prolonged drought leads to the risk of desertification in some regions, especially the South Central region, coastal sandy areas and sloping land in midland and mountainous areas, causing significant consequences for sustainable development. Climate change threatens multiple stressors on rice production, including high temperatures, saline intrusion, drought, and flood. However, some of

these negative impacts may be partially offset by the benefits of increased atmospheric $CO_2$ concentrations.

Firstly, floods and sea level rise will destroy arable land for agriculture. The Mekong River Delta is an extremely low delta region with an average elevation of about 80 cm. The region is therefore highly vulnerable to changes in sea level rise arising from the cumulative effects of global sea level changes and land subsidence. The Mekong River Delta is currently facing a high level of land subsidence, up to 5 cm/year in some places, mainly due to groundwater extraction (currently around 2.5,106 $m^3$/day, with an annual increase of 4 years). If groundwater extraction rates remain at current rates, cumulative subsidence coupled with sea level rise could cause much of the Delta to sink below sea level by the end of this century. Flooding will make nearly 50% of agricultural land in the Mekong River Delta flooded, making it impossible for farming. In addition, fishing and farming fishermen are also affected by storms and floods because people's livelihoods depend mainly on water sources and the abundance of coastal resources, which is one of the sensitive areas. and most vulnerable to the effects of climate change. Manifestations of negative impacts of climate change include: late arrival of monsoon rains and reduced rainfall causing a shortage of fresh water for production, but an increase in unseasonal rains, flooding the crop area and loss of crops. drain for aquaculture; In the dry season, rainfall is lower and fresh water in upstream decreases, causing salt water to penetrate deeper into the field, and farming activities are severely lacking in irrigation water; High temperature changes the living environment, which is favorable conditions for the development of diseases for both crops and livestock.

Secondly, saline intrusion in coastal areas will also narrow the area of agricultural land. A significant portion of arable land in the Red River Delta and Mekong River Delta will be saline because these two areas are low relative to sea level. In addition, the shortage of alluvium due to dams upstream and over-exploitation of sand has led to severe erosion of the riverbed over the past 20 years (about 10-20 cm/year), this leads to tidal infiltration and an increase in salinity intrusion. Saltwater intrusion reduces the area of arable land, from which the coefficient of land use can be reduced from 3-4 times/year to 1-1.5 times/year. If the sea level rises

by 1m, about 1.77 million hectares of land will become saline, accounting for 45% of the land area in the Mekong River Delta and it is estimated that about 85% of the people in the Mekong River Delta need assistance. about agriculture. Man-made erosion of the riverbed will still be the main cause of salinization in the Delta. In addition, saline intrusion causes damage to crops, reduced crop yields, destruction of forests, changes in soil properties, threaten the life of aquatic and terrestrial species.

The impact survey of saline intrusion in the Mekong River Delta focuses on effects on rice (first concern), fruit trees, vegetables and forests (melaleuca). Experiments and surveys show a relationship between salinity levels and yield loss. The percentage loss for each salinity level was estimated for the mean range of the salt concentration, specifically, 54% yield loss at 2.5 - 4 g/l was estimated to average between 33% ( 2.5g/l) and 75% (4g/l), similar to the estimated 17% loss for the salinity range of 1.0 - 2.5 g/l.

**Table 4. Numbers of Losses due to Saline Intrusion**

| Subjects | Salinity (g/L:PPT) | | | | | | | Note |
|---|---|---|---|---|---|---|---|---|
| | <0.5 | 0.5-1.0 | 1.0-2.5 | 2.5-4 | 4-10 | 10-20 | >20 | |
| Rice | 0% | 0% | 17% | 54% | 100% | 100% | 100% | FAO |
| Fruit trees | 0% | 0% | 19% | 55% | 100% | 100% | 100% | FAO |
| Vegetable | 0% | 0% | 29% | 71% | 100% | 100% | 100% | FAP |
| Forest (melaleuca) | 0% | 0% | 0% | 0% | 50% | 100% | 100% | SIWRP |

