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Phone: 024.32191967
Email: tapchinctckt@hvtc.edu.vn
Website: https://tapchitckt.hvtc.edu.vn/
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TÒA SOẠN
SỐ 58 LÊ VĂN HIẾN, Q. BẮC TỪ LIÊM - HÀ NỘI

Điện thoại: 024.32191967
E-mail: tapchinctckt@hvtc.edu.vn
Website: https://tapchitckt.hvtc.edu.vn/
https://tapchitckt.hvtc.edu.vn/?language=en-US

KINH TẾ, TÀI CHÍNH VĨ MÔ

NGHIÊN CỨU TRAO ĐỔI

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IMPACT OF BUDGET TRANSPARENCY ON HUMAN DEVELOPMENT AT PROVINCIAL LOCAL GOVERNMENTS IN VIET NAM

Phan Thi Thu Hien* - Assoc.Prof.PhD. Ngo Thi Thu Hong**

Abstract: ***The objective of the study is to assess the impact of budget transparency on human development by provincial local governments in Viet Nam. The study collected secondary data by the General Statistics Office (GSO) and the Budget Transparency Alliance (BTAP) for five years from 2017-2021. The analysis results on Stata 18 software show that budget transparency of provincial local governments has a positive impact on human development as measured through the HDI (provincial) human development index. From there, the paper also makes recommendations to improve transparency and human development for provincial local governments in Vietnam.***

• Keywords: *budget transparency, human development, provincial local government.*

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1. Introduction

Budget transparency (BT) refers to the comprehensive and timely provision of all pertinent financial information. BT is a necessary condition for the involvement of the public in budgetary procedures. According to the OECD (2002), the integration of BT and public engagement in financial procedures serves as a means to combat corruption, enhance public accountability of government institutions, and foster a more judicious allocation of the State budget.

The incorporation of budget transparency has become an essential component within the public sector. Extensive questionnaires and diagnostic tools have been established by the International Monetary Fund (IMF), World Bank, and OECD to assess budget transparency and budget process transparency (Worldbank, 2003; IMF, 2007; OECD, 2001). Budget transparency plays a crucial role in facilitating public access to information pertaining to public expenditure and the financial performance of the government. Enhanced budget transparency is positively correlated with improved governance through the facilitation of government accountability, dissemination of crucial information to the public, and mitigation of corruption. The establishment of transparency in governmental operations is widely regarded as a crucial requirement for fostering a sustainable and effectively regulated economy. This, in turn, serves as a fundamental basis for human growth, including various aspects such as living standards, health, education, and longevity. The implementation of budget transparency is a pertinent mechanism for enhancing human development. Transparency has the potential to enhance the quality of life by fostering improved governance. Transparency plays a crucial role in human growth, as supported by numerous research (Moldalieva, 2021).

The definition and measurement of human development pose challenges, however it remains a significant notion that warrants enhancement (Raphael, 2010). UNDP (1990) states that the basic objective of human development is to establish a favorable environment for improved quality of life. This objective is also crucial in assessing the effectiveness of public policies (Bovaird & Löffler, 2003; Santos & Martins, 2007). The primary objective of this study is to investigate the effects of budget transparency on human development, with a specific focus on a particular policy. De Renzio & Wehner (2017) posit that there is an assumption that government transparency can contribute to human development. However, there is a lack of substantial evidence supporting this claim, and the relationship between transparency and human development is nearly insignificant. Hence, the author anticipates evaluating the influence of budget openness on human development within the framework of Vietnam, particularly in provincial local governments.

The Vietnamese government has implemented significant reforms in order to enhance openness and accountability within the public sector, particularly in relation to budget transparency and citizen engagement in the budgetary process. Budget transparency enables citizens to have a clear understanding of how public resources are allocated in order to accomplish policy goals (OECD, 2015). Accountability, engagement, and transparency are

** Foreign Trade University; email: phanthuhien@ftu.edu.vn*
*** Academy of Finance*

important factors that contribute to human growth (Sahay & Walsham, 2017).

Provincial Open Budget Index (POBI), which is issued by the Budget Transparency, Accountability and People's participation Alliance (BTAP), serves as a means to showcase the level of budget openness exhibited by provincial local governments. Numerous global organizations, including the International Monetary Fund, the World Bank, and the Organization for Economic Co-operation and Development (OECD), have formulated standards pertaining to budget transparency. However, it is important to note that these approaches offer a rudimentary delineation of budget transparency and exhibit significant disparities between developed and developing nations. The scope of local government, particularly at the provincial level, is constrained. Provincial Open Budget Index (POBI) enables the comparison of several Provinces across time. It is developed by independent experts and relies on objective assessment rather than subjective perception (Seifert et al., 2013). As a result, POBI is considered a dependable measure of provincial budget transparency.

This study utilized data from 63 provinces in Vietnam spanning from 2017 to 2021 to investigate the impact of POBI on the Human Development Index (HDI) released by the General Statistics Office (2018-2022), taking into account the limited availability of POBI data. The Human Development Index (HDI) takes into account not just wealth and living conditions, but also educational and health factors. Despite the presence of several limitations and divergent viewpoints, the Human progress Index (HDI) has been extensively employed in different scholarly investigations (UNDP, 2019) as a means to depict the nuanced notion of "human development".

The subsequent sections of the article are organized in the following manner. The part titled "Overview and Research Hypotheses" offers a concise summary of human development and budget transparency, which then leads to the creation of hypotheses. The Research Methodology part provides an overview of the techniques employed for data collecting and processing, while the 'Results' section offers a concise review of the findings pertaining to the impact of budget transparency on human development. The concluding section of this study discusses the empirical findings and also puts up potential avenues for future research.

2. Literature review

2.1. Budget transparency

According to Gurluk (2009), considering the topic of economic growth to be one of the most contested questions in the history of economics is a significant accomplishment. When growth is taken into account, the neoclassical technique uses income as the key indicator. This is because income is the most important factor. "The traditional economic strategy that governments have chosen to implement involves the goal of increasing the national income per capita," according to Alkire (2002). This is the plan that has been chosen by governments. However, this method has been slowly contradicting itself, with some persons stating that the ultimate purpose of human activity is human development rather than economic expansion (Ranis et al., 2000). This is a contradiction that has been occurring for quite some time.

Studies have been conducted to investigate the relationship between human development and economic progress. These studies have been conducted in a number of different ways. It has been proposed by Ranis et al. (2000) that the completion of this link will lead to the establishment of two completely separate networks. To begin, the expansion of the economy is responsible for the generation of the resources that are necessary to achieve higher levels of human development. It is possible that these riches may be leveraged, for instance, to support investments in the fields of education and health. It is considered that human development, which may be achieved, for example, by improving the quality of labor, is a significant component that helps to the expansion of the economy. This is the second point of contention.

Through the examination of budget transparency, which is the primary tool through which governments proclaim how public resources will be used to achieve policy objectives, the study wants to make a contribution to the ongoing conversation that is taking place within the academic community.

2.2. Economic growth and human development

According to Gurluk (2009), one of the most contentious questions in the history of economics is the topic of economic growth. When growth is taken into consideration, the neoclassical method is based on income as the primary metric. According to Alkire (2002), the traditional economic strategy that governments have selected to implement involves the goal of increasing the national income per capita. On the other hand, this approach has steadily contradicted itself, with some individuals suggesting that the ultimate goal of human activity is human development rather than economic expansion (Ranis et al., 2000).

The relationship between human development and economic progress has been the subject of investigation in a number of studies. It has been

suggested by Ranis et al. (2000) that this link will result in the formation of two networks. Firstly, economic expansion generates the resources that are required to reach better levels of human development. These resources might be utilized, for example, to finance investments in health and education. Second, it is believed that human development, which may be accomplished, for instance, by enhancing the quality of labor, is a significant factor that contributes to the expansion of the economy.

By examining budget transparency, which is the principal instrument through which governments proclaim how public resources will be used to achieve policy objectives, the study intends to make a contribution to the ongoing discussion in the academic community.

2.3. Budget transparency and human development

From the perspective of Blondal (2003), budget transparency is a representation of the manner in which public resources are utilized to accomplish policy objectives (OECD, 2006, 2015). According to De Renzio and Wehner (2017), if budgeting is able to demonstrate how public resources are utilized, then budget openness will result in a more beneficial utilization of those resources. According to the United Nations Children's Fund (2007), the budget is a representation of how a society regards the actions and policies of the government. Therefore, in order to guarantee that budgeting is the instrument that is utilized to promote human rights, it is essential to make the budgeting process transparent, to encourage citizen engagement, and to enhance the responsibility of the government (Vizard et al., 2011). It is possible for the public to monitor the manner in which public affairs are managed (Heald, 2012). This transparency in the budget also enables citizens to examine the strategies and results of decisions made by the government (Alt & Lassen, 2005). In order to force governments to allocate public resources to specific priorities of their citizens, it is essential to have the ability to participate in budgeting. These priorities include things like quality of life, long and healthy lives, education, the acquisition of knowledge, and resources that are necessary to achieve better living standards (UNICEF, 2007). Drawing on these information, the following hypothesis is put forward:

H1: Budget transparency positively affects human development in provincial local governments in Viet Nam

3. Research methodology

3.1. Research sample

The research sample is 63 provincial-level local governments in Vietnam. The author collected data on budget transparency and human development of 63 provinces in Vietnam over a period of 5 years from 2017 to 2021. The author chose the timeline from 2017 because of the transparency index. The provincial budget was announced for the first year in 2017.

Research models and variables

To investigate the relationship between budget transparency and human development, the author proposes the following equation:

$$HDI_{it} = \beta_0 + \beta_1 PAPI_{it} + \alpha_1 POBI_{ijt} + \alpha_2 POBI_{it.total} + \beta_2 Growth_{it} + \beta_3 Openness_{it} + \beta_4 Invert_{it} + \beta_5 GINI_{it} + \varepsilon_t$$

Local Dependent Variable (HDI) is a provincial human development index published by the General Statistics Office from 2017 to 2021.

The Human Development Index (HDI) is a comprehensive measure reflecting human development in the following aspects: Health (represented by average life expectancy since birth); knowledge (represented by education) and income (represented by total national income per capita), the HDI index of the provinces is collected through data from the General Statistics Office.

HDI is a measure that assumes values between 0 and 1 ($0 \leq HDI \leq 1$), with 0 being the minimum and 1 being the maximum. HDI reaches a maximum of 1, which indicates that human progress has reached its ideal level; the HDI is at least zero, which indicates that society has not developed in a humane manner. Countries, territories, or regions, as well as regions, localities, and demographic divisions within the boundaries of a country or territory, are ranked according to their human development. These rankings are divided into four categories:

The term "standalone variable" pertains to the level of transparency exhibited by the budget, as indicated by the POBI index released by BTAP for the period spanning from 2017 to 2021.

The POBI survey questions are formulated in accordance with the legal framework in Vietnam, which includes the Law on Budget 2015, the Law on Public Investment, the Law on Access to Information, and the Law on Public Debt Management. Additionally, the survey questions are influenced by international standards of openness and transparency.

Furthermore, the determination of HDI levels is influenced by several socioeconomic and political aspects, as indicated in prior scholarly works, notably the research conducted by Amate-Fortes et al. (2017). The GRDP index's annual growth, the local economy's openness measured by the percentage of exports and imports relative

to GRDP (Openness), total local investment, also known as total realized investment (Investment), and inequality measured by the provincial GINI coefficient (Inequality) are all important factors to consider. Simultaneously, the author incorporates additional elements of effective governance such as involvement, publicity, control, and public service supply into the provincial PAPI index.

Initially, the model can be estimated using either fixed-effect or random effect estimators. These estimators necessitate stringent externality, homogenous errors, and the absence of sequential correlation errors. Hence, the author initially assessed the conditional homogeneity and uncorrelation of the mistakes through testing. Subsequently, the author proceeds to execute the research hypothesis.

4. Research results

The statistical inspection results, described in Table 1, show a total of 315 observations within 5 years of 63 provinces across the country. The HDI Human Development Value has the smallest value of 0.565 and the largest of 0.821. Meanwhile, the smallest value of total card budget transparency is below 1 and the highest is 90.1.

Table 1: Statistical inspection results

Variable	Obs	Mean	Std. dev.	Min	Max
POBI_Total	315	33.34763	16.96737	.5666667	90.06333
POBI_Parti	315	57.54679	23.61494	1.69	98.59
POBI_Account	315	42.26349	16.85796	12	80
POBI_Trans	315	36.8326	18.28881	4	100
Growth_LnGRDP	315	10.15064	22.18552	-158.3773	124.8838
LNG1	315	8.266924	.865312	4.615121	10.60242
TG	315	5.056327	.5161042	3.8	6.405872
CK	315	5.374582	.4235732	4.2	6.498768
TN	315	4.835344	.4037928	3.84	6.247622
KS	315	6.658419	.5570838	4.362395	8.285748
TT	315	7.294274	.2406095	6.64	7.947027
CU	315	7.233797	.393712	6.28	8.46
Openness	315	-2.382857	8.817216	-23.76	58.6
HDI	315	.695419	.0503644	.565	.821
GINI	315	.3606222	.0575663	.203	.525

Next, the author tests the correlation between variables in the study model. The results show that the correlation between variables satisfies the conditions for testing research hypotheses.

Next, the author conducts a linear multi-additive test of variables in the research model through the VIF index. The test results show that the VIF values are less than 2, therefore, the variables ensure that there is no linear multi-additive to be able to test the research hypothesis. The results of the hypothesis test are as shown in Table 2 below:

Table 2: Multi-plus test results from Stata 18 software

Source	SS	df	MS	Number of obs	=	315
		F(14, 300)	=	36.13		
Model	.499950938	14	.035710781	Prob > F	=	0.0000
Residual	.296533747	300	.000988446	R-squared	=	0.6277
		Adj R-squared	=	0.6103		
Total	.796484686	314	.002536575	Root MSE	=	.03144

HDI	Coefficient	Std. err.	t	P>t	Beta
POBI_Totl	.0002304	.0002656	0.87	0.386	.0776112
POBI_Trans	.0002511	.0001368	1.84	0.067	.1177169
POBI_Account	-.0000732	.0001073	-0.68	0.495	-.0245148
POBI_Parti	.000034	.0001434	0.24	0.813	.0123389
Growth_ LnGRDP100	.0000316	.000081	0.39	0.696	.0139394
LNG1	.0247928	.0025183	9.84	0.000	.4259651
TG	.0024451	.0052605	0.46	0.642	.0250564
CK	.009933	.0070254	1.41	0.158	.0835385
TN	.0101489	.0064413	1.58	0.116	.0813683
KS	-.0051329	.0041077	-1.25	0.212	-.0567754
TT	-.0000396	.008719	-0.00	0.996	-.000189
CU	.0167631	.0061248	2.74	0.007	.1310416
Openness	.0009914	.0002284	4.34	0.000	.173555
GINI	-.2746363	.0368669	-7.45	0.000	-.313908
_cons	.3696356	.0768849	4.81	0.000	.

Source: Author's Compilation

The test results show that income inequality through GINI has a statistically significant impact on the Human Development Index of provinces in Viet Nam with an adverse impact factor of 0.313 at a significant level of 1% (P_value=0.000). This means that the higher the inequality in provincial localities, the lower the human development index. What the author expects is that the level of budget transparency of provincial local governments will improve the human development coefficient according to development theory, resulting in that only the pillar of budget transparency (budget disclosure) - POBI_Trans has a statistically significant impact on the human development index with an impact factor of 0.117 at meaning 10% (P_value = 0.067). This means that the more local governments make their state budgets public, the higher the human development index, and this hypothesis is statistically significant. However, the other two aspects of budget transparency under BTAP (2022), Citizen Participation in the Budget Cycle and Government Accountability, are not statistically significant, there are not enough grounds to conclude that budget transparency improves the Human Development Index.

In addition, the aspect of good governance through the provincial PAPI index is also statistically significant to the provincial human development index. However,

only a few indicators in the PAPI index that have an impact on the provincial human development index are public governance indicators. This is interesting and further confirms that budget transparency in particular and public disclosure in general have a positive impact on human development. At the same time, the control of corruption and the provision of public services also had a statistically significant impact on human development with a corresponding impact of 0.127; -0.092; 0.117 All of these variables are at a 5% significance level (P_value <0.05).

5. Conclusions

The objective of this study was to examine the correlation between budget transparency and provincial-level human development in Vietnam, with the aim of determining if the pursuit of increased transparency could have an impact on the degree of human development. The findings indicate that there is a positive correlation between budget openness and the human development of localities and provinces, along with the findings of Vizard et al. (2011).

Prior studies have mostly examined the correlation between economic growth and human development, assessing the reciprocal connection between the two (Ranis et al., 2000). Previous research has examined the correlation between human development and the effects of governmental measures aimed at augmenting national GDP (Gürlük, 2009).

The notion of human development encompasses multiple dimensions. The author employed the Human Development Index (HDI) produced by the United Nations (UNDP, 2019) in order to empirically examine this topic. This indicator takes into account the characteristics of life expectancy, education, and a satisfactory level of living.

Prior research has predominantly focused on the analysis of budget transparency, specifically exploring the factors that influence it (Carlitz et al., 2009; Citro et al., 2019; Harrison & Sayogo, 2014; Ríos et al., 2013, 2016; Wehner & de Renzio, 2013). Previous research has examined the correlation between budget transparency and the effectiveness of governance (Goldfrank & Schneider, 2006; Touchton & Wampler, 2014), with particular emphasis on documenting the inverse relationship between budget transparency and corruption (Bastida & Benito, 2007; Hameed, 2005; Reinikka & Svensson, 2011).

According to De Renzio and Wehner (2017), a notable deficiency exists within the existing body of literature about the influence of budget openness on the process of development. This study aims to address the existing vacuum in the literature by investigating the correlation between budget transparency and province local human development indicators within a given country.

The analytical findings indicate that higher levels of budget openness will have a positive impact on human development. According to Vizard et al. (2011), the confirmation of the key role of transparency, involvement, and accountability has been established.

From a pragmatic standpoint, this study emphasizes the need to assess governments' endeavors to enhance human development by considering multiple elements. The proper execution of policies aimed at addressing human development and evaluating their long-term impact necessitates a focus on clarity. Nevertheless, it is crucial to assess the pre-planning of these programs. Hence, it is strongly advised to scrutinize budgets, guaranteeing both their transparency and the transparency of the entire budgeting process.

This work acknowledges its limitations, which should be considered in future research endeavors. During the initial phase, the analysis was conducted at the province level of local government. Hence, next research endeavors could explore the correlation between fiscal transparency and human development on a national scale, employing diverse methodologies.

Furthermore, this study employed the Human Development Index (HDI) created by the United Nations as a metric for assessing human development. While the reliability of this indicator is widely acknowledged, it is possible to explore alternative measures in order to encompass more dimensions of human development (Ranis et al., 2000).

References:

Alkire S. (2002), "Dimensions of human development", World Development, Vol. 30 No. 2, pp. 181-205.

Alt J.E. &; Lassen, D.D. (2005), "Transparency, political polarization, and political budget cycles in OECD countries". American Journal of Political Science, Vol. 50 No. 3, pp. 530-550.

Amate-Fortes I., Guarnido-Rueda A & Molina-Morales A. (2017), "Economic and social determinants of human development: A new perspective", Social Indicators Research, Vol. 133 No. 2, pp. 561-577.

Blume L. &; Voigt; S. (2013), "The economic effects of constitutional budget institutions". European Journal of Political Economy, Vol. 1 No. 29, pp. 236-251

Bovaird T. &; Löffler E. (2003), "Evaluating the quality of public governance: Indicators, models and methodologies". International Review of Administrative Science, Vol. 69 No. 3, pp. 313-328

De Renzio P. & Masud H. (2011), "Measuring and promoting budget transparency: The open budget index as a research and advocacy tool", Governance, Vol. 24, No. 3, pp. 607-616

De Renzio P. &; Wehner J. (2017), "The impacts of fiscal openness", The World Bank Research Observer, Vol. 32, No. 2, pp. 185-210.

Gürlük S. (2009), "Economic growth, industrial pollution and human development in the Mediterranean region", Ecological Economics, Vol. 68 No. 1, pp. 2327-2335.

Heald D. (2012), "Why is transparency about public expenditure so elusive?", International Review of Administrative Sciences, Vol. 78 No. 1, pp. 30-49

Kelly J.M. (2003), "The long view: Lasting (and fleeting) reforms in public budgeting in the twentieth century", Journal of Public Budgeting, Accounting & Financial Management, Vol. 15, No. 2, pp. 309-315.

UNDP (1990), "Concept and measurement of human development". United Nations Development Programme.

UNDP (2019), "Beyond income, beyond averages, beyond today: Inequalities in human development in the 21st century", United Nations Development Programme.

UNICEF (2007), "Open dialogue: Eyes on the budget as a human rights instruments".

Vizard P., Fukuda-Parr S. &; Elson D. (2011), "Introduction: The capability approach and human rights", Journal of Human Development and Capabilities, Vol. 1, No. 12, pp. 1-22.

PUBLIC DEBT MANAGEMENT WITH SUSTAINABLE ECONOMIC DEVELOPMENT IN VIETNAM

PhD. Bui Tien Hanh*

Abstract: ***State budget deficits and public debt are perennial issues in many countries. In Vietnam, these deficits are addressed through borrowing from both domestic and international sources. Such borrowing is intended exclusively for development investment. Consequently, public debt is inherently linked with fiscal discipline and public investment. When managed effectively, public debt can provide additional resources to advance the country's socio-economic development in a timely, efficient, and sustainable manner. Conversely, poor management of public debt can pose risks such as future debt burdens, financial crises, and adverse effects on macroeconomic stability and sustainable socio-economic progress. This article examines various aspects of public debt and its management in relation to sustainable economic development in Vietnam during the period from 2018 to 2023.***

• Keywords: *public debt, sustainable development.*

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1. Public debt and the impact of public debt management on sustainable economic development

According to the World Bank and the International Monetary Fund, public debt broadly encompasses the debt obligations of the public sector, including those of the central government, local governments, the central bank, and independent organizations. Independent organizations are defined as entities whose operating capital is determined by the state budget or whose state ownership exceeds 50%; in the event of default by these organizations, the state is responsible for repaying the debt. More narrowly, public debt includes the debt obligations of the central government, local governments, and the debt of independent organizations that is guaranteed by the government. The definition of public debt varies by country, depending on economic and political institutions. In most countries, public debt management laws define public debt to include both government debt and debt guaranteed by the government.

In Vietnam, the Public Debt Management Law No. 20/2017/QH14 stipulates that public debt includes government debt, debt guaranteed by the government, and local government debt. Government debt refers to obligations arising from domestic and foreign loans contracted or issued in the name of the state or government. Debt guaranteed by the government pertains to loans taken by enterprises or state policy banks, with repayment guaranteed by the government. Local government debt consists of obligations incurred from loans obtained by provincial People's Committees. Government guarantees are formal commitments by the government to repay the principal and interest in the event that the borrower fails to meet their repayment obligations when due.

Public debt and its management have significant implications for sustainable economic development, both positive and negative. When public debt remains within fiscal discipline limits, is aligned with domestic and international contexts, and is allocated and utilized efficiently, it supports the sustainability of national finances and macroeconomic stability, thereby fostering growth and economic restructuring toward sustainable development. Conversely, public debt that exceeds fiscal discipline limits or is poorly allocated and managed poses risks that can undermine the sustainability of national finances, macroeconomic stability, growth, and sustainable economic development.

2. Some results of public debt management

First, the legal framework for public debt and its management has been enhanced to better align with Vietnam's specific conditions and international best practices. This advancement has been marked by key legislative measures including Resolution No. 07-NQ/TW dated November 18, 2016, from the Politburo, the Public Debt Management Law No. 20/2017/QH14, National Assembly Resolution No. 23/2021/QH15,

* *Academy of Finance*

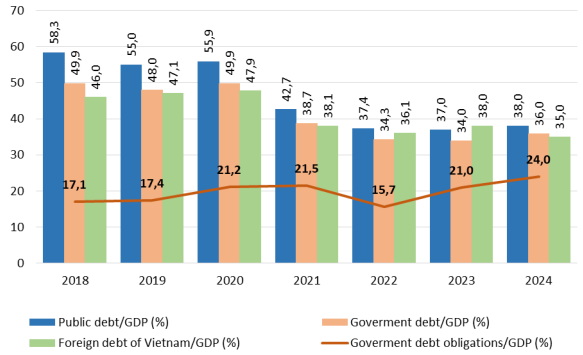
and Prime Minister's Decision No. 460/QĐ-TTg dated April 14, 2024, among others. Additionally, decrees guiding the implementation of the 2017 Public Debt Management Law have been issued comprehensively, reflecting Vietnam's unique context while adhering to international best practices. These include regulations on the issuance, registration, custody, listing, and trading of government debt instruments on the stock market, local government debt management, the re-lending of ODA loans and government concessional loans, management and use of ODA and concessional loans from foreign donors, government guarantees, and the management of the Debt Repayment Accumulation Fund. The legal framework also covers the centralization of public debt management, annual borrowing and debt repayment limits, the three-year debt management program, and public debt warning thresholds according to international standards. This framework has effectively institutionalized the Party and State's policies on public debt and its management, contributing positively to macroeconomic stability and sustainable economic development.

Second, the borrowing situation and public debt structure have undergone significant positive changes, which have contributed to ensuring the safety and sustainability of public debt, expanding fiscal policy space to respond to economic fluctuations, and promoting growth and sustainable economic development.

Borrowing and debt repayment plans have been periodically and seriously implemented by central and local agencies and promptly reported to the National Assembly every October. Local governments are responsible for assessing their needs, balancing resources, and planning the repayment of ODA and concessional foreign loans within their public investment plans and five-year financial plans. Local governments borrow foreign loans from the government at appropriate rates, in line with budget regulations during each three-year stability period and the five-year financial plan, sharing the repayment burden and maintaining public debt safety limits between central and local budgets. The repayment of government loans has been managed rigorously, with no overdue debt, thus avoiding breaches of commitments to investors and contributing to an improved national credit rating.

During the 2018-2023 period, public debt borrowing mobilized significant funds, totaling nearly VND 1,320 trillion from 2021 to 2023 alone, which represented almost 43% of the 2021-2025 plan. The central government borrowed approximately VND 1,280 trillion for socio-economic development programs and projects. This borrowing has positively impacted the development of the country's socio-economic infrastructure, particularly transport infrastructure, thereby increasing aggregate demand, attracting domestic and foreign investment, and fostering growth and economic restructuring toward sustainable development.

Chart 1. Public debt, foreign debt, government debt and government debt obligations in Vietnam from 2018 to 2024



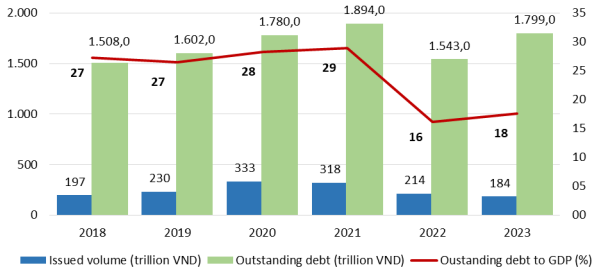
Source: Public Debt Bulletin No. 17 (January 2024) and data from the Ministry of Finance

The absolute public debt balance at the end of 2023 stood at approximately VND 4,000 trillion, reflecting a 17.34% increase compared to 2018. Despite this increase, public debt management has been conducted with strict prudence and has gradually undergone restructuring to ensure safety, sustainability, and efficiency. As a result, the ratio of public debt and government debt to GDP has shown a downward trend. Government debt obligations relative to state budget revenue remained within permissible limits. By the end of 2023, public debt was approximately 37% of GDP, and it is projected to reach about 38% of GDP in 2024, well below the 60% ceiling established by the National Assembly. Government debt at the end of 2023 was around 34% of GDP and is expected to be 36% of GDP in 2024, significantly lower than the 50% ceiling. In international comparisons, Vietnam's public debt ratio is considerably lower than the 2023 average for countries with a BB credit rating (52.8% of GDP) and those with a BBB rating (54.9% of GDP), despite Vietnam's credit rating being one notch below the BBB rating.

The structure of public debt has shifted positively. In 2023, domestic debt increased to approximately 71%, while foreign debt decreased to about 39% of government debt, thereby reducing exchange rate risks. Domestic debt is predominantly composed

of long-term government bonds, which mitigates refinancing risks. By the end of 2023, the listed government bond debt balance on the market reached VND 1,799 trillion, representing a 16.58% increase compared to the end of 2022. The average issuance term of government bonds in 2023 was around 12.5 years, exceeding the target set by Resolution No. 23/2021/QH15 on the National Financial Plan and Public Debt Borrowing and Repayment Plan for the 2021-2025 period. The issuance interest rate for government bonds was carefully managed to align with monetary policy operations. In 2023, the average issuance interest rate for government bonds was around 3.3% per year, a decrease of 0.18 percentage points compared to 2022, despite global interest rates continuing to rise.

Chart 2. Government bond issuance in Vietnam from 2018 to 2023



Source: Compiled from Ministry of Finance data

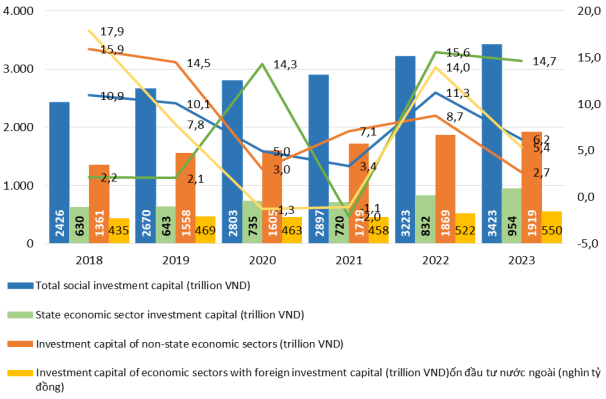
Government-guaranteed borrowing and debt repayment in 2023 adhered to approved limits, with total outstanding guarantees as of December 31, 2023, amounting to approximately VND 280 trillion, or about 2.7% of GDP, a reduction of VND 18 trillion from 2022. The structure of external debt also shifted, with self-borrowing and self-repayment by enterprises and credit institutions increasing from 61.4% in 2021 to 70.7% in 2023, while government and government-guaranteed foreign borrowing decreased from 38.6% in 2021 to 29.3% in 2023.

Third, management and use of public debt.

In Vietnam, borrowing by the government and provincial-level local governments is primarily used to address budget deficits for development investment and repayment of loan principal. The management and utilization of public debt are closely linked to investment in the state economic sector and public investment.

The total investment capital of the entire society increased by an average of 8.22% per year, with capital in the state economic sector growing by 10.29%. During the 2018-2023 period, the proportion of state economic sector investment in total social investment fluctuated between 24.08% and 27.87%. Public debt borrowing has been crucial in ensuring the availability of capital for public investment, particularly for investment in the state economic sector and socio-economic development, especially during the period affected by the COVID-19 pandemic and its aftermath.

Chart 3. State Economic Investment in Total Social Investment from 2018 to 2023



Source: Compiled from the 2023 Statistical Yearbook, Statistics Publishing House

Throughout the 2018-2023 period, laws and policies related to the decentralization and management of public investment have been progressively refined. Responsibilities for investment decisions and project ownership have been clearly defined. Inspections and audits have been strengthened to ensure the effective use of investment funds from the state budget, government bonds, ODA, and state investment credits. The allocation of public investment capital has adhered to clear principles, criteria, and distribution standards, ensuring a balanced allocation of investment capital among ministries, central agencies, sectors, and fields. Central budget capital has been supplemented with targeted funding for localities, prioritizing investments in national target programs, major national projects, expressways, high-speed rail projects, urban rail projects, regional connectivity projects, and projects with inter-regional impacts that foster rapid and sustainable socio-economic development. This includes programs and projects related to national defense, security, justice, science and technology, innovation, digital infrastructure, education, high-quality workforce training, public health, and environmental protection.

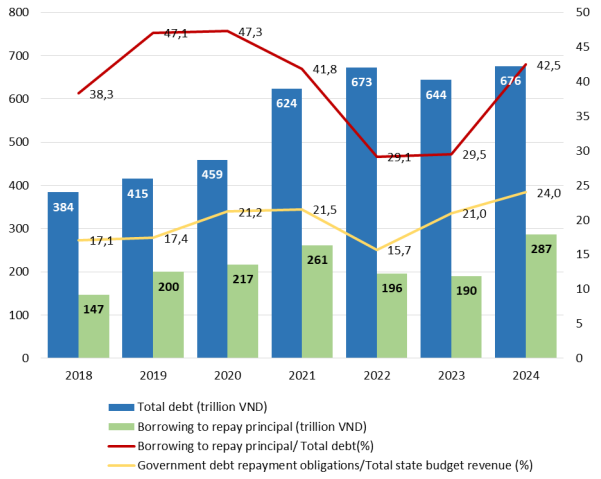
As a result, public investment has had a positive impact by creating a spillover effect that stimulates investment in the non-state economic sector and foreign-invested sector. This has significantly contributed to promoting growth and sustainable

economic development.

3. Some issues in public debt management

First, the government's direct debt obligations and borrowing for principal repayment are showing an upward trend, putting increasing pressure on the state budget. This creates challenges in balancing the need to ensure timely principal repayments while maintaining public debt safety. Additionally, it limits the fiscal space available for implementing fiscal policies aimed at stabilizing the macroeconomy, promoting growth, and achieving sustainable economic development.

Chart 4. Government debt obligations and principal repayment from 2018 to 2024 in Vietnam



Source: *Compiled from public debt borrowing and repayment plans for the years 2018-2024*

Second, the slow progress in project implementation and the low rate of public investment disbursement have adversely affected the effectiveness of public investment. This inefficiency leads to resource wastage and negatively impacts fiscal and monetary policies, macroeconomic stability, and efforts to promote sustainable economic growth and development.

Government and provincial-level local government borrowing is intended to cover budget deficits for development investment and principal repayment. The effectiveness of public investment is crucial for the optimal utilization of public debt funds. However, recent years have seen sluggish progress in project implementation and low disbursement rates for public investment. This has diminished the effectiveness of public investment, led to resource wastage, and reduced the positive spillover effects on growth and sustainable development.

Annual budget settlement data from 2018 to 2022 reveals significant budget carryovers, with public investment fund disbursement remaining very slow. Meanwhile, the budget has had to borrow to cover deficits and incur interest and commitment fees. The disbursement rate of the public investment plan as of January 31 of the following year was 73.41% in 2018, 70.80% in 2019, 82.8% in 2020, 76.78% in 2021, 83.50% in 2022, and 93.5% in 2023. Particularly, the disbursement of ODA and foreign concessional loans has been very slow, often failing to meet estimates. The cumulative disbursement of public investment funds was 32.85% of the plan in 2021 and 45.45% in 2022.

The slow disbursement of public investment funds is attributed to various objective and subjective factors, including: delays in the allocation of detailed capital plans by ministries and localities, difficulties in land clearance, lack of counterpart funds for compensation, delays and issues in bidding and contract execution, insufficient project preparation quality, issues with project adjustments and investment policy changes, lengthy design, appraisal, and approval procedures, and frequent project and loan agreement adjustments, with an average of about 20-30 projects or loan agreements processed annually.

Third, while public debt management in Vietnam is linked with fiscal and monetary policies, current practices predominantly focus on mobilizing concessional loans. International best practices in debt management, such as comprehensive monitoring and assessment of all loans and debt transactions according to risk parameters, risk monitoring of the entire government debt portfolio, integration of treasury management with public debt management, and the establishment of a shared database on public debt, have not been fully implemented.

4. Enhancing public debt management to promote sustainable economic growth and development by 2030

Firstly, enhance the institutional framework and policies on public debt management.

Continue to improve the regulatory framework and policies for public debt management. Promote proactive debt management tools and techniques to ensure the safety and sustainability of the national financial system.

Align budget management and public debt management closely with treasury management to improve the effectiveness of state financial resource management. Strictly oversee budget deficits and borrowing, ensuring that expenditures are directed toward development investments and that borrowing remains within repayment capacities.

Implement proactive debt management approaches based on international best practices. Develop soft warning indicators combined with hard limits appropriate for the level of socio-economic development to control public and private sector debt. Distinguish between the management of foreign debt in the public and private sectors and establish reasonable foreign debt ceilings within total public debt. Enhance risk management of government debt portfolios and balance the debt portfolio between domestic and foreign debt.

Create a database and apply statistical principles in line with international best practices. Utilize information technology in public debt management and proactively forecast and develop policy response plans for scenarios when debt indicators approach safety thresholds.

***Secondly*,** mobilize funds for the state budget and development investments with reasonable costs and risks; improve the debt portfolio structure.

Explore a variety of domestic and international funding sources and borrowing methods with appropriate maturities to meet the government's long- and medium-term financial needs.

Develop a range of financial products and market instruments to cater to investor demand. Promote the issuance of green bonds to fund environmental protection projects supporting sustainable economic development.

Proactively issue and manage the government bond portfolio to ensure that its volume, structure, and maturity align with strategic objectives, debt management programs, and government borrowing and repayment plans.

Work closely with fiscal and monetary authorities to stabilize interest rates, supporting state budget mobilization and government bond market development.

Reform mechanisms for mobilizing official development assistance (ODA) and concessional foreign loans to fund key infrastructure projects with significant spillover effects that support regional and national socio-economic development. Prioritize long-term, low-interest loans with substantial grant components.

***Thirdly*,** enhance the effectiveness of debt management and utilization, with a focus on debt repayment responsibility.

Ensure that debt funds are used exclusively for development investments, targeting national programs, key projects, and initiatives that enhance economic competitiveness and inter-regional connectivity.

Allocate sufficient resources for timely and complete debt repayment, aiming to gradually improve the national credit rating. Restructure debt to ensure sustainability and improve debt safety indicators. Rigorously manage and control government contingent liabilities.

Manage ODA and concessional loans from foreign donors in conjunction with public investment restructuring. Evaluate loans for economic efficiency, financial planning, and impact on medium-term investment plans, public debt indicators, budget, and repayment capacity. Focus foreign loans on key areas to maximize economic efficiency and support sustainable growth. Prioritize loans for projects with revenue recovery potential.

***Fourthly*,** strictly control contingent liabilities.

Guarantee that there are sufficient sources for debt repayment covered by government guarantees. Manage guarantees within regulatory limits, prioritizing funding for key national projects. Control the growth rate of government guarantees to not exceed the GDP growth rate of the previous year. Prioritize infrastructure projects with spillover effects and revenue potential for loan repayment.

***Fifthly*,** manage foreign debt of self-borrowing and self-repaying enterprises and credit institutions.

Strictly oversee the foreign debt of self-borrowing and self-repaying enterprises and credit institutions to ensure that national foreign debt indicators remain within permissible limits. Innovate management methods to fit the nature of short-term, medium-term, and long-term loans and associated risk levels. Enhance the institutional framework to apply measures for controlling foreign capital flows in accordance with international practices.

References:

Trâm Anh (2024), Public Debt Well Below the Ceiling, Debt Structure Showing Positive Changes, Vneconomy Electronic Journal, https://vneconomy.vn/no-cong-cach-xa-muc-tran-co-cau-no-chuyen -bien-tich-cuc.htm, January 30, 2024.

The Political Bureau (2016), Resolution No. 07-NQ/TW on the Policy and Measures to Restructure the State Budget and Manage Public Debt to Ensure National Financial Stability and Sustainability.

Ministry of Finance (2024), Public Debt Report No. 17 (T1-2024).

Kỳ Phong (2024), By the End of 2023, Vietnam's Foreign Debt Estimated at 3.8 Trillion VND, Vneconomy Electronic Journal, Vneconomy https://vneconomy.vn/den-cuoi-nam-2023-no-nuoc-ngoai-cua-viet-nam-khoang-3-8-trieu-ty-dong.htm, October 24, 2023.

Prime Minister (2018), Decision No. 437/QD-TTg on the Government's Borrowing and Repayment Plan and Debt Limits for 2018.

Prime Minister (2019-2024), Various Decisions No. 952, 1130, 856, 1869, 448, 458, 260, Approval of the 3-Year Public Debt Management Program and Annual Borrowing and Repayment Plans for 2019-2024.

Prime Minister (2022), Decision No. 468/QD-TTg Approving the Financial Strategy until 2030.

Prime Minister (2022), Decision No. 460/QD-TTg Approving the Public Debt Strategy until 2030.

General Statistics Office (2023), Statistical Yearbook 2023, Statistical Publishing House.

National Assembly (2017), Law No. 20/2017/QH14 on Public Debt Management.

National Assembly (2021), Resolution No. 23/2021/QH15 on the National Financial Plan and Borrowing and Repayment of Public Debt for the 2021-2025 Period.

National Assembly (2023), National Financial Plan and Borrowing and Repayment of Public Debt Achieve Set Goals, Electronic Information Portal, https://quochoi.vn/pages/tim-kiem.aspx?ItemID=81235, October 23, 2023.

FISCAL MULTIPLIER IN VIETNAM: SVAR APPROACH

Assoc.Prof.PhD. Vu Sy Cuong* - PhD. Luu Huyen Trang**

Abstract: ***Fiscal policy is used by the Vietnamese government to intervene in the economy. The study will analyse the impact of fiscal policy through the fiscal multiplier and examine how changes in government revenues and expenditures affect economic growth. Through the SVAR model with annual data, the results show that the long-term cumulative spending multiplier is positive and that of revenue is negative, and both have a value less than 1 (public spending multiplier: 0.62 and revenue multiplier: -0.22). This sugggest that the government should continue to increase public spending and taxe cuts to boost the economy. However, the effectiveness of fiscal policy is not as high as expected. The results show that short-term tax cuts have a more positive impact on the GDP of Vietnam than public spending increases. Nevertheless, the acticle demonstrate that increasing public spending is more effective than tax and fee reduction policies in the long term.***

• Keywords: *fiscal multiplier, fiscal policy, GDP growth, government spending, government revenue.*

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1. Introduction

Fiscal policy is an instrument used by many countries to overcome economic crises and create long-term growth stimuli for the economy. However, there is still much debate about the effectiveness of fiscal policy. The tax multiplier and the government spending multiplier are a quantitative measure of the change in output when the government increases or decreases taxes or government spending. This is considered as an important measure of the efficiency of fiscal policy in managing output fluctuations. A spending multiplier of more than 1 means that government spending can boost economic activity and final output more than the initial impact. A multiplier below 1 means that the initial increase in output is higher than the final output, which is due to the influence of a factor that reduces the effect of spending. These reversal effects are often due to the impairment of private investment activity and the fiscal impact of higher imports, which lead to a decline in production.

Although many efforts have been made to stimulate the economy through fiscal support packages, many studies show the limited impact of support packages on economic recovery and promotion in developed countries. In developing countries, on the other hand, the practical results show that the use of fiscal policy to overcome the consequences of the 2008-2009 financial crisis and the Covid-19 period was effective, as evidenced by the rapid and stable recovery of the economies. The crisis forced governments to intervene strongly through tax cuts and spending increase programs around the world to prevent a global deflation scenario (Hall, 2009, 2009; Lee et al., 2009; Spilimbergo et al., 2009). However, it remains difficult to estimate the role of spending multipliers for both developed and emerging economies, and the size of the multipliers remains uncertain (Blanchard and Leigh, 2013).

In Vietnam, fiscal policy is used by the government to promote sustained and sustainable economic growth, full and productive employment, especially in the global financial crisis (2008-2009) as well as in the period of Covid-19 pandemic. Many studies have also shown the role of fiscal policy in the economy, such as solving employment problems, increasing income and production. However, there is still a lack of quantitative research into the impact of fiscal policy on the economy. In this study, the author will analyze the role of fiscal policy through the fiscal multiplier and examine how changes in government revenues and expenditures affect economic growth. The remaining content of the study focuses on (i) Literature review, (ii) Methodology and Data (iii) Results and discussion, (iv) Conculsions.

2. Literature review

The fiscal multiplier measures the elasticity of production to changes in spending or taxes. The economic schools argue differently about the size of the fiscal multiplier. According to the classical Keynesian economic model, consumers and producers are slow to respond to price signals, especially during recessions, and government spending allows firms with limited demand to increase production.

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This increases income throughout the economy and reduces the unemployment rate. Households use some of the increased income, then consumption increases, income and jobs continue to be created for the economy. If this process continues, the cumulative effect on production can drive the value of the fiscal multiplier above 1. For the government, another way to stimulate demand is to reduce taxes. If taxes are lowered, householde and companies have more financial resources, which increases spending and investment and boosts economic activity.

Neoclassical economics, on the other hand, does not take the multiplier effect seriously. According to the standard neoclassical model, consumers and producers react quickly to price signals; higher spending forces the state to borrow, which leads to higher market interest rates, which in turn trigger private investment projects and reduce the effect of fiscal policy. Ricardian Equivalence Theory (Barro, 1996) assumes that households assume that higher government spending will lead to higher tax liabilities in the future, reducing their income. Households may cut back on modern consumption, reducing the fiscal multiplier to zero. If households decide to work more, output increases, the fiscal multiplier is positive but less than 1, so the negative impact on income reduces current consumption.

Even with Keynesian economic models, different economic structures can lead to different fiscal multipliers (Batini et al., 2014). Countries with low market openness, for example, tend to have higher spending multipliers, as demand is less likely to escape through imports. Fixed wages increase the responsiveness of output to fiscal shocks. A fixed exchange rate can lead to an increase in the fiscal multiplier, as exchange rate fluctuations can offset the impact of fiscal policy on the economy. The multiplier is also likely to be lower if tax revenues fail to materialize and inefficient spending limits the impact of fiscal policy on output.

In addition to the structural characteristics mentioned above, the size of the fiscal multiplier also depends on a number of temporal factors that reflect economic conditions (Farhi and Werning, 2016). One of these factors is the state of the business cycle. The impact of the fiscal multiplier is thought to be greater in recessions than in economic booms - although some recent empirical evidence suggests that the real value of the fiscal multiplier is higher in times of economic expansion than in times of recession (Ramey, 2019). A fiscal push is often less effective in a period of expansion, as an increase in public sector demand can crowd out private sector demand when the economy is closer to its potential. Fiscal tightening leads to a decline in output as credit-constrained institutions cannot borrow to meet spending needs. It is also important to note that economic contraction has a greater effect on the multiplier than periods of growth, for example, the multiplier increases more during a recession than it decreases during an economic expansion (Batini et al., 2014).

A time factor that affects the size of the fiscal multiplier is the degree of monetary policy adjustment to fiscal shocks. In an environment where nominal interest rates reach zero, fiscal instruments become effective as the investment crowding out effect of higher interest rates disappears and the economy is now operating above potential (Woodford, 2010; Christiano, Eichenbaum and Rebelo, 2011; Cloyne, Jordà and Taylor, 2020).

There are several empirical studies on spending multipliers, with most studies focusing on industrialized countries. Empirical studies show that government spending multipliers in developed countries such as the United States are generally less than 1 or vary between 0.6 and 1.2 (Ramey, 2011). Barro (2009) assumes that the multiplier in the USA is around 0. Ramey's survey (2019) concludes that most estimates of government spending multipliers are between 0.6 and 0.8 or up to 1.0.

These studies use time series analysis (structural autoregressive models of SVARs in a single country or a group of countries) or dynamic equilibrium models (DSGE). The study also finds evidence of spending multipliers greater than 1.0 during recessions or downturns, even if the multipliers are not sufficient to stimulate the economy and are higher than in times when monetary policy adjusts fiscal tools (e.g. in times of war or when interest rates are below zero). On the other hand, based on a survey of US studies, Whalen and Reichling (2015) document a cumulative spending multiplier of four quarters for state transfer payments to national and local governments. The mean value for infrastructure investments can reach 2.4. The finding that public investment has a higher fiscal multiplier than government spending is also confirmed by Alloza, Burriel and Pérez (2019), who argue that the cumulative four-quarter multiplier of investment in the EU region is 1.91 and the eight-quarter multiplier is 3.17.

Ramey (2019) also provides an empirical estimate of the cumulative tax multiplier (the largest within the first five years), which results in a multiplier of at least -2.0 to -3.0, which is much higher than the value of spending, contrary to what theory suggests. However, Ramey also notes that the tax multiplier estimated in the DSGE model is below 1.0 and never above 1.5 (in absolute value). Like the results reported in empirical studies, tax multipliers, unlike countercyclical spending multipliers, are procyclical, i.e. the real value of the tax multiplier is larger during economic expansions than during recessions.

While most empirical studies on fiscal multipliers focus on industrialized countries, there are also some studies on developing countries. Compared to developed countries, there is a strong argument that the fiscal multiplier is larger in developing countries, but there are also arguments that the multiplier is smaller (Batini et al., 2014). Reasons for calculating a larger fiscal multiplier in developing countries include greater liquidity constraints, less effective monetary policy responses and transmission, inefffective self-stabilizing instruments, low public debt, severe economic recession (such as higher unemployment and underemployment). The reasons for a lower fiscal multiplier in developing countries include larger savings reserves due to an increasingly unstable macroeconomic environment and poor revenue and expenditure management. As a result, the credibility of fiscal policy is lower despite high interest rates and small, open economies. In industrialized countries, on the other hand, resources are optimized, markets are often complete and function effectively.

Batini et al. (2014) provided an overview of empirical studies on lock-in multipliers in developing countries, including Asia, Latin America and the Caribbean, the Middle East, the EU and Africa. Most estimates of the first-year general government expenditure multiplier, including those in developing Asian economies, are between 0.1 and 0.5, a result that holds for both cases. This result is much lower than that of the industrialized countries. A notable exception is the estimate for the People's Republic of China with an expenditure multiplier of more than 2.0 (Wang and Wen, 2013). The expenditure multiplier for oil-exporting countries is also around 1.0. Similar to developed countries, the multiplier for public investment in developing countries is higher than the general expenditure multiplier, as found by Rafiq and Zeufack (2012) in the case of Malaysia, namely 2.7 in recessions and 2.0 in growth periods. In the case of the tax multiplier, the average estimate from the 20 studies conducted is 0.26, with more than half of them giving a result of 0. Batini et al. (2014) also show empirical results that suggest that the greater the economic openness and exchange rate flexibility, the smaller the fiscal multiplier.

In Vietnam, there are a few research on fiscal multipliers. The research by Dat and Hoa (2013) using quarterly time series data from 2000 to 2012, calculate the expenditure multiplier. Based simply on the Keynesian expenditure multiplier formula, the result for the expenditure multiplier is 3.29. This study does not distinguish how short- and long-term effect of fiscal policies. The VAR or SVAR model is commonly utilized in international studies to estimate fiscal multipliers, which consider the linear fluctuation of variables over time. This is not established in Dat & Hoa's investigation.

Using SVAR model, our study was conducted to estimate the fiscal multiplier in Vietnam for the period 1990-2022, particularly to answer the question: How does in budget revenues and expenditures affect economic outcome in the sort run and long run?

3. The methodology and data

Like previous studies (Blanchard and Perotti, 2002; Ramey, 2011), the study estimates the fiscal multiplier in Vietnam based on the SVAR regression model and uses time series data from 1990 to 2022. Fiscal policy implementation includes not only the main instruments of expenditure and tax changes but also changes in other budget revenues and expenditures implemented by the Vietnamese government. Therefore, the fiscal multiplier in this study includes the revenue multiplier and the expenditure multiplier (also known as government expenditure) to calculate the response of GDP to fiscal shocks, which is reflected in the results of the impulse responses in the estimations of the SVAR model. The short- and long-term fiscal multipliers are based on a range of responses to fiscal policy shocks.

SVAR models

The fiscal multiplier is estimated on the impulse response of the structural vector autoregressive (SVAR) model assuming a recursive structure. This estimation method was used in the studies by Ilzetzki, Mendoza and Végh (2013) and Blanchard and Perotti, (2002). The original VAR model estimates only two groups of endogenous variables: state-budget expenditure (or state-budget revenue) and GDP. The model can be written as follows:

$$A.Y_t = \sum_{k=1}^{K} C_k Y_{t-k} + \sum_{p=1}^{P} D_p Z_{t-p} + B.\varepsilon_t$$

In which: $Y_{i,t}$ represents a two-dimensional vector comprising budget expenditure (or budget revenues) and GDP in year t. Matrix A represents the simultaneous interaction between the variables and is assumed to be a lower triangular matrix. Similar to the work of Blanchard and Perotti, (2002), the structural hypothesis of the model is based on the observation that fiscal policy can only respond to shocks to output with a lag due to systematic constraints, but fiscal policy can affect output even in the present. The C_k matrix contains the lagged effects of the endogenous variables themselves; D_p contains the influence of the control variables, which are described as exogenous variables in the SVAR model. B is considered as a diagonal matrix, so that the vector ε_t consists of shocks that are randomly distributed and independent of each other with respect to the endogenous variables. The expected value of this vector is 0, $E[\varepsilon,t] = 0$ and $E[\varepsilon_t \times \varepsilon_t]$ is the identity matrix. The estimates of the reduced form of $A^{-1} \times C_k$ and $A^{-1} \times D_p$ are performed using OLS regression.

In addition to the endogenous variables, the model also contains control variables, which are expressed by the vector Z_{t-p}. The control variable included in the model is the inflation rate to control for the effects of monetary policy and changes in GDP.

The control variable also depends on the multiplier estimated in each model. If the multiplier is to determine the response of GDP to budget expenditure, then budget revenues belong to the group of control variables. When calculating the multiplier for budget revenues, expenditure is a control variable.

To determine the multiplier that measures the impact of fiscal shocks on the output variables in the economy, multivariate VAR models are estimated using the endogenous variables budget revenues, expenditure, and GDP together with the control variables described above to ensure a complete description of the economic system. The repulsive responses from the multivariate models were simulated and the corresponding multipliers and the confidence intervals of the multipliers were calculated.

The study uses annual data sets to obtain fiscal multipliers. The annual data set can overcome the quarterly data sets used in previous studies. Fiscal policy has a certain lag, quarterly data does not reflect the entire period of policy effectiveness. In Vietnam, quarterly revenue and expenditure data are often estimates rather than exact figures. Annual data, on the other hand, is the final data of the government's actual tax revenue and expenditure, which will reflect the fluctuations of fiscal instruments during the period of analysis. In addition, quarters are often seasonal, each quarter has different economic characteristics, using annual data solves this problem.

The data set used in the study comprises the total budget revenue and expenditure in the period 1990-2022, which is published in the annual budget statement of the General Statistics Office and the Ministry of Finance. Government expenditure includes development investment expenditure and regular expenditure. Budget revenue, which is used for estimation, is the total budget revenue including taxes, fees, and other revenue, with taxes accounting for most of the revenue. The government's fiscal policy is implemented by adjusting expenditure (including capital expenditure and current expenditure) and adjusting budget revenue (tax revenue and other revenues).

All data except the inflation rate is converted to natural logarithms. The variables in the model include GDP, government expenditure, budget revenue and the inflation rate, which are labeled in the model as follows*: GDP, EXP_BUD, REV_BUD and INF.*

Fiscal multipliers calculation

The impact multiplier (IM) is an index that measures the immediate impact (at time t=1, the time of the shock) when the analyzed fiscal variable increases by one unit, e.g. a change in budget expenditure (EXP_{BUD}) that causes a change in GDP output, $IM = \Delta GDP/(\Delta EXP\_BUD)$. If $IM > 1$, an increase in government spending has a positive effect on the economy, because then economic output increases more than government spending increases. On the contrary, if $IM<1$, the effect of increased government spending is partially reduced, resulting in GDP growth being lower than the increase in government spending.

The variables used in the estimations have the natural logarithm form, and the resulting impulse response functions have the same units. It is necessary to adjust the multiplier calculated directly from the repulsive response functions to obtain the *IM* in multiplier units. The exact value is obtained by dividing the immediate response of GDP to a fiscal shock (change in budget revenue or expenditure) by the average ratio of fiscal variables to GDP in the

VAR model estimation sample. In the formula below, ΔGDP_1 and Δex_bud_1 are derived from the impulse response at time t=1 or at the time the shock occurs.

$$IM = {}^{\Delta GDP_1}/_{\Delta EX\_BUD_1} = \frac{\Delta gdp_1}{\Delta ex\_bud_1} \div \frac{\overline{EX\_BUD}}{\overline{GDP}}$$

The cumulative multiplier (CM) is calculated as the cumulative effect on GDP divided by the cumulative change in government expenditure after the shock:

$$CM = {}^{\Sigma_j \Delta GDP_j}/_{\Delta EX_{BUD_j}}$$

In order to correct the ratio calculated from the cumulative impulse response and to obtain the cumulative multiplier in appropriate units, the ratio of average expenditure to average GDP in the sample is used.

$$IM == \frac{\Sigma_{j=1}^{J} \Delta GDP_j}{\Sigma_{j=1}^{J} \Delta EX\_BUD_j} = \frac{\Sigma_{j=1}^{J} \Delta gdp_j}{\Sigma_{j=1}^{J} \Delta ex\_bud_j} \div \frac{\overline{EX\_BUD}}{\overline{GDP}}$$

The long-term multiplier is defined as the cumulative multiplier when j→∞, but in reality the number of cycles required for the multiplier to stabilize is at the long-term value. In this study, a long-term time horizon of 33 years was set for all stable multipliers. The multipliers are the average values of the simulations. In all cases, this average is approximated by direct point estimates from the model.

4. Result discussion

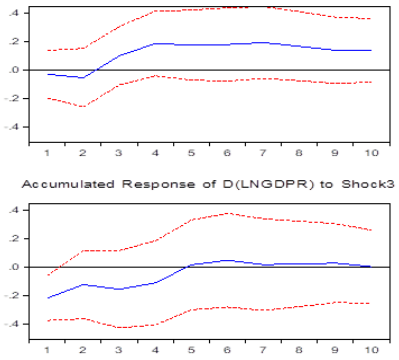
After testing the validity of the variables, the article uses the SVAR technique to estimate the model. ADF and Phillips Perron tests indicate that the most of variable is I(0). When the first difference is applied to GDP, all tests agrees in stationarity at this level (see annex 1). After regression, the study also tested the stability of the SVAR model. A necessary condition for stability of a SVAR system is that all characteristic roots lie within the unit circle (see annex 2).

We will first assess the impact of fiscal shocks on output through SVAR model to get the impulse response in short-term of individual variables. Based on SVAR results, to obtain a comprehensive picture of the interaction of fiscal shocks, fiscal multipliers are estimated using multivariate SVAR regression models. The order of the endogenous variables is based on the studies of Blanchard and Perotti (2002). An important feature of this simulation is that the impulse-response functions take into account all dynamic interactions between the endogenous variables in the model.

The fiscal multipliers in this section provide a comprehensive view of the impact of fiscal shocks, as the fiscal variables interact immediately and dynamically with each other and with GDP. Therefore, the effect of fiscal variables on output includes the dynamic interaction of the shock variables with other variables as the effects of the initial shock propagate throughout the economy. Budget revenues can affect budget expenditure and GDP. Budget expenditure impacts on GDP.

The results using accumulated response of variables are summarized below (in Figure 1). Since the variables are analyzed in logarithmic form, the results of SVAR impulse responses also indicate the size of the fiscal multipliers (not adjusted).

Figure 1: Fiscal multipliers taking into account interaction of variables



Source: Author's calculations

The solid line in the center shows the magnitude of the fiscal multiplier over 33 years, and the dashed lines on both sides show the 95% confidence interval. The shock 2 is the shock of public expenditure, subsequently, it is the shock of public revenue (the shock 3).

The article uses the fiscal multiplier calculation as described in the previous section. The results of expenditure and taxe multiplier are presented in the Table 1. It shows long-term impact of fiscal multiplier from SVAR model, in the first two years, the expenditure policy has negative impact on GDP but at modest level. That is because of time lag of fiscal policy, most of the change in public expenditure is capital spending which comes into effect after a certain period of time. In the 3rd year onward, the public expenditure shows its effect when the multiplier is approximately 1. The multiplier slightly decrease from the 8th year onward. In average, the spending multiplier of 10 year-period is 0.62 in the long-run, implying that the effect of shock in

public expenditure accompanying the increase in public investment, which contributes further to the expansion of GDP. This result is in line with the findings by Gonzalez-Garcia, Lemus and Mrkaic (2013). The spending multiplier is less than 1 means that the initial increase in GDP is eroded by crowding out effects.

Table 1: Sort term and long-term impact of fiscal multiplier from SVAR model

	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
Expenditure										
SVAR	-.0282	-.0522	.1012	.1863	.1753	.1799	.1932	.1670	.1389	.1387
Fiscal multiplier*	**-.1457**	**-.2700**	**.5232**	**.9629**	**.9060**	**.9299**	**.9987**	**.8634**	**.7180**	**.7170**
Revenue										
SVAR	-.2157	-.1215	-.1542	-.1095	.0167	.0487	.0183	.0226	.0283	.0035
Fiscal multiplier*	**-1.031**	**-.5807**	**-.7366**	**-.5233**	**.0796**	**.2329**	**.0875**	**.1079**	**.1354**	**.0166**

(*) Fiscal multipliers are calculated by formula in the section 3

Source: Author's calculations

The multiplier of revenue, on the other hand, shows a negative efect on GDP. In the 1st year, the multiplier is approximately -1 (-1.03), implying that economic activity is able to at least partially recover from the initial effect of extraction of one unit of ouput in the form of budget revenue. In three years later, the revenue multiplier slightly decrease to less than -1 (fluctuating from -0.5 to -0.7). The multiplier of less than -1 means that collection one unit of budget revenue causes a decrease in economic activity larger than one unit. From the 5th year onward, the multiplier of revenue shock turns into positive, the change in revenue cause a reverse effect on the economy. Overall, over the entire 10-year period, the average budget revenue multiplier is -0.22, less than zero, showing the positive effects of reducing government revenue with the economy. This result is consistent with other studies, including Hemming, Kell and Mahfouz (2006) and Kumhof et al., (2009).

The results show that short-term tax cuts have a more positive impact than public spending increases on the GDP of Vietnam. After 4 years, the impact of tax reduction is insignificant. The results also demonstrate that increasing public spending is more effective than tax and fee reduction policies in the long term, in the opposite direction.

Conclusion

Besides other macroeconomic policies, fiscal policy is one of the tools used by the government to manage output fluctuations in the economy. Over the years, along with a combination of other tools, the Vietnamese government has applied many fiscal packages including adjusting both budget revenues and expenditures to respond to economic fluctuations. Specifically, the financial crisis of 2008-2009 and recently the impact of the Covid-19 pandemic.

Changing budget revenues and expenditures helps the government control the level of output in the economy. The estimated fiscal multiplier results help evaluate the impact of fiscal policy during the study period. Through multivariate SVAR regression models, the results show that the long-term cumulative spending multiplier is positive and that of revenue multiplier is negative and both have a value less than 1 (spending multiplier: 0.62 and revenue multiplier: -0.22). It shows that much of the intended impulse ends up expanding the output. Therefore, the government should continue to increase public spending and tax cuts policies when the economy faces difficulties. Nevertheless, the effectiveness of fiscal policy also depends on the policy impementation.

References:

Alloza, M., Burriel, P. and Pérez, J.J. (2019) 'Fiscal policies in the euro area: Revisiting the size of spillovers.', Journals of Macroeconomics, 61(103132).

Barro, R.J. (1996) 'Reflections on Ricardian Equivalence', in NBER Working Paper Series. No. 5502. Massachusetts: National Bureau of Economic Research.

Barro, R.J. (2009) 'Government spending is no free lunch', Wall Street Journal, 22.

Batini, N. et al. (2014) 'Fiscal Multipliers: Size, Determinants, and Use in Macroeconomic Projections', in IMF Technical Notes and Manuals. Washington, DC: International Monetary Fund.

Blanchard, O. and Leigh, D. (2013) 'Growth Forecasts and Fiscal Multipliers', in IMF Working Paper WP/13/1.

Blanchard, O. and Perotti, R. (2002) 'An empirical characterization of the dynamic effects of changes in government spending and taxes on output', the Quarterly Journal of economics, 117(4), pp. 1329–1368.

Christiano, L., Eichenbaum, M. and Rebelo, S. (2011) 'When Is the Government Spending Multiplier Large?', Journal of Political Economy, 119(1), pp. 78–121.

Cloyne, J.S., Jordà, Ò. and Taylor, A.M. (2020) 'Decomposing the Fiscal Multiplier.', in NBER Working Paper Series. Massachusetts: National Bureau of Economic Research (No. 26939).

Dat T.T. and Hoa H.Q. (2013) 'Số nhân chi tiêu của nền kinh tế Việt Nam', Kinh tế & Phát triển, 198 tháng 12/2013.

Farhi, E. and Werning, I. (2016) 'Fiscal multipliers: Liquidity traps and currency unions', In Handbook of macroeconomics. Elsevier, 2, pp. 2417–2492.

Gonzalez-Garcia, M.J., Lemus, M.A. and Mrkaic, M.M. (2013) Fiscal Multipliers in the ECCU. International Monetary Fund.

Hall, R.E. (2009) 'By how much GDP rises if the government buys more output?', National Bureau of Economic Research, (No. w15496).

Hemming, R., Kell, M. and Mahfouz, S. (2006) The Effectiveness of Fiscal Policy in Stimulating Economic Activity: A Review of the Literature. No.02/208. IMF Working Paper.

Ilzetzki, E., Mendoza, E.G. and Végh, C.A. (2013) 'How big (small?) are fiscal multipliers?', Journal of monetary economics, 60(2), pp. 239–254.

Kumhof, M. et al. (2009) Fiscal stimulus to the rescue? Short-run benefits and potential long-run costs of fiscal deficits. International Monetary Fund.

Lee, J. et al. (2009) The Case for Global Fiscal Stimulus1. IMF Staff Position Notes.

Perotti, R. (2004) 'Public investment: another (different) look'.

Rafiq, S. and Zeufack, A. (2012) 'Fiscal multipliers over the growth cycle: evidence from Malaysia', in World Bank Policy Research Working Paper.

Ramey, V.A. (2011) 'Identifying government spending shocks: It's all in the timing', The Quarterly Journal of Economics, 126(1), pp. 1–50.

Ramey, V.A. (2019) 'Ten Years After the Financial Crisis: What Have We Learned from the Renaissance in Fiscal Research?', The Journal of Economic Perspectives, 33(2), pp. 89–114.

Shoag, D. (2010) 'The impact of government spending shocks: Evidence on the multiplier from state pension plan returns', unpublished paper, Harvard University [Preprint].

Spilimbergo, A. et al. (2009) Fiscal Policy for the Crisis. Available at SSRN 1339442.

Wang, X. and Wen, Y. (2013) 'Multiplier effects of government spending: a tale of china', In 2013 meeting papers, 214.

Whalen, C.J. and Reichling, F. (2015) 'The fiscal multiplier and economic policy analysis in the United States', Contemporary Economic Policy, 33(4), pp. 735–746.

Woodford, M. (2010) 'Simple Analytics of the Government Expenditure Multiplier.', in CEPR Discussion Paper. London: Centre for Economic Policy Research. (No. DP7704).

SOLUTIONS TO ATTRACT REMITTANCES, CONTRIBUTING TO THE DEVELOPMENT IN VIETNAM ECONOMY

MA. Pham Quang Truc*

Abstract: ***Remittances have increasingly represented an important source of foreign exchange earnings in developing countries. The contributions of remittances to the economy have made countries change their policies to attract and manage remittances. With teh policy of international intergration, Vietnam has been one of the countries attracting major remittances in the world for more than two decades. Remittances have been contributing significantly to the country's economic development. This paper focuses on analyzing the impact of remittances on economic growth from a macro perspective on both positive and negative aspects. On that basis, the author proposes a number of solutions to contribute to attracting remittances and boosting economic development in Vietnam in the coming time.***

• Keywords: *remittances, foreign exchange, economic development.*

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1. Introduction

In the world, remittances play an important role, contributing to economic and social development as well as improving the effectiveness of the Central Bank's monetary policy administration. Globally, remittance flows are estimated to have increased by 1.6 per cent from USD 843 billion in 2022 to USD 857 billion in 2023 and are projected to grow at a higher rate of 3 per cent in 2024.

In Vietnam, remittances are identified as one of the important resources for socio-economic development, especially in a context where the domestic economy still faces many difficulties. Remittances bring many benefits to people, as well as the country's economy. Remittances are usually sent from overseas Vietnamese or from overseas workers to relatives and families.

With the current situation of many people going abroad to study and work, it is estimated that Vietnam is ranked 10th in the world and is among the top countries receiving the most remittances in the world. However, due to the impact of the COVID-19 pandemic as well as the global economic reccession, the amount of remittances flowing to Vietnam in recent years has been very limited. With that important role, attracting remittances to contribute to promoting economic growth plays a very important role in the current context.

2. Overview of remittances

2.1. Perspectives on remittances

The International Monetary Fund (IMF) defines remittances as the sum of two main components in their Balance of Payments Statistics manual: (1) "Compensation of employees": This refers to income earned by temporary migrant workers in the host country, and the income of workers who are employed by embassies, international organizations and foreign companies (IMF, 2009: 272). (2) "Personal transfers": These are all current transfers in cash or in kind made or received by residents (be it migrants or non-migrants) from or to individuals in other countries ("all current transfers between resident and non-resident individuals" (IMF, 2009: 273).

Currently, Vietnamese law does not specifically stipulate the term and role of remittances. However, remittances can be understood as a source of money moving from people residing or working abroad to their relatives in their homeland.

In other words, remittances are foreign currency sent by people residing abroad to relatives or friends in the country. There are only a few types of assets accepted as remittances, including foreign currencies, papers valued in foreign currency units, gold meeting international standards,...

*** Thuongmai University; email: truc.pq@tmu.edu.vn***

According to current Vietnamese Law, subjects allowed to receive remittances from overseas Vietnamese include: Licensed credit institutions or agents of those credit institutions; Economic organizations are allowed to operate foreign currency services under the permission of the State Bank of Vietnam; The providers of financial and international postal services.

2.2. The role of remittances in national economy

Remittances have many important roles in the national economy, including some basic roles:

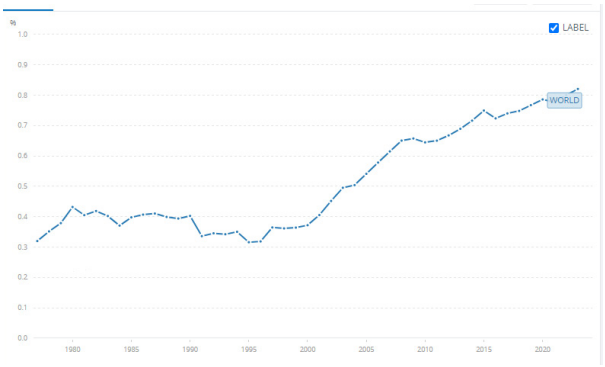
+ Remittances play a role in creating additional resources for the country's economy, helping to reduce imbalances in the balance of payments.

+ Remittances have the effect of balancing the current account, increasing national foreign exchange reserves and minimizing dependence on foreign capital.

+ Remittances helps create more jobs for people through investment and business of overseas Vietnamese.

Figure 1: Personal remittances, received (% of GDP)

(World Bank staff estimates based on IMF balance of payments data, and World Bank and OECD GDP estimate).



Source: World Bank

2.3. The impact of remittances on economic growth

2.3.1. Positive impact

- Remittances are a source of household income, contributing to hunger eradication and poverty reduction, economic growth, and helping to pay for daily life expenses, specifically for consumer goods to raise standard of living; Pay for health and education-related expenses; Support or buy real estate, farms for production...

- Remittances are inherently the direct income of the majority of workers in developing and poor countries, so it has an impact on helping families escape poverty. In other words, in the long term, remittances are a capital flow that helps accumulate profitable assets, increase agricultural productivity, and reduce poverty. Specifically, for developing countries in the Asia Pacific region, if remittances increase by 10%, poverty will be reduced by 2.8% (Ravallion and Chen, 1997). The study of Taylor et al. (2005) about rural areas in Mexico with survey data (in 2002) shows that the relationship between remittances and the poverty gap is negative in the long term.

- Remittances are a source of investment capital, supporting economic development: Remittances are an important financial resource and a source of foreign currency for developing countries, where foreign currency is scarce and the financial market underdeveloped, access to credit capital is limited. Being not an official source of capital shown on the financial balance, compared to other capital flows, but remittance flows are less affected by macroeconomic instability or interest rates, even when capital flows are considered stable as FDI and ODA decrease, private investment withdraws, the remittance flow remains stable, even tends to increase (Dilip Ratha, 2007).

- Remittance flows are considered a direct part of contributing to economic growth through the following channels: (i) Increasing capital accumulation; (ii) Changing the allocation of new capital resources (Chami et al., 2008).

- Remittances are considered an indirect source of investment capital for human resource development such as: (i) Remittance flows for education, medical and health development spending; (ii) Remittances reducing the gap between rich and poor in society, increasing income per capita (Sawada, (2003); Hanson, (2002); Cox - Edwards and Ureta (2003)).

- With the source of remittances attracted, it helps the country receive remittances gradually shift from a labor-based economic development

strategy to a capital-based economic development strategy. In the long term, the quality of the labor force changes will create opportunities for the next generation to access jobs that require more skills with higher salaries (Hoddinott and Francis, 1993), contributing to structural shifts of production and labor in the economy.

- Remittances contribute to supporting the international balance of payments: Remittances are a source of foreign currency revenue for the country; Remittances contribute to compensating the current account deficit and to increasing national foreign exchange reserves in developing countries.

- Remittances create demand for new services and products of the financial system: Money transferring and receiving activities between countries have led to the birth and development of other banking services. Besides, remittances create competition in the commercial banking system, between the official money transfer system and the informal money transfer system. More and more commercial banks are participating in the Western Union and Money Gram money transfer systems. Among commercial banks, there is competition in the quality of money transfer services.

- Remittances promote real estate market development. In fact, remittances can become a source of investment money in the form of bank deposits, and banks use mobilized capital to lend money to housing construction projects. Or households can directly buy shares of housing construction companies, increasing the supply of loan funds and increasing investment capital in the housing sector.

2.3.2. Negative impact

- Remittances increase the tendency to import: Once they earn a lot of money, some people with a tendency to show off and begin to tend to import and consume luxury goods. They can spend a large amount of money to buy expensive household appliances. This causes the demand for imported luxury goods to increase.

- Remittances can destabilize the international balance of payments: The balance of international payments depends on remittances, which is the cause of the international balance of payments crisis and the trigger for economic recession in many developing countries. Only focusing on attracting remittances as a source of compensating for the current account deficit, Some governments do not have a policy of using remittances to become investment capital for economic development (Giuliano, P. and Ruiz). -Arranz, 2006). This will affect long-term sustainable economic growth.

- Remittances can have a negative impact on financial market development: The more the domestic financial market integrates with the international financial market, and the more developed the domestic financial system, the remittances do not have a direct effect as domestic private investment. Remittances can also have negative effects on a country's level of financial development. In principle, remittances will help recipients reduce financial pressure. Therefore, when financial pressure decreases, the demand for credit from those who have received remittances will decrease. This development may have a negative impact on the development of the credit market.

- Remittances can create virtual demand and bubble phenomenon on the real estate: With an increased amount of money from remittances pouring into the real estate market, while real estate supply is low, real estate prices will be pushed up. With attractive profit rates, speculators continue to speculate, using real estate as mortgage at banks to borrow money to invest in other projects. When credit policies are tightened, speculators have difficulty with liquidity, the real estate market freezes, causing bad debt for banks and affecting the development of the real estate market.

- Remittances easily aggravate the problem of dollarization of the economy: In many countries, the Government allows remittance recipients not to have to resell foreign currency to the commercial banking system, so remittance recipients can use foreign currency for investment or spending... creates the initial cause of the dollarization of the economy. The phenomenon of permanent dollarization of the economy is accompanied by the operation of the black foreign exchange market.

- Remittances can be a money laundering channel for illegal activities: To successfully carry out the money laundering process, money launderers often intermingle dirty money with legal sources of money. They will be moved back and forth between business activities with many different accounts, or between domestic accounts and foreign accounts... And of course, criminals can act on behalf of or blend in with regular remittances to transfer money back to the country.

3. Current status of attracting remittances in Vietnam

In Vietnam, remittances are identified as one of the important resources for socio-economic development, especially in the context of domestic economic difficulties. Remittances bring many benefits to the people, as well as the economy of the host country, especially in developing countries (OECD, 2016).

Statistics from the authorities show that remittances continue to flow strongly into Vietnam, despite the difficult times of the global economy. Over the past 30 years, the total amount of remittances transferred domestically has reached about USD 230 billion, equivalent to the amount of foreign direct investment disbursed during this period.

In 2023, many countries have lifted strict immigration measures and relaxed health policies, leading to an increase in the number of Vietnamese people going abroad to work. This contributed to the increase in remittances compared to the COVID-19 pandemic period. In addition, despite facing many difficulties due to high inflation in their home countries, overseas Vietnamese in the UK, US, Canada, Europe... still turn to their homeland to support their relatives and families. According to reports from remittance service providers, in 2023, the amount of remittances sent to Vietnam reach USD 16 billion, an increase of 32.5% compared to 2022.

In the first 6 months of 2024, remittances to Ho Chi Minh City reached USD 5.178 billion, equal to 54.7% compared to the whole year of 2023 and increased by 19.5% over the same period. In Hanoi, in the first 6 months of the year, remittances from abroad transferred through economic units were estimated at USD 30 million. In July 2024 only, remittances from abroad transferred through economic units reached USD 10 million.

According to the Business Association of Overseas Vietnamese (2024), there are currently about 5.5 million Vietnamese people abroad and more than 1 million people are F2, F3 generations with foreign nationality whose parents or grandparents are Vietnamese. There are about 600,000 to 700,000 highly qualified businessmen and intellectuals. Of these, many people, especially those aged 60 and over (accounting for 20%), and many businessmen and intellectuals want to return to their homeland to live, invest, do business, and stay attached to their homeland. Therefore, the potential for remittances to Vietnam is very large.

In order to attract and facilitate the increasing amount of remittances to Vietnam, in recent years, banks and remittance companies such as Vietcombank, Agribank, Sacombank, BIDV... have strongly developed financial services to facilitate trade and international money transfers... The increase in the amount of remittances to Vietnam not only helps banks increase revenue from service activities, but also serves the policy of attracting foreign currency to Vietnam, contributing to increasing the national foreign exchange reserves.

To attract remittance resources, Sacombank Remittance Company cooperates with the world's leading money transfer companies to help customers transfer money quickly and safely. In addition, the company also has many preferential policies for overseas Vietnamese to send money to Vietnam. The amount of remittances transferred through the Company in the past 5 years is more than USD 10 billion. In the first 7 months of 2024, the amount of remittances to Vietnam through this system increased by more than 19% over the same period last year.

4. Recommendations for Vietnam

4.1. For the management agency

- Developing a strong financial market with safe and effective financial institutions, providing a variety of financial services is also very important in attracting and effectively

using remittance flows. It is necessary to direct remittance flows into production and business sectors, good investment channels such as corporate bonds, stocks, etc.

- The Government and management agencies need to continue to create a stable macroeconomic environment, increasingly open investment policies, reform administrative procedures, and create favorable conditions for foreign investors and overseas Vietnamese to invest in the country...

- Implementing transparent monetary and fiscal policies, creating policy confidence for overseas Vietnamese, developing the financial market in general and the stock market in particular in a transparent and sustainable manner to attract remittances to invest in this market.

- Issuing policies to encourage remittances, through encouraging and mobilizing migrants, especially overseas Vietnamese and exported workers, to transfer remittances back to the country for investment and business.

- Issuing policies to develop the labor market, create favorable conditions for loan policies so that the poor can be able to export labor, have opportunities to increase income for their families in the remittance receiving country. Have policies to encourage organizations to expand the labor export market.

- It is necessary to improve the quality of the team participating in exporting foreign labor by training in professional skills and foreign language proficiency.

4.2. For credit institutions

- Continuing to promote the development of overseas remittance services, increase investment in modern technology to process remittance payment transactions, meet the needs of fast and convenient customer service. Remittance procedures should be quite simple and fast.

- Strongly connecting with international organizations and intermediaries providing international payment services; investing in technology; enhancing the efficiency of online money transfer services to activate flexible, safe and smooth remittance flows to Vietnam.

- Expanding the remittance transaction network through partners to connect with overseas Vietnamese around the world.

- Continuing to reduce remittance fees, simplify transaction procedures to increase competitiveness, and attract remittances through informal channels.

- There are many attractive promotions and gifts for senders and recipients of remittances. Encourage recipients of remittances to transfer to VND for savings with attractive interest rates.

5. Conclusion

In recent years, the amount of remittances sent to Vietnam has increased sharply, not only helping banks increase profits from service activities but also serving the policy of attracting foreign currency to Vietnam, supplementing foreign exchange reserves. Along with that, resources from remittances contribute to helping businesses invest in expanding production and business, creating a positive driving force for socio-economic development. The continued strong growth of remittances in recent times shows the confidence of overseas Vietnamese in the stable macroeconomic situation and favorable investment and business environment in the country, along with the mechanisms and policies of the Government and the State Bank of Vietnam on attracting remittances. In addition, the State has also had many policies to facilitate overseas Vietnamese to invest in industries and projects in Vietnam.

References:

Chami, Ralph, Adolfo Barajas, et al.. (2008) "Macroeconomic Consequences of Remittances," IMF Occasional Paper No. 259. (Washington: International Monetary Fund).

Dilip Ratha, "Worker remitances: An important and stable source of external development finance", World Bank 2005.

Do Thi Kim Hao, Dinh Thi Thanh Long (2017). The impact of remittances on economic growth. The e-portal of the State Bank of Vietnam.

Do Thi Thuy (2022). Banks and attracting remittances. Journal of Financial and Monetary Markets No. 7, 2022.

Giuliano, P. and Ruiz-Arranz, M (2009). "Remittances, Financial Development and Growth," IZA Discussion Paper Series 2160.

Hoddinott và Francis, (1993), The Role of Destination, Gender, and Household Composition in Explaining Remittances: An Analysis for the Dominican Sierra, University of California at Berkeley.

International Monetary Fund (2009). Balance of Payments and International Investment Position Manual, 6th edition (BPM6), IMF, Washington, D.C.

International Monetary Fund (2009). International Transactions in Remittances: Guide for Compilers and Users, IMF, Washington, D.C.

Nguyen Anh Tuan (2017). Attracting remittances to Vietnam: Problems and solutions. Electronic information portal of the Institute of Strategy and Financial Policy.

Nguyen Anh Viet (2024). Important resources from remittances. People's Army Electronic Newspaper.

Ravallion, Martin and Shaohua Chen (1997), 'What Can New Survey Data Tell Us about Recent Changes in Distribution and Poverty?', World Bank Economic Review, 11(2), 357-82.

THE VITAL ROLE OF STATE AUDIT IN MONITORING THE 2030 AGENDA: A SPOTLIGHT ON SUSTAINABLE DEVELOPMENT GOALS

PhD. Ha Thi Thuy*

Abstract: ***Since the United Nations (UN) issued 17 sustainable development goals and called on countries to work together to achieve the goal of protecting the planet, protecting the environment and quality of life globally in 2030, Vietnam is one of the countries that become a member of the United Nations committed to implementing the 17 goals that have been included in the 2030 agenda. The goals in the 2030 agenda are good , but how to monitor countries implementing the roadmap correctly and effectively requires the participation and supervision role of the State Audit. This study was conducted to point out the important role and challenges of state audit in helping countries effectively implement the proposed sustainable development goals.***

• Keywords: *sustainable development goals; state audit institutions; Vietnam state audit office; 2030 agenda.*

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1. An overview of sustainable development goals (SDGs)

In 2015, the United Nations member states joined forces to create a roadmap for a better future for all. This ambitious plan, known as the Sustainable Development Goals (SDGs), outlines 17 interconnected goals designed to achieve a world free from poverty, hunger, and inequality, while protecting our planet.

Figure 1: 17 Sustainable development goals

Source: United Nations

The Sustainable Development Goals (SDGs) have a broad scope, encompassing a wide range of social, economic, and environmental issues (United Nations, 2015)

People: Several goals prioritize human well-being and equality. This includes:

* Ending poverty and hunger (Goals 1 & 2): Ensuring everyone has access to basic necessities like food, shelter, and sanitation.

* Promoting good health and education (Goals 3 & 4): Guaranteeing access to quality healthcare, education, and mental well-being for all ages.

* Achieving gender equality (Goal 5): Eliminating discrimination against women and girls and empowering them to reach their full potential.

* Building peaceful and inclusive societies (Goal 16): Promoting peace, justice, and strong institutions for everyone's safety and security.

Planet: Recognizing the importance of a healthy environment, the SDGs address:

* Combating climate change (Goal 13): Taking urgent action to reduce greenhouse gas emissions and adapt to climate impacts.

* Protecting biodiversity and ecosystems (Goals 14 & 15): Conserving our oceans, forests, and other natural resources for future generations.

* Promoting sustainable consumption and production (Goal 12): Shifting towards practices that minimize waste and environmental impact.

Prosperity: The SDGs acknowledge that economic development is essential for achieving sustainability. They aim to:

** University of Economics and Finance Ho Chi Minh City; email: thuyht@uef.edu.vn*

* Foster decent work and economic growth (Goal 8): Creating opportunities for everyone to have secure and fulfilling employment.

* Build resilient infrastructure and promote innovation (Goal 9): Developing infrastructure that can withstand environmental challenges and fostering technological advancements for a sustainable future.

* Reduce inequalities within and among countries (Goal 10): Closing the gap between rich and poor, both within and between nations.

Partnership: The SDGs acknowledge that achieving these goals necessitates collaboration:

* Partnerships for the Goals (Goal 17): Encouraging partnerships between governments, businesses, and civil society organizations to share resources, expertise, and best practices for implementing the SDGs.

2. The role of State Audit in monitoring sustainable development goals

Traditional state audit functions focus on financial accountability. However, for SDGs, their role expands to and likely relate to performance Auditing (INTOSAI Development Initiative, 2017).

Promoting Transparency and Accountability: Audits assess if government policies, programs, and budgets are aligned with the SDGs. This transparency fosters public trust and ensures resources are used efficiently for achieving these goals. Audits can identify potential misuse or misallocation of funds intended for SDG-related projects.

Evaluating Effectiveness and Efficiency: Audits determine if SDG-related programs are being implemented effectively and efficiently. This helps identify areas for improvement and prevents wasted resources. Audits can analyze if programs are truly achieving their intended outcomes in terms of contributing to specific SDGs.

Highlighting Risks and Challenges: Audits can identify potential roadblocks to SDG implementation, such as: Weak governance structures; Corruption; Inadequate data collection on progress. By bringing these issues to light, audits pave the way for corrective measures and improved strategies.

Measuring Progress: Audits provide independent verification of progress made towards achieving the SDGs. This quantitative data is essential for: Tracking progress on specific targets; Identifying areas where further action is needed.

Figure 2: Main role of State audit in monitoring SDGs

Source: Author's Summary

State audit serves as a powerful tool in ensuring successful implementation of the SDGs. By promoting accountability, transparency, and identifying areas for improvement, SAIs play a critical role in achieving the ambitious goals set forth in the 2030 Agenda (Rajaguguk, 2017).

3. Current status of auditing relate to SDGs in some countries

In Brazil: The Brazilian Court of Auditors (TCU) has conducted audits on various SDG-related areas, including: Public education spending and its effectiveness in achieving SDG 4 (Quality Education); Management of water resources and sanitation services, contributing to SDG 6 (Clean Water and Sanitation). During auditing, these audits have identified inefficiencies and made recommendations for improvement, leading to better allocation of resources and progress towards the SDGs.

In Kenya: The Office of the Auditor General (OAG) of Kenya partnered with the United Nations Development Programme (UNDP) to develop a guide for auditing county governments' performance on SDGs. This guide provides a framework for OAG auditors to assess how county governments are integrating the SDGs into their development plans and budgets. It helps ensure resources reach local communities and contribute to achieving the goals.

In India: The Comptroller and Auditor General of India (CAG) has conducted performance audits

on various government programs related to SDGs, such as: The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), which contributes to SDG 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth). The Swachh Bharat Mission (Clean India Mission), which contributes to SDG 6 (Clean Water and Sanitation). After auditing, these audits have highlighted issues like program implementation delays and gaps in targeting beneficiaries. This informs corrective measures and more effective program design to achieve the SDGs.

In Sweden: The Swedish National Audit Office (Riksrevisionen) has conducted audits on the government's integration of the SDGs into its national policies and strategies. After auditing, these audits have assessed how well Sweden's national plans align with the SDGs and identify areas for improvement. This ensures a more cohesive approach to achieving the goals.

4. State Audit Office of Vietnam in monitoring SDGs implementation

4.1. Main areas that Vietnam Sate Audit Office are focusing on

Vietnam recognizes the importance of the SDGs and has made significant strides towards achieving them. The State Audit Office of Vietnam (SAV) plays a crucial role in monitoring and promoting progress through its audit practices. The SAV incorporates SDGs into its audit strategy by focusing on areas directly linked to specific goals including: (1) Education: Audits might assess the efficiency and effectiveness of government spending on education programs, contributing to SDG 4 (Quality Education). (2) Healthcare: Audits could evaluate the management of public healthcare resources and accessibility of services, contributing to SDG 3 (Good Health and Well-being). (3) Poverty Reduction: Audits might examine government programs aimed at poverty alleviation and social safety nets, contributing to SDG 1 (No Poverty). (4) Environmental Protection: Audits could assess environmental regulations and compliance, contributing to SDG 13 (Climate Action) and SDG 15 (Life on Land).

4.2. Positive impacts that Vietnam State Audit Office made.

The SAV's SDG-focused audits have already made a positive impact during conducting audit, like:

Identifying Inefficiencies: Audits have revealed areas where government programs can be streamlined or targeted more effectively to achieve SDG goals.

Promoting Transparency: The SAV's audit reports contribute to transparency by highlighting progress made and areas needing improvement. This fosters public trust and encourages accountability.

5. Challenges in auditing sustainable development goals

While state audits offer a powerful tool for monitoring SDG implementation, there are several challenges SAIs (State Audit Institutions) face:

***First, limited resources*:** Conducting comprehensive audits, especially those encompassing complex topics like the SDGs, requires significant resources. This includes well-trained personnel, advanced data analysis tools, and adequate funding for conducting fieldwork. Many SAIs, particularly in developing countries, face budgetary constraints that limit their capacity to conduct in-depth SDG-focused audits.

***Second, lack of standardized methodologies*:** Currently, there's no single universally accepted methodology for auditing SDG implementation. This can lead to inconsistencies in how SAIs assess progress across different countries. Without standardized approaches, it can be difficult to compare results and share best practices effectively.

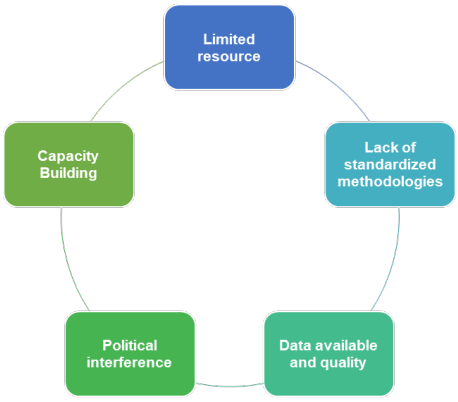
***Third, data availability and quality*:** Effective SDG monitoring relies on robust data collection and analysis. However, data availability and quality can be a major challenge, especially for developing countries. Inconsistent data collection methods, incomplete datasets, and lack of access to disaggregated data (data broken down by specific demographics) can hinder the effectiveness of audits.

***Fourth, political interference*:** In some cases, SAIs might face political pressure that could influence the scope or outcome of their audits. This can undermine the independence and objectivity of the audit process. Ensuring political will and commitment to transparency is crucial for SAIs to function effectively.

***Fifth, capacity building*:** Auditing SDGs requires specialized knowledge and skills beyond traditional financial auditing. SAIs need to invest in training their staff on the intricacies of the SDGs,

social and environmental auditing methodologies, and data analysis techniques.

Figure 3: Main challenges in auditing SDGs implementation



Source: Author's Summary

6. Solutions to the challenges of auditing relate to SDGs implementation

To overcome the challenges that auditors are facing in the process of conducting audits related to sustainable development goals. Here are some potential solutions to address the challenges SAIs face in auditing SDG

***First, about limited resources*:** SAIs can collaborate with international organizations like the World Bank or UN agencies to access technical expertise, funding, and training opportunities. Utilizing data analytics tools and automation can streamline audit processes and improve efficiency. SAIs can also strategically prioritize audits based on national SDG priorities and potential impact.

***Second, about lack of standardized methodologies*:** International organizations like INTOSAI can play a key role in developing and promoting standardized frameworks for SDG auditing. SAIs can participate in knowledge-sharing platforms to exchange best practices in developing and implementing SDG-focused audit methodologies. Developing and testing pilot SDG audit methodologies in specific countries can inform the creation of more standardized approaches.