*Source: JICA Group.*

Thirdly, anthropogenic greenhouse gas emissions cause higher temperatures and more $CO_2$ in the air, affecting agricultural production. Water resources in the dry season are increasingly scarce, making crop production to increase the cost of irrigation and other expenses, and the cost of products is getting higher and higher. At the same time, if the average temperature increases by 1$^oC$, the rice yield will decrease by 10% and this is extremely important for countries severely affected by climate change like Vietnam (GSO, 2019). The results showed that the concentration of greenhouse gas $CO_2$ caused the nitrate assimilation rate to be slowed down and the $CO_2$ concentration significantly reduced the nutritional value of crops.

Nextly, climate change affects the agricultural ecosystem. For example, beneficial animals and organisms such as microorganisms or bees may die. This affects the production of farmers. As temperatures increase, drought will affect the distribution of crops, especially reducing yields. Specifically, the rice yield of the Spring crop tends to decrease sharply compared to the rice yield of the crop; maize yield in the winter crop tends to increase in the North and decrease in the South. Climate warming affects livestock production and feed quality.

Finally, climate change affects people's food security, livelihoods and poverty. Agricultural production depends on water and temperature. When the climate is dry, the rate of forest fires increases. Food security is also affected by prices and consumer demand, food products can be affected by crop failure due to weather. If the price of food rises, households have to spend more of their income to buy food, or they have to buy food in smaller quantities or other substitutes. Therefore, affecting people's quality of life because income is not enough to spend, making them more miserable.

## 5. RESULTS AND RECOMMENDATIONS

From the above summarized research results, the impacts of climate change on agriculture are relatively clear and all stem from the climate components:

- When the temperature increases, it will affect the generation and development of plants and animals, causing changes in productivity and output;

- As rising temperatures degrade water resources, many regions have no water and cannot continue farming, leading to a decrease in the cultivated area;

- As temperatures rise, the ice melts, leading to more land being encroached on and inundated with saltwater and uncultivated crops or reduced yields;

- Changes in climatic conditions will reduce biodiversity, unbalance the ecology, especially natural enemies, and affect plant growth and development and disease outbreaks;

- Extreme and irregular weather phenomena such as early and late storms, unseasonal rains will cause difficulties in arranging the crop structure and cause damage, etc.

Mitigating the above impacts will be much more difficult than adapting and selecting and improving appropriate technologies to adapt to climate change. Therefore, climate change can only be solved through the efforts and joint efforts of the whole community, and climate change adaptation is a process that requires perseverance. Some recommendations for adaptation to climate change:

Firstly, farmers and scientists jointly experiment with suitable solutions in different ecological regions for cultivation, for example: farmers delay the winter-spring crop in the Red River Delta; switch to planting crops with high drought tolerance such as cassava, maize, peanuts in the Central region; switch to farming salt-tolerant aquatic species in the face of saltwater intrusion in the coastal areas of the Mekong River Delta; improve the capacity of veterinary services to deal with the situation of infectious diseases in the livestock industry.

Secondly, the circular economy in agricultural production is a solution to help agricultural production follow a closed cycle, reduce environmental pollutants, reduce the amount of resources used in inputs, increase the rate of agricultural waste recirculation.

Nextly, adjust and diversify the structure of livestock, crops and crops in accordance with the circumstances of climate change; changing farming practices and agricultural systems. Proper farming techniques will reduce CO2, increase organic sources for the soil, avoid erosion, and reduce nitrogen loss in the soil.

Then, to adapt to climate change, protect the ecological environment, reduce greenhouse gas emissions in agricultural production. At the same time, increase the rate of forest cover and area of protection forest to cope with rising temperatures.

Additionally, our country needs to come up with policies and activities to respond to climate change such as reducing the poverty rate, socio-economic development planning and plans that integrate risk management issues. disaster risk and climate change adaptation, building anchorage areas to avoid storms.