***Third, about data availability and quality*:** SAIs can work with national statistical agencies to improve data collection methods and ensure the availability of disaggregated data relevant to SDGs. Governments can invest in developing robust data infrastructure to improve data collection, storage, and accessibility for SAIs. SAIs can collaborate with civil society organizations that might possess data on specific SDG targets and challenges.

***Fourth, about political interference*:** Robust legal frameworks can safeguard the independence of SAIs and protect them from political influence. Raising public awareness about the importance of SAIs and their role in promoting transparency and accountability can create a stronger public demand for independent audits. International organizations can advocate for the importance of SAI independence and provide support to SAIs facing political pressure.

***Fifth, about capacity building*:** SAIs can invest in training programs for their staff on the SDGs, social and environmental auditing methodologies, and data analysis techniques. Collaboration with international organizations and SAIs from developed countries can facilitate knowledge exchange and capacity building for auditors in developing countries. Mentoring programs can pair experienced SDG auditors with new staff to facilitate knowledge transfer and skill development.

Conclusion: The ambitious goals outlined in the 2030 Agenda for Sustainable Development require a multifaceted approach. State Audit Institutions (SAIs) play a critical role in ensuring effective implementation of these goals by acting as guardians of accountability and transparency. While SAIs offer a powerful tool, they face challenges like limited resources, lack of standardized methodologies, and political interference. Collaboration with international organizations, capacity building initiatives, and innovative solutions are crucial to overcome these obstacles. Looking ahead, SAIs are likely to embrace technological advancements, further integrate SDG considerations into their work, and strengthen collaboration with stakeholders. This will enhance their ability to monitor progress, promote accountability, and ensure a more sustainable future for all.

References:

Chatterjee S. 2018, "Transforming the World Through Sustainability Efforts," INTOSAI Journal, July

INTOSAI Development Initiative (IDI) 2017, Auditing preparedness for the implementation of the SDGs. A guidance for Supreme Audit Institutions,

Rajaguguk, B. W., Yatnaputra, G. B. T., Paulus, A., 2017, Preparing Supreme Audit Institutions For Sustainable Development Goals, INTOSAI Journal, April.

UNEP 2010, Auditing the Implementation of Multilateral Environmental Agreements (MEAs): A Primer for Auditors, Nairobi.

United Nations 2015, Transforming our world: the 2030 Agenda for Sustainable Development, resolution A/RES/70/1.

https://vietnam.un.org/en/sdgs

https://www.intosai.org/focus-areas/intosai-un-sdgs/sais-a-regions.html

https://sustainabledevelopment.un.org/partnerships/supreme-audit-institutions

SOME RECOMMENDATIONS ON THE IMPLEMENTATION OF THE RESOLUTION NO. 107/2023/QH15 OF THE NATIONAL ASSEMBLY OF VIETNAM ON THE APPLICATION OF TOP-UP TAX UNDER THE GLOBAL ANTI-BASE EROSION RULES

Assoc.Prof.PhD. Le Xuan Truong* - MA. Pham Phuong Ha**

Abstract: ***Vietnam' Government has been preparing the Decree on the elaboration of the Resolution No. 107/2023/QH15 of the National Assembly of Vietnam. This is a must - be step to implement this Resolution. This paper discusses some important issues need to be clarified in the Decree such as need for clear explanation of crucial and new concepts and definitions, description of the MNEs Group within the scope of GloBE rules and their Constituent Entities, assignment of the responsibilities for reporting on consolidated revenue of the MNEs Group, elaboration of the financial accounting standards used for Qualified domestic minimum top-up tax (QDMTT) calculation etc. This paper also gives some suggestions on the preparation for implementing the Resolution, such as: negotiation of the acceptance of other IF countries on the VAS in preparing the CFSs which affect the top-up tax liability of MNEs Groups, identification of the MNEs Groups within the scope of GloBE rules and operating in Vietnam, propaganda and training issues etc.***

• Keywords: *GloBE, minimum top-up tax, model rules.*

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1. Some important issues need to be clarified in the Decree of the Government on the elaboration of the Resolution No. 107/2023/QH15 of the National Assembly of Vietnam

Firstly, *the need for clear explanation of crucial and new concepts and definitions*

The GloBE Rules are new and complex with many definitions and concepts being introduced. Chapter 10 of the Model Rules explains more than 150 essential definitions. Therefore, to understand the content of the regulations, the first requirement is to explain the concepts fully and clearly.

Compared to English-speaking countries, Vietnam encounters difficulties in internalizing the GloBE Rules because English version cannot be used directly, but a Vietnamese version through a good translation is needed. Vietnamese content needs to closely follow the original English version and at the same time is required to be easy to understand. Translation is not an easy task because of the cultural differences among countries in the world. In case of the GloBE Rules, the task even become more difficult because this field is very complicated and many concepts have ever been introduced in Vietnam so far. Hardly to find similar words for some technical terms which have never been used in Vietnam, such as: Tax Transparent Entity, Hybrid Entity, Reverse Hybrid Entity etc.

Moreover, in the GloBE Rules, there are several concepts relating to financial accounting and Country-by-country (CbC) reports. Therefore, it is necessary to compare with the Vietnamese terms in those fields. For example, some financial accounting terms such as deferred tax assets, functional currency, impairment gain or loss etc. are translated into Vietnamese and used in legislative documents on accounting. Therefore, the same Vietnamese terms should be used in the Decree to ensure the consistency in the system of legislative documents.

Secondly, *description of the MNEs Group within the scope of GloBE rules and their Constituent Entities*

The GloBE Rules apply to multinational entity Groups (MNEs Groups) having annual revenue of EUR 750 million or more in the Consolidated Financial Statements (CFS) of the Ultimate Parent Entity (UPE) in at least two of the four Fiscal Years immediately preceding the tested Fiscal Year.

An accurate description on how to determine whether a Group meets the above revenue threshold in specific cases such as Groups with a fiscal year shorter than 12 months, newly established Groups, and split or merged

** Academy of Finance*
*** General Department of Taxation*

Groups should be clarified in the Decree. In addition, it is essential to point out the entities that are excluded from the application of the GloBE Rules, including entities that carry out activities in the public interest, tax-neutral investment vehicles, and certain asset-holding entities controlled by excluded entities.

Thirdly, *assignment of the responsibilities for reporting on consolidated revenue of the MNEs Group*

The revenue to determine whether the Group is subject to the GloBE rules is the revenue on the CFS of the UPE. In cases where the UPE is not in Vietnam, it is difficult to obtain accurate and timely information about its consolidated revenue. Therefore, the taxpayers are responsible for providing information about the revenue of the ultimate parent company.

Besides, tax administrators should be assign to check the authenticity of information provided by taxpayers. It is the responsibility of tax administrations to obtain international information sources to identify MNEs Groups with constituent entities in Vietnam that are subject to the GloBE Rules.

Fourthly, *elaboration of the financial accounting standards used for Qualified domestic minimum top-up tax (QDMTT) calculation*

The Model Rules allow countries to use the local accounting standards applicable to the constituent entities when determining the net income or loss of a constituent entity. For Vietnam, Vietnamese accounting standards (VAS) is the accounting standard. Further guidance is provided by the Model Rules on the use of accounting standards as there are additional accounting standard requirements for the QDMTT to qualify as a safe harbour. Under the QDMTT accounting standard, countries are permitted to use the local financial accounting standard, subject to the requirements that all of the constituent entities have financial accounts based on that standard and are required to keep or use such accounts under a domestic corporate or tax law or such financial accounts are subject to an external financial audit. In addition, the local financial accounting standard may need to be adjusted to prevent material competitive distortions to the extent that it is an authorized financial accounting standard.

Overall, the choice of which accounting standards to adopt for the purpose of QDMTT requires careful consideration. To the extent that foreign accounting standards are used, having the administrative capacity to enforce and check the correct application of such rules may be challenging. In this case, the tax officials are require to fully understand not only VAS but also International Financial Reporting Standard and other countries' authorized accounting standard such as the Republic of Korea, Japan, United State of America etc. However, the use of local accounting standards that need to be adjusted for material competitive distortions may also be complex. If the Decree adopts VAS for QDMTT, each MNE has to test the material competitive distortion for a specific accounting principle. If there is one item that has a variation over the threshold, then the accounting treatment of any item/transaction subject to that principle must be adjusted. For example, if there is a Material Competitive Distortion in relation to the value of an asset, then all other transactions in relation to that asset (e.g. the amortization) need to be adjusted too

Fifthly, *illustration of how to determine each factor to calculate top-up tax liabilities*

To determine the top-up tax liability, it is necessary to accurately calculate the GloBE income or loss, adjusted covered tax, SBIE, and additional current top-up tax. Each element includes adjustments and special cases. Some additional examples to illustrate the interpretation and application of the regulations should be provided in the Decree. Good examples will support taxpayers and tax officials to easily visualize applicable situations and have a unified understanding of the concepts and specific cases in the Decree.

The Decree-Drafting Agency can use OECD examples or develop examples directly related to Vietnam. To illustrates how the exclusion of International Shipping Income and Qualified Ancillary International Shipping Income operates, OECD gives the example: "Assume a Constituent Entity has Financial Accounting Net Income of EUR 200. This Constituent Entity has an income of EUR 60 that was derived from performing an activity that is not covered by Article 3.3. In addition, this Constituent Entity has International Shipping Income of EUR 100 and Qualified Ancillary International Shipping Income of EUR 40. No adjustments other than the exclusion of International Shipping Income and Qualified Ancillary International Shipping Income are required to compute the GloBE Income of the Constituent Entity. The resulting GloBE Income of the Constituent Entity is EUR 60 (= 200 - (100 + 40))". The example is quite simple but valuable because it helps the reader easy to understand the provision

Sixthly, *allocation of top-up tax liabilities among constituent entities of the MNEs Group according to Income Inclusion rule (IIR) and QDMTT*

According to the Model Rules, the IIR is applied by certain parent entities in the MNE Groups using an ordering rule that generally gives priority in the application of the rule to the entities closest to the top in the chain of ownership (the "top-down" approach). The Resolution No.107/2023/QH15 only provides that the ultimate parent entity, partially-owned parent entity, or intermediate parent entity shall declare and pay a minimum amount of tax unless this top-up tax has been paid in another jurisdiction that is required to apply a qualified IIR under the GloBE rules. Therefore, the order to apply IIR to each parent entity in the MNEs Group need to be clarified in the Decree.

Meanwhile, a QDMTT applies exclusively with respect to domestic constituent entities. The OECD Commentary suggests that a QDMTT should impose a Top-up Tax on one or more domestic Constituent Entities with respect to the excess profits of all domestic constituent entities, including the domestic parent Entity. For this reason, the Decree is required to explain the allocation of QDMTT liability among domestic constituent entities to ensure that legal liability for the tax is allocated on a basis that complies with Vietnam's legal framework and is enforceable against at least one constituent entity.

Seventhly, *guidance on the tax registration, filing, and payment*

The Model Rules only provide the filing of information declarations under the GloBE Information Return (GIR), and do not specifically regulate tax registration, additional tax declarations, and tax payments. The Resolution No.107/2023/QH15 only regulates the subjects and deadlines for declaring and paying taxes and assigns the Government to base on the provisions of the Resolution and the Law on Tax Administration and relevant legal provisions to regulate the contents of tax administration of top-up tax under GloBE Rules.

Meanwhile, the GloBE Rules differentiate from other taxes because tax liabilities are calculated on the basis of combining constituent entities within the same group. Therefore, the guidance on tax registration, declaration, and payment must be included in the Decree. The Decree-Drafting Agency should consider the conditions to issue new tax identification numbers to manage the MNEs Groups subject to the GloBE Rules, and how the tax obligations associated with these tax identification numbers are tracked and inherited. Besides, it is necessary to design related declaration forms such as tax registration declarations, information change declarations, tax payment declarations, etc.

Eighthly, *related tax penalties on non-compliance*

Like other tax policies, to ensure the integrity and effectiveness of the implementation of the GloBE Rules, the Decree is required to manage cases of administrative violations regarding top-up tax liabilities, including regulations on violations, sanctioning authority, fine levels, sanctioning orders, and procedures. Because the OECD does not give a detailed description of this content, a reference to relevant tax administration regulations should be considered to provide specific regulations in this Decree.

Ninthly, *implementation of the Safe habour provisions*

MNE Groups and tax administrations will incur incremental compliance and administration costs concerning the application of the GloBE Rules. MNE Groups need to collect, adjust, and aggregate information on a jurisdictional basis to calculate the top-up tax. Thus, the safe harbor provisions are essential to limit unnecessary compliance and administrative burden for MNE Groups and tax administrations. Paragraph 6 and paragraph 7 of Article 6 of the Resolution No. 107/2023/QH115 provide the simplified safe harbor provisions. To ensure the feasibility, the following issues should be guided clearly in the Decree: (i) The subjects eligible to apply the Safe habour provisions; (ii) The subjects excluded; (iii) The criteria of the deduction conditions; and (iv) The procedures to enjoy the exemption. For example, to transitional CbCr safe habour, the purpose of this provision is to reduce the compliance difficulties that MNEs will face in building systems to collect the data needed for undertaking full GloBE calculations so rule is focused on bright-line rules that use readily available and easily verifiable data rather than seeking to achieve a high degree of precision by undertaking the full GloBE calculations for a jurisdiction. Therefore, more details on the source of data should be given in the Decree. These data would be from Qualified CbC Report which is prepared and filed using Qualified Financial Statements. The explanation of the definition of Qualified Financial Statements, the application of the test and the treatment of certain entities such as Joint ventures, Investment entities are also needed to clarified in the Decree.

Tenthly, *implementation when OECD gives more guidance on the application of GloBE Rules*

Currently, the OECD is continuing to publish additional Administrative Guidance. To ensure the accuracy and integrity of policy, the Decree should proclaim how the Government will deal with the new Administrative Guidance which are published after the effective date of the Decree. On one hand, the Government can consider to amend and supplement the content of the Decree. On the other hand, if the new Administrative Guidance does not contradict to the Decree, the Government can designate the Ministry of Finance to have specific regulations for implementation.

2. Some recommendations on the preparation for implementing the resolution No. 107/2023/QH15 of the National Assembly of Vietnam

Firstly, *negotiation of the acceptance of other IF countries on the VAS in preparing the CFSs which affect the top-up tax liability of MNEs Groups*

Since VAS is not one of the Acceptable Financial Accounting Standards defined in the Model Rules, the application of VAS for IIR purposes would need to be tested, and adjusted as necessary to prevent any material competitive distortions. For QDMTT purposes, as mentioned above, if the choice of the Decree is using the local financial accounting standard, this standard may need to be adjusted to prevent material competitive distortions to the extent that it is an authorized financial accounting standard (and not an acceptable financial

accounting standard). Therefore, for both IIR and QDMTT, the constituent entities applying VAS may need to adjust their accounts while the tax authority is responsible for verifying the entity's adjustment.

In the future, to minimize the compliance burden for both MNE Groups and tax authorities, Vietnam should prove the equivalence between VAS and IFRS to treat the VAS as an acceptable financial accounting standards.

Secondly, *identification of the MNEs Groups within the scope of GloBE rules and operating in Vietnam*

In principle, constituent entities subject to the GloBE Rules are responsible for self-declaring and paying additional taxes. However, determining the constituent entities in Vietnam that are subject to the GloBE Rules is a prerequisite and relatively difficult for the Vietnam tax authorities. According to international experience, three sources of information can be used to determine constituent entities in-scope of GloBE Rules, including information declaration according to GloBE Information Returns (GIR), CbC reports, and information directly from managing tax authorities.

The deadline for submitting the GIR is 15 or 18 months since the end of the financial year. Therefore, during the initial implementation of the GloBE Rules, Vietnam is not able to exploit information from GIR. Besides, Vietnam has, as of yet, not fully implemented CbC reporting and has not agreed to the exchange of information under the CbC Multilateral Competent Authority Agreement (or any similar competent authority bilateral agreements so Vietnam tax authorities do not have enough information from CbCr.

Thus, local tax authorities need to proactively and actively review entities under their management, coordinate with international information sources such as publicly released CbC data, and bilaterally exchange information to identify entities subject to the GloBE Rules in Vietnam.

Thirdly, *propaganda to enterprises on the Resolution No. 107/2023/QH15*

The tax authorities are responsible for disseminating policies to ensure effective implementation of the GloBE Rules. The propaganda is not only for protecting the rights and interests of businesses but also for avoiding errors in the declaration and payment process according to the rules. The following activities should be chosen for the propaganda: (i) An electronic handbook on the Resolution No. 107/2023/QH15 and detail guiding legislative documents both in English and in Vietnamese should be given free to all related enterprises directly to their emails and on the website of the General Department of Taxation; (ii) Workshops on the implementation of the Resolution No. 107/2023/QH15 should be held by the provincial tax offices to related enterprises in the localities in order to give detail guidance and to explain any questions from taxpayers on the implementation of the Resolution; (iii) Introduction of the Resolution No. 107/2023/QH15 and detail guiding legislative documents on TV programs and other internet platforms.

In addition, it is necessary to listen to opinions from entities about difficulties, problems, or suggestions to continue completing the regulations related to GloBE Rules. Therefore, a hotline phone and hotline internet emails should be establish to answer and to collect feedbacks from taxpayers on this issue.

Fourthly, *tax officers' training*

The application of the GloBE Rules imposes new requirements for tax officials, including updating international information, analyzing the return information, assessing risk areas, auditing taxpayers, and collecting top-up tax. Therefore, tax authorities need to prioritize efforts to develop knowledge and skills for tax officials, especially knowledge related to IFRS. The tax authority also needs to carry out the work of digitizing training programs and documents on the intranet system, strengthen the organization of online training classes for officials, contribute to improving professional qualifications for them, promote administrative reform, and apply information technology and electronics in management work.

Fifthly, *evaluation of the current tax incentive policy system to amend and supplement the Corporate Income Tax Law with a plan to adjust the tax rate system and tax incentives appropriately*

It is an urgent requirement for Vietnam to deploy an overall assessment of the current tax incentive policy system and develop a project to amend and supplement the Corporate Income Tax Law with a plan to adjust the tax rate system and tax incentives appropriately. In particular, it is possible to consider switching from income-based incentives (tax exemptions, reductions, or tax rate incentives) to incentives based on the time of recording expenses or based on investment costs (allowing accelerated depreciation or qualified refundable tax credit regulations according to OECD). Tax incentive reforms need to apply to all entities with production and business activities in Vietnam, not just entities covered by the GloBE Rules.

Besides, Vietnam should continue to improve the business investment environment, reform administrative procedures, and improve the efficiency of the process of organizing and implementing preferential policies to attract investment. This is a regular, continuous requirement that is decisive in attracting foreign investment and is a factor in ensuring that policies are properly and fully implemented in practice./.

References:

OECD (2024), Tax Challenges Arising from the Digitalization of the Economy - Administrative Guidance on the Global Antibes Erosion Model Rules (Pillar Two), June 2024.

OECD (2024), the Global Antibes Erosion Model Rules.

LOGISTICS SERVICE QUALITY AFFECTING CUSTOMER SATISFACTION AND REPURCHASE INTENTION TOWARD ONLINE SHOPPING PLATFORMS IN VIETNAM

PhD. Doan Minh Nga* - PhD. Doan Tuan Anh - PhD. Dinh Pham Hien****
PhD. Tu Thi Xuyen*** - Prof.PhD. Pham Thi My Dung*****

Abstract: ***This study investigates the impact of logistics service quality on customer satisfaction and repurchase intention in the context of online shopping platforms in Vietnam. By examining various dimensions of logistics service quality, such as information accuracy, order fulfillment, delivery quality, and customer service, the research aims to provide actionable insights for improving customer experiences and fostering long-term loyalty. The findings indicate that high-quality logistics services significantly enhance customer satisfaction and increase the likelihood of repeat purchases, emphasizing the critical role of logistics in achieving customer retention and driving sustained business growth in the burgeoning e-commerce sector. These insights are particularly relevant given the rapid growth of e-commerce in Vietnam, which necessitates efficient and reliable logistics operations to meet the evolving demands of consumers.***

• Keywords: *the logistics service quality, customer satisfaction, repurchase intention, online shopping platforms.*

JEL codes: L87, D01, L9, L81

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1. Introduction

The rapid growth of e-commerce in Vietnam has transformed the retail landscape, creating new opportunities and challenges for businesses and consumers alike. With the e-commerce market projected to reach $56 billion by 2026, the need for efficient and reliable logistics services has never been more critical (Do et al., 2023). As online shopping becomes increasingly popular, particularly among young consumers, logistics service quality has emerged as a key determinant of customer satisfaction and repurchase intention. This research aims to investigate how various dimensions of logistics service quality, such as information accuracy, order fulfillment, quality of delivery, and customer service, impact customer satisfaction and their intention to repurchase from online shopping platforms in Vietnam. Understanding these dynamics is crucial for e-commerce businesses striving to enhance the customer experience and build long-term loyalty.

The significance of this study lies in its potential to provide actionable insights for improving logistics operations in the burgeoning e-commerce sector. High-quality logistics services not only ensure that customers receive their orders accurately and on time but also enhance their overall shopping experience, thereby fostering customer satisfaction and encouraging repeat purchases. Previous studies have highlighted the positive correlation between logistics service quality and customer satisfaction, emphasizing the importance of logistics in achieving customer retention (Ren et al., 2020). By examining the specific factors that influence logistics service quality in the context of Vietnam, this research can offer valuable recommendations for businesses looking to optimize their logistics strategies and meet the evolving demands of their customers.

Moreover, this research is particularly relevant in the context of the ongoing digital transformation in Vietnam, where a significant portion of the population is now engaging in online shopping. Young customers, in particular, represent a substantial segment of the e-commerce market, characterized by high expectations for fast, reliable, and convenient

** Ha Noi Institute for Socio-Economic Development Studies; email: nga.ngocnga888@gmail.com*
*** University of Transport Technology, email: tuanda@utt.edu.vn*
**** Dong Do University; email: tuanda@hdiu.edu.vn - tuthixuyen1954@gmail.com - dungsird.vn@gmail.com (Contact author)*
***** Ministry of Agriculture and Rural Development; email: hiendp.htqt@mard.gov.vn*

delivery services (Trang, 2023). Addressing the logistics needs of this demographic is essential for e-commerce platforms aiming to capture and retain this critical consumer group. By providing empirical evidence on the impact of logistics service quality on customer satisfaction and repurchase intention, this study can inform both business practices and policy decisions, ultimately contributing to the sustainable growth of Vietnam's digital economy.

2. Literarure review

2.1. Theoretical framework

This study uses the Expectancy-Disconfirmation Paradigm (EDP) and the Technology Acceptance Model (TAM) to examine how logistics service quality affects consumer satisfaction and repurchase intention for online shopping platforms in Vietnam. According to the EDP, post-purchase performance evaluations and pre-purchase expectations determine consumer satisfaction. Service performance that surpasses expectations leads to positive disconfirmation and higher customer satisfaction. Conversely, when performance falls short, dissatisfaction results. Logistics services in e-commerce require fast and accurate delivery, making this framework highly relevant. Rejali et al. (2023) used the EDP to measure customer satisfaction and evaluate logistics services' ability to meet or exceed expectations, which in turn affects overall satisfaction and repurchase intentions.

The Technology Acceptance Model (TAM), proposed by Davis (1989), supplements the EDP by explaining how perceived ease of use and usefulness affect technology acceptance. TAM suggests that e-commerce logistics customers are more satisfied and likely to repurchase if they find the services easy to use and beneficial in enhancing their online shopping experience. TAM is useful for understanding how logistical innovations, such as real-time tracking and automated customer support, might improve service quality and satisfaction. This study applies TAM to examine how technology-related elements in logistics services affect perceived ease of use, usefulness, customer satisfaction, and repurchase intention (Rejali, 2023). Together, EDP and TAM provide a comprehensive theoretical framework to analyze the multiple effects of logistics service quality on customer behavior in Vietnam's dynamic e-commerce ecosystem.

2.2. Repurchase Intention toward online shopping platforms

Repurchase intention toward online shopping platforms refers to a customer's likelihood of buying products or services again from the same platform after an initial purchase. It is a critical metric for e-commerce businesses, as it indicates customer loyalty and satisfaction with the shopping experience. High repurchase intention often results from positive experiences with various service attributes, including product quality, website usability, and, particularly, logistics service quality, such as timely and accurate deliveries and effective customer service (Ren et al., 2020). In the context of this study, understanding repurchase intention is essential for evaluating how improvements in logistics service quality can enhance customer retention and drive sustained business growth in Vietnam's competitive e-commerce market.

2.3. Quality of Information

Effectiveness, clarity, and completeness of product descriptions, delivery updates, and customer reviews on online purchasing platforms affect customer satisfaction and repurchase intentions. According to the Expectancy-Disconfirmation Paradigm (EDP), customer satisfaction is based on the comparison between pre-purchase expectations and post-purchase perceptions (Syachrony et al., 2023). Accurate and detailed information reduces uncertainty and improves the shopping experience by meeting or exceeding customer expectations. Customers are happier with their purchases when they get accurate and complete information (Zeng et al., 2023). Customers repurchase intent from online buying platforms is also affected by information quality. Customers trust the platform and buy again when information is accurate and reliable. Clear, thorough, and trustworthy information minimizes perceived risk and improves the purchasing experience, making customers more inclined to repurchase (Ren et al., 2020). The Technology Acceptance Model (TAM) suggests that information quality influences perceived ease of use and perceived usefulness, which influence technology acceptance and use. As a result, we put up the following hypotheses:

H1a: Quality of Information has a positive impact on Customer Satisfaction toward online shopping platforms.

H1b: Quality of Information has a positive impact on Repurchase Intention toward online shopping platforms.

2.4. Quality of Order

Online shopping platforms' customer happiness and repurchase intention depend on order quality, including accurate order fulfillment, product condition, and delivery times. Correct order fulfillment reduces dissatisfaction and promotes satisfaction by delivering what customers purchased. Research shows that order fulfillment reliability and correctness greatly improve customer satisfaction (Do et al., 2023). Additionally, product quality and prompt delivery develop confidence and reliability, which are essential to consumer happiness. Studies show that clients are happier with the purchasing platform when their orders are intact and on time (Syachrony et al., 2023). Satisfaction boosts repurchase intentions. When orders are fulfilled well, buyers trust the platform and are more inclined to buy again. Reliable and timely deliveries lower perceived risks and boost consumer confidence in the platform, which supports the positive link between order quality and repurchase intention (Zeng et al., 2023). Consequently, the following hypotheses are constructed:

H2a: Quality of Order has a positive impact on Customer Satisfaction toward online shopping platforms.

H2b: Quality of Order has a positive impact on Repurchase Intention toward online shopping platforms.

2.5. Quality of delivery

Customer satisfaction and repurchase intention on online purchasing platforms depend on delivery quality, including timeliness, product condition, and service professionalism. Customers feel less anxious and enjoy shopping when their orders arrive on schedule. Delivery punctuality and reliability considerably increase customer satisfaction (Zeng et al., 2023). The product's quality upon arrival is crucial; any damage or inconsistency might cause problems and poor evaluations. Ren et al. (2020) found that customers are happier when their goods arrive in good condition, demonstrating the platform's quality commitment. Delivery staff professionalism also affects client satisfaction. Positive delivery experiences gratify customers and develop trust and reliability, driving repeat purchases. Timely and well-handled deliveries increase consumer loyalty and repeat purchases (Do et al., 2023). Therefore, the following hypotheses are constructed:

H3a: Quality of Delivery has a positive impact on Customer Satisfaction toward online shopping platforms.

H3b: Quality of Delivery has a positive impact on Repurchase Intention toward online shopping platforms.

2.6. Quality of customer service

Online purchasing satisfaction and repurchase intention depend on customer service quality, including timeliness, professionalism, and problem-solving. Quality customer service helps customers resolve difficulties quickly and efficiently, improving their buying experience. Since it addresses customer demands and concerns, prompt and professional customer service increases customer satisfaction (Do et al., 2023). Solving problems like returns and refunds swiftly builds client trust and loyalty. Studies suggest that timely and reliable customer support increases platform satisfaction and loyalty (Hien, 2023). Satisfied clients are more inclined to return to platforms with good service. Excellent customer service minimizes perceived risks and boosts consumer confidence, leading to repeat purchases (Dang et al., 2023; Hien, 2023). Thus, we propose the following hypotheses:

H4a: Quality of Customer Service has a positive impact on Customer Satisfaction toward online shopping platforms.

H4b: Quality of Customer Service has a positive impact on Repurchase Intention toward online shopping platforms.

2.7. Customer satisfaction

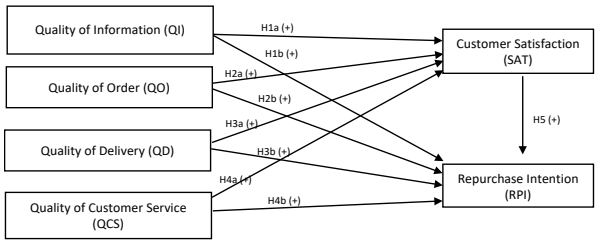
Repurchase intention in online buying is strongly influenced by consumer satisfaction, which measures platform performance and meets expectations. Happy clients are more likely to trust and loyally buy from the platform, which increases their likelihood of repeat purchases. Research shows that satisfied customers return to platforms where they have pleasant experiences, which increases repurchase intentions (Hien, 2023). The

Expectancy-Disconfirmation Paradigm (EDP) states that consumer satisfaction increases future purchase propensity when experiences meet or surpass expectations (Do et al., 2023). According to studies, satisfied customers are more likely to suggest the platform and spread positive word-of-mouth, which strengthens their loyalty and chance of repurchase (Zeng et al., 2023). Therefore, the following hipothesis is constructed:

H5: Customer Satisfaction has a positive impact on Repurchase Intention toward online shopping platforms.

From the above discussions, the the research model is developed as:

Figure 1. Research model



3. Data colleciton and analysis

3.1. Data collection and sampling

This study collected repurchase intention uptake data using a self-administered questionnaire. For broad reach and ease, Vietnamese online buyers received the questionnaire via Zalo, Viber, Facebook, and email. Convenience sampling was utilized to swiftly collect data from a broad sample (Hien, 2024; Hair et al., 2020). Quality of Information, Order, Delivery, Customer Service, Satisfaction, and Repurchase Intention are measured in the demographic poll. Ten online purchasers pre-tested the questionnaire to ensure clarity and relevance, making minor changes for improved comprehension. Between May and June, 252 surveys were done. This sample size met structural equation modeling recommendations of 10 units per latent variable (Hair et al., 2020). SmartPLS 4 SEM revealed online shopping platform repurchase intention.

3.2. Data analysis

The study on logistics service quality affecting customer satisfaction and repurchase intention for online shopping platforms in Vietnam has various demographics. The sample of 252 respondents is slightly more feminine (58.3%) than male (41.7%). The bulk of participants were 36–45 years old (31%), followed by 46–55 (29%), 26–35 (19.8%), over 55 (10.3%), and 18–25 (9.9%). Nearly half of respondents (48.4%) have college degrees, followed by higher education (37.3%) and high school/intermediate (14.3%). The largest group earns 15 to less than 20 million VND per month (31%), followed by 20 to less than 30 million (29%), 10 to less than 15 million (19.8%), and less than 10 million (9.9%), with 10.3% earning 30 million or more. This broad demographic data provides a complete picture of Vietnam's online purchasing customers, aiding the study's logistical service quality and effect findings.

Table 1. Demographic information of the respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	105	41.7
	Female	147	58.3
Age	18-25	25	9.9
	26-35	50	19.8
	36-45	78	31.0
	46-55	73	29.0
	Over 55	26	10.3
Education Level	High school/Intermediate	36	14.3
	Undergraduation	122	48.4
	Higher Education	94	37.3
	Other	0	0.0
Monthly Income	Less than 10 milVND	25	9.9
	From 10 to less than 15 milVND	50	19.8
	From 15 to less than 20 milVND	78	31.0
	From 20 to less than 30 milVND	73	29.0
	30 milVND or above	26	10.3
TOTAL		**252**	**100.0**

Source: From the authors' data analysis results

Table 2. Reliability and discriminant validity tests

	α	CR (rho_a)	CR (rho_c)	AVE	QCS	QD	QI	QO	RPI	SAT
QCS	0.918	0.919	0.938	0.753						
QD	0.901	0.902	0.926	0.716	0.814					
QI	0.926	0.927	0.944	0.771	0.604	0.425				
QO	0.890	0.891	0.919	0.694	0.693	0.523	0.459			
RPI	0.924	0.927	0.946	0.814	0.684	0.582	0.446	0.495		
SAT	0.914	0.916	0.936	0.745	0.543	0.764	0.543	0.564	0.643	

Source: From the authors' data analysis results

Customer Satisfaction, Quality of Customer Service, Quality of Delivery, Quality of Information, and Quality of Order are evaluated. The reliability of each construct was evaluated using Cronbach's alpha (α), composite reliability (CR), and average variance extracted (AVE). All constructs had high Cronbach's alpha values from 0.890 to 0.926 and composite reliability

scores from 0.891 to 0.944, showing great internal consistency. Convergent validity was confirmed by the AVE values, which ranged from 0.694 to 0.814 and measured the construct's variance relative to measurement error. The square root of the AVE for each construct was bigger than the inter-construct correlations, confirming discriminant validity. The thorough validation procedure assures trustworthy and valid structures, laying the groundwork for analyzing logistical service quality, customer happiness, and repurchase intention relationships.

3.3. Structural equation modelling

Table 3. Path coefficients

Hypothesis	Relationship	Original sample	Mean	STDEV	T statistics	P values	Result
H1a	QI -> SAT	0.178	0.177	0.074	2.402	0.016	Acepted
H1b	QI -> RPI	0.271	0.272	0.072	3.783	0.000	Acepted
H2a	QO -> SAT	0.182	0.182	0.061	2.973	0.003	Acepted
H2b	QO -> RPI	0.270	0.270	0.057	4.780	0.000	Acepted
H3a	QD -> SAT	0.124	0.125	0.056	2.200	0.028	Acepted
H3b	QD -> RPI	0.148	0.147	0.059	2.523	0.012	Acepted
H4a	QCS -> SAT	0.490	0.490	0.054	9.121	0.000	Acepted
H4b	QCS -> RPI	0.216	0.217	0.067	3.212	0.001	Acepted
H5	SAT -> RPI	0.475	0.475	0.060	7.917	0.000	Acepted

Source: From the authors' data analysis results

The results supported all hypotheses with substantial p-values. The path coefficient for Quality of Information (QI) and Customer Satisfaction (SAT) (H1a) is 0.178 (p = 0.016), and for QI and Repurchase Intention (RPI) (H1b) is 0.271 (p = 0.000). Quality of Order (QO) route coefficients to SAT (H2a) and RPI (H2b) are 0.182 (p = 0.003) and 0.270 (p = 0.000). QD has a path coefficient of 0.124 (p = 0.028) with SAT (H3a) and 0.148 with RPI (H3b) (p = 0.012). Quality of Customer Service (QCS) positively affects SAT (H4a) with 0.490 (p = 0.000) and RPI (H4b) with 0.216 (p = 0.001). Finally, Customer Satisfaction (H5) positively affects Repurchase Intention with a path coefficient of 0.475 (p = 0.000). Results indicate that high-quality logistics services boost consumer happiness and online shopping platform repurchase likelihood.

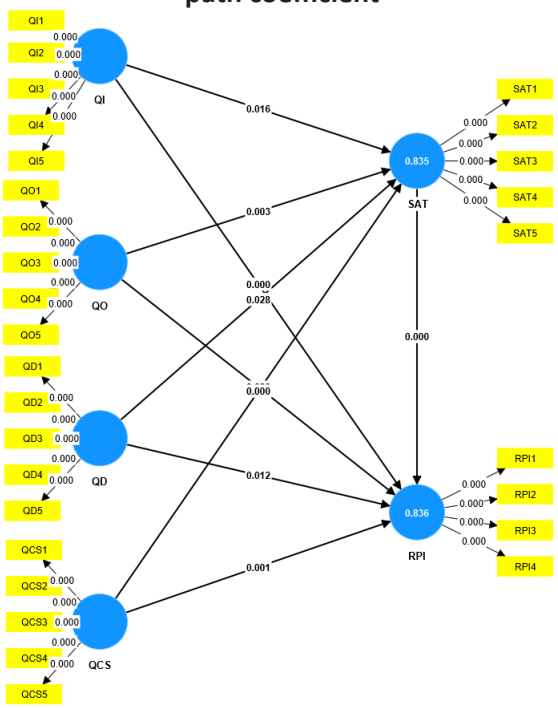
Table 4. Specific indirect effects

Relationship	Original sample	Sample mean	STDEV	T statistics	P values	Result
QD -> SAT -> RPI	0.059	0.059	0.028	2.121	0.034	Supported
QO -> SAT -> RPI	0.086	0.086	0.031	2.763	0.006	Supported
QCS -> SAT -> RPI	0.233	0.233	0.042	5.591	0.000	Supported
QI -> SAT -> RPI	0.084	0.084	0.036	2.332	0.020	Supported

Source: From the authors' data analysis results

All indirect pathways are significant, according to the research. Quality of Delivery (QD) indirectly affects Repurchase Intention (RPI) through Customer Satisfaction (SAT) by 0.059 (p = 0.034). Quality of Order (QO) indirectly affects RPI via SAT by 0.086 (p = 0.006). QCS indirectly affects RPI through SAT with a path coefficient of 0.233 (p = 0.000). Finally, QI indirectly affects RPI through SAT by 0.084 (p = 0.020). Results indicate that improving logistics service quality elements, including delivery, order, customer service, and information, leads to increased customer satisfaction and repurchase intentions.

Figure 2. Result of PLS-SEM structural model path coefficient



Source: From the authors' data analysis results

4. Findings discussion

This study shows that logistics service quality significantly affects customer satisfaction and repurchase intention on Vietnamese online shopping platforms. The study found that accurate, clear, and complete product specifications, delivery updates, and customer reviews improve consumer satisfaction and repurchase intention. Higher-quality information decreases ambiguity, improves the buying experience, and increases customer happiness and repeat purchases, supporting hypothesis H1a and H1b.

Moreover, the study emphasizes the importance of order fulfillment quality, including the accuracy of order fulfillment, the condition of

the received products, and adherence to promised delivery times. These factors significantly enhance customer satisfaction and repurchase intention, supporting hypotheses H2a and H2b. Accurate and reliable order fulfillment minimizes dissatisfaction and increases trust in the platform, further encouraging repeat purchases. This finding aligns with existing literature, which suggests that reliable and timely order fulfillment is crucial in enhancing customer satisfaction and loyalty.

The quality of delivery, encompassing timely delivery, the condition of the product upon arrival, and the professionalism of the delivery service, also plays a critical role in customer satisfaction and repurchase intention, supporting hypotheses H3a and H3b. The study shows that timely and well-handled deliveries meet customer expectations, build trust, and reliability, which are essential for fostering customer loyalty and encouraging repeat purchases. This finding is consistent with previous research, indicating that high-quality delivery services significantly influence customer satisfaction and repurchase behavior.

Additionally, the quality of customer service, including responsiveness, professionalism, and effective problem-solving, is shown to positively impact customer satisfaction and repurchase intention, supporting hypotheses H4a and H4b. The study demonstrates that prompt and professional customer service directly addresses customer needs and concerns, enhancing their overall shopping experience. Effective handling of returns and refunds solidifies customer trust and loyalty, leading to increased repurchase intentions. This is supported by evidence that excellent customer service reduces perceived risks and enhances consumer confidence, driving repeat purchases. Overall, the study provides valuable insights for e-commerce platforms in Vietnam to improve logistics service quality, thereby boosting customer satisfaction and fostering long-term customer loyalty.

5. Implications

The findings from this study have several important implications for e-commerce platforms in Vietnam. Firstly, the significant positive impact of information quality on customer satisfaction and repurchase intention underscores the necessity for online shopping platforms to prioritize the accuracy, clarity, and completeness of the information they provide (Do et al., 2023; Ren et al., 2020). Ensuring that product details, delivery updates, and customer reviews are precise and comprehensive can significantly enhance the customer experience, reduce uncertainties, and build trust, which in turn drives higher customer satisfaction and repeat purchases. This implies that investments in technology and processes that improve information quality, such as real-time updates and detailed product descriptions, are essential for fostering customer loyalty.

Secondly, the positive relationship between the quality of order fulfillment and both customer satisfaction and repurchase intention highlights the critical role of reliable and accurate order processing. Platforms must ensure that orders are fulfilled correctly and delivered in good condition within the promised timeframe. This involves efficient inventory management, robust quality control processes, and effective logistics partnerships. Enhancing these aspects can minimize customer dissatisfaction and increase trust in the platform, encouraging repeat business. Therefore, e-commerce businesses should continuously evaluate and improve their order fulfillment processes to meet and exceed customer expectations, ultimately leading to sustained business growth and customer retention.

References:

Dang, H. L., Bao, N. V., & Cho, Y. C. (2023). Consumer Behavior towards E-Commerce in the Post-COVID-19 Pandemic: Implications for Relationship Marketing and Environment. Asian Journal of Business Environment, 13(1), 9-19.

Davis, M. B. (1989). Lags in vegetation response to greenhouse warming. Climatic change, 15(1), 75-82.

Do, A. D., Ta, V. L., Bui, P. T., Do, N. T., Dong, Q. T., & Lam, H. T. (2023). The Impact of the Quality of Logistics Services in E-Commerce on the Satisfaction and Loyalty of Generation Z Customers. Sustainability, 15(21), 15294.

Hair Jr, J. F. (2020). Next-generation prediction metrics for composite-based PLS-SEM. Industrial Management & Data Systems, 121(1), 5-11.

Hien, P. H. (2023). The mediating effects of employee trust and job satisfaction in the relationship between empowerment leadership and employee loyalty. International Journal of Environment, Workplace and Employment, 7(2), 130-147. https://doi.org/10.1504/IJEWE.2023.134527

Rejali, S., Aghabayk, K., Esmaeli, S., & Shiwakoti, N. (2023). Comparison of technology acceptance model, theory of planned behavior, and unified theory of acceptance and use of technology to assess a priori acceptance of fully automated vehicles. Transportation research part A: policy and practice, 168, 103565.

Ren, S., Choi, T. M., Lee, K. M., & Lin, L. (2020). Intelligent service capacity allocation for cross-border-E-commerce related third-party-forwarding logistics operations: A deep learning approach. Transportation Research Part E: Logistics and Transportation Review, 134, 101834.

Syachrony, M. I., Hamdan, H., & Ilhamalimy, R. R. (2023). The Effect of E-Service Quality, Website Quality, Promotion, and E-Trust on Repurchase Intentions at E-Commerce Shopee in DKI Jakarta. BASKARA: Journal of Business and Entrepreneurship, 5(2), 193-205.

Zeng, S., Fu, Q., Haleem, F., Han, Y., & Zhou, L. (2023). Logistics density, E-commerce and high-quality economic development: An empirical analysis based on provincial panel data in China. Journal of Cleaner Production, 426, 138871.

FUNDAMENTAL AND TECHNICAL ANALYSIS: THE COMBINATION FOR STOCK TREND DETERMINATION

MA. Nguyen Tuan Minh*

Abstract: ***Fundamental and technical analysis are the two most popular methods in world investing. Although fundamental and technical analysis are different in several aspects, such as the way of functioning and execution, the time horizon used, the tools used, the combination of these two methods often leads to appropriate outcomes. This paper demonstrates the differences, the pros and cons of these two methods through some cases, and recommends steps to how to use these methods for determining stock market trends.***

• Keywords: *fundamental analysis, technical analysis, stock market trends.*

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1. Introduction

A strategic approach is necessary in the world of trading and investing if you want to maintain a consistent profit and have a clear advantage. In general, technical and fundamental analysis are the two primary schools of thought and approaches in the financial markets. The study of the underlying factors influencing the health of the economy, business associations, and industry groupings is known as fundamental analysis. The objective of this research, like most others, is to estimate future price movement and make money off of it. Fundamental analysis at the corporate level may entail a review of the company's finances, management, business plan, and competitors. The forces driving product supply and demand may be examined at the industry level. In order to evaluate the current and potential future growth of the national economy, fundamental analysis may concentrate on economic data. According to AS (2013), Fundamental analysis uses corporate, industry, and economic analysis to determine a stock's intrinsic value, or fair value, which is used to estimate future stock prices. The stock is either overvalued or undervalued, according to fundamental experts, if fair value does not match the present stock price. When determining whether or not to purchase an asset, one should assess its fair value because the current market price will eventually converge towards it. Fundamental analysts seek to profit from apparent price differences because they think that prices do not fully reflect all available information.

Rather than being utilized in place of fundamental analysis, technical analysis is often employed as an addition to it. Technical analysis states that supply and demand in the market determine a stock's price. Its relationship to the intrinsic worth is not very strong. The market price of a particular stock already takes into account all of its financial and market information. Tools and methods have been created by technical analysts to examine historical trends and forecast future prices (Edwards, 2018). In essence, technical analysis is the study of markets alone. Technical analysts examine and objectively evaluate the technical traits that can be anticipated at market turning times. In order to create certain traits that would aid in identifying significant market tops and bottoms, the historical turning moments are researched. Human reactions are generally comparable, if not exactly the same; the technician uses a variety of instruments to try and accurately identify and capitalize on trend shifts.

2. Advantages and disadvantages of fundamental and technical analysis

2.1. Advantages of fundamental analysis

The first benefit of using fundamental analysis to value equities is that it looks at actual market and economic issues. In order to ascertain if stocks are priced properly in light of the current economic conditions, fundamental analysis looks to analyze changes in the economy, business sectors, and firms. To start studies, investors look at the economic forecast to see which industry groups stand to gain. Selecting the leaders of the industry and understanding the group are equally crucial; the best companies in a stagnant or falling market are not likely to be the best choices. As the analysis comes to a close, the leaders in the emerging industries are examined, along with important data, management,

** International School - Vietnam National University, Hanoi*

and business strategies. The fact that stock prices are based on a company's performance and potential for profit is the second benefit of fundamental research. Therefore, the valuation of the market values of shares is likely to be reasonably accurate if you make correct projections and predictions about future earnings (Bartram, 2015). The economic logic and viability of the investment criterion, which states that a share is an undervalued investment when its market value is lower than its true intrinsic value and, conversely, that a share is not recommended for purchase when its market value is higher than its true intrinsic value, constitutes the third benefit of fundamental analysis.

The primary drawback of fundamental analysis is its time-consuming nature. It is impossible to find and process the information fast enough to make intelligent stock selections. Both your assessments and your interpretation of fair worth are subjective. It might be necessary to assess several industrial groups using different standards, which will take time. The efficient market hypothesis is the subject of the second flaw in the fundamental analysis. Agustin (2019) demonstrated that with the exception of unlawful insider information, all information regarding stocks is known to the public, and stock prices reflect this knowledge. Stock prices cannot be overvalued or undervalued if they are based on all available facts. However, since information flows aren't perfect, you'll succeed more than people who don't conduct due diligence.

2.2. Advantages and disadvantages of technical analysis

The straightforward logic and application of technical analysis is one of its main advantages. It is evident in the fact that it just analyzes price and volume traded data to predict future prices, ignoring any economic, market, technological, or other aspects that might have an effect on the business or the industry (Cohen, 2013). When a specific pattern in the stock's price movement appears, the technical analyst forms the assumption that it will recur in the future and bases trading decisions on this presumption. Finding particular price trends in the market is the primary objective of technical analysis, as stated previously. The availability of several computer tools and applications that make technical analysis easier to do is its second benefit. In technical analysis, you can obtain specific investment signals by just entering the required parameters in the relevant computer program. This is in contrast to fundamental analysis, where it can be difficult to investigate certain factors like the company's potential for future growth and the state of the industry and branch. Naturally, interpreting these signals and acting appropriately requires knowledge and expertise in finance and investments. Technical analysis's third benefit is that it does not take into account subjective factors related to specific companies, like the analyst's personal expectations. The graphs' findings are the only factors taken into consideration while making a final decision. Technical analysis also assists with timing decisions, such as when to buy or sell a certain stock.

The primary disadvantage of the technical analysis is that it lacks any academic or scientific backing and cannot be supported by any logical reasoning. Technical analysis is compared to reading tea leaves by its detractors. They claim that a stock's movement is not always foreseeable just because of a chart pattern. However, if a sufficient number of followers are convinced of the chart's predictive ability, they will participate in the buying and selling activity necessary to bring the prediction to pass.

3. Differences between fundamental and technical analysis

3.1. Charts versus financial statements

Technical analysts primarily rely on price-moving charts as their primary source of data, while fundamental analysts mostly consult financial statements. The income statements, balance sheets, and cash flow statements are examined by the fundamental analyst in order to determine the stock's intrinsic value. The reasoning behind this strategy's investing decisions is straightforward: if a stock is trading for less than its estimated intrinsic value, it is a wise choice. However, fundamental analysts incorporate more sophisticated data into their analysis beyond what is contained in the financial statements. However, technical analysts think that the stock price charts provide all the information you need to know about a stock.

3.2. Time horizon

When studying equities, fundamental analysis takes longer than technical analysis. While fundamental analysis spans intervals of several years, technical analysis employs relatively short periods, such as days, weeks, or months. That suggests that investors who are attempting to select stocks whose value will rise over a number of years in the future utilize fundamental analysis. Even if it takes several years, they think that if they have selected the right stocks, their price will eventually grow. The technicians, on the other hand, are looking for companies that they can trade in the near future,

that is, stocks whose values will move significantly in the next few days or weeks.

The two types of investors those who use technical and those who use fundamental analysis lead to different time frames for their analyses. As we all know, a fundamental analyst estimates the share's true value, but that value will eventually become its market price; this is known as value investing. If the market reflects every change related to shares that momentarily affects price, both value investing and fundamental analysis would be impossible. Additionally, the data used by fundamental analysts is not released every day, unlike data on price movements and trading volume. Instead, it is released quarterly or annually. Financial statements are sometimes only released once a year, although price information is constantly updated.

3.3. Trading versus investing

Beyond just differing in how they approach problems over a short or long term period of time, fundamental and technical analysis also have different time horizons. Fundamental analysis aims to make investments, while technical analysis generally serves as a tool for trading. While technical analysis is most often employed by traders seeking to make quick profits, fundamental analysis is primarily used by investors who buy and hold stocks for a while. Investing in certain stocks is based on the belief that their value will increase in the future, whereas trading in certain stocks is based on the belief that the trader will be able to sell them for a higher price in a relatively short amount of time. This distinction may not always be evident, but there is a distinct methodology between these schools of thought.

4. Recommendations for investments

4.1. Combined used of fundamentals and technical analysis

In the world of investment, technical and fundamental analysis are viewed as complete opposites. Nonetheless, a lot of traders and investors have been able to mix them and get good outcomes. Technical analysis can be used by investors who primarily utilize fundamental research to pinpoint the precise moment to buy or sell an asset. According to Safronov (2021), Technical analysis works well when combined with fundamental analysis because it is essentially a market timing tool. Sometimes, making the right decision about when to take advantage of an investing opportunity might be more crucial than making the actual transaction. Thus, the ideal course of action would be to research the essential elements, choose an investment, and use technical analysis to choose whether to buy or sell.

In contrast, investors who primarily rely on technical research may find that fundamental analysis is useful in some circumstances. When a technical analyst sees a pattern in price and concludes that a specific stock is a suitable investment, he can verify his conclusion by looking into several key business factors, which can provide significant details about the company's capabilities and financial standing.

This implies that although the technical and basic analyses are different from one another, they are not inherently incompatible. The idea of merging technical and fundamental analysis is generally not well-liked by those who support either one separately. While technical and fundamental analysis are the most significant and potent instruments in the world of finance and investing, it is indisputable that there are certain benefits to combining them or at the very least having a greater understanding of both kinds of investment methods.

4.2. Steps of using fundamentals and technical analysis to determine market direction: The case of VN-Index

Step 1: Analyze market charts (VN-Index for Vietnam market) to determine market trends according to technical approach.

Figure 1: VN-Index price for the past four years

Source: Investing.com

Investors can use the VN-Index chart to analysis the market. Analysis of Figure 1 shows that the VN-Index has reversed its trend, forming a bottom in the area around 900 points in November, 2022. After that, the market is in a small uptrend to 1,300. However, this is a really strong resistance as it was the point where the market significantly dropped before. As a result, the market is in a really risky position. Investors might wait for the market to breakout of the top, or it might strongly decrease.

Step 2: Use fundamental analysis to analyze the macro environment to forecast the economic outlook. If the economy has good prospects, the market trend will be positive and vice versa.

From the analysis of the macro environment, it is shown that Vietnam's economy has a stable foundation and good macro balance. However, the macroeconomic situation in developed economies such as the US and UK is facing problems. For example, inflation in the US has reached its highest level in the last 20 years, leading to the US stock market crash, affecting the Vietnam stock market since 2022. Nonetheless, Vietnam's GDP growth and consumer demand in 2023 and have been still stable, creating a short-term uptrend. The current slow recovery of the VN-Index is consistent with the analysis of Vietnam's macro economy.

Step 3: Forecast market trends based on fundamental valuation. If the market is still undervalued, the market outlook will increase and vice versa.

This step uses fundamental analysis, performs P/E analysis (an index that evaluates the relationship between the market price of a stock and earnings per share) of the entire market and compares it with the fluctuations of VN-Index over time. In Vietnam, P/E below 9 times is a low market, the market is likely to form a bottom if it is in a downtrend. On the contrary, the market is likely to form a peak if the P/E of the entire market is above 18. From this analysis, it can be seen that the market is still in a neutral position as the P/E ratio is currently priced at around 12. The market still has a high potential to continue growing if the macroeconomic factors are in favor.

Step 4: Analyze the valuation of some pillar stocks to supplement valuation information (this content, in addition to trend forecasting, can be used to select investment portfolios).

At this step, analysts can select a number of stocks in the strong industries of the market, conduct valuation to analyze the buying and selling decisions of value investors using fundamental analysis. If the valuation of these stocks is cheap, the market outlook is likely to create an upward trend and vice versa, stocks are already in the high valuation zone while the market is in an upward trend, the market will have the risk of trend reversal. From this perspective, when top stocks are overvalued, profit prospects decline, value investors will tend to sell to create a downward trend and vice versa. Specifically, in the Vietnamese stock market, the financial sector is a very large sector with a high total capitalization. Therefore, to predict the general trend of the market, predicting financial sectors such as banking or securities is very important. Investors can look at the growth potential of this sector or the P/E index to determine whether this stock can increase or not, leading to the stock market increasing or decreasing.

Step 5: Synthesize the analysis of the above 4 steps and conclude on the market trend.

Through the above analysis process of VN-Index, based on technical analysis, it can be concluded that VN-Index bottomed out on November 16, 2022. However, VN-Index did not increase sharply after bottoming out because Vietnam's GDP growth prospects tended to decline compared to the years before the Covid-19 pandemic, and market cash flow declined due to interest rates remaining quite high. Therefore, the market is establishing a small recovery waiting for cash flow to increase. Based on the analysis and valuation of the entire market and key industries, it can be seen that the valuation of the banking industry (one of the key industries) is still at a low valuation level. Currently, many banking stocks are at an attractive level for value investing. Although Vietnam's growth prospects have declined, Vietnam's macro indicators are still stable, and valuations are still attractive for investment. Using a combination of technical analysis and fundamental analysis, the author predicts that the market will establish an upward trend after the current small recovery. However, the market still needs a lot of time to accumulate before going into an uptrend.

Conclusion: The paper has shown that there are numerous differences between fundamental and technical analysis, ranging from the underlying presumptions to the techniques employed and their intended purposes. These variations demonstrate that technical and fundamental analysis are fundamentally distinct approaches to investing decision-making. The observed variations, however, do not always imply that technical and basic analysis produce distinct investment outcomes. Actually, each analysis has benefits and drawbacks that can be combined to produce the best outcomes. As a result, investors should learn both strategies and practice to get the best results.

References:

AS, S. (2013). A study on fundamental and technical analysis. International Journal of Marketing, Financial Services & Management Research, 2(5), 44-59.

Agustin, I. N. (2019). The integration of fundamental and technical analysis in predicting the stock price. Jurnal Manajemen Maranatha, 18(2), 93-102.

Bartram, S. M., & Grinblatt, M. (2015). Fundamental analysis works. Social Science Research Network.

Cohen, G. (2023). Technical Analysis in Investing. Review of Pacific Basin Financial Markets & Policies, 26(2).

Edwards, R. D., Magee, J., & Bassetti, W. C. (2018). Technical analysis of stock trends. CRC press.

Safronov, A. A., & Sazonov, A. I. (2021). Assessing the investment attractiveness of shares: The joint use of fundamental and technical analysis. Universal Journal of Accounting and Finance, 9(5), 908-915.

THE IMPACT OF CASH FLOW AND FINANCIAL CONSTRAINTS ON INVESTMENT OF LISTED FIRMS IN VIETNAM

MA. Bui Ngoc Mai Phuong* - Assoc.Prof.PhD. Dang Van Dan*

Abstract: ***The paper measures the impact of investment on cash flow under conditions of financial constraints of non-financial enterprises listed on the Vietnamese stock market in the period from 2012 - 2022. Using the SGMM method, the research results show that: investment expenditures are very sensitive to cash flow shocks; furthermore, sensitivity increases with the level of financial constraints. The results are relevant for financial managers to develop reasonable investment policies to minimize the impact of financial constraints on investment and new institutional policies to support access to capital sources for firms.***

• Keywords: *financial constraints, corporate investment.*

JEL codes: G31, G32

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1. Introduction

To achieve the goal of maximizing firm value, financial administrators will make important decisions such as investment decisions, financing decisions, distribution decisions or asset management decisions. Investment decisions are considered the most important decisions of corporate financial management. According to Brealey et al. (2020), the correct investment decision will contribute to increasing corporate value, thereby increasing asset value for shareholders.

From theories between investment decisions and corporate financial characteristics such as the asymmetric information theory, the agency problem theory or the pecking order theory, as well as the trade-off between the cost of capital and investment opportunities have opened up for economists avenues for empirical research on the relationship between internal capital representing is the cash flow and investment of the enterprise, taking into account financial constraints due to asymmetric information. The study of Fazzari, Hubbard & Petersen (1988) (FHP88) is one of the first publications to provide evidence of the existence of a positive relationship between investment and internal cash flow (Investment Cash flow Sensitive) (ICFS). After that, many other authors have researched this relationship in many countries around the world, especially in countries with emerging or developing economies, including Vietnam such as Machokoto et al. (2021), Guizani and Ajmi (2022), An & Ngoc (2022), etc., results of these studies strongly affirm that: cash flow and financial constraints have a large influence on managers' investment decisions, as a result, firms will be limited in choosing potential projects. to invest and influence the firm value.

In addition, in Vietnam, where the financial market has a shift in the structure of the financial system but still fundamentally relies on the banking system (Dao Minh Thang, 2023), capital mobilization from Corporate bond issuance still faces a series of difficulties and is still quite modest compared to other countries in the region (Vietnam Bond Market Association 2022). Thus, in recent years, the development of the size of Vietnam's financial market has been slow and not commensurate with its potential, leading to limited access to the capital market for economic entities in Vietnam. In particular, firms face a large barrier when mobilizing capital at a reasonable cost, thereby affecting their plans and investment strategies. Therefore, this study focuses on measuring the impact of investment on cash flow in a financially constrained environment in Vietnam in the period 2012 - 2022.

2. Theoretical and literature review

2.1. Theoretical basis

According to Keynes (1937), investments are made until expected future returns equal the opportunity cost of capital, or net present value to zero. Accordingly, Jorgenson (1967) defines

** Ho Chi Minh University of Banking, Viet Nam; email: phuongbnm@hub.edu.vn*

investment as the capital expenditure of the enterprise during the period. To make investment decisions, every firm requires cash flow as a basic input. When cash flow is lacking, firm operations will be disrupted and can even lead to insolvency (Keige, 1991).

From the perspectives of background theory on the relationship between cash flow and investment have been mentioned such as: the neoclassical theory, the asymmetric information theory, the agency theory, the trade-off theory, the pecking order theory show that: when asymmetric information exists, making firm's internal and external finance unable to completely substitute for each other due to issues related to agency costs and payment risks; At the same time, there are financial barriers or constraints that prevent s from mobilizing additional external finance at the reasonable cost.

From there, financial constraints are defined as the limitations of businesses in mobilizing domestic and foreign capital for investment (FHP88). Later, Kaplan & Zingales (1997) concretized this concept, an enterprise is considered to have financial constraints when there is a difference between the cost of mobilizing internal and external finance; this difference is larger, the enterprise has a higher level of financial constraints.

The theory of the influence of cash flow on corporate investment comes from theories related to financial decisions and investment decisions including: the asymmetric Information theory, the agency theory, the pecking order theory. In corporate finance, Myers & Majluf (1984) gave the first arguments on the application of asymmetric information in the decision to choose a firm's finance. Bernanke & Gertler (1989), have proven that: asymmetric information or agency costs of free cash flow lead to conflicts of interest between shareholders and managers; besides, when information problems appear, the cost and liquidity of firm's capital have a direct impact on investment decisions and future cash flows of the firm (Jensen, 1986). From the arguments of the background theory on the agency problem, empirical researchers have conducted studies from many different aspects to exploit ICFS. The combined effects of asymmetric information, agency problems and transaction costs expose the difference between the costs of internal and external capital. Under such financial constraints, investment decisions depend on the availability of internal capital. Furthermore, the heterogeneity in firm characteristics and cash flows implies that investments by financially constrained firms are more likely to be affected by the availability of internal capital.

To reflect the influence of market factors on firm value due to asymmetric information and agency costs, some researchers such as Abel & Blanchard (1983) exploited the Q theory approach to investment. Since then, FHP88 has proposed the internal cash flow factor in the equation describing the investment behavior of financially constrained firms:

$$I_{i,t}/K_{i,t-1} = \beta_0 + \beta_1 Q_{i,t} + \beta_2(CF_{i,t}/K_{i,t-1}) + \varepsilon_{it} \quad (1)$$

I: investment in period t; K: capital expenditure in period t; Q: Q index at the beginning of period t; CF: cash flow. The Q model has the advantage of using market information for calculation, so the Q index directly measures the expected value of future profitability based on the assessment of investors (Wale, 2014). Based on these advantages, the author uses the Q model to represent the investment equation of a firm.

Besides the Q investment model, based on the consideration of the structure of investment behavior and the incorporation of adjustment costs while the investment level reaches the optimal capital level by Bond and Meghir (1994), authors such as Love (2003) and Ratti et el. (2008) built the Euler investment model to reflect the relationship between investment and cash flow under financial conditions in an imperfect capital market as follows:

$$I_{i,t}/K_{i,t-1} = \beta_1(I_{i,t-1}/K_{i,t-2}) + b_2(S_{i,t}/K_{i,t-1}) + \beta_3(CF_{i,t}/K_{i,t-1}) + \varepsilon_{it} \quad (2)$$

In this equation, S/K is the marginal profit of capital. The Euler investment model is used by many authors when considering the relationship between investment and cash flow such as Guizani and Ajmi (2022) with the argument that the Euler investment model approach can capture changes in the financial situation of each enterprise, as well as fluctuations in the economic environment. Therefore, this model can be applied to consider ICFS for unlisted enterprises or enterprises operating in emerging or underdeveloped financial markets.

Thus, depending on the research objectives, characteristics of the observation sample, specific space and time, Q and Euler investment models are applied to make comments on the relationship between investment and cash flow. Within the scope of this article, the author uses both Q and Euler

investment models to clarify the research objectives and strengthen the research results more strongly.

2.2. Literature review

FHP88 has conducted the first official research to test the influence of cash flow on the investment level of firms in the case of controlling growth opportunities under the influence of the Q index. The research was conducted. with a fixed effects regression model with manufacturing enterprises in the US, and enterprises are classified at the level of financial efficiency based on the ratio of dividend payments to after-tax income of each year. These authors asserted that: imperfect capital markets create financial decentralization for the use of internal and external capital, investment will depend on internal cash flows and the level of firm's financial access. The higher financial constraints firm has the larger ICFS. Subsequently, many other studies by Machokoto et al. (2021), An & Ngoc (2022) v.v also gave results supporting the FHP88 view after using the GMM method to regression models suggesting that: financial constraints impact on investment, ICFS increases with the level of financial constraints, and cash flow is a valid measure for financial constraints.

However, there have also been conflicting conclusions with FHP88, typically the study of Kaplan & Zingales (1997). The results of Kaplan & Zingales (1997) show that: although cash flow and investment have a positive relationship as concluded by FHP88, only a small portion of firms in the sample with low dividends have difficulty accessing external finance. At the same time, low financially constrained firms have larger ICFS than high financially constrained firms, due to mainly relying on internal cash flow for investment despite the availability of low-cost funds.

Empirical evidence from research of some developing countries such as research by Guizani and Ajmi (2022) in Gulf Cooperation Council or An & Ngoc (2022) in the Vietnamese market, also shows that investments are positively related to cash flows and ICFS increases with the level of financial constraints; because that stock market imperfections exist in these countries.

Mohamed (2021) has commented on the two most commonly used models, the Q and Euler models, when discussing the relationship between cash flow and investment, the results with insignificant differences that: ICFS still exists and has special significance for firms with agency costs. Recently, Akbar.A et al. (2022), Nicolas (2022) have provided empirical evidence on the link between capital budgeting decisions and cash flow of non-financial enterprises in Pakistan.

Through literature review the author finds that: in countries with developing economies and financial markets, there still exists a significant dependence of investment on cash flow; depending on the measure to determine financial constraints, the investment model, as well as the time and area where the research is conducted, the level of influence is different. Therefore, this relationship needs to be considered further, especially for firms operating in countries or territories classified as frontier or emerging markets.

From the research objectives, as well as the results of theoretical review and previous experimental research, the article proposes the following research hypotheses:

H1: Cash flow has a positive impact on corporate investment.

H2: ICFS of more constrained firm is higher less constrained firm

3. Data and methodology

3.1. Data sampling and collecting

Through Fiinpro's database, the author collected data from audited financial statements of non-financial firms listed on the Vietnamese stock market (listed non-financial enterprises) in the period from 2012 to 2022. In addition, macroeconomic data (GDP) is taken from data from World Development Indicators (WDI).

The author classifies the sample according to the level of financial constraints based on the dividend payout ratio proposed by FHP88, which is also the classification criterion used in the majority of studies that mention the level of firm's financial access such as Guizani and Ajmi (2022), Sun et al. (2022) etc.

According to these authors, the dividend payout ratio is useful for determining the level of financial profitability, as these firms have costly external financing leading to increased retained earnings ratio and decreased dividend payment ratio. Thus, the author classifies the sample of firms into two groups with different levels of financial constraints: (i) firms with a dividend payout ratio = 0 are classified in more constrained firms; (ii) the remaining firms are classified in less constrained firms.

The total official observation sample after data processing includes 3,952 observations and is arranged in unbalanced panel data. The group of less constrained firms has 3,171 observations, accounting for over 80%; the group of more constrained firms has 781 observations, accounting for nearly 20%.

3.3. Research models

The author relies on the original model of FHP88, Bond and Meghir (1994) builds on the Q and Euler investment model, which is applied in many other studies on the relationship between cash flow and investment, the latest being Research by author groups such as Machokoto et al. (2021), Guizani et al. (2022), Sun et al. (2022), An & Ngoc (2022) etc.

Model (1): $I_{i,t} = \beta_0 + \beta_1 I_{i,t-1} + \beta_2 CF_{i,t} + \beta_3 Q_{i,t-1} + \sigma_j X_{i,t} + \alpha_i + \eta_t + \varepsilon_{it}$ (3)

Model (2): $I_{i,t} = \beta_0 + \beta_1 I_{i,t-1} + \beta_2 CF_{i,t} + \beta_3 S_{i,t} + \sigma_j X_{i,t} + \alpha_i + \eta_t + \varepsilon_{it}$ (4)

where $I_{i,t}$ is the dependent variable reflecting denotes the firm i's fixed investment ratio at time t (the ratio of difference between the book value of tangible fixed assets at the end of period t and t-1 plus depreciation plus depreciation in period t to the book value of tangible assets at the end of period t-1); $I_{i,t-1}$ is the lagged variable of the dependent variable 1-year; $CF_{i,t}$ and $W_{i,t}$ are independent variables, respectively, reflecting the firms i's cash flow ratio (the ratio of profit after tax in year t plus depreciation in period t to the book value of tangible assets at the end of period t-1) and net working capital ratio at time t (the ratio of difference between short-term assets and short-term liabilities to the book value of tangible assets at the end of period t-1); $Q_{i,t-1}$ and $S_{i,t}$ control for changes in demand for investment (Q is calculated as the book value of total liabilities plus the market value of total shares minus deferred tax to the book value of total assets in period t; S is calculated as the ratio of net sales in period t to the book value of tangible assets at the end of period t-1); $X_{i,t}$ includes firm-specific control variables and country-level macroeconomic variable (firm leverage - LEV, sales growth - GRO, size - SIZE, age - AGE and GDP growth); a_i is the firm-specific time invariant and component; h_t is the time-specific component accounting for changes in business cycles and ε_{it} is the idiosyncratic random error component.

The author regresses model (1) and (2) on two sample sets of enterprises with less and more constrained firms. Based on the characteristics of the investment model Q and Euler, models have been proposed with data sets including variables related to economic sectors; the dependent and lagged dependent variables are also considered endogenous as the standard in the literature. Therefore, the author selected the two-step SGMM to perform regression of the models given in this study, such as: Machokoto et al., 2021; Akbar et al., 2022; An & Ngoc, 2022 v.v.). All data processing and testing were performed on the Excel platform and Stata 17 software.

4. Results discussion

4.1. Descriptive statistics

Table 1 presents descriptive statistics of the variables mentioned in the model including values related to: mean, standard deviation, minimum value and maximum value.

Table 1. Descriptive statistics

Variable	Obs	Mean	SD	Min	Max
I	**3952**	**0.3482**	**0.8264**	**-0.5068**	**10.2464**
LI	3952	0.2859	0.7374	-0.9078	8.0702
CF	3952	0.9746	1.5600	0.0277	31
Q	3952	1.1318	0.5401	0.2110	6.0192
S	3952	21.4288	60.7253	0.0826	1.247.777
LEV	3952	0.4850	0.2066	0.0396	0.8957
GRO	3952	0.0657	0.2677	-1.0215	1.2737
SIZE	3952	6.6234	1.4184	3.2974	10.8785
AGE	3952	1.9491	0.6407	0.0000	2.8904
GDP	3952	0.0603	0.0179	0.0260	0.080

The results in table 1 show that: investment expenditure each year of the firms in the research sample are very different; with the mean and standard deviation of the I being 0.3482 and 0.8264, respectively. For the CF variable, the mean and standard deviation are 0.9746 and 1.56, respectively; it can be said that: the cash flow ratio between firms is relatively low.

Control variables such as: the growth opportunity (Q) and (S), the leverage (LEV), the size (SIZE), the listing time (AGE) and the economic development (GDP) have standard deviation is not too large compared to the mean; shows that the difference between observations is quite small. In particular, the sales growth among firms is not uneven.

Table 2 presents those descriptive statistics and tests the equality of the mean of both groups: Less constrained firms often have large size, and investment and growth opportunities are reflected in better market price stock, and annual cash

flows are also larger than more constrained firms; however, more constrained firms prefer debt over equity, have higher sales growth rates than the less constrained firms.

Table 2. Firm characteristics by firms group: mean test

Variable	Less constrained firms (N = 3171)	More constrained firms (N = 781)	Mean test
I	0.3377	0.3907	-0.0530
LI	0.2860	0.2854	0.0006
CF	1.0348	0.7301	0.3047***
Q	1.1763	0.9513	0.2250***
S	22.0621	18.8577	3.2044
LEV	0.4765	0.5193	-0.0428***
GRO	0.0618	0.0815	-0.0197*
SIZE	6.6673	6.4449	0.2224***
AGE	1.9564	1.9196	0.0368

*Note: ***, **, and * represent statistical significance at 0.01, 0.05, and 0.1, respectively.*

4.2. Regression results and discussion

Table 3 respectively presents the testing results of the regression models performed on less constrained firms and more constrained firms using the SGMM method.

Table 3. Cash flow' impact on corporate investment with financial constraints

	Model (1)		Model (2)	
	Less constrained firms	More constrained firms	Less constrained firms	More constrained firms
LI	0.0175***	-0.0233***	0.0171***	0.0083***
CF	0.0539***	0.2783***	0.0463***	0.2948***
Q	0.2064***	-0.2410***		
S			-0.0001	-0.0038***
LEV	0.1783***	0.4933***	0.5884***	0.3353***
GRO	-0.0081	0.5598***	-0.0267	0.3389***
SIZE	0.0531*	-0.1188***	-0.1723***	-0.0113***
AGE	-0.1879***	0.1293***	0.0955***	0.2219***
GDP	0.7423***	0.0021	0.9378***	1.1909***
_cons	-0.0958	0.5494	1.2419***	-0.4661***
Number of observations	3171	781	3171	781
Number of groups	419	125	419	125
Number of instrument variables	114	87	116	89
AR(2)	0.551	0.454	0.501	0.271
Hansen	0.410	0.987	0.205	0.943

*Note: ***, **, and * represent statistical significance at 0.01, 0.05, and 0.1, respectively*

The results presented in table 3 show that: the regression results are consistent with the hypothesis of a positive relationship between the variable representing cash flow (CF) and the dependent variable representing investment (I). Both the Q investment model and the Euler investment model are significant at the 1% level.

The results are consistent with the explanation of the relationship between investment and cash flow based on asymmetric information theory, agency problem theory and pecking order theory; at the same time, it is also similar to the conclusion of FHP88 and most studies on the positive correlation between investment and cash flow. These authors explain that when capital markets are imperfect, combined with the presence of asymmetric information and agency problems, external investors require higher capital costs than internal capital sources to compensate for risks. Therefore, in the context of Vietnam as a transitional economy, bank credit is still the main source of funding for firms (Vo, 2019), firms tend to prioritize internal capital to finance investment activities; in case of shortage of internal funds, firms will cut investment due to asymmetric information, leading to a strong positive relationship between investment and cash flow (Mohamed, 2021; Akbar et al., 2022; Nicolas, 2022; Sun et al., 2022; An & Ngoc, 2022).

This is also evidence supporting the view that ICFS still exists in the business system in countries with underdeveloped financial markets or emerging market countries, such as Pakistan (Akbar et al., 2022), Vietnam (An & Ngoc, 2022), India (Gupta and Mahakud, 2019) v.v. Accordingly, the financial markets in these countries are still weak, causing poor information transmission and transparency, leading to the existence of many barriers, making it difficult for firms to access external capital.

The elasticity of investment concerning cash flow assessed at the sample average of the two sample sets is 0.1651 respectively; 0.5200 for model (1) and 0.1419; 0.4022 for model (2). Thus, when cash flow increases by 10%, corporate investment in the less constrained firms increases by more than 1.6% and 1.4%; And for more constrained firms, it is more than 5.2% and 4%. It shows that ICFS increases with the level of financial constraints, this is consistent with the hypothesis and the results of Guizani and Ajmi (2022), An & Ngoc (2022). Thus, when the capital market is not perfect, it will create financial decentralization in the use of internal and external capital, and the level of investment, in addition to depending on internal cash flow, will also be affected by the level of financial access. Enterprises classified as having high financial constraints will have greater agency costs and fewer

channels to access external capital, so investment expenditures must depend more on cash flows, leading to limitations in dividend payments. (Vo, 2019; Machokoto et al., 2021; Sun et al., 2022).

The results are consistent with Nugroho (2020), Sun et al. (2022) etc. that: assessing growth opportunities from outside investors through the Q-index has a positive relationship with less constrained firms' investment. Meanwhile, in more constrained firms, the Q index is negatively correlated to investment but is not statistically significant. Financial leverage will promote corporate investment, this result is similar to Nugroho (2020), An & Ngoc (2022) related to the control rights of shareholders and the benefits of tax shields from interest, thus debt encourages firms to increase investment.

Besides, the research also finds a statistically significant negative relationship between S and I in low constrained firms, this emphasizes that: large firms with high cash flow will tend to be more cautious in investment activities. This result can be explained that: firms with large sales tend to limit the expansion of firms investment activities and instead focus on improving sales performance; this is another evidence confirming the prudent investment practices of successful firms in Vietnam (Vo, 2019). However, the regression coefficient of variable S is quite low compared to variable Q in both sample sets, this shows that the corporate investment in Vietnam, whether with high or low financial constraints, is sensitive to growth opportunities from market rather than from within the enterprise. This is also evidence confirming the importance of financial system development to corporate operations.

In addition, the listing time is also an important factor, having a significant impact on corporate investment in countries with underdeveloped financial markets, especially for less constrained firms, supporting the argument of An & Ngoc (2022).

Finally, economic development also has a significant and statistically significant positive influence on investment of more constrained firms, but it is not statistically significant in less constrained firms. Implying that: more constrained firms benefit a lot from opportunities brought by economic development such as government investment, using inputs more effectively to increase investment.

5. Conclusion

This research aims to test the sensitivity of investment to cash flow in VietNam's listed non-financial firms in the period from 2012 to 2022 with financial constraints. Using the SGMM estimation, the results obtained show that: low dividend payout ratio firms have the sensitivity of investment to cash flow is higher than high dividend payout ratio firms.

Evidence from the results of this research also provides some implications for policy development. On the firm side, financial administrators need to introduce reasonable investment policies to minimize the impact of financial constraints, to maintain and increase corporate investment. In addition, to minimize the impact of asymmetric information and agency cost problems, thereby reducing financial constraints when mobilizing capital, enterprises in Vietnam need to improve the quality of their information disclosure, building trust and confidence of investors. Finally, given the role of the capital market in mobilizing savings for investment, new institutional policies need to be applied to develop the financial market and support access to capital sources for firms.

References:

Akbar, A., Jiang, X., & Akbar, M. (2022). Do working capital management practices influence investment and financing patterns of firms?. Journal of Economic and Administrative Sciences, 38(1), 91-109.

An, T. T. H., & Ngoc, H. L. H. (2022). Cash flows–investment sensitivity under financial constraints: The case of Vietnam. Tạp chí Khoa học và Công nghệ-Đại học Đà Nẵng, 20(6.1), 64-68.

Bernanke, B., & Gertler, M. (1989). Agency costs, net worth, and business fluctuations. The American Economic Review, 79(1), 14-31.

Bond, S., & Meghir, C. (1994). Financial constraints and company investment. Fiscal tudies, 15(2), 1-18.

Brealey, R. A., Myers, S. C., & Allen, F. (2020). Principles of corporate finance. McGraw-hill.

Dao Minh Thang. (2023). Giải pháp thúc đẩy tăng trưởng tín dụng: Để "cung" và "cầu" tín dụng gặp nhau, truy cập tại https://tapchinganhang.gov.vn/giai-phap-thuc-day-tang-truong-tin-dung-de-cung-va-cau-tin-dung-gap-nhau.htm [ngày truy cập 15/08/2023]

Fazzari S.M., Hubbard R. G., & Petersen B. C. (1988). Financing Constraints and Corporate Investment. Brookings Papers on Economic Activity, 1, 141-195.

Guizani, M., & Ajmi, A. N. (2022). Islamic banking and corporate investment efficiency: empirical evidence from Malaysia. International Journal of Productivity and Performance Management, 71(5), 1854-1871.

Kaplan, S. N., & Zingales, L. (1997). Do investment-cash flow sensitivities provide useful measures of financing constraints? The Quarterly Journal of Economics, 112(1), 169-215.

Keynes, J. M. (1937). The general theory of employment. The quarterly journal of economics, 51(2), 209-223.

Machokoto, M., Tanveer, U., Ishaq, S., & Areneke, G. (2021). Decreasing investment-cash flow sensitivity: Further UK evidence. Finance Research Letters, 38, 101397.

Nicolas, T. (2022). Short-term financial constraints and SMEs' investment decision: evidence from the working capital channel. Small Business Economics, 58(4), 1885-1914.

Sun, J., Zu, N., & Liu, Z. (2022). The Trends and Gaps in the Sensitivity of Investment to Cash Flow: Evidence from China. Sustainability, 14(12), 7461.

Vo, X. V. (2019). Leverage and corporate investment–Evidence from Vietnam. Finance Research Letters, 28, 1-5.

Vietnam Bond Market Association 2022, Vietnam Bond Market Summary 2022, accessed at https://vbma.org.vn/vi/reports/yearly [access date April 30, 2023]

BUILDING A SECURE DATA-SHARING FRAMEWORK FOR VIETNAMESE FINANCIAL INSTITUTIONS

PhD. Chu Thi Hong Hai* - PhD. Tran Thanh Thu* - Dang Truong Thinh**

Abstract: ***For financial institutions, data plays a crucial role in business decision-making. Incomplete data can lead to poorly informed, inefficient, and unreliable decisions. To address this issue, building a safe data-sharing framework is an optimal solution for financial institutions to enrich data, supporting business decision-making quickly. However, fulfilling this request is challenging because of the sensitive nature of the data and the intense competition within the financial industry. This paper clarifies the theoretical foundation and the importance of data sharing among organizations, enabling them to build a secure data-sharing framework for their organizations. The proposed data-sharing framework is built based on the specific characteristics and the current technological and policy landscape in Vietnam.***

• Keywords: *data sharing, secure sharing framework, financial institutions, Vietnam.*

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1. Introduction

Data sharing is an essential factor of the digital economy. Data sharing brings benefits by creating new value, promoting the development of smart applications and personalized services, and building advanced solutions for social and business issues. It is also a powerful tool to foster creativity and collaboration among organizations, opening cooperative opportunities and enhancing understanding and deeper consumer analysis. Data sharing provides organizations with a scale of data they cannot build on their own and helps them gain deeper insights into many issues, thereby facilitating the automation of decision-making more quickly and accurately.

Data sharing in Vietnam is developing very slowly, lacking common standards, fragmented data, and not fully utilizing the potential of data, especially in financial institutions with large amounts of sensitive data that require high security and information safety. Additionally, data sharing can encounter legal, technological, and operational challenges. Therefore, this study suggests a safe and straightforward way to share data among organizations. It will help speed up safe data sharing, ensuring that the benefits are used well and last long in financial institutions in Vietnam and other organizations and businesses. The safe data-sharing framework proposed by the authors is based on the theories of data sharing and principles of the data-sharing ecosystem. The authors examine current domestic and international data-sharing mechanisms, policies, and issues to provide a solid basis for the proposed safe data-sharing framework. The paper also validates the proposed model in practice by discussing the necessary conditions for a successful, safe data-sharing framework among organizations in Vietnam.

2. Theoretical basis for secure data sharing

2.1. Definition of secure data sharing

Secure Data Sharing (SDS) can be defined as sharing data that allows organizations to collect and use data transparently (IndyKite, 2024). According to Creme Global - secure data sharing is the legal and technical framework to promote and facilitate data sharing among organizations by establishing rules, security, and privacy (Creme Global, 2024). The definition of Secure Data Sharing emphasizes the importance of three characteristics of SDS: transparency and fairness, compliance, and collaboration. Transparency and fair treatment among organizations mean that shared data must be treated and used honestly and transparently without any bias or the private interests of any organization. Transparency facilitates the flow of data and the accountability of using data in different organizations. Compliance emphasizes the importance of rules and measures to ensure the safety of data sharing among organizations. Data breaches and attacks might cause profound damage to any organization, leading to the collapse of the operating system.

** Banking Academy of Vietnam*
*** Foreign Trade University*

Therefore, organizations must establish policies and procedures to protect data from unauthorized access and ensure user privacy. Besides, data sharing requires collaboration among organizations. The efficiency of data sharing is ensured if and only if each organization of the data-sharing framework shows its willingness to cooperate and share data. By sharing data transparently and safely, organizations can utilize data resources effectively and efficiently to make profits while creating value for the community. Alternatively, data-driven decision-making allows an organization to target its business activities and balance its performance to society's benefit.

2.2. Forms of data sharing

Data sharing is the methods or mechanisms organizations and individuals use to exchange information and data resources. These forms include *bilateral, multilateral, centralized,* and *decentralized data sharing,* as outlined below:

Bilateral data sharing

Bilateral data sharing is exchanging information between two parties or organizations without involving a third party. The Data Provider and the Data Consumer establish a direct relationship and exchange data in this model. The data is transmitted through pre-established communication channels between the two parties, with no intermediary or third party (Data Service Provider) involved in the exchange process.

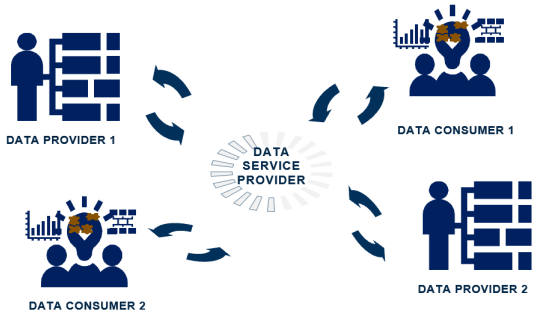
Figure 1. Bilateral data sharing

Bilateral data sharing occurs when both parties have a common goal and cooperate by sharing data to achieve it. This can involve sharing data on products, services, or business strategies between two organizations or exchanging information between an organization and a partner to optimize workflows or improve performance. Bilateral data sharing is the simplicity and flexibility of the process. Without third-party intervention, data can be transmitted quickly and efficiently. It enhances trust and efficiency in the relationship and facilitates cooperation and mutual development. However, maintaining this form of sharing requires strict management and monitoring to ensure transparency and data security throughout the exchange.

Sharing multi-dimensional data

Multilateral data sharing is a form of exchange between three or more parties, usually through agreements or data-sharing platforms. In this model, participants share information and resources to achieve common goals or create cooperative value. An essential aspect of multilateral data sharing is developing agreements or platforms to support the exchange process. This may include establishing regulations, principles, or data management and exchange standards. Multilateral agreements often set rules for sharing, protecting, and managing data to ensure transparency, fairness, and security. Multilateral data sharing typically requires the consent and commitment of all participating parties. Participants can include organizations, companies, governments, or other stakeholders. Each party contributes to the process and can benefit from exchanging information and resources. One advantage of multilateral data sharing is the ability to create cooperative value and innovation. When organizations combine their resources and information, they can develop new solutions and services that would be unattainable individually. Additionally, multilateral data sharing can enhance transparency and oversight in the data exchange, creating a fairer and more transparent business environment. Multilateral data sharing includes the following entities: Data service providers, Data consumers, and Data providers.

Figure 2. Sharing multi-dimensional data

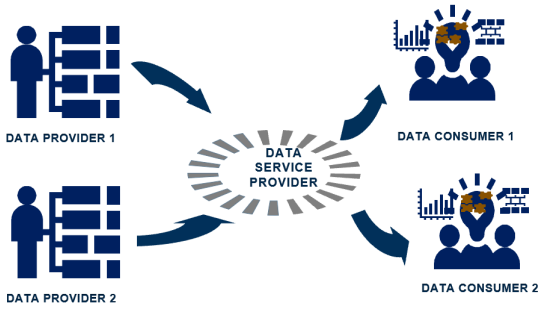


Centralized data sharing

Centralized data sharing involves managing and storing data at a central point, usually overseen by a Data Service Provider. In this model, Data Providers send their data to the central database for storage and management. Data consumers can access and exchange information through the Data Service Provider. A key feature of centralized data sharing

is the concentration of data into a single hub. This enhances efficiency and data management since all information is in one place. It also simplifies data management and security, as security measures and access controls are centralized.

Figure 3. Centralized data sharing

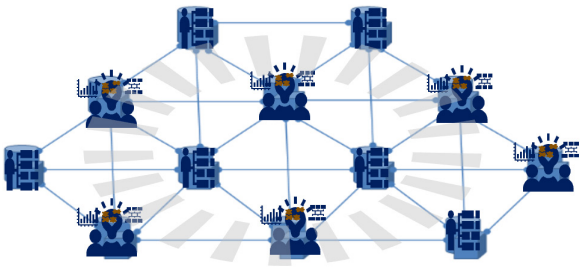


The advantage of centralized data sharing is efficiency and ease of management. With data stored in a single hub, accessing and managing it becomes more straightforward, from searching for information to protecting data. Centralizing data also increases transparency and regulatory compliance, as all information is stored in one place and can be easily checked and monitored. However, centralized data sharing also has the drawback of dependence on a single system. If this system encounters a problem or is attacked, it can lead to data loss or disruption in information access. Therefore, protecting and backing up centralized data is crucial to ensure the safety and continuity of the system.

Decentralized data sharing

Decentralized data sharing is a model where data is distributed and managed across multiple systems without centralization. In this model, no single central point manages all the data. Instead, data is stored and managed on a network of independent nodes, each capable of holding shared data and functioning independently. A defining feature of decentralized data sharing is the distribution of data, which is spread across various systems rather than centralized in one location. This model offers numerous benefits, such as flexible scalability, high fault tolerance, and increased flexibility in managing and accessing data. The primary advantage of decentralized data sharing is the independence and flexibility of each system. With data distributed across multiple nodes, a failure at one node does not compromise the entire system, enhancing the reliability and durability of the data infrastructure. Additionally, this distribution facilitates expansion and future development. However, managing and protecting decentralized data is more complex than in a centralized model. Ensuring safety, security, and regulatory compliance requires sophisticated security measures and controls due to the dispersed nature of the data. Furthermore, accessing and exchanging data can be more complicated because the data is spread across different systems.

Figure 4. Decentralized data sharing



2.3. Principles of safe data sharing

Safe data sharing must ensure the following principles:

Transparency: Transparency involves clarity among all parties in data sharing to ensure success. It is continuous and applies at all stages of the sharing process.

Accessibility: It relates to technical access and includes accessing metadata to identify initial datasets, evaluate data quality and suitability, and agree on data-sharing mechanisms and limitations. Accessibility helps establish mutual trust and ensures the right people access the data at the right time.

Standardization: Standardization involves consistently applying legal, technical, and other measures to facilitate data-sharing cooperation.

Fairness and Ethics: Fairness and ethics go beyond meeting individual data protection and technical standards. They require the application of ethical standards in creating and using data-sharing systems and frameworks from the initial design stage.

Accountability: Accountability involves compliance with data protection laws and specific rules for data-sharing partnerships. It also requires a robust governance structure and a business culture that encourages responsibility in data handling.

Data Security and Integrity: Data security and integrity involve implementing measures to protect and securely safeguard information, creating a secure environment for data sharing.

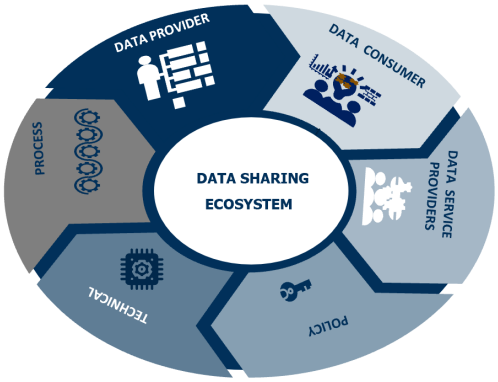
Protection and Defense Against Attacks: Measures must be in place to prevent and respond to

Denial-of-Service (DoS) attacks, scanning attacks, or malware attacks.

2.4. Data sharing ecosystem

The data-sharing ecosystem is a network of entities, technologies, policies, and processes to facilitate efficient and secure data sharing between organizations, individuals, and stakeholders. The current data-sharing ecosystem is depicted in Figure 5 below:

Figure 5. Data sharing ecosystem



The ecosystem consists of six components:

(1) Data provider: Organizations, individuals, businesses, etc., that create and provide data.

(2) Data consumer: Entities that consume data.

(3) Data service provider: Organizations that offer data-sharing services, including technology platform providers, cloud computing service companies, data management companies, etc.

(4) Policy: Mechanisms that supervise data sharing within the ecosystem.

(5) Technical: Necessary technologies to store, manage, and share data, such as cloud platforms, distributed databases, blockchain, and security solutions.

(6) Process: Ensures that data-sharing activities occur in an organized, efficient, and secure manner. This process is crucial for transparency, efficiency, and security in the data-sharing ecosystem, helping organizations and individuals maximize the value of data sustainably and reliably.

The ecosystem enhances data-sharing activities between stakeholders that occur constantly with vast amounts of data, enabling organizations to expand cooperation mechanisms, optimize data value, and seize significant development opportunities. However, building and maintaining the ecosystem is only a step towards creating a favorable data-sharing environment. Safe data sharing has not yet been fully established and controlled. To ensure safe data sharing, the ecosystem needs a data-sharing framework that provides references, fundamental principles, and detailed guidelines for organizations to build and implement secure data-sharing activities.