Last but not least, the orientation of using climate change parameters for the agricultural sector, such as:

| Fields | Script parameters | Purpose |
|---|---|---|
| Agriculture | Scenario of temperature, precipitation, minimum and maximum temperature, extreme cold, harmful cold, heat, drought, maximum 1-day, 5-day maximum rainfall, sea level rise. | Land use planning;<br>Planning of irrigation works;<br>Assess the impact of climate change on agriculture. |
| Forestry | Sea level rise scenario;<br>Scenario temperature, precipitation. | Assessment of decline in forest land fund and forest area;<br>Assessment of forest structure and quality degradation. |
| Aquaculture | Sea level rise scenario. | Assessment of aquatic environment at sea;<br>Environmental planning for aquaculture. |

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# COST AND BENEFIT ANALYSIS OF ADAPTATION METHODS TO CLIMATE CHANGE: A CASE OF SALTWATER INTRUSION IN CENTRAL COASTAL REGION OF VIETNAM

**Nguyen Thi Dieu Linh[1], Brent Bleys[2]**

***Abstract:*** *This study examines the costs and benefits of traditional rice production as well as of different adaptation methods to saltwater intrusion in the Central Coastal region of Vietnam. Our results indicate that traditional rice production becomes less profitable as the level of saltwater intrusion on the land plots increases. The different adaptation methods are grouped in two categories according to whether the farmers continue to grow crops on their land, or whether they convert their land to ponds for aquaculture. In the crop group, vegetable production has the highest net present value followed by papyrus production, whereas switching to new rice varieties has the lowest net present value. However, regarding the benefit-cost ratio papyrus production ranks highest, followed by vegetable production and switching to new rice varieties. Taking this risk related to the selling price into account results in a different ranking of the crop adaptation methods as switching to new varieties of rice varieties moves to the top of the list, and this at all three levels of the discount rate. We also find that, accounting for risk, papyrus production has the lowest net present value of all methods, yet its benefit-cost ratio is higher than that of vegetable production. In the aquaculture group, shrimp production yields a higher net present value than lotus-fish production, yet in terms of the benefit-cost ratio, lotus-fish outperforms shrimp production. Here, the risks related to the selling price for both adaptation methods are considered to be identical.*

***Keywords:*** *Cost and benefit analysis, adaptation methods, net present value, benefit-cost ratio.*

[1] Faculty of Business Administration, University of Economics, Hue University, Vietnam
[2] Faculty of Economics and Business Administration, Ghent University, Belgium

# THE EFFECTIVENESS OF FINANCIAL SOURCES FOR CLIMATE CHANGE IN VIETNAM

**Nguyen Thi Nhung[1,*], Nguyen Minh Hoa[2], Vu Thi Phuong Anh[3], Do Thi Hoang Anh[4]**

***Abstract:*** *This working paper focuses on five sources of financing climate finance in Vietnam, including: (i) State budget used by ministries (A1); (ii) State budget used by provinces (A2); (iii) Bilateral funds (A3); (iv) Multilateral funds (A4) and (v) private funds. By using primary data collected from surveys sent to 12 experts, then analyzing data through the AHP method, the study shows that climate finance sources in Vietnam are all ineffective. However, funds from the private sector (A5) are considered to be the most effective financial sources for climate change.*

***Keywords:*** *Climate change, climate finance, climate funds.*

[1] Faculty of Finance and Banking - VNU University of Economics and Business, Vietnam

* Corresponding author. Email: nguyenthinhung.1684@gmail.com

[2,3,4] Faculty of Finance and Banking - VNU University of Economics and Business

**NHÀ XUẤT BẢN**
**ĐẠI HỌC QUỐC GIA HÀ NỘI**
16 Hàng Chuối - Hai Bà Trưng - Hà Nội

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Tổng biên tập: (024) 39714896
Biên tập: (024) 39714896
Quản lý xuất bản: (024) 39728806
Fax: (024) 39729436

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