3. Current situation of data sharing and the need for data sharing framework

Numerous studies have affirmed that developing databases and sharing data is essential for implementing digital government services and the digital economy. Data sharing improves productivity, international competitiveness, economic growth, and the standard of living. However, data sharing within organizations and countries often depends on data quality, IT infrastructure, and legal aspects (Deloitte, 2017; Government, 2020). In 2017, Deloitte highlighted the challenges and urgency of data sharing. The firm conducted surveys and analyses on the national data landscape, IT infrastructure, and barriers to data sharing among various governmental departments (Deloitte, 2017). McKinsey & Company confirmed the significant benefits of sharing banking data. They emphasized the legal considerations in regulating data types and sharing methods (McKinsey & Company, 2017). Another study by the International Telecommunication Union (ITU) focused on policies and regulations for digital infrastructure in Asia-Pacific countries. It proposed policies to support digitization and data sharing in the region (ITU, 2019).

Recently, the Singapore government announced regulations on the Data Sharing Framework (IMDA & PDPC, 2019), guiding data sharing among businesses. The framework provides best practices for data sharing while ensuring compliance with security regulations developed through collaboration between the Infocomm Media Development Authority (IMDA) and the Personal Data Protection Commission (PDPC). Organizations recognize the immense value of data, but responsible and reliable data sharing remains a challenge. With this document, businesses in Singapore can apply responsible data sharing to create better products and services, reduce costs, and improve operations through data-driven decisions. It could be seen that data sharing has garnered interest and implementation at all levels, from government to businesses and individuals. However, detailed studies lack methods, techniques, and legal aspects for quick, convenient, and safe data sharing.

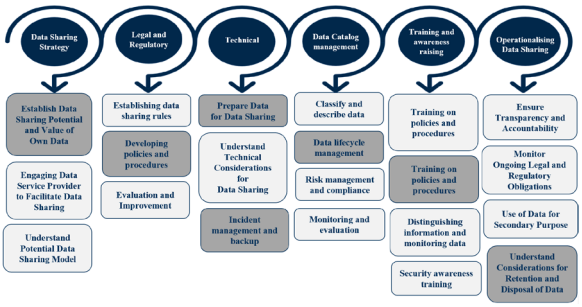
In Vietnam, the benefits and challenges of data sharing are recognized. The Vietnamese government has taken steps towards implementing data sharing between and within departments. Decree No. 47/2020/NĐ-CP issued on 9th April 2024 regulated digital data connection and sharing in building e-government. It also provides a basis for departments to assess infrastructure and legal frameworks to ensure information security in data sharing (Government, 2020). In 2018, the State Bank of Vietnam amended Circular No. 35, regulating security for Internet banking services, aiming for safe data sharing (State Bank, 2018). SBV also researched and updated the list of databases and issued regulations on the exploitation and use of shared data under the control of SBV. The Ministry of Information and Communications (MIC) completed a project on "Solutions for Connection, Data Sharing, and IT Infrastructure Restructuring" in 2021. The project outlined the national database situation, the need for shared data use, the implementation of large-scale IT systems, and specific tasks for each department. By late 2020, MIC completed the e-Government Architecture Framework (NGSP) Vietnam, version 2.0, which connects and shares data among national-level information systems, guiding ministries and sectors in building and updating e-Government architecture.

The importance of data as a new resource in the digital economy is strongly expressed in government policies and regulations. Data connection, integration, and sharing are core stones for the comprehensive and inclusive development of the Vietnamese economy. Data Sharing maximizes the value of data to benefit all related stakeholders. However, exponential growth in data requires data sharing to be done securely. IT infrastructure and data sharing need more attention to embrace the 4.0 revolution and promote digital transformation fully (Nguyen, 2020). Therefore, a secure data-sharing framework is primary for the sustainable added value of sharing data among organizations. In the next part, we propose a secure data-sharing framework for an organization and discuss the application of the framework to financial institutions in Vietnam.

4. Secure data sharing framework for financial institutions in Vietnam

The proposed secure data-sharing framework combines the Data-Sharing Framework (IMDA & PDPC, 2019) and the Data-sharing framework for small and medium enterprises (Marc Strittmatter et al., 2023). The proposed secure data-sharing framework for financial institutions includes six pillars: Strategy, Regulation, Technical, Data management, Data training, and Operationalizing data sharing. The framework provides the theoretical and principle basis necessary to develop the data-sharing ecosystem in a practical, sustainable, and safe manner.

Figure 6. Secure data sharing framework



Data Sharing Strategy: The data-sharing strategy aims to assess data sources' potential value and scalability within a financial institution when sharing data. Data-sharing strategy defines the potential and value of shared data. Digital transformation recategorizes the assets of financial institutions, by which data becomes a new asset for any financial institution. Open Banking and BankAS have replaced traditional banks in consumer financial services. Therefore, the data-sharing strategy must indicate the significance of data and data-sharing. Financial institutions must understand their data, assess its potential, and price it accurately. Moreover, financial institutions must diversify data sources and understand data-sharing policies. Diversifying data sources and services helps financial institutions benefit more during the data exchange. However, providing diversified data services in multilateral, centralized, and decentralized models is complex. Financial institutions need to understand the internal data-sharing policies of the Data Service Provider and assess potential issues with sharing platforms. Besides, financial institutions must research and analyze feasible models or methods for sharing data between organizations, departments, or entities. It includes evaluating the benefits, risks, and other factors related to data sharing to build a suitable and effective model or strategy.

Legal and Regulatory: Data in financial institutions is often sensitive and private. Hence, a legal basis needs to be established to ensure that data can be shared in a manner that complies with

regulations and the data-sharing agreements of the involved parties. It is based on:

Establishing data-sharing rules: Financial institutions must set rules for shared data types. Building principles can be derived from laws, regulations, organizational data principles, agreements, etc.

Developing policies and procedures: Establish clear and detailed policies and procedures for each type of data sharing. There should be specific guidelines on handling, storing, and accessing data and necessary security measures. Policies and procedures should demonstrate transparency related to the sharing and use of data.

Continuous assessment and improvement: Conduct regular evaluations of the performance and safety of data sharing. Adjust security measures and procedures as needed to improve performance and minimize risks.

Technical*:* This pillar refers to the technologies, standards, and methods used to share information safely, effectively, and efficiently. This pillar includes:

Preparing data for sharing: Depending on the data type and its potential use, financial institutions optimize the data before sharing to ensure it fits its intended purpose.

Understanding technical platforms and considerations when sharing: This aspect focuses on procedures that enable effective monitoring and task execution to implement changes or maintain technological capabilities in a timely. Additionally, it covers infrastructure security, which involves necessary security mechanisms and controls for networks and facilities to prevent breaches or attacks that could harm business operations.

Incident management and backup: This highlights operational processes that ensure system resilience and continuity.

Data Catalog Management: Managing the data catalog in data sharing is crucial to ensure data is used effectively and safely. It consists of the following aspects:

Data classification and description: Identify and classify different data types according to their sensitivity and importance. Provide detailed descriptions of each data type, including definitions, properties, structure, origin, update cycle, and other related factors to help understand the classified data.

Data lifecycle management: Manage the process from data collection, storage, processing, and sharing to deletion or preservation according to the organization's legal and internal policy requirements.

Risk management and compliance: Assess, manage, and mitigate risks related to the use and sharing of data while ensuring compliance with legal regulations and security standards.

Monitoring and evaluation: Establish monitoring mechanisms to assess the effectiveness of data catalog management and implement necessary measures to improve and adjust if needed.

Training and awareness raising*:* This pillar aims to ensure that employees and relevant members understand and apply data security rules, prevent and respond to security threats, comply with legal regulations, minimize risks, and improve operational efficiency in data sharing activities. Raising awareness and training focuses on the following contents:

Training on policies and procedures: Provide knowledge about the organization's policies and procedures related to secure data sharing. It includes information security regulations, access management, and specific guidelines on how to share data safely.

Training on technology and tools: Training on the technologies and tools used to protect data during the sharing process.

Distinguishing information and monitoring data: To distinguish important information and sensitive data, thereby identifying appropriate protective measures. Ensure that data monitoring rules and procedures are effectively implemented to prevent security incidents.

Security awareness training: Enhance awareness of common information security threats such as network intrusions, phishing attacks, and other attacks that employees may encounter during data sharing.

Operationalizing data*:* Financial institutions can share data after preparing the legal and technical infrastructure, management mechanisms, and staff training. This is the time to transform data from a stored state into a usable resource. Financial institutions must be transparent about how the shared data will be used during the data-sharing process.

Ensuring Transparency and Accountability: Financial institutions should be clear on how the shared data will be used during data-sharing. Data sharing and analysis is an iterative process in which

data-sharing partners should refer to the Data Sharing Agreement if ambiguities arise. As a best practice, financial institutions can prepare audit logs (related to access management, monitoring, and risk management) and provenance records to demonstrate accountability and transparency in the data-sharing partnership. It helps financial institutions ensure that the data is managed as agreement.

Monitoring Ongoing Legal and Regulatory Obligations: For the received data, financial institutions should continuously monitor for any changes in legal and regulatory obligations and take necessary measures to remain compliant. Financial institutions should also monitor staff access and use to ensure adherence to the scope of the Data Sharing Agreement or other applicable governance policies and rules.

Using data for secondary purposes: Once financial institutions have achieved the objectives in the Data Sharing Agreement, they can use the data for secondary purposes (if agreed upon) or retain/dispose of the data accordingly. Financial institutions may use the data based on the agreed terms of use, governance structure, rules, and restrictions between the data-sharing partners. However, suppose the organization intends to use the shared data for purposes not initially stated in the Data Sharing Agreement. In that case, it should engage its data-sharing partners to negotiate or request the new use of data.

Understanding Considerations for Retention and Disposal of Data: For business data, organizations should retain or dispose of the data according to the policies and procedures agreed with the data sharing partners and/or Data Service Providers. If not set out in the Data Sharing Agreement, organizations should follow policies and procedures based on applicable laws and/or internal data management policies based on the classification of the received data.

A secure data-sharing framework helps financial institutions that hold a lot of sensitive data to share data conveniently and safely. Our data-sharing framework has several new elements compared to previous frameworks:

Firstly, the content of training and raising awareness among personnel. This content is added because the level of digital and IT competency of personnel in Vietnam is generally still lower than that of developed countries.

Secondly, the management of the data-sharing catalog. This is an essential activity in the context of secure data sharing. Thanks to catalog management, the shared data will be labeled regarding importance or sensitivity, helping data-sharing activities be more thoroughly vetted before sharing.

Thirdly, some activities within the contents, such as sharing strategy, technology, law, and organizational operations, have been adjusted to suit the current situation in Vietnam.

5. Conclusion

Data and data-sharing are increasingly important in developing Digital Government, Digital Economy, and Digital Society. The extensive benefits of data sharing are undeniable. However, how to share and use data effectively and efficiently is a big question for any organization, especially financial institutions, as the finance and banking industry has been rapidly developing. Besides data storage, data sharing comprises many challenges, such as transparency, quality, and information security. This paper proposes a secure data-sharing framework for financial institutions with six pillars. We elaborate on the importance and contents of each pillar. A secure data-sharing framework enables faster, broader, and more straightforward data sharing for financial organizations. It also ensures that shared data is used appropriately and complies with legal regulations and incorporated agreements.

References:

Bộ Thông tin và Truyền thông (2017). Thông tư 13/2017/TT_BTT&TT: Quy định các yêu cầu kỹ thuật về kết nối các hệ thống thông tin, cơ sở dữ liệu với cơ sở dữ liệu quốc gia.

Bộ thông tin và truyền thông (2019). "Đề án giải pháp kết nối, chia sẻ dữ liệu và tái cấu trúc hạ tầng công nghệ thông tin tại các bộ, ngành, địa phương."

Chính phủ (2020). Nghị định47/2020/NĐ-CP: Quản lý, kết nối và chia sẻ dữ liệu số của cơ quan nhà nước.

Deloitte (2017). New Technologies Case Study: Data Sharing in Infrastructure A final report for the National Infrastructure Commission. Public Sector.

Ghosh, A., & Arora, K. (2019). Six Data Architecture and Infrastructure Governance Mandates for Multinational Banks. Public Cognizant.

Higgins, E., Taylor, M., Lisboa, P., Arshad, F. (2014). Developing a data sharing framework: a case study, Transforming Government: People, Process and Policy, 8(1), 151 – 164.

Infocomm Media Development Authority of Singapore (IMDA) and Personal Data Protection Commission (PDPC). (2019). Trusted Data Sharing Framework Singapore. Public Infocomm Media Development Authority of Singapore (IMDA) and Personal Data Protection Commission (PDPC).

ITNavi (2021). "Nền tảng kết nối việc làm IT". ITNavi. Truy cập tại: https://itnavi.com.vn/blog/oauth-la-gi.

ITU (2019). Digital Infrastructure Policy and Regulation in the Asia – Pacific Region. ITU Regional Office for Asia

Lê Trung Nghĩa (2019). "Hiến chương Dữ liệu Mở của Đối tác Dữ liệu Mở Châu Á,". Hiệp hội các trường đại học cao đẳng Việt Nam.

Marc Strittmatter, Manuel Treiterer, Sophia Schick, 2023. Data Sharing Framework for SMEs, address: https://www.data-sharing-framework.eu/topics.

McKinsey & Company (2017). Data sharing and Open Banking. McKinsey & Company.

Natasha S. Mauthner (2013). Open Access Digital Data Sharing: Principles, Policies and Practices. Newcastle University, 47-67.

Ngân hàng Nhà nước (2018). Thông tư 35 sửa đổi bổ sung một số điều của thông tư 35/2016/TT-NHNN ngày 29 tháng 12 năm 2016 của Thống đốc Ngân hàng Nhà nước Việt Nam quy định về an toàn bảo mật cho việc cung cấp dịch vụ trên Internet.

Nguyễn Công Minh (2020). "Thực trạng chia sẻ dữ liệu trong hoạt động ứng dụng và hạ tầng CNTT ở Việt Nam". Bộ công nghệ thông tin- Cục chuyển đổi số Quốc gia.

Viện công nghệ phần mềm và Nội dung số Việt Nam (2017). "Một số vấn đề về sự cần thiết ban hành các quy định, chính sách về dữ liệu mở,'. Viện công nghệ phần mềm và Nội dung số Việt Nam.

Zheng, C., & Huang, L. (2015). An Improved ODS Platform on Large Enterprise-level. Published in ICM.

CORPORATE GOVERNANCE AND RISK-TAKING OF VIETNAMESE LISTED FIRMS IN THE FOOD AND BEVERAGE INDUSTRY

MA. Le Ngoc Cuong*

Abstract: ***The study aims identify the factors influencing the Risk-Taking (RT) of food and beverage (F&B) companies listed on the Vietnam stock market from 2017 to 2023. The research results show that corporate governance (CG) factors such as state ownership, CEO duality, and gender diversity on the board of directors (BOD) negatively affect the RT of F&B enterprises. Additionally, the study finds that RT of F&B enterprises is also influenced by firm value, company size, and financial leverage.***

• Keywords: *corporate governance, corporate risk-taking, board of directors.*

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1. Introduction

In the context of globalization and fierce competition, CG has increasingly become a key factor determining the success or failure of companies, particularly in the fast-changing food and beverage industry, which faces various risks such as fluctuations in raw material prices, shifts in consumer preferences, and stringent regulations on food safety and public health. Within CG, one of the biggest challenges is determining the appropriate level of risk that a company is willing to accept in order to achieve its business goals. This decision is not only influenced by the external business environment but is also strongly shaped by internal governance factors, such as the size of the BOD, the independence of the BOD, ownership structure, and the dual role of the CEO...

Previous studies have shown that good CG can help companies identify and manage risks more effectively, thereby improving profitability and long-term stability. However, the specific impact of governance factors on corporate risk-taking (CRT) in specific industries, especially in the F&B enterprises, has not been widely explored in recent empirical research.

This study aims to assess the impact of internal CG factors on the RT of F&B companies listed on the Vietnam stock market. The research results will provide important practical evidence to help businesses better understand the relationship between CG and CRT, enabling them to develop appropriate governance strategies to optimize profitability while maintaining stability in a volatile business environment.

In addition to the introduction, the study includes a literature review, research model and methodology, and research results.

2. Literature review

Corporate risk-taking and corporate governance

Risk is an inevitable part of most financial and business activities, closely tied to the decision-making process of managers within a company. According to Bromiley (1991), risk is defined as "the uncertainty in a company's income stream," meaning that risk is not only a measurable factor but can also be viewed from both positive and negative perspectives. Based on this view, Wright et al. (1996) developed the concept of CRT, suggesting that it involves analyzing and selecting projects based on the uncertainty reflected by the volatility of expected outcomes, specifically the company's cash flow. This implies that fluctuations in income streams reflect the outcome of a company's risk-taking behavior.

Thus, CRT can be understood as the level of uncertainty in income streams that the company and its managers are willing to accept in their decision-making processes. This view has been supported by numerous researchers, including Wright et al. (1996), Cheng (2008), Akbar et al. (2017), Anh & Thanh (2019). CRT plays a crucial role in decision-making processes and significantly impacts business outcomes and long-term survival. Sanders & Hambrick (2007) pointed out that risk-related decisions are influenced by CG mechanisms, which can be explained by various governance-finance theories such as agency theory, resource dependence theory, and leadership impact theory.

CG is understood as the process of establishing relationships among a company's management components, including the BOD, executive management, shareholders, and other stakeholders, to ensure that the company is effectively managed and controlled. Internal governance factors often

*** Thuong Mai university; email: cuong.ln@tmu.edu.vn***

include board characteristics, ownership structure, and executive management factors. Meanwhile, external governance factors may involve investor protection, shareholder relations, the business environment, and research and development (R&D) activities.

CG frameworks vary across countries (Roe, 1992), so there is no universal standard applicable to all companies. Typically, CG is measured in two main ways: (i) developing a comprehensive governance index, and (ii) measuring individual governance factors either internally or externally to the company. However, studies rarely use a comprehensive index due to data collection challenges (Cremers & Nair, 2005). Instead, most research focuses on individual governance factors, particularly internal factors, to assess the governance level of a company (Cheng, 2008; Akbar et al., 2017; Anh & Thanh, 2019; and Nguyen, 2011).

The relationship between corporate governance and corporate risk-taking

Previous studies have proposed many CG factors that influence the CRT. However, this study focuses on three main groups of factors: board structure, ownership structure, and executive management factors.

Board structure: The BOD is seen as a key internal control mechanism tasked with overseeing the company's operations on behalf of the shareholders. The BOD helps manage and control the risks faced by the company. Empirical studies have demonstrated that CRT is closely related to the structure of the BOD (May, 1995). Elements of the BOD structure include board size, independence, dual roles, and gender diversity (Cheng, 2008). Each of these factors has a distinct impact on the company's risk management decisions.

Board size: According to agency theory, the board size influences decision outcomes. Smaller boards are generally viewed as more efficient due to fewer communication and coordination issues (Jensen, 1993; Lipton & Lorsch, 1992). Although larger boards might offer more human capital, the costs can outweigh the benefits (De Andres et al., 2005). Research indicates that firms with smaller boards often perform better (Eisenberg et al., 1998; Yermack, 1996). Additionally, larger boards can slow down the decision-making process and reduce risk-taking, as achieving consensus becomes more challenging (Cheng, 2008). Evidence supports a negative relationship between board size and CRT (Pathan, 2009).

Board independence: Agency theory presents two hypotheses regarding board independence and CRT. The "risk-taking" hypothesis suggests that the involvement of independent directors may encourage management to pursue riskier policies (Jiraporn & Lee, 2018; Huang & Wang, 2015). On the other hand, the "risk-averse" hypothesis argues that independent directors, through their oversight, tend to favor less risky decisions to protect their reputation (Pathan, 2009; Akbar et al., 2017). Also, on the basis of the monitoring hypothesis, it is assumed that the presence of non-executive directors on corporate boards is expected to reduce CRT. This hypothesis assumes that as a result of limited information available to firm's executives, the information asymmetry increases and as a result, the cost of information will be higher for non-executive directors (Boone et al., 2007; Linck et al., 2008; Raheja, 2005).

CEO duality: In listed companies in Vietnam, the duality of roles, where the chairman of the BOD also serves as the CEO, is common. In the context of the agency relationships the separation of CEO and chairperson positions is desirable because the dual role may have negative consequences on the monitoring function of the corporate board which eventually might negatively impact firms' shareholders (Jensen, 1993; Lipton & Lorsch, 1992). Moreover, Jensen (1993) argues that excessive power is concentrated in the CEO when she/he is also the chair of the BOD which encourages self-interested managerial behaviour, impeding effective monitoring. However, it has also been argued in other research papers that as a result of the managerial risk-aversion attitude duality will lead to lower CRT (Demsetz & Lehn, 1985; Jensen & Meckling, 1976). Pathan (2009) are consistent with the view about the positive effects of duality on firms' operations, suggesting that CEO-Chairman duality reduces bank risk taking in the US.

Gender diversity on the BOD: Gender diversity, particularly the presence of female members on the BOD, is often emphasized in research. Faccio & Mura (2014) found that women tend to be more cautious and less individualistic than men, making them more risk-averse in financial decision-making. Studies by Carter et al. (2003) and Perryman et al. (2016) also indicate that gender diversity within the BOD helps reduce CRT.

Impact of ownership structure on corporate risk-taking: In companies where the state holds a controlling interest, investment projects are generally approached with greater caution. This stems from the state's objectives to sustain industries, maintain its position, secure jobs, and promote socio-economic benefits (Fogel et al., 2008). Additionally, state-owned stakes managed by corporations, funds, or state capital

management committees tend to avoid high-risk investments, resulting in a lower CRT (Dyck, 2001; John et al., 2008). The conservative approach of state ownership reflects its focus on stability and long-term economic goals, often reducing the willingness to pursue riskier, yet potentially higher-return, investments.

Other Factors Influencing Corporate risk-taking

Company size: Larger companies tend to exhibit lower risk levels compared to smaller enterprises due to their ability to diversify (Akbar et al., 2017; Konishi & Yasuda, 2004; Nguyen, 2011). Larger firms can spread risk more efficiently, leveraging stronger financial resources and gaining access to various business sectors. This diversification not only mitigates risk but also provides stability in times of market volatility.

Financial leverage: Firms with high financial leverage tend to accept lower levels of risk (Adams et al., 2005; Akbar et al., 2017). The use of financial leverage can amplify profits but also increases financial risk, requiring companies to carefully manage their risk to achieve their desired returns. High debt levels push firms to adopt a more conservative risk management approach to avoid potential financial distress.

Firm value: Companies with a higher market value relative to their book value of assets often have more growth options and are, therefore, more likely to take on higher risks (Akbar et al., 2017; Konishi & Yasuda, 2004). These companies are better positioned to invest in new projects or expand their operations with the expectation of higher profits, despite the accompanying risks. Elevated firm value offers both the capacity and motivation to engage in bolder, more innovative investments, leading to an increased CRT.

3.2. Research model and measurement of variables

3.2.1. Dependent Variable: Corporate Risk-Taking (CRT)

This study measures risk appetite based on the volatility of accounting-based profitability ratios, specifically fluctuations in Return on Assets (ROA) and Return on Equity (ROE). These ratios represent the variability in a company's income stream (Boubakri et al., 2013; Cheng, 2008; Faccio et al., 2016; Nakano & Nguyen, 2012). Thus, the risk appetite is calculated using the following formula:

$$CRT_{it}(ROA) = ROA_{it} \,.\, \delta ROA_i$$

$$CRT_{it}(ROE) = ROE_{it} \,.\, \delta ROA_i$$

In which:

$$\delta ROA_i = \sqrt{\frac{\sum_1^n (ROA_{it} - \frac{\sum_1^n ROA_{it}}{n})^2}{n-1}} \qquad \delta ROE_i = \sqrt{\frac{\sum_1^n (ROE_{it} - \frac{\sum_1^n ROE_{it}}{n})^2}{n-1}}$$

This formula captures the volatility in the company's financial performance, with higher fluctuations indicating a greater CRT. This approach aligns with previous research, where volatility in profitability is linked to managerial risk-taking behavior and CG structures.

3.2.2. Independent Variables

The paper examines the impact of CG on the CRT in the F&B enterprises. Therefore, the explanatory variable is a factor related to CG. Additionally, the author uses control variables that affect the CRT, including: Firm size (SIZE); Firm value (TOBIN'S Q); Financial leverage (LEV).

Table 1: Summary of variables and their measurement methods in the research model

Variable	Symbol	Measurement	Source
Board Size	BSIZE	Number of board members	(Jensen, 1993; Lipton & Lorsch, 1992, 2013; Cheng, 2008; Pathan, 2009)
Board Independence	IND	Number of independent board members	(Akbar et al., 2017; Boone et al., 2007; Jiraporn & Lee, 2018; Linck et al., 2008; Pathan, 2009; Raheja, 2005)
Gender Diversity on the BOD	GEND	Number of female members on the board	(Carter et al., 2003; Faccio et al., 2016; Perryman et al., 2016)
CEO Duality	CEO	Dummy variable equal to (1) if the positions of CEO and chairperson are combined, (0) otherwise.	(Demsetz & Lehn, 1985; Jensen, 1993; Jensen & Meckling, 2019; Lipton & Lorsch, 1992)
State Ownership	STATE	Percentage of state-owned shares	(Dyck, 2001; Fogel et al., 2008; John et al., 2008)
Tobin's Q	TobinQ	(Market value of equity + Book value of debt) / Book value of total assets	(Akbar et al., 2017; Konishi & Yasuda, 2004)
Financial Leverage	LEV	Total debt / Total assets	(Adams et al., 2005; Akbar et al., 2017)
Firm Size	SIZE	Ln(Total assets)	(Akbar et al., 2017; Konishi & Yasuda, 2004; Nguyen, 2011)

Source: Compiled by the author

4. Research results

4.1. Descriptive statistics

Table 2: Describe the features of the variables in the model

Variable	Observation	Mean	Std. dev	Min	Max
CRTROA	210	.0105558	.0196053	-.095697	.0927722
CRTROE	210	.003927	.0063142	-.0214742	.0356195
BSIZE	210	5.642857	1.574641	0	10
IND	210	.9952381	1.535848	0	8
CEO	210	.1857143	.3898051	0	1
GEND	210	.9	.3007168	0	1
STATE	210	10.57148	22.59309	0	89.59
TOBINQ	210	1.447478	.880974	.3876669	5.265925
SIZE	210	14.14817	1.813418	10.17535	18.7667
LEV	210	.4337194	.1631507	.1062586	.8200034

Source: Analysis results from Stata 17

Table 2 summarizes the number of observations and descriptive statistics of the variables in the model. Firstly, the data shows that the return on assets (ROA) of F&B companies ranges from -0.096 to 0.093, and return on equity (ROE) ranges from -0.022 to 0.036. Secondly, the percentage of state ownership ranges from 0 to

89.59%, with an average value of 10.57%, indicating that F&B companies have a small proportion of state ownership. Thirdly, the average financial leverage ratio of F&B companies is relatively low, around 0.163, ranging from 0.106 to 0.82, suggesting that companies have increased capital from equity. Fourthly, the board size has a maximum of 10 members, while the number of independent board members is less than 8, and the number of female board members is quite low, with a maximum of only 1 member.

4.2. Correlation and multicollinearity test of variables

Table 3: Correlation matrix and multicollinearity among variables

	CRTROA	CRTROE	BSIZE	IND	CEO	GEND	STATE	TOBINQ	LEV	SIZE	VIF
CRTROA	1.000										
CRTROE		1.000									
BSIZE	0.0352	0.0204	1.000								1.45
IND	0.0207	-0.0460	0.4167	1.000							1.38
CEO	-0.1584	-0.1333	-0.0629	-0.2143	1.000						1.12
GEND	-0.1101	0.0032	-0.1566	-0.260	0.1182	1.000					1.28
STATE	0.0581	-0.0029	-0.0730	-0.0135	-0.2023	-0.0404	1.000				1.52
TOBINQ	0.3725	0.2335	-0.0956	0.1612	-0.0810	-0.3399	0.4687	1.000			1.54
LEV	-0.2758	-0.1452	0.0585	0.0172	0.1418	0.2623	0.1636	-0.2893	1.000		1.32
SIZE	0.0810	0.01108	0.4539	0.3318	-0.0493	-0.0955	-0.2799	0.1805	0.2081	1.000	1.51

Source: Analysis results from Stata 17

Table 3 shows the correlation and multicollinearity among the variables in the model. It can be observed that CRTROA and CRTROE are correlated with most of the variables in the model. The VIF test indicates that the VIF values for all independent variables are below 2, which suggests that there is no multicollinearity among the independent variables.

4.3. Regression model

Table 4: OLS regression results

	CRTROA			CRTROE		
	Coeficient	Std. err	P>|t|	Coeficient	Std. err	P>|t|
BSIZE	-.000142	.0002959	0.632	-.0005025	.0009681	0.604
IND	-.0003904	.0002958	0.188	-.0019586	.0009678	0.044
CEO	-.002752	.0010514	0.010	-.0090777	.0034398	0.009
GEND	-.0020941	.0014592	0.048	-.0097352	.0047742	0.043
STATE	-.0000779	.0000211	0.000	-.0002447	.0000692	0.001
TOBINQ	.0031625	.0005461	0.000	.0076104	.0017866	0.000
LEV	-.009888	.0027286	0.000	-.0212435	.0089272	0.010
SIZE	.0005184	.0002623	0.039	.0022332	.0008582	0.018
Cons_	-.0030566	.0035442	0.389	-.022546	.0115955	0.053

Source: Analysis results from Stata 17

4.4. Discussion of research results

The regression results in Table 4 show that the variables CEO, GEND, STATE, TOBIN'Q, LEV, and SIZE have a significant impact on CRT(ROA) at the 5% level. The variables IND, CEO, GEND, STATE, TOBIN'Q, LEV, and SIZE significantly affect CRT(ROE) at the 5% level. Specifically:

State Ownership: Has an inverse effect on the Corporate Risk-Taking with dependent variables CRT_ROA and CRT_ROE. For state-controlled enterprises, investment projects are carried out more cautiously, resulting in lower CRT. With a relatively low average state ownership of about 10.57% in F&B companies, it indicates these firms have a higher CRT (Dyck, 2001; John et al., 2008).

CEO Duality: With CEO duality, due to the risk-averse attitude of managers, dual roles will lead to a reduction in the firm's risk-taking behavior, thus lowering CRT. This finding is consistent with research by Demsetz & Lehn (1985) and Jensen & Meckling (2019).

Gender Diversity on the Board of directors: The number of female board members has an inverse relationship with the CRT of F&B firms. Women tend to be more cautious and less individualistic in financial decision-making compared to men, which reduces the CRT. This result aligns with studies by Carter et al. (2003), Faccio et al. (2016), and Perryman et al. (2016).

Financial Leverage: Has an inverse effect on CRT, indicating that firms with lower debt levels tend to have higher CRT and vice versa. This finding is consistent with research by Adams et al. (2005) and Akbar et al. (2017).

Firm Value and Firm Size: Both have a positive impact on CRT. Larger firms and those with higher firm value have more growth and expansion opportunities, leading to a higher tendency to accept risks (Konishi & Yasuda, 2004; Akbar et al., 2017).

References:

Adams, R. B., Almeida, H., & Ferreira, D. (2005). Powerful CEOs and their impact on corporate performance. The Review of Financial Studies, 18(4), 1403-1432.

Akbar, S., Kharabsheh, B., Poletti-Hughes, J., & Shah, S. Z. A. (2017). Board structure and corporate risk taking in the UK financial sector. International Review of Financial Analysis, 50, 101-110.

Anh, N. H. & Thanh, N. P. (2019). Corporate governance & risk-taking of listed companies. Financial Journal, Issue 2, August 2019.

Boone, A. L., Field, L. C., Karpoff, J. M., & Raheja, C. G. (2007). The determinants of corporate board size and composition: An empirical analysis. Journal of Financial Economics, 85(1), 66-101.

Boubakri, N., Cosset, J.-C., & Saffar, W. (2013). The role of state and foreign owners in corporate risk-taking: Evidence from privatization. Journal of Financial Economics, 108(3), 641-658.

Bromiley, P. (1991). Testing a causal model of corporate risk taking and performance. Academy of Management Journal, 34(1), 37-59.

Carter, D. A., Simkins, B. J., & Simpson, W. G. (2003). Corporate governance, board diversity, and firm value. Financial Review, 38(1), 33-53.

Cheng, S. (2008). Board size and the variability of corporate performance. Journal of Financial Economics, 87(1), 157-176.

Cremers, K. J. M., & Nair, V. B. (2005). Governance mechanisms and equity prices. The Journal of Finance, 60(6), 2859-2894.

Demsetz, H., & Lehn, K. (1985). The structure of corporate ownership: Causes and consequences. Journal of Political Economy, 93(6), 1155-1177.

Dyck, A. (2001). Privatization and corporate governance: Principles, evidence, and future challenges. The World Bank Research Observer, 16(1), 59-84.

Faccio, M., Marchica, M.-T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. Journal of Corporate Finance, 39, 193-209.

Huang, S., & Wang, C. (2015). Corporate governance and risk-taking: Evidence from board structure and ownership. Journal of Corporate Finance, 33, 120-145.

Fogel, K., Morck, R., & Yeung, B. (2008). Big business stability and economic growth: Is what's good for General Motors good for America? Journal of Financial Economics, 89(1), 83-108.

Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. The Journal of Finance, 48(3), 831-880.

Jensen, M. C., & Meckling, W. H. (2019). Theory of the firm: Managerial behavior, agency costs and ownership structure. In Corporate governance (pp. 77-132). Gower.

Jiraporn, P., & Lee, S. M. (2018). How do independent directors influence corporate risk-taking? Evidence from a quasi-natural experiment. International Review of Finance, 18(3), 507-519.

John, K., Litov, L., & Yeung, B. (2008). Corporate governance and risk-taking. The Journal of Finance, 63(4), 1679-1728.

Konishi, M., & Yasuda, Y. (2004). Factors affecting bank risk taking: Evidence from Japan. Journal of Banking & Finance, 28(1), 215-232.

Linck, J. S., Netter, J. M., & Yang, T. (2008). The determinants of board structure. Journal of Financial Economics, 87(2), 308-328.

Lipton, M., & Lorsch, J. W. (1992). A modest proposal for improved corporate governance. The Business Lawyer, 59-77.

May, D. O. (1995). Do managerial motives influence firm risk reduction strategies? The Journal of Finance, 50(4), 1291-1308.

Nakano, M., & Nguyen, P. (2012). Board size and corporate risk taking: Further evidence from Japan. Corporate Governance: An International Review, 20(4), 369-387.

Nguyen, P. (2011). Corporate governance and risk-taking: Evidence from Japanese firms. Pacific-Basin Finance Journal, 19(3), 278-297.

Pathan, S. (2009). Strong boards, CEO power and bank risk-taking. Journal of Banking & Finance, 33(7), 1340-1350.

Perryman, A. A., Fernando, G. D., & Tripathy, A. (2016). Do gender differences persist? An examination of gender diversity on firm performance, risk, and executive compensation. Journal of Business Research, 69(2), 579-586.

Raheja, C. G. (2005). Determinants of board size and composition: A theory of corporate boards. Journal of Financial and Quantitative Analysis, 40(2), 283-306.

Roe, M. J. (1992). Some differences in corporate governance in Germany, Japan and America (Issue 86). Center for Law and Economic Studies, Columbia University School of Law.

Sanders, W. G., & Hambrick, D. C. (2007). Swinging for the fences: The effects of CEO stock options on company risk taking and performance. Academy of Management Journal, 50(5), 1055-1078.

Wright, P., Ferris, S. P., Sarin, A., & Awasthi, V. (1996). Impact of corporate insider, blockholder, and institutional equity ownership on firm risk taking. Academy of Management Journal, 39(2), 441-458.

THE IMPACT OF GREEN MARKETING ON THE PURCHASING DECISIONS OF SUSTAINABLE FACIAL SKINCARE PRODUCTS BY GEN Z IN HO CHI MINH CITY

Assoc.Prof.PhD. Pham Hung Cuong* - Le Hieu Trinh - Nguyen Xuan Thinh*****

Abstract: ***Through surveying 325 young individuals aged 16 to 26 in Ho Chi Minh City from January to March 2024, the article identifies key factors influencing the impact of green marketing on the purchasing decisions of sustainable facial skincare products by Gen Z in Ho Chi Minh City as follows: (1) Green Product, (2) Green Place, (3) Green Price, (4) Perceived Environmental Knowledge. There is no conclusion yet for variable Green Promotion.***

• Keywords: *green marketing, skincare product, gen z, sustainable development.*

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Introduction

Vietnam is ranked as one of 16 nations with high biodiversity. However, like many other nations, we have various obstacles in biodiversity conservation, which is intimately linked to economic growth and social sustainability. Vietnam's skincare product market was valued at 850 million USD in 2019 and is expected to reach 1.922 billion USD by 2027, with an annual growth rate of 11.7%. Businesses are focusing on developing sustainable products but face challenges in creating effective green marketing strategies to attract customers. Consumers' environmental knowledge plays a key role in promoting sustainable purchasing decisions. Research on green marketing in Southeast Asia, particularly Gen Z, remains limited and requires further study as Gen Z is a potential target for green products.

Review of literature and research methology

Green marketing

Green Marketing, also recognized as sustainable or environmental marketing, is a strategic approach embraced by businesses to endorse products or services that possess environmentally friendly or sustainable attributes. By prioritizing environmental sustainability, green marketing assists businesses in achieving their goals while simultaneously meeting the needs of stakeholders and mitigating adverse environmental impacts (Nguyen et al., 2021)

Green marketing encompasses a diverse range of strategic, tactical, and operational initiatives, with particular attention often directed towards the tactical level, which has been extensively studied. The green marketing mix comprises a variety of tools and elements utilized by companies to effectively serve their target market and achieve objectives while minimizing harm to the environment.

These components encompass green product development, pricing strategies aligned with environmental considerations, environmentally conscious distribution channels, and promotion methods that emphasize sustainability. Companies have the capacity to intentionally manage these marketing variables to underscore environmental concepts, paralleling the traditional 4Ps of marketing.

Characteristics of Generation Z

Generation Z individuals are highly adept at utilizing technology and digital platforms to engage with their preferred brands online. Drawing from the study "Consumer Decision-making Style of Gen Z: A Generational Cohort Analysis" (Thangavel et al., 2022), four decision-making styles among Generation Z consumers can be summarized as follows:

Firstly, there are individuals who base their decisions on analysis, demonstrating a meticulous and cautious approach to purchasings, seeking abundant information and being less swayed by emotions or social pressures.

** Foreign Trade University*

*** Foreign Trade University, Ho Chi Minh City Campus*

**** University of Economics Ho Chi Minh City*

Secondly, there are those who make decisions based on inspiration, often acting impulsively without extensive planning or evaluation, and may be more susceptible to emotional or social influences.

Lastly, there are those who adhere to rules when making decisions, meticulously planning their shopping endeavors and rarely deviating from established norms or guidelines.

Members of this generation are characterized by their high level of education, technological proficiency, and innovation, which can be attributed to their upbringing in a hyper-connected world with improved living standards and readily available resources. They are often described as being open-minded, adaptable, and highly interactive, with a tendency towards impatience (Yazici and Ayazlar, 2021).

Review of literature

The Theory of Reasoned Action (TRA) was developed by Fishbein and Ajzen and officially published in 1975. This model is considered a pioneering theory widely used in behavior research, particularly in the fields of marketing and communication. The theory posits that an individual's behavior is influenced by their intention to perform a specific behavior, and this intention is determined by the individual's attitude toward the behavior and subjective norms.

A person's view of a particular object or behavior can affect their intention to perform that behavior. Subjective norms are the normative beliefs that individuals will act according to the expectations of others in their social environment, including family, friends, colleagues, and the surrounding community (Fishbein & Ajzen, 1975). Generally, both attitudes and subjective norms positively influence behavioral intention, which in turn leads to actual behavior.

Theory of Planned Behavior (1991) was developed by Ajzen (1991) from Theory of Reasoned Action, by adding the factor of "perceived behavioral control" into the original TRA model. To prove the necessity of such addition, Ajzen conducted 16 different studies which all confirm the impact of perceived behavioral control on actual behavior. TPB concludes that a person's intention is influenced by three factors: attitude, subjective norms, and perceived behavioral control. This theory has been widely applied in various studies on purchasing intentions across diverse fields and products, including MPX. However, TPB still has certain limitations.

For the first group, Mansoor et al., (2018) explored the factors influencing consumers' intentions to buy sustainable and green products, concentrating on skincare items in Islamabad and Rawalpindi, Pakistan. They discovered that the perceived advantages of sustainable products, environmental consciousness, customer experiences, brand eco-friendliness, and social appeal all had a substantial impact on purchasing intentions. Meanwhile, Khan and Salim (2021) investigated factors influencing female customers' buying intentions in Saudi Arabia and discovered that income, understanding of sustainable skincare products, and educational attainment are important variables. Furthermore, some researches have used the Theory of Planned Behavior (TPB) to better understand the relationship between sustainability-related characteristics and green purchasing intentions (Maichum et al., 2016).

Moreover, Singhal and Malik (2018) suggested that demographic inequalities, attitudes toward green products, and purchasing habits, which are impacted by factors such as product features, price, marketing, and convenience, may influence shopping decisions notwithstanding environmental knowledge. Their findings revealed that, whereas female customers of all ages and educational backgrounds hold comparable opinions regarding green cosmetic goods, income levels have a substantial influence on these attitudes.

They also proposed that future study should incorporate additional factors such as customer perceptions and intentions, as well as product availability and cost. The author discovered that Perceived Environmental Knowledge (PEK) is a significant factor affecting customers' intentions to purchase sustainable items. This concept relates to customers' comprehension and awareness of environmental concerns, as well as the environmental effect of their purchasing decisions. Perceived Environmental Knowledge improves customers' capacity to recognize the benefits of sustainable products, which can have a substantial impact on their purchasing decisions. According to research, Perceived Environmental Knowledge has a significant impact on customer attitudes toward sustainable products and consequent purchasing intentions.

For example, Surahman et al. (2024) found that greater levels of Perceived Environmental Knowledge magnify the favorable influence on customers' green and sustainable purchasing intentions. This conclusion implies that customers who are more aware about environmental concerns are more likely to recognize the benefits of sustainable products and, as a result, have higher inclinations to buy them.

For the second group, various studies have looked into how Green Marketing methods affect customers' sustainable purchasing behaviors. Notably, Mahmoud (2018) claim that using the green marketing strategy improves consumer purchasing decisions. Similarly, Walia et al. (2019) looked at the correlation between green marketing elements and purchasing intentions, with a special emphasis on fast-moving consumer goods (FMCG), and how customer attitudes influence this relationship. Their findings show that the marketing mix's 4Ps (Product, Price, Place, and Promotion) affect consumer attitudes and inclinations to buy environmentally friendly items.

This insight assists marketers, businesses, and policymakers in understanding consumer preferences and developing future strategies for adopting green marketing initiatives, especially those aimed at the younger population. In terms of sustainable skincare, the product dimension of the green marketing mix refers to the formulation, packaging, and sourcing procedures used by skincare firms. Consumers nowadays are more concerned about the ingredients in skincare products, choosing natural, organic, and cruelty-free formulations.

Green marketing strategies target environmentally concerned consumers by emphasizing product features such as biodegradability, recyclability, and non-toxicity. Brands that embrace sustainability in their product development process frequently gain a competitive edge and strengthen brand loyalty among environmentally conscientious consumers. Integrating Perceived Environmental Knowledge (PEK) into the 4Ps of Green Marketing (Product, Price, Place, and Promotion) can considerably improve the efficacy of green marketing campaigns.

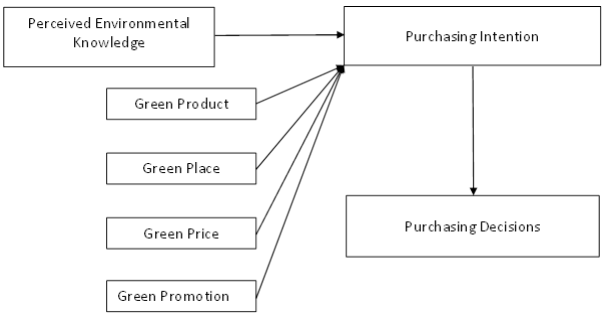
Companies that prioritize product features, clear pricing, sustainable distribution, and focused promotional activities may better satisfy the requirements of environmentally aware consumers and build a more sustainable marketplace. According to Surahman et al., 2024, this study underscores the need of emphasizing product qualities that are consistent with customer environmental awareness in order to increase purchasing intentions.

Furthermore, customers' environmental understanding influences their income levels and willingness to pay, implying that open communication regarding pricing and sustainability might drive purchasing decisions (Singhal and Malik, 2018). While there have been few studies that explicitly integrate Perceived Environmental Knowledge with the 4Ps as different variables in a single model, the evidence suggests that Perceived Environmental Knowledge greatly improves the success of green marketing tactics overall. By incorporating Perceived Environmental Knowledge into the 4Ps, businesses may better target environmentally concerned customers and promote sustainable purchasing habits.

Proposed research model

Based on the theories of TRA, TPB, the Theory of Consumer Behavior, and various empirical studies related to the topic that the author has compiled and referenced, a research model has been developed to investigate the impact of Green Marketing on the decision to purchase sustainable facial skincare products among Gen Z in Ho Chi Minh City. The model includes: Independent variables: (1) Green Product, (2) Green Place, (3) Green Price, (4) Green Promotion, (5) Perceived Environmental Knowledge

Figure 1: Proposed research model and hypotheses



Source: Author's recommendation, 2024

Hypothesis

H1. The Green Product factor positively influences the Sustainable Facial Skincare Products Purchasing Intention among Gen Z in Ho Chi Minh City.

H2. The Green Price factor positively influences the Sustainable Facial Skincare Products Purchasing Intention among Gen Z in Ho Chi Minh City.

H3. The Green Place factor positively influences the Sustainable Facial Skincare Products Purchasing Intention among Gen Z in Ho Chi Minh City.

H4. The Green Promotion factor positively influences the Sustainable Facial Skincare Products Purchasing Intention among Gen Z in Ho Chi Minh City.

H5. The Perceived Environmental Knowledge factor positively influences the Sustainable Facial Skincare Products Purchasing Intention among Gen Z in Ho Chi Minh City.

H6. The Sustainable Facial Skincare Products Purchasing Intention positively influences the

Sustainable Facial Skincare Products Purchasing Decisions among Gen Z in Ho Chi Minh City.

Research methodology

Data collection took place over a span from January to March, 2024 about young people between 16 and 26 ages, in Ho Chi Minh City, utilizing online methods by Google Form and Facebook network. In total, out of the 325 responses received, 303 responses are utilized for subsequent statistical analysis.

Result and discussion

Cronbach's alpha coefficient test

According to common standards in social science research, a Cronbach's Alpha value of 0.7 or higher is considered acceptable and indicates good scale reliability. With this value, all of the scale meets the reliability criteria. Additionally, the inter-item correlations are all greater than 0.3 (Table 1)

However, the GRM variable had to be re-tested a second time because GRM1, violates this criterion with an inter-item correlation of -0.064. With the revised study results, the overall Cronbach's Alpha coefficient for the GRM scale is acceptable at 0.749. Furthermore, the inter-item correlations are all greater than 0.3. Therefore, the structure of the GRM scale now, with only 3 observed variables (GRM2, GRM3, and GRM4), is deemed acceptable and does not require any further adjustments

Table 1. Cronbach's Alpha coefficients result of the official study

Variables	Abbreviations	Cronbach's Alpha	N of Items
Green Product	GP	0.804	4
Green Place	GRL	0.838	4
Green Price	GRI	0.896	4
Green Promotion	GRM	0.749	3
Perceived Environmental Knowledge	PEK	0.824	4
Purchasing Intention	PI	0.751	3
Purchasing Decision	PD	0.791	3

Source: SPSS result (2024)

Explanatory factor analysis (EFA)

As summarized in the above table 2, all the requirements for the evaluation on the measurement scales of independent variables are met. Firstly, the KMO coefficient for EFA analysis is 0.819, higher than the standard of 0.5, indicating the consistence of the factor analysis with the survey data.

Bartlett's test with the sig value equals 0.000 < 0.05, indicating the sample's adequacy with correlated observed variables. Besides, the cumulative of variance is 59.596%, indicating the ability of selected seven factors to explain 59.596% of the data variation, exceeding the standard of 50%. Therefore, the selected factors in the research model can be confirmed to be statistically meaningful. Finally, the Eigen value stops at 1.011 with the right components, which still meets the requirement of exceeding 1. Therefore, all the measurement items of the independent variables are verified to be statistically significant.

Table 2. KMO, Barlett's test and sums of squared loading

	Result	Threshold	Implication
KMO Measure	0.819	0.5<0.819<1	Appropriate
Sig.	0.000	0.000<0.05	Appropriate
Cumulative of Variancce	59.596	50%<59.596%<100%	Appropriate
Eigenvalues	1.011	1<1.011	Appropriate

Source: SPSS result (2024)

Confirmatory factor analysis (CFA)

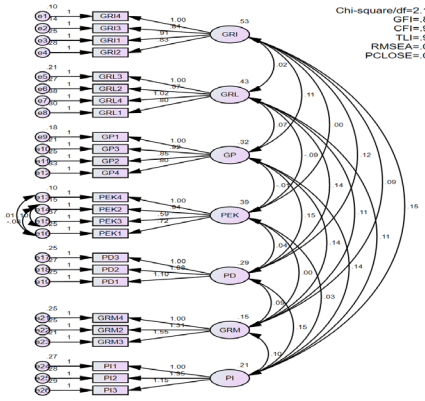
Confirmatory Factor Analysis (CFA) for the theoretical model was conducted with 25 observed variables and 7 latent constructs. The CFA results for the 7 latent constructs in the model meet the acceptable threshold according to the model fit indices (including: Chi-squared = 544.580, GFI = .872, TLI = .900, CFI = .916, RMSEA = .062, PCLOSE = .003). Therefore, with the current model of 7 latent constructs, no further improvement is needed (Table 3).

Table 3. Standardized results of the CFA analysis for the research model

No.	Independent variables	Representative variable	AVE	CR	Observed variables
1	Green Product	GP	0.517	0.809	GP1, GP2, GP3, GP4
2	Green Place	GRL	0.572	0.842	GRL 1, GRL 2, GRL 3, GRL 4
3	Green Price	GRI	0.694	0.900	GRI 1, GRI 2, GRI 3, GRI 4
4	Green Promotion	GRM	0.501	0.749	GRM 2, GRM 3, GRM 4
5	Perceived Environmental Knowledge	PEK	0.551	0.825	PEK 1, PEK 2, PEK 3, PEK 4
6	Purchasing Intention	PI	0.504	0.752	PI 1, PI2, PI3
7	Purchasing Decision	PD	0.557	0.791	PD 1, PD2, PD3

Source: SPSS result (2024)

Figure 2. Standardized CFA analysis results for the theoretical model



Source: Collected and synthesized using IBM Amos 24, 2024

Structural Equation Modeling Analysis (SEM)

Similar to CFA, the structure retains the 7 research variables. Subsequently, the regression coefficients of the structural relationships between variables are assessed. The exogenous latent variable in the model is Green Price (GRI), and the endogenous latent variables are the remaining variables: Green Product (GP), Green Promotion (GRM), Green Place (GRL), Perceived Environmental Knowledge (PEK), Purchasing Intention (PI), and Purchasing Decision (PD) (Table 4).

Table 4. Unstandardized structural model results

Relationship			Unstandardized Coefficients	Standardized Coefficients	C.R.	P	R^2	Model Fit Indices
PI	<--	GRI	.174	.286	4.650	***	.578	Chi-square/ df = 2.201; GFI = .868; CFI = .911; RMSEA = .063; PCLOSE = 0.001
	<--	PEK	.132	.186	3.110	.002		
	<--	GRL	.194	.288	4.169	***		
	<--	GP	.279	.354	3.976	***		
	<--	GRM	.167	.146	1.472	.141		
PD	<--	PI	.823	.676	7.693	***	.457	

*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$

Source: SPSS result (2024)

Overall, the results indicate that the proposed model meets the model fit indices with a Chi-square/ df of 2.201, GFI of 0.868, CFI of 0.911, and RMSEA of 0.063. Therefore, it can be affirmed that the proposed model of 7 latent factors is theoretically and practically meaningful. Regarding the R-squared values, the model explains 57.8% and 45.7% of the variance in Purchasing Intention and Purchasing Decision factors, respectively.

In the tested model, 5 out of 6 hypotheses are accepted with high significance at $p < 0.05$ according to the 95% confidence standard. These hypotheses include H1 (Green Product to Purchasing Intention), H2 (Green Price to Purchasing Intention), H3 (Green Place to Purchasing Intention), H5 (Perceived Environmental Knowledge to Purchasing Intention), and H6 (Purchasing Intention to Purchasing Decision) with regression path coefficients (β) and corresponding t-values of 0.279 (3.976), 0.174 (4.650), 0.194 (4.169), 0.132 (3.110), and 0.823 (7.693), respectively.

Conclusion and implications

Conclusion of the research

After completing 1 month of data collection, 325 responses were received, with 303 valid responses, and data analysis was conducted. The study used SPSS and SmartPLS software to analyze data and test scales and hypotheses. Research shows a number of factors that impact of green marketing on the purchasing decisions of sustainable facial skincare products by Gen Z in Ho Chi Minh City include: (1) Green Product, (2) Green Place, (3) Green Price, (4) Perceived Environmental Knowledge. There is no conclusion yet for variable Green Promotion.

The considerable and beneficial influence of green items on green purchasing intention emphasizes their critical role in influencing customer intentions to make green purchasings. The quality and features of green products, when linked with customers' values and preferences, have a significant impact on their purchasing intention. Furthermore, the study adds to the current literature, particularly in the context of emerging countries such as Vietnam, by highlighting the mediating role of green purchasing intention in the link between the green marketing mix and green purchasing decisions among Generation Z.

The results show that Green Product has the greatest influence, followed by Green Place, Green Price, and, finally, Perceived Environmental Knowledge. Unfortunately, Green Promotion does not make a substantial contribution to this study. According to the research findings, consumers who have positive attitudes toward green products are more likely to have a high level of environmental awareness and frequently patronize green products to the point where they mentally integrate these brands as a significant aspect of themselves. As a result, utilizing the green marketing mix promotes attitudes and, eventually, impacts intentions to use green products.

Recommendations

This empirical study offers businesses and marketers practical suggestions on how to get young people to purchase skincare goods. It turns out that the factor most affecting consumers' intentions to buy green products is green products. Marketers need to understand that they cannot take for granted the environmental advantages of their eco-friendly products. Rather, it has to be demonstrated and disseminated in a way that enhances the caliber and functionality of eco-friendly products.

Organizations should persistently enhance and refine the sustainable attributes of their products to meet consumer demand. Furthermore, a strategy to heighten awareness of a product's environmental impact involves the adoption of innovative and eco-friendly packaging. Implementing such methods can effectively highlight the ecological benefits of

the product, enabling young consumers to make more informed purchasing decisions. Additionally, these approaches assist businesses in portraying themselves as dedicated and responsible advocates of sustainability, thereby fostering a positive and enduring brand image.

Although green promotions do not have a significant impact, it is still important to consider a few points. Hence, it is essential for skincare product firms to highlight the environmental advantages of their products, encourage sustainable lifestyles, enhance their green brand image, and minimize the information asymmetry of eco-friendly products in a competitive marketplace.

Companies in the sustainable face care cosmetics sector should prioritize product quality and environmental sustainability, while maintaining transparency regarding their sustainability certifications and practices. This approach will facilitate engagement with Generation Z consumers and foster brand loyalty. To increase awareness of the benefits of sustainable products, companies should focus on educational marketing initiatives.

Additionally, aligning brand positioning with Generation Z values, such as integrity and social responsibility, is essential. Offering customers sustainable options and promoting a more eco-conscious lifestyle can strengthen customer relationships, while leveraging social media and collaborating with influencers can enhance brand visibility. By actively incorporating customer feedback and engaging in continuous innovation, organizations can remain competitive and responsive to the evolving market demands. To improve their interaction with Generation Z customers in the sustainable facial care cosmetics industry, companies might explore the following additional recommendations: Establish loyalty programs; Produce seasonal and limited-edition goods; Utilize environmentally sustainable shipping methods; Host green events and workshops; Monitor and adapt to trends.

By implementing these additional recommendations, businesses can deepen their connection with Generation Z consumers, strengthen their green marketing strategies, and contribute to the broader movement toward sustainability. Furthermore, governments play a pivotal role in fostering an environment that encourages businesses to adopt sustainable practices and incentivizes investments in the production and development of environmentally friendly products.

To achieve this objective, governments can implement a range of incentives and regulations that support and promote green initiatives. Eco-friendly products are generally more expensive than conventional ones due to factors such as the complexity of sourcing or handling materials, the reengineering processes involved, and the limited supply of sustainable items (Chekima et al., 2016).

Moreover, providing financial assistance, such as tax breaks or subsidies, to businesses that prioritize environmentally friendly manufacturing practices and produce green products is an effective strategy. These incentives can help businesses mitigate the high costs associated with implementing sustainable standards, thereby enabling them to access and afford the expensive raw materials required for producing environmentally friendly goods.

Additionally, governments can offer grants or other forms of support specifically aimed at research and development in sustainable technology, thereby fostering innovation and the development of environmentally friendly solutions.

References:

Chekima, B., Wafa, S. A. W. S. K., Igau, O. A., Chekima, S., & Sondoh Jr, S. L. (2016). Examining green consumerism motivational drivers: does premium price and demographics matter to green purchasing?. Journal of cleaner production, 112, 3436-3450.

Khan, S., & Salim, A. (2021). Saudi females' buying behavior of green cosmetics: A pertinent motivational aspect. Journal of Marketing Communications, 27(6), 594-606.

Mahmoud, T. O. (2018). Impact of green marketing mix on purchase intention. International Journal of Advanced and applied sciences, 5(2), 127-135.

Maichum, K., Parichatnon, S., & Peng, K. C. (2016). Application of the extended theory of planned behavior model to investigate purchase intention of green products among Thai consumers. Sustainability, 8(10), 1077.

Mansoor, M., Saeed, A., Rustandi Kartawinata, B., & Naqi Khan, M. K. (2022). Derivers of green buying behavior for organic skincare products through an interplay of green brand evaluation and green advertisement. Journal of global fashion marketing, 13(4), 328-343.

Singhal, A., & Malik, G. (2018). The attitude and purchasing of female consumers towards green marketing related to cosmetic industry. Journal of Science and Technology Policy Management, 12(3), 514-531.

Surahman, S., & Andriyani, A. (2024). The Influence of Green Human Resource Management Practices on Corporate Environmental Performance through the Mediation of Pro-Environmental Behavior Moderated by Environmental Knowledge. Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE), 7(2), 2656-2676.

Thangavel, P., Pathak, P., & Chandra, B. (2022). Consumer decision-making style of gen Z: A generational cohort analysis. Global Business Review, 23(3), 710-728.

Walia, S. B., Kumar, H., & Negi, N. (2019). Consumers' attitude and purchase intention towards' green'products: a study of selected FMCGs. International Journal of Green Economics, 13(3-4), 202-217.

Yazici, S., & Arslan Ayazlar, R. (2021). Generation Z and tourism entrepreneurship: Generation Z's career path in the tourism industry. In Generation Z Marketing and Management in Tourism and Hospitality: The Future of the Industry (pp. 53-99). Cham: Springer International Publishing.

Ajzen, I. (1991), "The Theory of Planned Behaviour", Organizational Behaviour and Human Decision Processes, Vol. 50 No. 2, pp. 179-211.

Ajzen, I. and Fishbein, M. (1980), Understanding Attitude and Predicting Social Behaviour, Prentice-Hall, Eaglewood Cliffs.

THE INTERPLAY AMONG DIGITALIZATION, AGRICULTURE AND ENVIRONMENT: A SYSTEMATIC ANALYSIS

Assoc.Prof.PhD. Vu Hoang Nam* - Assoc.Prof.PhD. Nguyen Thi Khanh Chi*

MA. Vu Quoc Bao**

Abstract: ***The agricultural sector is experiencing a remarkable evolution driven by cutting-edge information and communication technologies. This evolution is transforming traditional farming practices and creating new opportunities for environmental improvement. A systematic literature review indicates that Agriculture 5.0 has emerged and become widespread. While recent studies concentrate on various facets of digitalization in agricultural production, they often overlook critical aspects of environmental protection. This research gap is particularly noticeable in emerging economies, which calls for a more structured approach. By synthesizing findings from 57 related published articles, this study underscores the potential of digitalization to enhance environmental sustainability in agricultural production. Therefore, tackling the challenges of integrating these advanced technologies into farming systems is warranted for sustainable agricultural development.***

• Keywords: *digitalization, environmental protection, agricultural production, emerging economies, Vietnam.*

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1. Introduction

According to Rotz et al. (2019), digitalization is fundamentally transforming the processes of agricultural production. This digital transformation encompasses various 4.0 technologies, including the Internet of Things, big data, artificial intelligence, digital twins, blockchain, and machine learning (Klerkx et al., 2019). In the agricultural sector, digitalization manifests in various forms such as smart farming (Prakash et al., 2023) and precision farming (Mizik, 2023). Specifically, digitalization involves managing tasks both on and off the farm and utilizing rich data collected by sensors to control drones and other machines to monitor soil, water, plants, and animals (Kumar et al., 2023). The data collected not only reflects past conditions but also predicts future outcomes, enabling more timely and informed decision-making through continuous monitoring and big data analysis (Sarker, 2021). As a result, exploring the application of digitalization in agricultural production is vital for achieving sustainable agricultural development and food security during the digital era.

The intensification of agricultural production has negative impacts on the environment, causing land degradation, water pollution, and increased carbon emissions from pesticide and chemical input use and inappropriate farming practices (Tudi et al., 2021). It is noted that technologies play a crucial role in aiding environmental management (Engler & Krarti, 2021). Panpatte et al. (2016) propose the use of nanotechnology to minimize the release of agrochemicals and enhance the delivery of various macromolecules. Elahi et al. (2022) discover that young, educated, and affluent farmers in Pakistan are open to adopting green energy solutions. This finding suggests that farmer perceptions and acceptance are vital for implementing green technologies in agricultural production to safeguard the environment. Other scholars have also pointed out the potential of new tools and technologies in crop management and yield optimization. However, Morais et al. (2019) argue that despite the availability of various solutions made possible with new technologies in agricultural production, many of these solutions and standards remain underutilized in practice. Indeed, there are already various systematic literature reviews on digitalization in agricultural production (Peladarinos et al., 2023). Several themes have emerged, such as the relationship between digitalization and agricultural knowledge (Fielke et al., 2019) and the economics and management of agricultural systems (Rojo-Gimeno et al., 2019). Various aspects of technology use in different agricultural production activities have been explored. However, the understanding of how digitalization mitigates the environmental impacts of agricultural production remains limited. Therefore, it is essential to expand our understanding of technology applications in agricultural production to bridge the gap

** Foreign Trade University; email: namvh@ftu.edu.vn - chintk@ftu.edu.vn*

*** General Department of Viet Nam Customs; email: baovq@customs.gov.vn*

in the existing literature. This is particularly important in developing countries, where leveraging technology to mitigate environmental pollution from agricultural production is promising (Khan et al., 2021).

To address the research gap, this study synthesizes current trends in agricultural digitalization and environmental protection to uncover insights and suggest future directions for the development of sustainable agricultural production in emerging economies. To address the development of agricultural production with environmental protection through the lens of digitalization, we pose two research questions: (1) How has digitalization in agriculture progressed? (2) To what extent is digitalization in agriculture contributing to environmental protection??

The structure of this paper is as follows: Section 2 presents the literature review; Section 3 outlines the methodology; Section 4 presents the results; Section 5 discusses the findings; and Section 6 concludes the paper.

2. Literature review

2.1. Digitalization in agriculture

Digitalization refers to the use of digital technology to generate revenue, enhance business processes, and foster a digital business environment (Klerkx et al., 2019). According to Reis et al. (2020), digitalization highlights the distinction between the technological conditions necessary for social change and the actual changes that occur. In agriculture, digitalization facilitates access to advanced, sustainable farming practices (Klerkx et al., 2019). Many countries have prioritized national digital transformation programs within their agricultural sectors as key development policies (Brunetti et al., 2020). This transformation aims to enhance the agricultural production system, increase added value, address productivity challenges to meet rising demand, and promote sustainable development in agriculture (Klerkx et al., 2019). Consequently, digital transformation serves as a new solution to the challenges faced by the agricultural and rural sectors (Nemchenko et al., 2022).

From a management standpoint, digital transformation enhances the efficiency of managing the agricultural industry in general and agricultural enterprises in particular (Rijswijk et al., 2021). The integration of information technology and digital tools in operations and management enables faster, more accurate decision-making through streamlined and timely reporting, thereby improving management effectiveness and the efficiency of state agricultural agencies (Ye et al., 2023) (Table 1). Thus, digital transformation in agriculture is characterized by the creation of a smart agricultural ecosystem that fosters effective and sustainable practices (Khanna et al., 2022).

Table 1. Different technologies employed in agricultural production

Technologies in agriculture	Number of articles (WoS)	Period	Countries
Internet of Things (IoT)	3919	2008-2023	India, China, USA, Italy, Saudi Arabia, Spain, Pakistan, Brazil
Wireless sensor networks	2196	2003-2023	India, China, USA, Italy, Malaysia, South Korea
Cloud computing	745	2010-2023	China, India, USA, Spain, Italy, Brazil, Australia, Saudi Arabia, England
Robotic system	3319	1989-2023	China, USA, India, Japan, Italy, Germany, England
Big Data	1947	2012-2023	China, USA, India, Australia, Germany, Italy
Deep learning	3420	2012-2023	China, India, USA, Saudi Arabia, South Korea, Australia
Cyber-physical systems	185	2007-2023	USA, China, Italy, India, Greece, Spain, Australia
Digital win	107	1995-2023	China, USA, Netherlands, England, Germany, Italy

Sources: Authors' compilation

El Bilali and Allahyari (2018) note that digital transformation and technological solutions have been implemented across various sub-sectors of the agricultural sector, including farming, animal husbandry, forestry, and fisheries. In farming, IoT technology and big data are leveraged through software to analyze environmental conditions and monitor the development stages of crops. Consumers can trace the origin of plants and observe their growth in real-time. IoT applications also extend to managing seeds, soil, water, fertilizers, pesticides, energy, and livestock (Rejeb et al., 2021). In the forestry sub-sector, the barcode technology is utilized for managing tree varieties and forest products (Kress & Erickson, 2012). Additionally, the GIS technology and remote sensing images are employed to create monitoring software for early detection of deforestation and soil degradation in agricultural areas (Mohamed et al., 2015).

Muangprathub et al. (2019) highlight that technology in agriculture can be utilized to collect, analyze, and predict weather and climate change. Accurate weather forecasts enable farmers to determine optimal times for planting, harvesting, and taking care of their crops. Climate modelling provides insights into trends of and changes in climate, allowing farmers to adjust their plans and develop appropriate response strategies. Technology facilitates the monitoring and early warning systems that track crop health, disease spread, and environmental factors such as temperature and humidity (Khattab et al., 2019). New technology allows farmers to receive timely alerts about potential issues, enabling them to take preventive or corrective

actions to mitigate losses (Ramírez-Gil et al., 2018).

2.2 .Environment in agriculture

To meet the increasing population demands and ensure global food security, agricultural production has been intensified (Pretty et al., 2010). Agricultural practices have generated significant waste, which negatively impacts the natural environment (Duque-Acevedo et al., 2020). This waste originates from various sources, including crop residues, livestock, and aquaculture (Koul et al., 2022). The resulting pollution poses serious risks not only to agricultural ecosystems but also to human health. In the aquaculture sub-sector, particularly in intensive and super-intensive shrimp farming, the quality of land, water, and ecosystems has deteriorated remarkably due to pollution and degradation (Bhari et al., 2018). Therefore, to safeguard the environment, it is essential to apply digitalization, biotechnology, and innovative technological methods in agricultural production.

Table 2. The evolution of agriculture development

	Agriculture 1.0	Agriculture 2.0	Agriculture 3.0	Agriculture 4.0	Agriculture 5.0
Key features	Manpower & animal forces, simple tools	Machinery, chemicals	Computer programs, Robots	Smart systems, smart devices (IoT, Big Data, AI, Cload computing)	Machine learning, Data management system, Blockchain, fintech solutions
Results	Low productivity, harmful environment	Increased efficiency, destruct the ecological environment	Improve the precision of irrigation, prevent the environment pollution	High productivity, increased efficiency, improved precision agriculture, food security	High productivity, increased efficiency, improved precision agriculture, food security, protected environment

Sources: Authors' compilation

Table 2 illustrates how advancements in steam engine technology facilitated the transition from Agriculture 1.0 to Agriculture 2.0 (Gagliardi et al., 2022). In the 19th century, the advent of computers and robotics propelled the evolution from Agriculture 2.0 to Agriculture 3.0 (Lezoche et al., 2020). More recently, the integration of the Internet of Things, Big Data, Artificial Intelligence, and Cloud Computing has been driving the transformation from Agriculture 3.0 to Agriculture 4.0 (Raj et al., 2021).

3. Methodology

According to Tahai and Rigsby (1998), bibliometric analysis examines literature to review, summarize, and identify trending topics, current conditions, and future research directions using statistical and mathematical methods. By conducting a bibliometric analysis, we can gain a comprehensive understanding of the existing framework of smart production in emerging economies, which can inform digital agriculture initiatives in similar countries (Vu & Chi, 2024).

For data collection, we chose the database of articles from the Web of Science (WoS). The WoS is recognized as one of the most reliable databases of published articles. Organizing data by bibliographic structure and research field facilitates easier searching and analysis through bibliometrics. We retrieved meta-data from published papers related to digitalization in agriculture and the environment, with the retrieval date set for December 29, 2023. We excluded publications in languages other than English and focused on articles published from 2011 to 2023. By concentrating on digitalization in agriculture and the environment, we aim to uncover similarities in agricultural digitalization across countries with comparable economies, thereby supporting government policies for sustainable development. The total number of selected papers is 57.

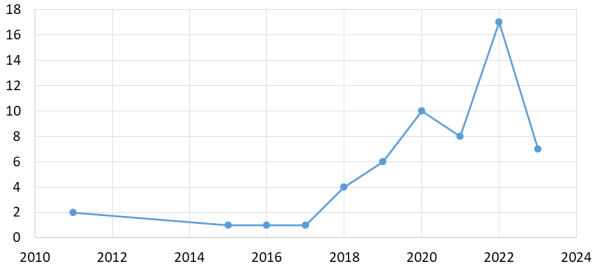
The selected papers were then reviewed using citation analysis, co-citation analysis and co-occurrence analysis. By citation analysis, we reveal the influential authors and published articles that have made important contributions to agricultural digitalization. The co-citation analysis was employed to identify clusters of keywords. The co-occurrence analysis was conducted to draw the insights of digitalization in agriculture. The strings that we used to search are: *((TS=("digitalization" AND "agricultur*" AND "environment")) OR TI=("digitalization" AND "agricultur*" AND "environment")) OR AB=("digitalization" AND "agricultur*" AND "environment").*

4. Results

4.1 The evolution of the literature on digitalization in agriculture

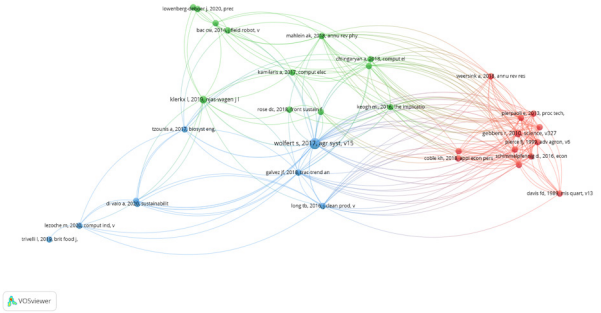
The articles included in our sample were published between 2011 and 2023. The volume of papers was relatively low from 2011 to 2017, but there was a significant increase between 2018 and 2020. From 2021 to 2023, the number of publications fluctuated.

Figure 1: The number of papers published from 2011 to 2023



The co-citation analysis is depicted in Figure 2. The publications related to digitalization in agriculture are highlighted. Wolfert et al. (2017) demonstrate the largest connections with other studies. They discuss how the Internet of Things and cloud computing drive technological advancements and advocate for integrating robots and artificial intelligence in agriculture. These technologies are crucial in switching agricultural practices toward a climate-smart approach.

Figure 2: Co-citation analysis



Three clusters illustrate the evolution of the literature on digitalization in agriculture. The first cluster is the early application of big data in precision agriculture. In this cluster, Morota et al. (2018) discuss various aspects of precision agriculture. Pierce and Nowak (1999) express concerns about the potential of precision agriculture to provide economic, environmental, and social benefits, noting that the spatiotemporal continuum of crop production has not been sufficiently addressed. Meanwhile, Morota et al. (2018) propose a framework for machine learning and data mining, highlighting their potential to tackle critical issues in precision agriculture.

The second cluster focuses on digitalization aimed at developing smart agriculture. Bac et al. (2014) advocate for using robots to replace manual weeding and harvesting in farming. Klerkx et al. (2019) note that researchers have recently explored aspects of digital agriculture related to farming systems, value chains, and food systems, leading to an expanding body of literature.

The third cluster highlights the digitalization in agriculture that prioritizes environmental protection. Galvez et al. (2018) discuss the application of blockchain technology to enhance traceability and transparency. They examine how blockchain can facilitate traceability and authenticity in the food supply chain. Long et al. (2016) emphasize that the adoption and diffusion of technological innovation in OECD countries are progressing slowly. They identify the key socio-economic barriers that impede the adoption and spread of climate-smart agricultural innovations.

4.2. Digitalization in agriculture for environmental protection

Through our co-occurrence analysis, we identified several keywords associated with the impact of digitalization on agriculture and the environment. The occurrences of these keywords include digitalization (19), agriculture (8), big data (7), food security (5), precision agriculture (4), sustainability (4), and environment (4). While there is a strong connection between digitalization and some of these keywords, its connection with the environment remains limited. Most studies on the effects of digitalization on the agricultural environment have emerged since 2022.

Studies on the role of digitalization in agriculture for environmental protection highlight two key aspects. The first is the application of digital technologies in circular agricultural production, which aims to enhance sustainability and environmental conservation. Karpushova et al. (2022) argue that international experience and the digital economy are pivotal in supporting the circular model of agriculture. Transitioning to circular agriculture by promoting the adoption of smart technologies can reduce production waste and cope with climate change. Similarly, Li et al. (2022) also suggest employing technologies in the circular economy application. They indicate that circular techniques to filter wastewater and regenerate raw materials should be developed to reduce the environmental impact of the agriculture sector.

The second is the development of smart climate agriculture through digitalization. Xie et al. (2022) find that digital transformation improves the environment, with environmental protection awareness moderating the relationship between digital transformation and environmental behaviors. Jakku et al. (2019) note that the fourth agricultural revolution not only maximizes production benefits but also prioritizes environmental protection. Smart technology can improve the environment by allowing more food to be produced on existing land, thereby limiting further land conversion (Rose et al., 2021).

5. Concluding remarks

5.1. Findings

This study provides an overview of the current landscape and a roadmap for future research on digitalization in agriculture and environmental protection. First, existing studies on digital applications in agriculture have largely overlooked environmental protection challenges. The current research is limited in offering digital solutions to mitigate the negative environmental impacts

of agricultural practices. Future research should explore an integrated framework for applying digital technologies that prioritize environmental protection in agricultural production, particularly in developing countries. Recent studies have proposed the use of digital agriculture technologies without sufficiently addressing their environmental implications. Second, our findings indicate that while barriers and challenges associated with digital agriculture and Agriculture 5.0 have been discussed, little has been examined on how to safeguard the environment. There is an opportunity for further empirical research to investigate the challenges of protecting the environment in agricultural production in the digital era.

5.2. Implications

Our research has some practical implications. Our findings offer stakeholders in agricultural production to enhance productivity and environmental protection by applying digital technologies. This is particularly relevant as these stakeholders are navigating the transition from Agriculture 1.0 to Agriculture 4.0. New technologies such as robotization, big data management, blockchain, and fintech should be more widely applied in agriculture. Governments and policymakers in developing countries should have better policies to facilitate the 4.0 technology adoption for improving agricultural productivity and preserving the environment.

5.3. Limitations and future research

There are some limitations of this study. The study has not provided a comparison of empirical evidence across different thematic clusters in the relationship between digitalization and agricultural environment protection. In addition, while we have not highlighted specific digital solutions to mitigate the effects of agricultural production on the environment. Future studies could focus on these aspects.

References:

Bac, C. W., Van Henten, E. J., Hemming, J., & Edan, Y. (2014). Harvesting robots for high-value crops: State-of-the-art review and challenges ahead. Journal of Field Robotics, 31(6), 888-911.

Bhari, B., & Visvanathan, C. (2018). Sustainable aquaculture: Socio-economic and environmental assessment. Sustainable Aquaculture, 63-93.

Duque-Acevedo, M., Belmonte-Ureña, L. J., Cortés-García, F. J., & Camacho-Ferre, F. (2020). Agricultural waste: Review of the evolution, approaches and perspectives on alternative uses. Global Ecology and Conservation, 22, e00902.

Elahi, E., Khalid, Z., & Zhang, Z. (2022). Understanding farmers' intention and willingness to install renewable energy technology: A solution to reduce the environmental emissions of agriculture. Applied Energy, 309, 118459.

El Bilali, H., & Allahyari, M. S. (2018). Transition towards sustainability in agriculture and food systems: Role of information and communication technologies. Information Processing in Agriculture, 5(4), 456-464.

Engler, N., & Krarti, M. (2021). Review of energy efficiency in controlled environment agriculture. Renewable and Sustainable Energy Reviews, 141, 110786.

Fielke, S. J., Garrard, R., Jakku, E., Fleming, A., Wiseman, L., & Taylor, B. M. (2019). Conceptualising the DAIS: Implications of the 'Digitalisation of Agricultural Innovation Systems' on technology and policy at multiple levels. NJAS: Wageningen Journal of Life Sciences, 90(1), 1-11

Gagliardi, G., Cosma, A. I. M., & Marasco, F. (2022). A decision support system for sustainable agriculture: The case study of coconut oil extraction process. Agronomy, 12(1), 177.

Galvez, J. F., Mejuto, J. C., & Simal-Gandara, J. (2018). Future challenges on the use of blockchain for food traceability analysis. TrAC Trends in Analytical Chemistry, 107, 222-232.

Jakku, E., Taylor, B., Fleming, A., Mason, C., Fielke, S., Sounness, C., & Thorburn, P. (2019). "If they don't tell us what they do with it, why would we trust them?" Trust, transparency and benefit-sharing in Smart Farming. NJAS-Wageningen Journal of Life Sciences, 90, 100285.

Khan, N., Ray, R. L., Sargani, G. R., Ihtisham, M., Khayyam, M., & Ismail, S. (2021). Current progress and future prospects of agriculture technology: Gateway to sustainable agriculture. Sustainability, 13(9), 4883.

Klerkx, L., Jakku, E., & Labarthe, P. (2019). A review of social science on digital agriculture, smart farming and agriculture 4.0: New contributions and a future research agenda. NJAS-Wageningen journal of life sciences, 90, 100315.

Koul, B., Yakoob, M., & Shah, M. P. (2022). Agricultural waste management strategies for environmental sustainability. Environmental Research, 206, 112285.

Kress, W. J., & Erickson, D. L. (2012). DNA barcodes: methods and protocols (pp. 3-8). Humana Press.

Karpushova, S. E., Denisov, I. V., Oudah, A. M. M. Y., & Dubova, Y. I. (2022). Environmental and Energy Efficiency as a Criterion for Sustainable Agriculture. In Sustainable Agriculture: Circular to Reconstructive, Volume 1 (pp. 55-64). Singapore: Springer Singapore.

Khanna, M., Atallah, S. S., Kar, S., Sharma, B., Wu, L., Yu, C., ... & Guan, K. (2022). Digital transformation for a sustainable agriculture in the United States: Opportunities and challenges. Agricultural Economics, 53(6), 924-937.

Khattab, A., Habib, S. E., Ismail, H., Zayan, S., Fahmy, Y., & Khairy, M. M. (2019). An IoT-based cognitive monitoring system for early plant disease forecast. Computers and Electronics in Agriculture, 166, 105028.

Kumar, P. R., Meenakshi, S., Shalini, S., Devi, S. R., & Boopathi, S. (2023). Soil Quality Prediction in Context Learning Approaches Using Deep Learning and Blockchain for Smart Agriculture. In Effective AI, Blockchain, and E-Governance Applications for Knowledge Discovery and Management (pp. 1-26). IGI Global

Lezoche, M., Hernandez, J. E., Díaz, M. D. M. E. A., Panetto, H., & Kacprzyk, J. (2020). Agri-food 4.0: A survey of the supply chains and technologies for the future agriculture. Computers in industry, 117, 103187.

Li, H., Li, M., Fu, Q., Cao, K., Liu, D., & Li, T. (2022). Optimization of biochar systems in the water-food-energy-carbon nexus for sustainable circular agriculture. Journal of Cleaner Production, 355, 131791.

Rotz, S., Duncan, E., Small, M., Botschner, J., Dara, R., Mosby, I., ... & Fraser, E. D. (2019). The politics of digital agricultural technologies: a preliminary review. Sociologia ruralis, 59(2), 203-229.

Long, T. B., Blok, V., & Coninx, I. (2016). Barriers to the adoption and diffusion of technological innovations for climate-smart agriculture in Europe: evidence from the Netherlands, France, Switzerland and Italy. Journal of cleaner production, 112, 9-21.

Mohamed, E. S., Belal, A., & Shalaby, A. (2015). Impacts of soil sealing on potential agriculture in Egypt using remote sensing and GIS techniques. Eurasian Soil Science, 48, 1159-1169.

Morais, R., Silva, N., Mendes, J., Adão, T., Pádua, L., López-Riquelme, J. A., ... & Peres, E. (2019). mySense: A comprehensive data management environment to improve precision agriculture practices. Computers and Electronics in Agriculture, 162, 882-894.

Mizik, T. (2023). How can precision farming work on a small scale? A systematic literature review. Precision agriculture, 24(1), 384-406.

Morota, G., Ventura, R. V., Silva, F. F., Koyama, M., & Fernando, S. C. (2018). Big data analytics and precision animal agriculture symposium: Machine learning and data mining advance predictive big data analysis in precision animal agriculture. Journal of animal science, 96(4), 1540-1550.

Muangprathub, J., Boonnam, N., Kajornkasirat, S., Lekbangpong, N., Wanichsombat, A., & Nillaor, P. (2019). IoT and agriculture data analysis for smart farm. Computers and electronics in agriculture, 156, 467-474.

Nemchenko, A. V., Dugina, T. A., Shaldokhina, S. Y., Likholetov, E. A., & Likholetov, A. A. (2022). The digital transformation as a response to modern challenges and threats to the development of agriculture. In Smart Innovation in Agriculture (pp. 37-45). Singapore: Springer Nature Singapore.

Panpatte, D. G., Jhala, Y. K., Shelat, H. N., & Vyas, R. V. (2016). Nanoparticles: the next generation technology for sustainable agriculture. Microbial Inoculants in Sustainable Agricultural Productivity: Vol. 2: Functional Applications, 289-300.

Peladarinos, N., Piromalis, D., Cheimaras, V., Tserepas, E., Munteanu, R. A., & Papageorgas, P. (2023). Enhancing smart agriculture by implementing digital twins: A comprehensive review. Sensors, 23(16), 7128.

Pierce, F. J., & Nowak, P. (1999). Aspects of precision agriculture. Advances in agronomy, 67, 1-85.

Prakash, C., Singh, L. P., Gupta, A., & Lohan, S. K. (2023). Advancements in smart farming: A comprehensive review of IoT, wireless communication, sensors, and hardware for agricultural automation. Sensors and Actuators A: Physical, 114605.

Pretty, J., Sutherland, W. J., Ashby, J., Auburn, J., Baulcombe, D., Bell, M., ... & Pilgrim, S. (2010). The top 100 questions of importance to the future of global agriculture. International journal of agricultural sustainability, 8(4), 219-236.

Rejeb, A., Rejeb, K., Abdollahi, A., Zailani, S., Iranmanesh, M., & Ghobakhloo, M. (2021). Digitalization in food supply chains: A bibliometric review and key-route main path analysis. Sustainability, 14(1), 83.

Raj, M., Gupta, S., Chamola, V., Elhence, A., Garg, T., Atiquzzaman, M., & Niyato, D. (2021). A survey on the role of Internet of Things for adopting and promoting Agriculture 4.0. Journal of Network and Computer Applications, 187, 103107.

Ramírez-Gil, J. G., Martínez, G. O. G., & Osorio, J. G. M. (2018). Design of electronic devices for monitoring climatic variables and development of an early warning system for the avocado wilt complex disease. Computers and Electronics in Agriculture, 153, 134-143.

Rijswijk, K., Klerkx, L., Bacco, M., Bartolini, F., Bulten, E., Debruyne, L., ... & Brunori, G. (2021). Digital transformation of agriculture and rural areas: A socio-cyber-physical system framework to support responsibilisation. Journal of Rural Studies, 85, 79-90.

Rojo-Gimeno, C., van der Voort, M., Niemi, J. K., Lauwers, L., Kristensen, A. R., & Wauters, E. (2019). Assessment of the value of information of precision livestock farming: A conceptual framework. NJAS-Wageningen Journal of Life Sciences, 90, 100311

Rose, D. C., Wheeler, R., Winter, M., Lobley, M., & Chivers, C. A. (2021). Agriculture 4.0: Making it work for people, production, and the planet. Land use policy, 100, 104933.

Tahai, A., & Rigsby, J. T. (1998). Information processing using citations to investigate journal influence in accounting. Information Processing & Management, 34(2-3), 341-359.

Sarker, I. H. (2021). Data science and analytics: an overview from data-driven smart computing, decision-making and applications perspective. SN Computer Science, 2(5), 377.

Tudi, M., Daniel Ruan, H., Wang, L., Lyu, J., Sadler, R., Connell, D., ... & Phung, D. T. (2021). Agriculture development, pesticide application and its impact on the environment. International journal of environmental research and public health, 18(3), 1112.

Vu, N. H., & Chi, N. T. K. (2024). Stakeholders' assessment of feed produced from nutrients recovered from aquaculture waste in an emerging economy. Aquaculture, 593, 741333.

Wolfert, S., Ge, L., Verdouw, C., & Bogaardt, M. J. (2017). Big data in smart farming–a review. Agricultural systems, 153, 69-80.

Xie, Y., Chen, Z., Boadu, F., & Tang, H. (2022). How does digital transformation affect agricultural enterprises' pro-land behavior: The role of environmental protection cognition and cross-border search. Technology in Society, 70, 101991.

Ye, F., Qin, S., Nisar, N., Zhang, Q., Tong, T., & Wang, L. (2023). Does rural industrial integration improve agricultural productivity? Implications for sustainable food production. Frontiers in Sustainable Food Systems, 7, 1191024.

COMPLETION OF LEGAL REGULATIONS FOR VIETNAMESE GOVERNMENT BOND MARKET

PhD. Luu Huyen Trang* - PhD. Doan Thi Hai Yen - MA. Bui Ha Hanh Quyen****

MA. Viengkham THONGSAVAT***

Abstract: ***In order to meet the demand for financing for development investment, the government bond market is an effective channel to mobilize capital for the State Budget in Vietnam. The article focuses on analyzing: (i) the current legal status of the government bond market in Vietnam; (ii) the operational situation of the government bond market under the regulation of legal documents; and (iii) some suggestions. The analysis and recommendations are presented in the study to improve legal regulations on the government bond market in Vietnam and to serve as a basis for legislators to amend and adjust the legal documents to promote the development of the government bond market in Vietnam in the coming period.***

• Keywords: *legal documents, government bond, bond market, government-guaranteed bonds.*

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1. Introduction

Indeed, the government bond market plays a crucial role in the financial ecosystem of any country, and it's interesting to see how Vietnam's market has evolved since its formation in the 1990s. The main purpose of the government bond market is to serve as an effective channel for mobilizing capital for the state budget. By issuing bonds, the government can raise funds to finance public projects, infrastructure development, and social programmes. This is essential for fostering economic growth and maintaining public services. The government bond market also aims to set a benchmark for other segments of the financial market. Government bonds are typically seen as low-risk investments, and their yields can help set interest rates for other debt instruments in the market. This creates a framework for pricing and evaluating risk across various financial products. Despite its relatively recent inception compared to other nations, the Vietnamese government bond market has indeed made significant strides. However, the rapid increase in public debt, particularly in the context of a growing GDP, raises concerns about fiscal sustainability.

At the end of 2023, the debt ratio was around 37% of GDP, well below the ceiling of 60% authorised by the National Assembly. The structure of public debt has recently changed in the direction of increasing domestic debt and gradually decreasing foreign debt. Outstanding domestic debt accounts for about 71% of government debt and consists mainly long term bonds (with an average maturity of 12.4 years), which reduce the risk of exchange rate fluctuations and debt restructuring. Government bonds have become an important instrument for mobilising funds for the national budget in order to carry out major projects that are the driving force of the economy. However, the government bond market still has many limitations and has not developed equal with its potential. The market is still small, with many existing problems, such as simple goods, undiversified investors, and infrastructure does not meet the needs of development.

To improve the functioning of the government bond market, numerous legal documents have been issued to create a standardized legal framework for the market. Despite a series of amendments to respond to market fluctuations, the relevant legal documents still have many shortcomings, that hinder the development of the government bond market in Vietnam.

The study was carried out to analyze legal regulations on the government bond market, to point out deficiencies and inappropriate issues, and to serve as a basis for proposals to improve market operations in the coming period.

2. Overview of the government bond market in Vietnam

2.1. Legal documents regulate the government bond market

In the early stages of the government bond market, there were very few legal documents and regulations regulating the government bond market. By 1994, some of the first official documents regulating the issuance of government bonds in Vietnam were issued, e.g. Decree 72/CP dated July 26, 1994, Decree 23/CP dated 22 March 1995, Ordinance No. 12/1999/PL- UBTVQH10.

In the course of international integration, the Vietnamese government bond market has undergone many significant changes. Some government decisions have changed market operations, including the issuance of government bonds in large batches, the tendering of government bonds through the centralized stock

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*** Academy of Finance*

**** Lao PDR Academy of Finance and Accounting*

exchange market, and, in particular, the decision to approve construction projects. The specialized government bond market has brought the government bond market a big step forward. The legal framework for bond market development is generally issued at the same time and in line with the respective market phase, taking into account integration obligations and international trends and practices. Some legal documents for the functioning of the government bond market in the current period include:

Laws: State Budget Law (2015); Law on Public Debt Management (2017), Law on Securities (2006), Law amending and supplementing a few articles of the Law on Securities (2010), Law on Securities (2019) regulates the issuance of more government bonds to mobilize funds for the state budget.

Decree

- Decree 53/2009/ND-CP on international bond issuance (partially suspended);

- Decree 01/2011/ND-CP on the Issuance of Government Bonds, Government Guaranteed bonds and Local Government bonds. The circulars provide detailed guidance on Decree 01/2011/ND-CP, including processes and procedures for the issuance, deposit registration and listing of bonds, taking into account international market practices.

- Decree 58/2012/ND-CP implementing the Securities Law and the Law amending and supplementing certain articles of the Securities Law, Decree 60/2015/ND-CP amending and supplementing certain articles of the Securities Law Decree No. 58/2012/ND-CP.

- Government Decree No. 91/2018/ND-CP dated June 26, 2018, on the issuance and management of Government guarantees.

- Government Decree No. 93/2018/ND-CP dated June 30 2018 regulating the debt management of local authorities.

- Government Decree 95/2018/ND-CP dated June 30 2018 regulating the issuance, registration, custody, listing, and trading of government debt instruments on the stock market.

- Decree No. 83/2023/ND-CP amending Decree 95/2018/ND-CP regulating the issuance, registration, endorsement, listing, and trading of government debt instruments on the stock market.

Circulars

- Ministry of Finance Circular No. 15/2018/TT-BTC dated February 7, 2018, regulating the costs of issuance, exchange, repurchase, principal and interest payment of government bonds and government-guaranteed bonds as well as local government bonds.

- Circular No. 110/2018/TT-BTC issued by the Ministry of Finance on 15 November 2018, which regulates the repurchase and exchange of government debt instruments, government-guaranteed bonds, and local government bonds in the domestic market.

- Ministry of Finance Circular No. 111/2018/TT-BTC dated November 15, 2018, which regulates the issuance and payment of government debt instruments in the domestic market.

- Circular No. 30/2019/TT-BTC dated 28 May 2019 of the Ministry of Finance regulating the registration, custody, listing, trading, and payment of transactions of government debt instruments and bonds issued by the Government; Government guarantees 6bissued by policy banks; and local government bonds.

- Circular No. 81/2020/TT-BTC dated September 15, 2020, of the Ministry of Finance amending and supplementing several articles of Circular No. 110/2018/TT-BTC dated November 15, 2018, which regulates the repurchases and exchange of government debt instruments, government-guaranteed bonds, and local government bonds in the domestic market.

- Circular No. 107/2020/TT-BTC dated December 21, 2020, of the Minister of Finance regulating temporary repurchase transactions of government bonds from temporarily unused state treasury funds. Circular 12/2023/TT-BTC dated February 10, 2023, amending and supplementing several articles.

Decision

- Decision 576/QD-SGDHN amending and supplementing the bidding procedure for government bonds, government-guaranteed bonds, and local government bonds at the Hanoi Stock Exchange, issued with Decision No. 276 /QD-SGDHN August 3, 2012. And Decision 373/QD-SGDHN dated June 15, 2016, amended Decision 576/QD-SGDHN.

- Decision 253/QD-UBCK on listing and trading of government bonds issued in foreign currency at the Hanoi Stock Exchange.

- Decision 1583/QD-NHNN issued on July 27, 2017, on the payment process for transactions of government bonds, government-guaranteed bonds, and local government bonds at the State Bank of Vietnam.

- Decision 494/QD-BTC 2016 on the rules for access and security of information on the issue interest rate framework and bidding information for issuance of government bonds, government-guaranteed bonds, and local government bonds method issued by the Minister of Finance.

- Decision 750/QD-SGDHN on the trading process of government bonds, government-guaranteed bonds, and local government bonds at the Hanoi Stock Exchange.

- Decision 756/QD-SGDHN on the disclosure of information and reporting procedures for members trading government bonds at the Hanoi Stock Exchange.

- Decision 501/QD-SGDHN issued on July 5, 2017, on the regulations for trading in government bonds,

government-guaranteed bonds, and local government bonds issued by the Hanoi Stock Exchange.

- Decision 573/QD-SGDHN 2023 on amending and supplementing articles of the Term Repurchase Transaction Process of government bonds from temporarily unutilized funds of State Treasury on the Hanoi Stock Exchange.

- Decision 16/QD-DTV 2023 on regulations on payment activities for transactions in government debt instruments, government-guaranteed bonds issued by policy banks, and local government bonds issued by the Council issued by a member of Vietnam Securities Depository and Clearing Corporation.

The legal framework focuses on developing the government bond market into an effective capital-raising channel for the state budget while also serving as a standard market for the financial system. Government bond issuance and transactions are improved in line with the market conditions and international practices by making the issuance of government bonds market orientation.

2.2. The status of the government bond market in Vietnam

The gradual improvement of the legal framework has promoted the development of the government bond market in Vietnam. This is reflected in the changes in methods, volumes, issuance costs (interest rates), investor base, and commodities in the government bond issuance market. Currently, the government bond market includes three types: government bonds, government-guaranteed bonds, and local government bonds. In detail, the situation of the government bond market is as follows:

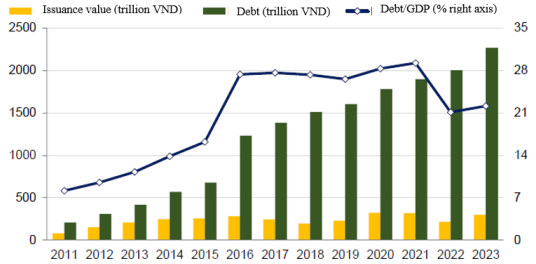
Method and scale of government bond issuance

In accordance with Decree No. 01/2011/ND-CP on the issuance of government bonds, government-guaranteed bonds, and local government bonds, government bonds are issued in four forms: bidding at HNX, retail bonds, underwriting and issuance agents, in which the three issuance methods are bidding, bond retail and underwriting are the most commonly used.

The volume of government bonds issued depends on the Government's needs, the balance of state budget revenues and expenditures, and other sources of government debt. In the early years, the volume of government bonds issued was limited, and the issuance of government bonds was sporadic and without a clear plan. Since the establishment of the government bond market and the Ho Chi Minh City Stock Exchange Center, the issuance of government bonds has improved. Before 2011, the volume of government bonds issued increased over the years, with the exception of the four years of 2001, 2004, 2008, and 2009, when there was negative growth. In the following years t, the volume of bonds issued increased, while in some years it fell slightly. This result is due to a stable macroeconomy, a stable money market and exchange rate, good liquidity of credit institutions, and lower deposit and lending interest rates in the money market.

From 2011 to the present, the functioning of the government bond market has been fundamentally reformed since the publication of the legal framework at the same time, in terms of products, commodities, issuing organization, registration, custody, listing, trading and investor base. In the period 2011-2023, the total volume of government bonds issued has changed over the years, covering the annual need for capital for the state budget by more than 72%. The highest volume of bonds issued in 2020 was VND 323,953 billion, an increase of 63.8% compared to 2019. In 2022, the transaction value decreased, and resale transactions (repo) also decreased in the following years. The government's outstanding debt has increased over the years, but thanks to the steady increase in GDP, the ratio of outstanding debt to GDP tends to be stable and decreases, especially in 2022 and 2023.

Chart 1: Issue value and outstanding debt of government bonds in the period 2011-2023



**2023 figure is estimated*

Source: Ministry of Finance, HNX, VBMA (2023)

The scale of listing on the secondary market

By the end of 2023, the total face value of government bonds listed on the Hanoi Stock Exchange (HNX) is about 1.8 million billion VND with 194 bond codes. Compared to 2010, the listed value has increased 10.4 times after 24 years, while the number of bond codes decreased by more than 55%. The reason is that the State Treasury actively deployed issuance in large batches, creating the conditions for many investors to hold the same bond code, which improved market liquidity. The average value of a listed government bond code increases from about 400 billion VND in 2010 to approximately 8,100 billion VND at the end of 2022 and 9,273 billion VND at the end of 2023.

Bidding for bonds

Decree No. 01/2000/ND-CP on implementing bond bidding at the Ho Chi Minh Stock Exchange Center is considered a turning point in the Vietnamese government bond market. In the period from 2000 to 2006, the volume of government bonds auctioned was quite limited, and accounted for a small proportion of the total number of government bonds issued (around 10% to less than 20%). In 2006, the Ministry of Finance issued

Decision 2276/2006/QD-BTC on focusing on bidding for government bonds at the Hanoi Stock Exchange Center (now Hanoi Stock Exchange), promoting the development of issuing government bonds through bidding. The electronic bidding system increased the value in 2013 by almost seven times compared to 2010. In the following years, the bidding volume of government bonds continued to increase and became a main capital mobilization channel for the state budget.

In recent years, the value of investors'bids has improved significantly compared to the calling value. In 2023 in particular, the ratio between the bid and purchase value of government bond for the country as a whole is quite high, reaching 2.7 times.

Table 1: Ratio of bidding/calling value of government bonds (times)

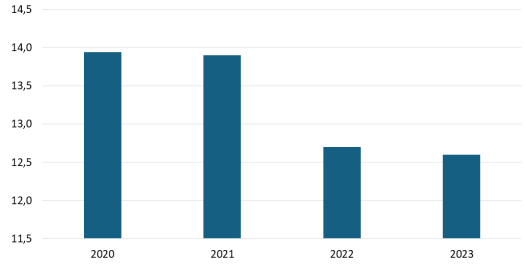
Month	1	2	3	4	5	6	7	8	9	10	11	12
2020	3.95	2.99	2.83	1.73	1.83	3.04	2.28	2.01	3.50	1.64	2.33	2.81
2021	3.00	2.35	2.29	3.00	2.86	2.23	2.80	2.89	1.90	1.73	2.56	2.37
2022	2.19	1.75	2.07	1.67	1.46	1.44	1.58	1.37	1.28	1.52	1.93	3.58
2023	3.32	2.99	3.52	2.54	2.99	3.01	2.23	2.00	1.51	1.36	2.99	2.58

Source: VBMA

Term of the issue

Prior to 2016, the overpayment rate was mainly focused on short-term bonds. Implementing Resolution No. 25/2016/QH14 of the National Assembly on the national 5-year financial plan for the period 2016-2020, from 2017, the Government focused on bidding for government bonds with terms of 5 years or more and continued to sell very long-term bonds of 20 years and 30 years with high bidding and winning rates, which shows that the market has changed positively when long-term bonds receive more attention. The average term changes over the years, depending on the economic situation and the government's capital needs in each period. Government bonds with 10-year and 15-year terms continue to make up the majority. In 2022 and 2023, 10-year terms account for 60% and 39.8% respectively, while 15-year terms account for 35% and 44%. The 30-year term accounts for approximately 4% and the 20-year term accounts for less than 1%.

Chart 2: Average government bond issuance term (year)

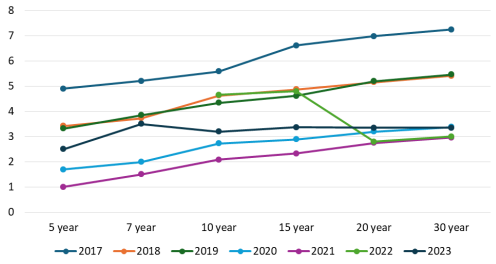


Source: VBMA

Interest rate

As the government bond market develops, the control of government bond issuance's interest rates is gradually diminishing. Under Decree 141/2003/ND-CP, the bond interest rates are set by the Minister of Finance based on the financial market's actual situation at the time of issuance. In the case of interest rate bidding, the interest rate is set according to the bidding results. In general, interest rates mobilized through the issuance of government bonds tend to gradually fall and are often lower than the lending interest rates of banks. The average issuance interest rate of all terms in 2022 is 3.48%, and in 2023 is 3.21%.

Chart 3: Average winning interest rate for the period 2017-2023 (%/year)



Source: HNX, VBMA

Structure of investors bidding for Government bonds

In 2012, Circular 17/2012/TT-BTC of the Ministry of Finance regulating the issuance of government bonds in the domestic market, set out the conditions for commercial banks, financial companies, securities companies, insurance companies, investment funds, and other financial institutions legally set up and operating in Vietnam to participate the government bond bidding. The organizations must have a minimum capital equivalent to the legal capital under relevant laws, they must meet capital adequacy ratios and operate for more than 3 years, they must be a member of the specialized government bond market on the Hanoi Stock Exchange. The Ministry of Finance will yearly issue a list of members bidding for government bonds. With this list's introduction, the government bond market's operation has gradually converged with international practices.

Underwriting of bond issuance

The issuance of government bonds was implemented in 2000. Accordingly, government bonds are distributed via guaranteed organizations such as investment firms, commercial banks, and financial companies following approval of the Ministry of Finance. The State Treasury negotiates and agrees with the volume, term, interest rate, and bond underwriting fee for each issuance with the guaranteed organization.

In the early years of issuing government bonds under the underwriting method, the volume of government bonds issued in this form increased over the years and mainly focused on government bonds with long terms of 5 years and over. In the subsequent period (2008-2012), the structure of government bonds issued by guaranteed

method changed towards many bonds with short terms of 2-3 years, while the number of bonds with long terms of 10-15 years was low.

Circular 111/2015/TT-BTC on regulating the issuance of government bonds in the domestic market regulates the types of bonds issued under a guaranteed method with a term of 5 years or more. The underwriting method helps the Government provide long-term bonds, changing the term structure of government bonds in a positive direction. At the same time, the issuer through the underwriting system can better and more accurately assess the market supply and demand. The Bank for Social Policies (VBSP) and the Vietnam Development Bank (VBSPVN) are two entities that issue guaranteed bond bidding activities. In the two years 2022-2023, the value of government bonds guaranteed by VBSP increased over the years while VNDB temporarily suspended issuance activities in these two years.

As for the local government bond market, the above scale is still relatively modest in both the primary and secondary markets.

Table 2: Volume of government- guaranteed bonds and local government bonds

Criteria	2020	2021	2022	2023
Government guaranteed bonds	133,441	127,117	137,417	154,962
Local government bonds	11,743	11,243	11,069	10,919
Total	**154,184**	**138,360**	**148,486**	**165,881**

Source: HNX

Commodities on the government bond market

Government bonds are issued in increasingly diverse forms, certificates, and book entries, from registered to anonymous bonds, making the transfer and transaction of government bonds easier and more convenient.

In addition to government bonds that pay interest periodically once a year at the beginning or end of the period, the Ministry of Finance has introduced a number of other government bond products, such as bonds that do not pay periodic interest (zero coupons), or bonds with the first interest payment period is shorter or longer than the standard period (long, short coupon).

3. Some evaluation and suggestions

3.1. Achievements

Basically, the market has created a clear legal corridor for the activities of the government bond market. Thanks to that, the government bond market has significantly expanded and has become an important capital mobilization channel for the state budget. The government bond market is becoming more integrated with the regional market, as evidenced by the narrowing gap between Vietnamese government bond rates compared to government bond interest rates in reference markets. The government bond market becomes more accessible to investors, showing an increasingly diverse investor base. Diverse trading methods, including electronic transaction transactions and conventional transactions, support many types of investors taking part in the market. In addition, the increasing proportion of repo transactions shows the development of market depth. In addition, the infrastructure for the market has been significantly improved, becoming more modern and synchronous, providing good support for domestic and foreign investors.

The types of government bonds issued have become more diverse. In addition to the traditional product of bonds with standard periodic interest payments, the market has added bond products with no periodic interest payments and bonds with a long first interest payment period or shorter than the standard term. The quality of goods in the government bond market has gradually improved. The number of bond codes issued is trending downwards, and the volume of individual codes is increasing. Diverse and superior quality products meet the requirements of different investors, making the government bond market more accessible to investors.

On government bond bidding, the process is increasingly improved, making it easier for investors to participate in bidding. The electronic bond bidding system allows bidders to submit bid forms remotely, edit or cancel bid forms according to market developments, and receive instant online bidding results, helping to shorten review time. The submission of bids, the determination of bid results and the connection of administrative authorities, issuers, and market organizations with all bidders are approaching the standards of developed stock markets in the world.

Membership structure: In recent years, the membership structure of the government bond market has become more diverse, thanks to the participation of two organizations: social insurance (since 2014) and deposit insurance (since 2016). Along with many measures and efforts of the Government, the structure of investors in the bond market has shifted in a positive direction, creating conditions for sustainable development of the bond market.

3.2. Restrictions

The legal framework related to the government bond market and market participants remains limited

The legal framework has been modified to accommodate the development of the market, but there is no uniformity or synchronization, which creates difficulties for entities taking part or intending to participate in the market. The legal framework for the establishment, operation, and participation in the government bond market is still limited for many companies such as investment funds, insurance companies, and commercial banks, especially foreign investors. The tax regulations on income from securities investment also do not encourage investors to take part in the market.

Market transparency is not high

The market is becoming increasingly transparent. In addition to the specialized trading system for government bonds, the information system has also been rebuilt, which ensures data security and is provided via members, news agencies, and electronic news websites. This makes the information content on bonds richer and more diverse, which better meets the needs of market participants and the public and creates the conditions for building a standardized yield curve. Information on public debt, debt management, government bond issuance, and transactions are publicly available to investors. Plans, timetables, annual and quarterly bidding results, and publication dates are announced specifically, promptly, and accurately. However, the quality of information disclosure is still limited. The information provided is monotonous and consists mainly of general, short-term information that is not suitable for in-depth, long-term analysis and is used for valuation, identifying market trends, and policy proposals.

Government bond underwriting is still subject to government requirements and intervention in terms of the issuance volume and agreed interest rates, which restricts the freedom of the market. The issuance of government bonds in this form has gradually declined in recent years and has focused on the issuance of long-term government bonds and bonds that are difficult to sell on the market, which is a good sign for the government bond market.

As far as issue interest rates are concerned, the liberalization of interest rates on the government bond market is slow. Government bond interest rates are simultaneously influenced by the supply and demand ratio on the market and the State Bank's monetary policy. The Government's regulation of ceiling interest rates leads to a low winning bid volume, while the bid volume is high. This affects the freedom of the government bond market, interest rates do not accurately reflect the market's valuation of government bonds.

3.3. Some suggestions

Firstly, the rules on mobilizing state budget capital through debt, and ensuring debt security must be revised, in particular by setting debt thresholds based on revenue, debt balance, the amount of debt mobilized, the amount of debt repayment, direct and indirect debt obligations, and contingent debt obligations to localities and countries. The public debt threshold must be based on clear principles, a scientific and well-founded calculation method that complies with international standards in order to assess the public debt burden and the ability to repay debt on the basis of the actual situation.

Second, gradually reducing government guarantees for loans, clear, transparent, and strict classification of guaranteed issues, whereby only necessary issues and projects are guaranteed. Limiting the underwriting of government helps to ensure the freedom of the government bond market.

Third, the Ministry of Finance must apply the framework for bidding interest rates flexibly in order to closely monitor market developments. In the context of an increasingly evolving market, it is necessary to issue government bonds with interest rates that follow the laws of market supply and demand and refrain from non-market intervention measures on interest rates.

Fourth, limiting and phasing out regulations that prescribe the purchase and holding of government bonds. In particular, the regulation on the minimum quota for the holding of government bonds by a financial institution will be abolished to ensure that the purchase and sale of government bonds follow market rules.

Fifth, draft legal documents to promote the formation of a tier 1 bond dealer system, including specialized financial intermediaries with obligations and privileges to support the development of government bonds. The regulations must clearly specify the subjects in the level 1 bond dealer system, the scale of the system according to the market size of each lever, and the criteria for categorizing market makers.

Sixth, complete the legal framework for the establishment and adaptation of the activities of credit rating companies on the basis of credit rating regulations. The rules on terms and conditions for credit rating services must be adapted to the respective phase of market development.

Seventh, improvement of the legal provisions on the quality of information published on the market. Information disclosure must ensure completeness, accuracy, and timeliness in accordance with the law. This requires a clear indication of specific standards for the relevant parties and coordination between parties.

The development of the government bond market requires the participation of all levels, sectors, and competence authorities as well as the coordination of all parties involved in the market. This requires the State to further improve the legal framework to ensure the development of government bonds in accordance with market rules while also meeting its role as a capital mobilization channel for the state budget.

References:

Governement (2011) Decree No. 01/2011/ND-CP dated January 05, 2011 of the Government on issuance of government bond, government-guaranteed bonds and local government bonds.

Ministry of Finance (2006) Decision 2276/2006/QD-BTC issued on 20 Jun 2006 on focusing on bidding for Government bonds at the Hanoi Stock Exchange Center.

Ministry of Finance (2012) Circular No. 17/2012/TT-BTC of February 08, 2012, guidelines on the issuance of Government bonds in the domestic market.

Ministry of Finance (2015) Circular 111/2015/TT-BTC issued on 28 July 2015 guidance issuance of government bonds domestic market in Vietnam.

The Government (2000) Decree No. 01/2000/ND-CP dated January 13, 2000 of the Government promulgating the Regulation on the issuance of the government bonds.

The Government (2003) Decree No. 141/2003/ND-CP dated November 20, 2003 of the Government on the issuance of the government's bonds, bonds guaranteed by the government and bonds of local government.

The National Assembly (2006) Law on Securities (2006), (2010), (2019).

The National Assembly (2016) Resolution No. 25/2016/QH14 dated November 09, 2016, on national 5-year financial plan in 2016-2020 period.

The National Assembly (2015) Luật on State budget 83/2015/QH13, issued on 25/6/2015.

The National Assembly (2017) Law No. 20/2017/QH14 issued on 23 Nov 2017 on Public Debt Management.

VBMA (2023) Báo cáo Thị trường trái phiếu Việt Nam 2023. VBMA.

PREDICTING NFT PRICE TRENDS USING MACHINE LEARNING ALGORITHMS

Emmanuel Lance Christopher VI M. Plan* - Nguyen Ngoc Nhat* - Nguyen Thi Mai Huong*
Pham Thu Thao* - Nguyen Quang Huy*

Abstract: ***This work explores the potential of utilizing classification machine learning algorithms to predict the sale trends of NFT collections. Models were trained on data from five top art collections, including transactional sales information, market activity, and user engagement, which are readily accessible to an NFT enthusiast. Our results show that most machine learning algorithms display modest values of predictive accuracy around 70%, with neural networks easily obtaining 90% accuracy regardless of simplicity or complexity of architecture. This work can aid investors and enthusiasts make appropriate trading strategies given market features that significantly affect price movement.***

• Keywords: *non-fungible tokens, machine learning, price trend prediction.*

JEL codes: G10, G17

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1. Introduction

A non-fungible token (NFT) is a digital asset whose underlying form is some artwork, music, in-game items, videos, among others. They are traded online using cryptocurrency, and they are operated by the same technology as cryptocurrencies (Conti, 2024). Since cryptocurrencies attracted attention in 2020 the NFT market has seen an explosive growth, particularly in the domain of art (Luo *et al.*, 2023). These tokens facilitated not only a means of asserting ownership but also a platform for artists to reach a global audience. Their appeal lies in their ability to ensure the uniqueness and provenance of digital works of art. This opened up new avenues for artists to monetize their work and for collectors to invest in digital art with verified authenticity.

Along with its increasing popularity comes pricing challenges. Investors want to identify which characteristics of tokens are deemed to be valuable and tradable. Rarity and being associated with popular labs are among them (Luo *et al*., 2023; Mekacher *et al*., 2022). Furthermore, machine learning methods revealed that NFT prices are correlated with the presence of a strong community, in particular with the number of tweets in Twitter (now X) and their content (Luo *et al*., 2023, Alon *et al*., 2022). For NFT artworks, the size of the image as well as the market size are found to be influential in dictating an NFT's value (Horky *et al*., 2022). These, among others, allow investors to make informed decisions about entry and exit points, thereby maximizing potential profits and navigating the ever-changing NFT landscape (Brown, 2023; Hoffelt, 2023, Bsteh, 2021).

Thanks to the availability of data, researchers can utilize machine learning (ML) methods to further understand pricing trends and NFT dynamics (Wang *et al*., 2023; Nadini *et al*., 2021). Such insights, however, require massive amounts of data. This work aims to simplify the analysis by analyzing easily accessible data on NFT collections to implement models and insights that can predict pricing trends with acceptable accuracy. Demonstrated using historical data of some top art collections, we determine which machine learning models exhibit sufficient predictive power to determine pricing trends. This can thus aid an investor of an NFT collection not only predict expected price fluctuations for their assets but also obtain insights on the NFT market dynamics.

2. Related work

The popularity of NFTs and its potential for various applications motivated analysts and researchers to analyze the NFT market. Being a unique kind of digital asset like cryptocurrency, but non-fungible in nature like real estate, and traded globally unlike traditional country-specific stock market, pricing NFTs provided unique challenges. Research articles on the NFT market mostly utilized key metrics such

** Hanoi School of Business and Management, Vietnam National University, Hanoi, Vietnam*

as transaction volume, collection risk, popularity (Wang *et al*., 2023; Horky *et al*., 2022; Nadini *et al*., 2021). Some more unique factors that influence market prices include the rarity of the artwork, the reputation of the artist, and the aesthetic value of the NFT, including attributes such as color, density and composition (Zheng, 2022) To cope with the amount of data generated by these transactions, ML techniques had been used to forecast the price of NFTs and trading behavior of NFT market players.

Most studies use regression models to predict an NFT's price. Jain *et al*. (2022) used linear regression and recurrent neural network to predict NFT value. Their analysis of public market data, NFT metadata, and social trends showed a strong correlation between these features and NFT prices. Similarly, Kong and Lin (2021) developed a hedonic regression model to construct an overall price index for NFTs, controlling for observable characteristics of each CryptoPunk and other relevant variables. Schaar and Kampakis (2022) also applied a hedonic regression model to data from the Larva Labs website, focusing on rarity and the number of attributes identified for each token.

Other studies have used classification machine learning models (Alon *et al*., 2023; Gumelar *et al.*, 2022; Nansen, 2022). Gumelar *et al.* (2022) used the K-Nearest Neighbors algorithm method to provide information under the conditions that investors expect. Automated machine learning was used to predict price determinants of non-fungible tokens (NFTs) by investigating market-related features and the network of buyers (Alon *et al*., 2023). In their work, the most important price determinant was shown to be Twitter membership followed by Discord membership. More complicated machine learning models have also been proposed. Costa *et al.* (2023), for instance, proposed a multimodal deep learning framework called MERLIN, which integrates transformer-based language models, visual models, and graph neural networks. This model uses NFT images and text descriptions to predict selling prices, achieving significant performance improvements over baseline classifiers. These studies highlight the diverse methods being applied to NFT price prediction, from simple regression models to complex neural networks.

3. Methodology

Data collection

We collected data about NFT art collections with the highest trading volume from January 1, 2022 to May 31, 2023. This period covers the time when the NFT market was still growing strongly in many fields such as music, images, and art. Although the NFT market in general displayed a downward trend in trading volumes, the beginning of 2023 recorded a significant recovery of NFTs compared to the second half of 2022. For this study, we collected transactional data from five popular NFT collections with more than $50 million in trading volume: Rumble Kong, Creature World, HashMasks, Galaxy Egg, Galaxy Eggs, and Killer GF. Data was collected through APIs provided by cryptocurrency applications Moralis.io and cryptoslam.io. All Ethereum-based transactions of each collection were collected from Moralis.io and were aggregated to obtain the daily number of transactions and trading volume. Daily sales information of the collection such as sales, number of transactions, unique buyers, unique sellers, total owners, and active owners were collected from Crypto Slam. Data collection and analysis were all performed using the programming language Python.

In machine learning, the dependent variables are called features and the independent variable is the target variable. Table 1 shows the data collected from the sources along with their description. Using the following features, we will show that ML models can accurately predict pricing trend (target variable) effectively by using a combination of market activity indicators, participant metrics, and sales trends. The features above will first be trimmed down to minimize collinearity and then the remaining features will serve as input.

Table 1. Data features

Variables	Data	Source
Sales	Sum of selling price of the tokens in a collection in one day in USD	Crypto Slam
Sale Difference	Calculated by taking the difference of the sales of a day and the previous day	Crypto Slam
Average Sales	The average selling price of the collection in one day in USD	Crypto Slam
Transfers	The number of token transfers performed in a day	Crypto Slam
Unique sellers	Total number of unique sellers	Crypto Slam
Unique buyers	Total number of unique buyers	Crypto Slam
Active owners	Total number of unique active owners	Crypto Slam
Total owners	Total number of owners in a collection per day	Crypto Slam

Sales: This gives the daily revenue generated by the NFT collection through its transactions. Large values of sales mean that a collection is generating actual trades.

Sale Difference: This feature captures the daily change in sales, which can highlight trends and

volatility in the market. It helps in understanding the momentum and directional movement of sales. For classification ML methods, the sign of this (positive/ negative) will serve as the target variable.

Average Sales: This feature captures the average price of NFTs transactions in a day, expressed in USD. By analyzing the average sale price, we can gain insights into the perceived value of the NFTs and the willingness of buyers to spend. Small values indicate that individual tokens are not sold at high prices, while large values indicate the presence of rare and valuable tokens (Khati, 2022).

Transfers: This gives the total number of transfers that are not sales, i.e. ownership of a token is passed on from one wallet to another wallet for zero-value.

Unique sellers: The number of unique sellers indicates the supply side of the market. A high number of unique sellers suggests a healthy market. Tracking the number of unique sellers can provide insights into market competition and the availability of NFTs for sale.

Unique buyers: The number of unique buyers reflects the demand side of the market. More unique buyers can indicate higher interest and demand for the NFTs, potentially driving up prices.

Active owners: This feature represents the total number of unique owners who are actively trading or engaging with the NFTs in a particular period of time (in this report, per day). Tracking the number of active owners can provide insights into community participation and the potential for sustained market activity. A high number of unique active owners suggests a vibrant and engaged community.

Total owners: This feature represents the total number of unique owners in a collection per day. A large number of owners can imply a well-distributed and popular collection. Understanding the daily total number of owners helps in assessing the market reach and adoption of the NFTs.

Machine learning algorithms for price trend prediction

One type of machine learning algorithms are supervised classification problems. Here we classify whether there is an increase or decrease in the daily total sales. Such predictions can help an investor examine the activity and profitability of a collection and ultimately affect his or her decision in acquiring a token from that collection.

For this study, we chose to evaluate the efficacy of four select classification methods: logistic regression, Support Vector Method (SVM), XGBoost, and Convolutional Neural Network (CNN). These methods are widely known and among the commonly used classification ML methods (Bruce *et al*., 2020; Géron, 2017). While more complex algorithms exist, we decided to keep the data and its methods reachable to a wider audience. Nevertheless, we demonstrate that such algorithms can still provide insights with acceptable accuracy. Python was used to perform all machine learning algorithms, together with the standard packages like statsmodels, scikit-learn, and tensorflow.

4. Results and Discussion

Descriptive Analysis and data preprocessing

We first preprocessed all transactional-level data and the daily collection data: null values, particularly on days without transactions are assigned the value to 0; duplicates were removed and the data is properly formatted. After cleaning, transactional data is aggregated into daily data and joined with the rest of the features. Sample descriptive statistics for the collection Rumble Kong are reported in Table 2.

Table 2. Summary Statistics

	Number of transactions	Sum of value	Sales (USD)	Avg Sale (USD)	Number of unique sellers	Number of unique buyers	Number of active owners	Number of total owners	Number of transfers
Count	514	514	514	514	514	514	514	514	514
Mean	485.5972	2.39	20354.6326	2125.5764	5.6245	5.4785	5.5797	3429.2645	16.5856
Median	298.5	7.31	4236.455	791	4	4	5	3438.5	11
Std	903.8894	9.43	43307.7948	3077.0377	4.8442	4.5666	4.4858	55.5031	20.1620

Data was split into training and testing sets using an 80-20 split. To ensure that the features are on a comparable scale, data were normalized using the norms calculated from the training set. Since some variables are highly correlated to each other, we trimmed down our features by performing a stepwise least squares regression analysis using one model collection Rumble Kong (see Table 3 for the results of the final regression while pairwise correlations between the remaining variables are reported in Figure 1). Features with p-values that are not significant are removed one-by-one until all remaining features are significant. In the end, only the following features are taken as independent variables: transfers, unique buyers, active owners, and total owners, with sales being predicted by the equastion:

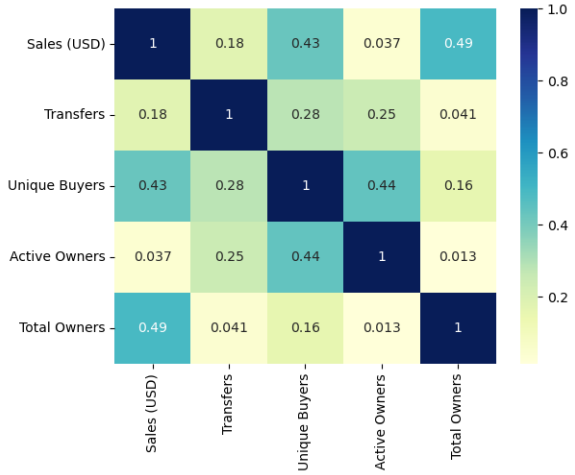
$$\hat{y} = 21970 + 7227 \times Transfers + 25750 \times Unique\ Buyers - 13390\ Active\ Owners - 22840\ Total\ Owners$$

With an adjusted R-squared is 0.763. Surprisingly, the number of owners has a negative impact on sales, whereas the number of buyers and token transfers positively contribute to the predicted total sales. The model is significant for all remaining variables and each of their variance inflation factors remain below 5. Moreover, the Durbin-Watson statistic is 1.999, indicating low autocorrelation.

Table 3. Results of the final stepwise least squares regression

R-squared	0.765	Adj. R-squared	0.763
F-statistic	330.4	Prob (F-statistic)	3.32
	Coef	t	p-value
Constant	21970	19.810	0.000
Transfers	7227.2316	5.463	0.000
Unique Buyers	25750	15.915	0.000
Active Owners	-13390	-9.217	0.000
Total Owners	-22840	-17.955	0.000

Figure 1. The coefficient of determination of the variables taken pairwise



Further regression tests on the resulting variables confirm that the calculated R-squared using alternative machine learning regression methods, such as the Random Forest Regression and XGBoost Regression. The Random Forest regression algorithm constructs an ensemble of decision trees, where each tree predicts the target variable (Sales) based on the features of the data points; in our implementation, 100 trees were initialized to strike a balance between model complexity and computational efficiency. Meanwhile, the XGBoost regression utilizes the XGBoost algorithm. Here, we initialized with objective loss function 'squarederror' and a fixed random state (=42) for reproducibility. The resulting R-squared are 0.6500 for Random Forest Regression and 0.6266 for XGBoost Regression. While these are notably lower than OLS regression, these values nevertheless demonstrate moderate predictive capabilities.

Machine learning techniques used and preprocessing required

We will predict the pricing trend, i.e. whether there will be an increase or decrease in sales, using the following ML methods: logistic regression, support vector machine, XGBoost, and convolutional neural network (CNN). We will first demonstrate the results in detail for one of the collections RumbleKong; similar performance statistics were observed in other collections.

Using Sale Difference, which represents the day-to-day difference in Sales (USD), a binary target variable, Sale_Direction, was generated depending on the sign of Sale_Diff. The data shows roughly equivalent numbers of price increases (53 instances of positive sale difference) and price decreases (50 instances of negative sale difference).

(1) Price trend prediction for a collection: Rumble Kong

Logistic regression

In logistic regression, the target classification is determined based on the probability arising from the logistic regression model. This regression model can predict the correct price trends 59.22% of the time, with more false positives predicting a price decrease when there is an actual increase (lower precision of 0.59), and an unimpressive predictive power for price decreases (recall of 0.5). The confusion matrix is reported in Table 4, together with other key model performance statistics in Table 5. The f1-score is moderately good.

Table 4. Confusion matrix for logistic regression

	Positive	Negative
Positive	36	17
Negative	25	25

Table 5. Classification report for logistic regression

	Precision	Recall	F1-score	Support
Negative	0.59	0.68	0.63	53
Positive	0.60	0.50	0.54	50
Accuracy			0.59	103
Macro average	0.59	0.59	0.59	103
Weighted average	0.59	0.59	0.59	103

Support Vector Machine (SVM)

We employed Support Vector Machine (SVM), a versatile machine learning model effective for high-dimensional classification tasks. It utilizes ensemble

learning and offers a more efficient alternative to random forest algorithm thanks to an iterative boosting technique. This method sequentially fits multiple decision trees, each subsequent tree correcting errors made by its predecessors. This iterative process helps mitigate both bias and variance, thereby improving prediction accuracy. The XGBoost classifier was initialized with binary objective function using logistic methods. Initialized with a linear kernel, SVM seeks to find an optimal hyperplane that separates data points into two classes: an increase in sales (Positive) and a decrease in sales (Negative). This method results in a slightly better accuracy of 61.17% and a comparable f1-score of 61%.

Table 6. Confusion matrix for SVM

	Positive	Negative
Positive	37	16
Negative	24	26

Table 7. Classification report for SVM

	Precision	Recall	F1-score	Support
Negative	0.61	0.70	0.65	53
Positive	0.62	0.52	0.57	50
Accuracy			0.61	103
Macro average	0.61	0.61	0.61	103
Weighted average	0.61	0.61	0.61	103

XGBoost

Using the XGBoost classifier (in contrast to XGBoost regression discussed above), we obtain a more impressive accuracy of approximately 75.73%, with 39 true positives and 39 true negatives.

Table 8. Confusion matrix for XGBoost

	Positive	Negative
Positive	39	14
Negative	11	39

Table 9. Classification report for XGBoost

	Precision	Recall	F1-score	Support
Negative	0.78	0.74	0.76	53
Positive	0.84	0.78	0.76	50
Accuracy			0.76	103
Macro average	0.76	0.76	0.76	103
Weighted average	0.76	0.76	0.76	103

Convolutional Neural Network (CNN)

Neural networks, in general, has been used extensively for their versatility in artificial intelligence tasks. We explored the efficacy of CNN architectures for predicting NFT sales based on selected features. Four distinct neural network architectures were evaluated to obtain an appropriate network: a single hidden layer with 5 nodes, a single hidden layer with 10 nodes, two hidden layers with 5 nodes each, and two hidden layers with 10 and 5 nodes respectively. These architectures were selected to investigate the impact of network depth and node size on model performance. Each model underwent training for 50 epochs using a batch size of 32. The target variable was transformed into a binary classification problem by comparing each value to the mean of the training set. Each architecture was trained and evaluated on the test set to measure its accuracy. The results from these evaluations are as follows (see Table 10).

Table 10. Results using neural networks

Architecture	Accuracy(%)
[5]	0.9805
[10]	0.9805
[5,5]	0.9417
[10,5]	0.9805

Three architectures provided impressive accuracy of 98.05% accuracy, although the simplest one with a single hidden layer with 5 nodes will arguably suffice. This finding suggests that while a deeper network structure with moderate node sizes can effectively capture the complex relationships within the data, predicting NFT sales trends can be done using a simpler neural network. Most notably, however, we note that CNN outperforms the other classification methods above. We remark that decreasing the epoch size (e.g. 15) and batch size (e.g. 10) keeps accuracy above 95.15%, although more complex architectures may perform better. A low epoch size may decrease the accuracy of the single layer with 5 nodes to approximately 80%.

(2) Generalization

To ensure the performance of our methods is not dependent on the characteristics of a single collection, we have performed the study on some other performing collections. The R-squared values using various regression models show moderate correlation between the total sales and the selected features, with values ranging mostly from 0.5 to 0.79 (Table 11). This shows that the features have potential to predict the price. Despite the use of limited data, these features were used to predict price trends with accuracies better than random guesses (above 50%). Among those observed, the accuracy of logistic regression is lowest, ranging from 0.55 to 0.61. This is followed by SVM, with a range of 0.59 to 0.64, although logistic regression may outperform SVM in some collections (HashMask). XGBoost displays an admirable accuracy above

0.70, even reaching 0.90 for HashMask. Lastly, neural networks hold most promise given accuracies exceeding 90% for all collections. Not surprisingly, many researchers have been utilizing adapted forms of neural network to predict NFT prices (Jain *et al.*, 2022; Costa *et al.,* 2023). This underscores the neural networks' capacity to discern subtle patterns and in NFT market data, crucial for making informed investment decisions.

Table 11. Summary of results of ML algorithms. The top 3 rows provide the regression results (particularly R-squared or R2) as part of the descriptive analysis, while the bottom 4 rows provide the accuracy of predicting price trends

ML Method	Rumble Kong	Creature World	HashMask	Galaxy Egg	KillerGF
OLS	R2 = 0.765	R2 = 0.73	R2 = 0.486	R2 = 0.77	R2 = 0.71
Random Forest Regression	R2 = 0.65	R2 = 0.69	R2 = 0.52	R2 = 0.64	R2 = 0.58
XGBoost Regression	R2 = 0.63	R2 = 0.79	R2 = 0.73	R2 = 0.65	R2 = 0.72
Logistic Regression	accuracy = 0.59	accuracy = 0.55	accuracy = 0.61	accuracy = 0.58	accuracy = 0.55
SVM	accuracy = 0.61	accuracy = 0.62	accuracy = 0.59	accuracy = 0.61	accuracy = 0.64
XGBoost	accuracy = 0.75	accuracy = 0.72	accuracy = 0.90	accuracy = 0.77	accuracy = 0.70
Neural Network (50 epochs, batch size=32)	accuracy = 0.91 Single hidden layer with 5 nodes	accuracy = 0.95 Single hidden layer with 10 nodes	accuracy = 0.90 Single hidden layer with 5 nodes	accuracy = 0.92 Single hidden layer with 10 nodes,	accuracy = 0.92 Single hidden layer with 5 nodes

Conclusion

This study evaluated the potential of using supervised machine learning (ML) algorithms for predicting NFT price trends, focusing on the use of data easily accessible to the less experienced traders. The results show that the fundamental classification methods can be used to predict price trends with reasonable accuracy. While most algorithms provide 60-75% accuracy, neural networks demonstrated superior performance in the task of predicting whether the data price of an NFT collection will increase or decrease, achieving accuracy higher than 90%. Some regression models also showed moderate capability to predict the total sales.

Our work focused on utilizing basic transactional data and market activity to predict a collection's price trend. Alternative and usually more complex pricing models and algorithms exist. Together with these our findings underscore the necessity of accounting for NFT collection attributes, market activity, among others, when forecasting NFT price trends. Factors such as user engagement metrics and market dynamics can significantly influence model performance. Therefore, adopting a nuanced approach that considers these factors is essential for developing robust predictive models in the volatile and rapidly evolving NFT market landscape. This work also emphasizes the value of AI-driven research to support investment decisions in the NFT market by providing insights, e.g. in price trends. It is important to note that model performance can be affected by many factors, including data quality, as well as hyperparameter configuration. Our work only demonstrated it for five top collections, and the study can easily be expanded to more collections, and even more features if desired. Likewise, more innovative approaches such as automated machine learning can be used to further enhance the accuracy and thrilling ability of price projection models for NFTs (Alon *et al*., 2023).

References:

Alon, I., Bretas, V. P. G., and Katrih, V. (2023). Predictors of NFT Prices: An Automated Machine Learning Approach. Journal of Global Information Management 31(1). https://doi.org/10.4018/JGIM.317097

Alon, I., Bretas, V. P. G., Sclip, A., & Paltrinieri, A. (2022). Greenfield FDI attractiveness index: A machine learning approach. Competitiveness Review, 32(7), 85–108. https://doi.org/10.1108/CR-12-2021-0171

Brown, D. (2023). Decoding NFTs: Exploring the Intersection of Art, Technology, and Digital Ownership. Accessed from: https://b2bdaily.com/fintech/decoding-nfts-exploring-the-intersection-of-art-technology-and-digital-ownership/. Accessed on 22 July 2024.

Bruce P., Bruce A., and Gedeck P. (2020) Practical Statistics for Data Scientists. O'Reilly Media Inc.

Bsteh, S. (2021). From Painting to Pixel: Understanding NFT artworks. Accessed from https://www.researchgate.net/publication/351346278_From_Painting_to_Pixel_Understanding_NFT_artworks. Accessed on 22 July 2024.

Conti, R. What Is An NFT? Non-Fungible Tokens Explained (2024). Forbes. Accessed from https://www.forbes.com/advisor/investing/cryptocurrency/nft-non-fungible-token. Accessed on 22 July 2024.

Costa, D., La Cava, L., and Tagarelli, A. (2023). Show me your NFT and I tell you how it will perform: Multimodal representation learning for NFT selling price prediction. In Proceedings of the ACM Web Conference 2023 (WWW '23). Association for Computing Machinery, New York, NY, USA, 1875–1885. https://doi.org/10.1145/3543507.3583520

Géron, A. (2017). Hands-On Machine Learning with Scikit-Learn and Tensorflow. O'Reilly Media Inc.

Gumelar, A., Pudjiantoro, T., & Sabrina, P. (2022). NFT Coin Price Prediction (Non-Fungible Token) Using K-Nearest Neighbors Method. In 3rd Asia Pacific International Conference on Industrial Engineering and Operations Management.

Hoffelt, C. (2023). The Value Of Art In The Shape Of NFTs: One Step Closer To Perfect Provenance, market transparency, and access to profit. Jurimetrics 63, 355-84. https://www.americanbar.org/content/dam/aba/publications/Jurimetrics/summer-2023/the-value-of-art-in-the-shape-of-nfts-one-step-closer-to-perfect-provenance-market-transparency-and-access-to-profit.pdf

Horky, F., Rachel, C., and Fidrmuc, J. (2022). Price determinants of non-fungible tokens in the digital art market. Finance Research Letters 48, 103007. https://doi.org/10.1016/j.frl.2022.103007

Jain, S., Bruckmann, C., and McDougall, C. (2022). NFT Appraisal Prediction: Utilizing Search Trends, Public Market Data, Linear Regression and Recurrent Neural Networks. https://doi.org/10.48550/arXiv.2204.12932

Khati, P. (2022). Measurement, Analysis, and Insight of NFTs Transaction Networks. https://doi.org/10.48550/arXiv.2211.15600

Kong, D.-R. and Lin, T.-C. (2021). Alternative Investments in the Fintech Era: The Risk and Return of Non-fungible Token (NFT). http://dx.doi.org/10.2139/ssrn.3914085

Luo J., Jia Y., Liu X. (2023). Understanding NFT Price Moves through Tweets Keywords Analysis. In GoodIT '23: Proceedings of the 2023 ACM Conference on Information Technology for Social Good, 410-418. https://doi.org/10.1145/3582515.3609562

Mekacher, A., Bracci, A., Nadini, M. et al. (2022). Heterogeneous rarity patterns drive price dynamics in NFT collections. Scientific Reports 12, 13890. https://doi.org/10.1038/s41598-022-17922-5

Nadini, M., Alessandretti, L., Di Giacinto, F. et al. (2021). Mapping the NFT revolution: market trends, trade networks, and visual features. Scientific Reports 11, 20902 https://doi.org/10.1038/s41598-021-00053-8

Nansen (2022). NFT Price Estimates Machine Learning Model. Accessed from: https://www.nansen.ai/research/nft-price-estimates-machine-learning-model. Accessed on 02 August 2024.

Schaar, L., & Kampakis, S. (2022). Non-Fungible Tokens as an Alternative Investment: Evidence from CryptoPunks. The Journal of The British Blockchain Association, 31949(1), 1–12. https://doi.org/10.31585/jbba-5-1-(2)2022

Wang, Z., Chen, Q., Lee, S. (2023). Prediction of NFT sale price fluctuations on opensea using machine learning approaches. Computers, Materials & Continua, 75(2), 2443-2459. https://doi.org/10.32604/cmc.2023.037553

Zheng, X. (2022). Multimodal Learning for Improved NFT Price Prediction, in 2022 IEEE International Conference on e-Business Engineering (ICEBE), Bournemouth, United Kingdom, 2022 pp. 74-79. https://doi.org/10.1109/ICEBE55470.2022.00022

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INTERNAL AND EXTERNAL FACTORS AFFECTING THE PROFITABILITY OF COMMERICAL BANKS IN AN EMERGING ECONOMY

PhD. Pham Xuan Kien* - Prof.PhD. Nguyen Van Cong**

Abstract: ***This study investigates the internal and external factors affecting the profitability of listed joint-stock commercial banks in Vietnam. The study uses Stata 15 to run multivariate regression models - including robust regression. Asset management positively affects all three profitability measures (ROA, ROE and NIM); bank size and inflation rate positively impact ROA and ROE. Still, bank size has a negative relationship with NIM, and the inflation rate hurts NIM but is insignificant. Other factors such as liquidity, capital adequacy, bank longevity, revenue growth, cost-effectiveness, deposit-to-asset ratio, and market strength all impact profitability but are different in trend and influence. The results also show that the GDP growth rate affects profitability but not significantly.***

• Keywords: *commercial bank; liquidity; profitability; return on assets; return on equity.*

JEL codes: C33, E44, G21, G28

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1. Introduction

Commercial banks play a vital role in the economic development of each country (Bucevska & Hadzi Misheva, 2017; Demirgüç-Kunt & Huizinga, 1999). As part of a financial system, a banking system provides financial intermediation and boosts the economy by converting deposits into efficient investments (Demirgüç-Kunt & Huizinga, 1999; Salike & Ao, 2018; Sufian & Habibullah, 2009).

Profitability has always been a topic of interest to many managers and researchers (Căpraru & Ihnatov, 2014, 2015; Dietrich & Wanzenried, 2014; T. N. L. Nguyen & Nguyen, 2020; Petria et al., 2015). Most emphasize the importance of profitability because it determines the survival and growth of the business in the operation process.

Studies on factors affecting the profitability of commercial banks are often divided into two categories. The first is to examine the influence of internal bank factors on profitability. Among these studies, some studies focus on exploring the role of loan-to-deposit ratio and fee income on bank profitability (Azad et al., 2019); or focus on comparing the profitability determinants of Islamic banks and conventional banks (T. Alzoubi, 2018); or factors affecting bank profitability over time (Ali & Puah, 2019; AL-Omar & AL-Mutairi, 2008; Schiniotakis, 2012; Sufian & Habibullah, 2009). Factors affecting profitability are often mentioned in these studies, such as bank size (Ali & Puah, 2019; AL-Omar & AL-Mutairi, 2008; T. Alzoubi, 2018; Menicucci & Paolucci, 2016; Sufian & Habibullah, 2009); assets (AL-Omar & AL-Mutairi, 2008; E. S. S. Alzoubi, 2018; Bougatef, 2017); liquidity (Ali & Puah, 2019; Bougatef, 2017; Sufian & Habibullah, 2009).

The second category in these studies is to examine the influence of internal and external factors on bank profitability. Some of the studies in this category focus on exploring the factors affecting the profitability of international banks or selected banks of a bloc, a region, or a continent (Adelopo et al., 2018; Bucevska & Hadzi Misheva, 2017; Căpraru & Ihnatov, 2014; Demirgüç-Kunt & Huizinga, 1999; T. D. Q. Le & Ngo, 2020; Martins et al., 2019. The remaining studies focus on the factors affecting the profitability of a country's commercial banking system (Al-Homaidi et al., 2018, 2020; Ariyadasa et al., 2017; Batten & Vo, 2019; Bolarinwa et al., 2019).

Vietnam is a developing country with an imperfect financial market and small size, banks must find appropriate measures to close the gap between savers and borrowers and ensure the safety of the currency and their mobilization and investment. Besides mobilizing and lending activities, banks also play the role of financial intermediaries, contributing to economic development through practical deposit investment activities. However the profitability of this field has not yet met the expectations. Currently, studies on the factors affecting profitability of banks in Vietnam are still relatively scarce, for example (Batten & Vo,

** School of Accounting and Auditing, National Economics University, Hanoi*

*** Industrial University of Ho Chi Minh City*

2019; Dao & Nguyen, 2020; Phan et al., 2020; Vu & Nahm, 2013). Therefore, our research not only aims to consider and measure the impact of factors affecting the profitability of Vietnamese commercial banks but also to contribute to the existing literature by providing new empirical evidence on the factors affecting bank profitability in an emerging economy.

2. Literature review

Many ratios measure profitability, but ROA and ROE are the most common. This can be found in many studies (Al-Homaidi et al., 2020; AL-Omar & AL-Mutairi, 2008; Bagh et al., 2017; Bolarinwa et al., 2019; Căpraru & Ihnatov, 2014; Dietrich & Wanzenried, 2014; Goddard et al., 2004; Kosmidou, 2008; Petria et al., 2015; Sufian & Habibullah, 2009). ROA measures a bank's ability to generate a return on assets, while ROE measures return for shareholders. In addition to ROA and ROE, some studies also use NIM to measure bank profitability (Adelopo et al., 2018; Al-Homaidi et al., 2018; Căpraru & Ihnatov, 2015; Derbali, 2021; Gupta & Mahakud, 2020b; Horobet et al., 2021; Martins et al., 2019; Saleh & Abu Afifa, 2020). NIM represents a bank's ability to generate income from its assets.

Research by Demirgüç-Kunt & Huizinga (1999) shows that bank characteristics, macroeconomic indicators, implicit and explicit financial taxes, deposit insurance, overall financial structure, and regulatory and institutional environment significantly affect bank interest rates and profitability.

Bolarinwa et al. (2019) confirm that the bank's profitability is mainly affected by cost efficiency, bank size, credit risk, deposit growth, real GDP and equity to total assets ratio. Efficient and cost-effective utilization of a larger bank size and a more remarkable ability to attract deposits are the driving factors for increased profitability. Conversely, higher credit risk reduces bank profitability. The research results also show that the macroeconomic performance indicators of inflation and economic growth are strong determinants of the profitability of banks in Nigeria.

The study by Salike & Ao (2018) confirmed that poor asset quality significantly negatively impacts banks' profitability. Other factors such as capital adequacy, liquidity ratio, income diversification, and real GDP growth rate are essential determinants that positively affect profitability. On the contrary, inefficiency and macroeconomic factors (growth rate of CPI, interest spread) negatively affect banks' profitability.

Bucevska & Hadzi Misheva (2017) concluded that cost efficiency and NIM are the most critical factors in explaining bank profitability. Furthermore, only size has a negligible effect on bank profitability among bank-specific control variables. The results also show that neither inflation nor economic growth affects bank profitability.

A study by Adelopo et al. (2018) revealed that the financial crisis did not affect the relationship between some bank-specific determinants and bank profitability. In particular, a significant relationship exists between bank-specific determinants and ROA before, during, and after the financial crisis. However, the relationships between industry-level determinants and macroeconomics are sensitive to both periods of analysis and the ROA or NIM.

3. Methodology

3.1. Data

The data used in this study consists of panel data collected over nine years (2013 - 2021) from the financial statements of 30 commercial banks in Vietnam. As of December 31, 2021, there are 31 commercial banks in Vietnam (Y. N. Le, 2022); in which there are 30 banks listed on Vietnam Stock Exchanges (HOSE, HNX, UPCOM, OTC) and 01 bank has been delisted since 2014 (Dong A Bank).

3.2. Research models

This paper uses dependent variables - ROA, ROE and NIM - as proxies for profitability and 12 independent variables. They are descirbed in Table 1.

Table 1. Summary of variables in the models

Variable	Formula	Expected Sign
Dependent variable		
1. ROA	Net Income/Average Total Assets	
2. ROE	Net Income/Average Total Equity	
3. NIM	Net Interest Income /Average Total Assets	
Independent variable		
4. LDR	Total Loans Securities/ Total Deposits Marketable	+
5. CAR	Total Equity/ Total Assets	+
6. SIZ	Natural logarithm of Total Assets	+
7. AGE	Number of established years	+/-
8. SGR	[Net Sales$_t$ - Net Sales$_{(t-1)}$]/ Net Sales$_{(t-1)}$	+
9. LOAR	Total Loans/Total Assets	+
10. AM	Operating Income//Total Assets	+
11. CIR	Operating Expenses//Total Income	-
12. DAR	Total Deposits/ Total Assets	-
13. MP	Each bank' assets/Assets of all banks	+/-
14. GDP	Annual real GDP growth rate	+
15. INF	Annual inflation rate	-

Source: Summarized by authors

The following regression models are proposed:

Model 1: $ROA = \beta_0 + \beta_1 LDR + \beta_2 CAR + \beta_3 SIZ + \beta_4 AGE + \beta_5 SGR + \beta_6 LOAR + \beta_7 AM + \beta_8 CIR + \beta_9 DAR + \beta_{10} MP + \beta_{11} GDP + \beta_{12} INF + \varepsilon$

Model 2: $ROE = \beta_0 + \beta_1 LDR + \beta_2 CAR + \beta_3 SIZ + \beta_4 AGE + \beta_5 SGR + \beta_6 LOAR + \beta_7 AM + \beta_8 CIR + \beta_9 DAR + \beta_{10} MP + \beta_{11} GDP + \beta_{12} INF + \varepsilon$

Model 3: $NIM = \beta_0 + \beta_1 LDR + \beta_2 CAR + \beta_3 SIZ + \beta_4 AGE + \beta_5 SGR + \beta_6 LOAR + \beta_7 AM + \beta_8 CIR + \beta_9 DAR + \beta_{10} MP + \beta_{11} GDP + \beta_{12} INF + \varepsilon$

Where:

β_0, β_1, β_2, …, β_{12}: are correlation coefficients;
ε: is an error.

4. Results

4.1. Descriptive statistics

Table 2 reflects descriptive statistics results of all 15 variables.

Table 2. Descriptive statistics

Variable	Mean	Std. Dev	Min	Max
ROA	.0071051	.0063382	-.0038244	.0323799
ROE	.0855105	.0118334	-.0459247	.2638763
NIM	.0242203	.0118334	-.0048254	.08131
LDR	.6968064	.242991	.2588804	3.878087
CAR	.085342	.0328574	.0262139	.2383814
SIZ	18.72546	1.082395	16.50232	21.28954
AGE	2.975895	.5055763	0	3.555348
SGR	.2080761	.2994795	-.3969362	2.829605
LOAR	.571097	.1105287	.2200516	.7880604
AM	0314296	.0143907	.0039216	.0963815
CIR	.5580933	.1555527	.2419544	1.085061
DAR	.8353827	.069244	.1888263	.9864284
MP	.0333333	.0398892	.002072	.1644869
GDP	.0563222	.0162691	.0258	.0708
INF	.0320889	.0154768	.0063	.0659

Source: Result from Stata 15

The results show that the mean and maximum value of ROE is much higher than ROA and NIM. This can be easily explained by a peculiarity of the banking field, which is a moderate amount of equity capital.

4.2. Results

The mean value of VIF is 3.04 which concludes that there is no multicollinearity between the independent variables.

Then the study used Fixed Effects Model (FEM) and Random Effects Model (REM)and Hausman test is applied to compare them. The results show that, in Model 1 (ROA) and Model 2 (ROE), FEM is selected because their P-values are 0.17% and 0.45%, respectively, while REM was chosen for Model 3 (NIM) because its P-value is 15.52%.

Continue to test autocorrelation by Wooldridge test for 3 models and variance with Modified Ward (for ROA and ROE) and Breusch and Pagan Lagrangian multiplier (for NIM). The results show that these models have autocorrelation (Model 1 and 2 have Prob > F = 0.0000, Model 3 has Prob > F = 0.0002; i.e. all Prob > F < 5%) and variable variance (3 models have Prob>chi2 = 0.0000 <5%).

To correct defects of Heteroskedasticity and Autocorrelation, we applied the command of Robust. Table 3 shows the heteroskedasticity and autocorrelation issues have been resolved. Besides, the overall R-squared index of models is relatively high which proves that they are pretty strong and have a high level of model interpretation within each group, between groups, and the data as a whole.

Table 3. The Robust regression result of ROA, ROE and NIM

Variables	ROA		ROE		NIM	
	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|
LDR	-.0027806	0.107	-.0338544*	0.081	.0030931*	0.054
CAR	.0514177*	0.091	-.4311841*	0.053	-.0119592	0.561
SIZ	.0052258***	0.005	.0165644***	0.009	-.0025583***	0.009
AGE	-.0020782	0.169	.0163016**	0.019	-.0015432	0.256
SGR	-.00022	0.735	.0074642	0.937	-.0026321***	0.007
LOAR	-.0004193	0.932	.0673903	0.425	.0025219	0.462
AM	.2411066***	0.000	.7717315***	0.005	.8054739***	0.000
CIR	-.0067754**	0.020	.0405608**	0.018	-.0023526	0.463
DAR	-.0079687	0.326	.087785	0.221	.0118903*	0.100
MP	-.034289	0.525	.5923917	0.488	.0506321***	0.007
GDP	.0044362	0.783	.1533694	0.864	.0099147	0.481
INF	.0249738***	0.004	.1063995***	0.008	-.0168021	0.325
_cons	-.0837792**	0.032	.3550548	0.132	.0393502**	0.030
R-sq:						
- within	0.7378		0.6433		0.7892	
- between	0.7236		0.6827		0.9527	
- overall	0.7080		0.6543		0.9082	
Prob > F	0.0000		0.0000		0.0000	
Corr(u_i, Xb)	- 0.4971		-0.3927		0	
Obs.	270		270		270	
sigma_u	.0031453		.0336057		.00203836	
sigma_e	.00230469		.02759154		.00299495	
Rho	.6506564		.59733493		.31657321	

*Note(s): ***, ** and * significant in less than 1% (p < 0.01), 5% (p < 0.05) and 10% (p ≤ 0.10) level respectively*

Source: Result from Stata 15

Based on the results of Table 3, we have the following models:

ROA = - 0.08378 - 0.00278LDR + 0.05142CAR + 0.00523SIZ - 0.00208AGE - 0.00022SGR - 0.00042LOAR + 0.24111AM - 0.00678CIR - 0.00797DAR - 0.03429MP + 0.00444GDP + 0.02497INF

ROE = 0.35505 - 0.03385LDR - 0.43118CAR + 0.01656SIZ + 0.01630AGE + 0.00746SGR + 0.06739LOAR + 0.77173AM + 0.04056CIR + 0.08779DAR + 0.59239MP + 0.15337GDP + 0.10640INF

NIM = 0.03935 + 0.00309LDR - 0.01196CAR - 0.00256SIZ - 0.00154AGE - 0.00263SGR + 0.00252LOAR + 0.80547AM - 0.00235CIR + 0.01189DAR + 0.05063MP + 0.00991GDP - 0.01680INF.

Model 1 shows a negative and significant relationship between CIR and ROA which implies that the higher CIR, the lower the ROA. Meanwhile, in Model 2, CIR has a positive relationship with ROE which means that the bank's capital structure has changed significantly, the proportion of owners' equity decreased, and the ratio of liabilities increased. Therefore, when this determinant increase, ROE will increase, but ROA will decrease.

Model 2 reveals a positive relationship between AGE with ROE. This result expresses that the early established banks have more experience using, managing assets and managing expenses than the newly established banks.

For the AM factor, there is a positive and significant relationship between AM and profitability. This finding proves that the better the asset management, the higher the

profitability of commercial banks. This finding is consistent with the study of Al-Homaidi et al. (2018, 2020), Masood & Ashraf (2015), Menicucci & Paolucci (2016).

Variable of SIZ positively and significantly affects profitability excluding NIM. It means that bigger banks harvest higher profitability than smaller ones. This conclusion is the same with many scholars, such as Adusei (2015), Al-Homaidi et al. (2018, 2020), Bekhet et al. (2020), Bolarinwa et al. (2019), Derbali (2021), Kosmidou (2008), Mebounou et al. (2015), Staikouras & Wood (2011), Sufian (2009), Vu & Nahm (2013). However, this result contrasts with studies by Căpraru & Ihnatov (2014), Dao & Nguyen (2020), Dietrich & Wanzenried (2014), Farooq et al. (2021), Gupta & Mahakud (2020b), Pasiouras & Kosmidou (2007), Sufian & Chong (2008). However, in Model 3, this determinant hurts NIM; the inflation rate is negatively related to NIM but not statistically significant.

Unlike the ROA and ROE models above, INF has a negative and insignificant effect on NIM. This result shows that when the inflation rate increases, the customer's loan demand rises to meet consumer demand. The bank can increase loan sales and earn profits from its operations. This action increases the bank's ROA and ROE.

In Model 3, MP variable has an impact positive to NIM. This result suggests that a strong bank can have many advantages over competitors, including negotiating higher interest rates with borrowers or attracting customers to save with lower interest rates. As a result, a bank's strength can lead to higher NIM, increasing the bank's net profit and improving business performance.

The SGR has no significant impact on ROA and ROE but hurts NIM. This result contrasts the studies of (Coccorese & Girardone, 2021; Phan et al., 2020; Sufian & Habibullah, 2009). This is understood because ROA and ROE measure the profitability of assets and equity, while the growth rate of a bank's operating revenue only measures revenue growth. The revenue growth rate of a commercial bank has an inverse relationship with NIM, possibly because the bank decides to reduce lending rates or increase deposit rates to retain customers or attract new customers. As a result, the revenue growth rate increased, but NIM decreased.

Regression results show that LDR hurts ROA and ROE, while its effect on NIM is positive. The impact of LDR on ROA was not statistically significant. This result is roughly consistent with a study by Derbali (2021). In contrast, Farooq et al. (2021) find found a negative effect on ROA, but its impact on ROE and NIM was statistically insignificant. Mebounou et al. (2015) confirm a positive and non-significant relationship between LDR and ROA, and ROE. However, Bourke (1989), Kosmidou (2008), Phan et al. (2020), Vu & Nahm (2013) conclude that LDR significantly positively affects profitability.

CAR factor shows a positive influence and statistical significance on ROA. This is suitable with most studies up to now, such as Adelopo et al. (2018), Adusei (2015), Bekhet et al. (2020), Bucevska & Hadzi Misheva (2017), Căpraru & Ihnatov (2015), Demirgüç-Kunt & Huizinga (1999), Derbali (2021), Dietrich & Wanzenried (2014), Farooq et al. (2021), Gupta & Mahakud (2020b), Kosmidou (2008). Besides, others found an insignificant positive impact of CAR on profitability (Al-Homaidi et al., 2018; Phan et al., 2020; Rahman et al., 2020). Other authors like Al-Homaidi et al. (2020), Dao & Nguyen (2020), Vu & Nahm (2013) discovered the contrast. Meanwhile, Table 3 reveals a negative effect but insignificant CAR statistic on ROE. This result is nearly in line with studies by Al-Homaidi et al., (2020), Dietrich & Wanzenried (2014), Sufian (2009). However, papers by Al-Homaidi et al. (2018), Farooq et al. (2021), Petria et al. (2015), Rahman et al. (2020) revealed an insignificant statistic and positive tie between CAR and ROE. In this paper, CAR also shows a positive and significant statistic on NIM.

AGE has insignificant adverse effects on ROA and NIM; a significant positive impact on ROE. It means that older commercial banks have lower profitability than younger ones. This result is supported by Gupta & Mahakud (2020b), while Mebounou et al. (2015) also found a negative but insignificant of AGE on ROA and ROE. In contrast, Dietrich & Wanzenried (2014) and Horvey & Ankamah (2020) detected a positive association between this determinant and ROA and ROE.

SGR factor has a negative effect on ROA and NIM but positively affects ROE. However, only the negative impact on NIM is significant. This outcome shows that the revenue growth of commercial banks hurts profitability. This result is against with Pattitoni et al. (2014) and Grau & Reig (2018).

The LOAR factor affects profitability but has no statistical significance. This finding is supported by Adusei (2015), Al-Homaidi et al. (2018), Sufian (2009). However, studies by Dietrich & Wanzenried (2014), Sufian & Chong (2008) gave the opposite result.

CIR has an inverse relationship with ROA and NIM but only a significant ROA while having a positive relationship with ROE. This result supports studies of Căpraru & Ihnatov (2014), Dao & Nguyen (2020), Farooq et al. (2021), Gupta & Mahakud (2020b), Masood & Ashraf (2015), Petria et al. (2015), Sufian (2009). Nevertheless, Petria et al. (2015) detected the opposite conclusion.

Determinant of DAR has a negative effect on ROA and a positive effect on ROE and NIM, but it is

only statistically significant for NIM. This means that deposits have a positive effect on profitability. This result supports the papers of Abrar & Javaid (2016), Farooq et al. (2021). However, studies by Menicucci & Paolucci (2016) and Al-Homaidi et al. (2020) have reached the opposite conclusion.

MP positively affects ROE and NIM but negatively affects ROA. Only the impact on NIM is significant in the relationship between MP and profitability. This research result is supported by the research results of Adelopo et al. (2018), Gupta & Mahakud (2020a) but contrary to the research results of Adelopo et al. (2018), Batten & Vo (2019), Bucevska & Hadzi Misheva (2017), Pervana et al. (2015).

GDP factor has a positive but insignificant statistical impact on all 3 dependent variables. Our finding is similar to the papers by Al-Homaidi et al. (2018), Bucevska & Hadzi Misheva (2017), Sufian & Chong (2008). While studies by Adelopo et al. (2018), Bolarinwa et al. (2019), Căpraru & Ihnatov (2015), Demirgüç-Kunt & Huizinga (1999), Dietrich & Wanzenried (2014), Farooq et al. (2021). discovered a significant positive link between GDP and profitability. Nevertheless, a contrary result can be found in other research by Al-Homaidi et al. (2020), Dao & Nguyen (2020), Staikouras & Wood (2011).

INF variable has a positive impact on both ROA and ROE. This outcome expresses that a higher inflation rate leads to better profitability. Many other scholars also have a similar conclusion, such as Al-Homaidi et al. (2018), Bekhet et al. (2020), Bolarinwa et al. (2019), Bourke (1989), Căpraru & Ihnatov (2014, 2015), Demirgüç-Kunt & Huizinga (1999), Derbali (2021), Kosmidou (2008). However, Adelopo et al. (2018), Al-Homaidi et al. (2020), Dao & Nguyen (2020), Farooq et al. (2021), T. D. Q. Le & Ngo (2020), Salike & Ao (2018) explored an opposite conclusion. INF has a negative impact on NIM but is not significant.

5. Conclusions

This study shows that bank-specific and macroeconomic determinants drive banks' profitability and align with many previous studies. Significantly, two elements, including SIZ and AM, significantly impact profitability. INF also has a positive, significant effect on ROA and ROE. This demonstrates that they are the most important determinants that affect commercial banks' profitability.

From this finding, bank managers can maximize their profitability by improving SIZ and AM. Firstly, they should mobilize more capital by issuing equity rather than debt securities. This solution will remarkably overcome a specific weak point of the banking industry is moderate equity capital. After mobilizing capital, bank managers should invest in their total assets to expand their scale of operation. Significantly, when these banks increase their equity capital, it also helps to raise the CAR factor. As a result, according to this paper, the higher CAR, the better the ROA of banks. However, these banks must accept a lower ROE and NIM. Secondly, after investing in total assets, commercial banks should maintain and promote their management and utilization of these assets to create more income from business operations. Thirdly, these banks should increase their loans to their customers because it is their primary function and a source to raise their revenue. Impact of CIR makes banks to consider their capital structure in addition to saving operating costs.

Regarding macroeconomic determinants, results from running regression models suggest that Vietnam's government should maintain a moderate annual inflation rate. This suitable inflation rate level will promote the economy's growth rate generally and the profitability of commercial banks.

References:

Adusei, M. (2015). Bank profitability: Insights from the rural banking industry in Ghana. Cogent Economics and Finance, 3(1). https://doi.org/10.1080/23322039.2015.1078270

Al-Homaidi, E. A., Tabash, M. I., & Ahmad, A. (2020). The profitability of islamic banks and voluntary disclosure: empirical insights from Yemen. Cogent Economics and Finance, 8(1). https://doi.org/10.1080/23322039.2020.1778406

Ali, M., & Puah, C. H. (2019). The internal determinants of bank profitability and stability: An insight from banking sector of Pakistan. Management Research Review, 42(1), 49-67. https://doi.org/10.1108/MRR-04-2017-0103

Alzoubi, T. (2018). Determinants of bank profitability: Islamic versus conventional banks. Banks and Bank Systems, 13(3), 106-113. https://doi.org/10.21511/bbs.13(3).2018.10

Ariyadasa, C., Selvanathan, E. A., Siddique, M. A. B., & Selvanathan, S. (2017). On the profitability of commercial banks: the Sri Lankan case. Applied Economics, 49(21), 2106-2116. https://doi.org/10.1080/00036846.2016.1231909

Batten, J., & Vo, X. V. (2019). Determinants of Bank Profitability - Evidence from Vietnam. Emerging Markets Finance and Trade, 55(6), 1417-1428. https://doi.org/10.1080/1540496X.2018.1524326

Bougatef, K. (2017). Determinants of bank profitability in Tunisia: does corruption matter? Journal of Money Laundering Control, 20(1), 70-78. https://doi.org/10.1108/JMLC-10-2015-0044

Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. Journal of Banking & Finance, 13(1), 65-79. https://doi.org/10.1016/0378-4266(89)90020-4

Chen, K. (2020). The effects of marketing on commercial banks' operating businesses and profitability: evidence from US bank holding companies. International Journal of Bank Marketing, 38(5), 1059-1079. https://doi.org/10.1108/IJBM-08-2019-0301

Curak, M., Poposki, K., & Pepur, S. (2012). Profitability Determinants of the Macedonian Banking Sector in Changing Environment. Procedia - Social and Behavioral Sciences, 44, 406-416. https://doi.org/10.1016/j.sbspro.2012.05.045

Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: Some international evidence. World Bank Economic Review, 13(2), 379-408. https://doi.org/10.1093/wber/13.2.379

Dietrich, A., & Wanzenried, G. (2014). The determinants of commercial banking profitability in low-, middle-, and high-income countries. Quarterly Review of Economics and Finance, 54(3), 337-354. https://doi.org/10.1016/j.qref.2014.03.001

Farooq, M., Khan, S., Atique Siddiqui, A., Tariq Khan, M., & Kamran Khan, M. (2021). Determinants of profitability: a case of commercial banks in Pakistan. Humanities & Social Sciences Reviews, 9(2), 1-13. https://doi.org/10.18510/hssr.2021.921

Gupta, N., & Mahakud, J. (2020a). CEO characteristics and bank performance: evidence from India. Managerial Auditing Journal, 35(8), 1057-1093. https://doi.org/10.1108/MAJ-03-2019-2224

Gupta, N., & Mahakud, J. (2020b). Ownership, bank size, capitalization and bank performance: Evidence from India. Cogent Economics and Finance, 8(1). https://doi.org/10.1080/23322039.2020.1808282

Horobet, A., Radulescu, M., Belascu, L., & Dita, S. M. (2021). Determinants of Bank Profitability in CEE Countries: Evidence from GMM Panel Data Estimates. Journal of Risk and Financial Management, 14(7), 307. https://doi.org/10.3390/jrfm14070307

Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration. Managerial Finance, 34(3), 146-159. https://doi.org/10.1108/03074350810848036

Martins, A. M., Serra, A. P., & Stevenson, S. (2019). Determinants of real estate bank profitability. Research in International Business and Finance, 49, 282-300. https://doi.org/10.1016/j.ribaf.2019.04.004

Mebounou, T. G. C., Karan, M. B., & Dannon, H. (2015). Liquidity and bank profitability in WAEMU zone: A panel data analysis. Afro-Asian Journal of Finance and Accounting, 5(2), 113-134. https://doi.org/10.1504/AAJFA.2015.069888

Menicucci, E., & Paolucci, G. (2016). The determinants of bank profitability: empirical evidence from European banking sector. Journal of Financial Reporting and Accounting, 14(1), 86-115. https://doi.org/10.1108/jfra-05-2015-0060

Molyneux, P., & Thornton, J. (1992). Determinants of European bank profitability: A note. Journal of Banking and Finance, 16, 1173-1178.

Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of Banks' Profitability: Evidence from EU 27 Banking Systems. Procedia Economics and Finance, 20, 518-524. https://doi.org/10.1016/s2212-5671(15)00104-5

Quoc Trung, N. K. (2021). Determinants of bank performance in Vietnamese commercial banks: an application of the camels model. Cogent Business & Management, 8(1). https://doi.org/10.1080/23311975.2021.1979443

Staikouras, C. K., & Wood, G. E. (2011). The Determinants Of European Bank Profitability. International Business & Economics Research Journal (IBER), 3(6). https://doi.org/10.19030/iber.v3i6.3699

Sufian, F., & Chong, R. R. (2008). Determinants of Bank Profitability in a Developing Economy: Empirical Evidence from the Philippines. Asian Academy of Management Journal of Accounting and Finance, 4(2), 91-112.

Vu, H., & Nahm, D. (2013). The determinants of profit efficiency of banks in Vietnam. Journal of the Asia Pacific Economy, 18(4), 615-631. https://doi.org/10.1080/13547860.2013.803847

COVID-19 PANDEMIC, FIRM PERFORMANCE AND THE MODERATING ROLE OF REVENUE GROWTH VARIABLE: RESEARCH ON LISTED COMPANIES IN VIETNAM

PhD. Tran Thi Phuong Thao*

Abstract: ***This article examines how the COVID-19 pandemic has impacted the performance of enterprises listed in Vietnam. Using panel data of 508 listed companies from 2018-2021, we prove the negative correlation between the COVID-19 pandemic and the firm performance. The study uses revenue growth as a moderating variable to investigate the mechanism of the pandemic impact and indicates that the negative effect of the COVID-19 pandemic is more severe for businesses with high revenue growth. This is one of the first studies to include the revenue growth variable to consider the relationship between COVID-19 and the business performance of enterprises.***

• Keywords: *COVID-19, firm performance, pandemic, Vietnam.*

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1. Introduction

COVID-19 is a global infectious disease pandemic caused by a coronavirus knonw as SARS-CoV-2. The first case of infection by this virus was announced in Wuhan, China, in December 2019. Realizing the danger of this new virus, the World Health Organization officially declared a global health emergency in March 2020 (WHO, 2020). Across the globe, it spread rapidly, brought unprecedented challenges, and significantly impacted the economic development of countries.

Governments in countries worldwide have responded with various policy approaches to mitigate the consequences of the pandemic. Many countries and regions implemented quarantines and travel restrictions for people who had recently traveled to the areas heavily affected by COVID-19. Some countries launched stimulus packages to revive its COVID-hit economy.

Earlier research conducted stated that the COVID-19 pandemic had influenced the performance of listed companies in G7 countries (Narayan et al., 2021), Saudi (Makni, 2023), and China (Shen et al., 2020). However, none of these studies investigate the role of revenue growth as a moderating variable in the relationship between the COVID-19 pandemic and the operating performance of companies. Therefore, it is essential to examine the influence of this dangerous pandemic on business performance in Vietnam and determine whether moderating variables affect this relationship.

The research paper is structured as follows: The following section covers the literature review and hypothesis generation. Section 3 outlines the technique and data utilized. Section 4 presents the empirical results, and section 5 ends the research.

2. Literature review and hypothesis development

2.1. Literature review

The COVID-19 pandemic has caused serious loss of life worldwide and posed unprecedented challenges to public health, the economy, and the operations of businesses in particular. According to Johns Hopkins University (2023), By March 2023, COVID-19 infected over 600 million individuals and caused over 6 million deaths. A significant impact caused by the pandemic was the imposition of 'lockdown' periods in which access to or movement within a given area is restricted to protect public health or safety.

Narayan et al. (2021) investigated how the G7 government responded to the COVID-19

** Foreign Trade University; email: thaottp@ftu.edu.vn*

pandemic on the stock market. The authors used time-series data covering the sample from July 1, 2019 to April 16, 2020. The results of the study indicated that economic stimulus packages, lockdown measures, and travel restrictions all contribute positively to the excess returns of the stock markets in the G7 countries. However, lockdowns minimized the impact of COVID-19 most effectively.

Shen et al. (2020) used the data of Chinese firms from 2013 to 2019 and demonstrated that COVID-19 creates an adverse impact on the performance of firms, with the degree of influence becoming more pronounced as the investment volume or sales revenue of the company decreases. Makni (2023) also came to a similar conclusion when researching companies in the Saudi market for the period from 2009 to 2019.

In Vietnam, from March 2020, entry was temporarily suspended for all foreigners and all entry cases for Vietnamese citizens were quarantined for 14 days. From April 1, Vietnam instituted a nationwide lockdown for fifteen days. Former prime minister Nguyen Xuan Phuc declared a nationwide pandemic of COVID-19 on the same day (Ministry of Health portal, 2020). In the two years 2020 - 2021, businesses had been profoundly affected by the implementation of social distancing measures in an effort to avert the COVID-19 pandemic.

Phan et al. (2022) investigated the effects of the COVID-19 pandemic on the operational effectiveness of 21 commercial institutions in Vietnam during the period of 2012 - 2021. The study used the ratios ROA (return on assets) and ROE (return on equity) to represent business efficiency. The results indicated that COVID-19 significantly reduced the business efficiency of Vietnamese commercial banks.

Tran and Le (2023) studied the reaction of the Vietnamese stock market in the context of the health crisis. The results showed that the COVID-19 pandemic no longer negatively impacts stock market movements in the long term, especially when the government no longer implements shutdown orders. The research showed that there are no lasting restrictions of the COVID-19 pandemic on the stock market.

2.2. Hypothesis development

Worldwide, the COVID-19 pandemic has had a significant impact on the investment and trade activities of nations. In numerous nations, social distancing reduces the value of imported and exported products and services. With its deep level of international integration, Vietnam's economy has suffered many impacts, seriously affecting all socio-economic fields. Many businesses have gone bankrupt, suspended, or reduced the scale of operations. Therefore, the following hypothesis is proposed:

H1: The COVID-19 pandemic has a negative influence on the business performance of Vietnamese-listed companies

Due to the impact of the COVID-19 pandemic, the cost of input materials, transportation costs, and other costs related to epidemic prevention have increased. Therefore, businesses that try to boost revenue may face the risk of higher costs, causing profits to decrease. Based on these arguments, we propose the following hypotheses:

H2: The COVID-19 pandemic has a more negative effect on the performance of a business when the company's sales growth is larger.

3. Methodology and data

3.1. Data

With the support of FiinPro - an application-based platform providing financial databases, the study collected data from companies listed on the Vietnam Stock Exchange from 2018 to 2021 to study the effects of the COVID-19 pandemic on business performance. After eliminating incomplete data and companies operating in the banking and credit institutions sector, the study obtained balanced data of 508 companies.

3.2. Methodology

The research models used is as follows:

$$ROA_{it} = \alpha_0 + \alpha_1 Lockdown_{it} + \alpha_2 Growth_{it} + \alpha_3 Leverage_{it} + \alpha_4 Size_{it} + \alpha_5 Tangibility_{it} + \varepsilon_{it} \quad (1)$$

$$ROA_{it} = \alpha_0 + \alpha_1 Lockdown_{it} + \alpha_2 Growth_{it} + \alpha_3 Growth*Lockdown_{it} + \alpha_4 Leverage_{it} + \alpha_5 Size_{it} + \alpha_6 angibility_{it} + \varepsilon_{it} \quad (2)$$

The dependent variable is ROA - return on assets, which denotes the firm's performance. LOCKDOWN represents a dummy variable equal to 1 if there are any mobility restrictions in the country during that year (2020 and 2021) and zero otherwise.

Control variables are added, including GROWTH, which represents the growth rate

in revenue; LEVERAGE represents the capital structure of a business and is determined by the ratio of debt to total assets; Firm size (SIZE) is measured by the natural logarithm of total assets; and TANGIBILITY is the ratio of fixed assets divided by total assets.

The study uses an inferential statistic T-Test to assess whether there is a considerable difference in firm profitability of two groups, COVID years and non-COVID years. The research model is estimated using ordinary least squares (OLS) and regression methods with panel data (including the fixed effects model (FEM) and the random effects model (REM)). Then, the study uses the Breusch - Pagan Lagrangian Multiplier test to compare the OLS regression model and the regression models for panel data (FEM/REM) and the Hausman test to choose the fixed effect model and the random effects model.

4. Empirical results

4.1. Descriptive statistics

Based on financial data from 2018 to 2021, Table 1 displays the descriptive statistics of the primary variables.

Table 1: Descriptive statistics

Variables	N	Mean (N)	Standard Deviation (SD)	Minimum	Maximum	Median
ROA	2032	.0614	.0744	-.227	.8122	.0439
LOCKDOWN	2032	.5	.5	0	1	.5
GROWTH	2032	.1556	1.6176	-1.0487	55.0593	.0354
LEVERAGE	2032	.4741	.2178	.0027	.9919	.479
SIZE	2032	27.6375	1.5356	23.4861	32.8141	27.5637
TANGIBILITY	2032	.2413	.2126	0	.9627	.1838

Source: Results on Stata software

The average value of ROA is .0614, and the median is .0439, meaning most companies do not have high profitability. The average value of GROWTH is .1556, which shows that companies still have steady growth in revenue but not high between 2018 and 2021.

4.2. Correlation analysis

Before performing a regression analysis of the relationship between COVID and firm performance, we conducted a correlation analysis between the variables used in the empirical model.

Table 2: Correlation matrix

	ROA	LOCKDOWN	GROWTH	LEV	SIZE	TANG
ROA	1					
LOCKDOWN	-0.0651***	1				
GROWTH	0.0498**	0.0132	1			
LEV	-0.3819***	-0.0197	-0.0072	1		
SIZE	-0.0509**	0.0379*	0.0111	0.3317***	1	
TANGIBILITY	0.0270	-0.0188	-0.0066	-0.0413*	0.1281***	1

*10%, 5%, and 1% significance levels are denoted by *, **, and ***, respectively.*

Source: Results on Stata software

Correlation analysis determines the association between the COVID-19 pandemic and firm-specific variables over the entire period. In general, the correlation coefficients across variables are generally low, suggesting that there is no significant multicollinearity issue among the variables in the study.

4.3. T-Test result

A T-test was performed to determine if ROA is different between COVID and NON-COVID years.

Table 3: Results of testing the difference in firm performance

Groups	N	Mean (N)	Std. Err.	Std. Dev.
0	1016	.06623	.00243	.07751
1	1016	.05654	.00222	.07083
Diff	2032	.06139	.00165	.07439

Ha: diff < 0	Ha: diff ! = 0	Ha: diff > 0
Pr(T < t) = 0.9983	Pr(|T| < |t|) = 0.0033	Pr(T > t) = 0.0017

Source: Results on Stata software

Table 3 shows that the average value of the ROA in the NON-COVID years is 0.06623, and in the COVID years, it is 0.05654. Pr(|T| < |t|) = 0.0033 demonstrates that there is a significant difference in the firm performance between COVID years and NON-COVID years.

4.4. Regression results

After performing regression using three methods (OLS, FEM, and REM), the study used the Breusch - Pagan Lagrangian Multiplier test to select the REM/FEM regression method and the OLS method. The statistical results of the test for the two research models are summarized in Table 4:

Table 4: Breusch - Pagan Lagrangian test results

Model	Chi^2	Pro > Chi^2	Selected method
Model 1	1026.23	0.0000	REM/FEM
Model 2	1034.99	0.0000	REM/FEM

Source: Results on Stata software

The value of Pro > Chi^2 for the two models is 0.0000, implying that OLS estimation is not as good as REM/FEM estimation. The study persists in utilizing the Hausman test to select between random effects model (REM) and fixed effects model (FEM).

Table 5: Hausman test results

Model	Chi^2	Pro > Chi^2	Selected method
Model 1	27.34	0.0000	FEM
Model 2	48.63	0.0000	FEM

Source: Results on Stata software

Results from the Hausman test show that the FEM regression method is more appropriate for considering the impact of the COVID-19 pandemic on the performance of Vietnam's listed companies and considers revenue growth rate as the moderating variable. The study's empirical findings are displayed in Table 6:

Table 6: Regression analysis of the impact of COVID-19 on Vietnamese-listed firm performance

	Model 1		Model 2	
	Pandemic impact		Revenue growth	
	Coefficients	t-value	Coefficients	t-value
LOCKDOWN	-.0134***	-6.49	-.01158***	-5.68
GROWTH	.0032***	4.59	.0217***	9.13
GROWTH*LOCKDOWN			-.0201***	-8.13
LEVERAGE	-.1210***	-6.82	-.1381***	-7.89
SIZE	.0173***	3.23	.0235***	4.44
TANGIBILITY	-.0696**	-4.16	-.0751***	-4.58
Constant	-.3365	-2.34	-.5003***	-3.52
YEAR	Yes		Yes	
N	2,032		2,032	
Adj-R2	.6542		.6684	

*10 %, 5 %, and 1 % significance levels are denoted by *, **, and ***, respectively.*

Source: Results on Stata software

Model 1 reports the impact of the COVID-19 pandemic on the performance of Vietnamese-listed companies. The LOCKDOWN coefficient is -.0134 and is significant at the 1% level, explaining that the COVID-19 pandemic negatively impacts firm performance. Therefore, hypothesis 1 is supported.

Hypothesis 2 proposes the moderating role of sales growth in the relationship. As shown in Section 2, LOCKDOWN is significantly associated with ROA at the 1% level. The coefficient of LOCKDOWN is -.01158, with a significant level of 1%, and the coefficient of GROWTH*LOCKDOWN is -.0201, with a significant level of 1%. This shows that if the firm's sales growth increases, the negative influence of the pandemic on corporate performance will also go up. Hence, Hypothesis 2 is supported.

Conclusion

This study examines how the COVID-19 pandemic has affected the performance of enterprises listed in Vietnam. The results show that the COVID-19 pandemic significantly negatively impacts firm performance. We also explain and analyze the relationship with the moderating variable as revenue growth. The study findings indicate that the influence of COVID-19 on firm performance is more severe for businesses with high growth. This result can be explained by businesses' compliance with epidemic prevention and quarantine regulations, leading to higher production and business costs.

The twenty-first century has witnessed several waves of serious infectious disease outbreaks, devastatingly impacting our lives globally. The SARS coronavirus outbreak in 2003, the H1N1 flu (swine flu) pandemic in 2009, the Ebola virus 2013 - 2016, centered in West Africa, the Zika virus epidemic in 2015, and the COVID-19 pandemic in 2019 all resulted in significant morbidity and mortality (Baker, R.E. et al., 2022). Future pandemics may occur more frequently, spread faster, be more dangerous, and have more severe economic impacts. This research results imply that in the context of countries being forced to implement quarantine measures and movement restrictions due to the pandemic, the more businesses expand their activities, the more negative impact a pandemic has on business performance.

This research still has some limitations, such as the research period being only in the period 2018 - 2021, and the impact of the COVID-19 pandemic on different economic sectors not being studied. To expand the scope and depth of research in this area, future studies could examine the impact of pandemics on various industries and regions.

References:

Baker, R.E., Mahmud, A.S., Miller, I.F. et al. Infectious disease in an era of global change. Nat Rev Microbiol 20, 193–205 (2022). https://doi.org/10.1038/s41579-021-00639z

Huayu Shen, Mengyao Fu, Hongyu Pan, Zhongfu Yu & Yongquan Chen (2020) The Impact of the COVID-19 Pandemic on Firm Performance, Emerging Markets Finance and Trade, 56:10, 2213-2230

Makni, M. S. (2023). Analyzing the impact of COVID-19 on the performance of listed firms in Saudi market. Technological Forecasting and Social Change, 187, 122171.

Ministry of Health portal. (2020). Announcing the nationwide COVID-19 pandemic, Available from: < https://moh.gov.vn/hoat-dong-cua-lanh-dao-bo/-/asset_publisher/TW6LTp1ZtwaN/content/cong-bo-dich-covid-19-toan-quoc> [Accessed 25 December 2023]

Narayan, P. K., Phan, D. H. B., & Liu, G. (2021). COVID-19 lockdowns, stimulus packages, travel bans, and stock returns. Finance Research Letters, 38, 101732.

Phan T. H. Nga, Pham M. Tien, Nguyen T. A. Thu, Tran T. Nhi, Tran N. Xuan, Tran N. N. Quynh, Phan T. L. Anh. (2022). Impact of Covid-19 on business efficiency of Vietnam commercial banks, Journal of Finance – Marketing

Tran P. Trac, Le T. T. Hang. (2023). The reaction of the Vietnamese stock market in the context of the Covid pandemic. The Journal of Economics and Development, 308 (2), 70-80.

WHO, 2020. Director-General's Opening Remarks at the Media Briefing on COVID-19, Available from: https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020 [Accessed 25 December 2023]

Johns Hopkins University. (2023). COVID-19 Dashboard December, Johns Hopkins Coronavirus Resource Center. Center for Systems Science and Engineering (CSSE). Available from: https://coronavirus.jhu.edu/map.html

THE RELATIONSHIP BETWEEN ELECTRONIC CIGARETTE BOYCOTT BEHAVIOR AND PURCHASE INTENTION AMONG STUDENTS IN HANOI

PhD. Phan Thanh Hung* - PhD. Nguyen Binh Minh* - PhD. Le Thuy Huong*
MA. Nguyen Thi Lan Phuong**

Abstract: ***This study aims to investigate the impact of electronic cigarette boycott behavior on the purchase intention of such products among university students in Hanoi. A survey sample of 268 students from various universities in Hanoi was collected and analyzed using structural equation modeling. The results indicate that students who have previously engaged in boycotting behavior against electronic cigarettes are less likely to intend to purchase these products. Conversely, students with a positive attitude toward purchasing electronic cigarettes, who receive support from those around them, or who perceive the acquisition of electronic cigarettes as easy are more likely to have an increased intention to purchase these products. The study also proposes several policy implications for administrators to reduce the purchase intention of electronic cigarettes among students in Hanoi.***

Keywords: *boycott, e-cigarett, student, intention.*

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1. Introduction

The global rise in e-cigarette use is increasingly alarming. Specifically, e-cigarette use among adolescents and children has surged from 1.4% in 2016 to 3.2% in 2020 (The Centers for Disease Control and Prevention, 2020). In Vietnam, a 2021 World Health Organization report indicates a significant increase in e-cigarette use among students aged 13-17, from a national rate of 2.6% in 2013 to an estimated 8.1% by 2023 (Lê Nga, 2024), with urban areas like Hanoi and Ho Chi Minh City reporting 7.9% (Park, 2021). The highest usage rates are observed among individuals aged 15 to 24, primarily students (Lê Nga, 2024).

This trend poses substantial public health risks, evidenced by over 1,200 hospitalizations related to e-cigarettes and heated tobacco products in Vietnam in 2023 (Lê Nga, 2024). WHO (2020) highlights that e-cigarette use among youth can lead to severe health issues, including respiratory and mental health problems, cardiovascular diseases, and developmental brain effects (Park, 2021).

In response, the Vietnamese government has enacted several measures, including Decision 140/QD-TTg on February 2, 2024, to enhance legal regulations on e-cigarettes (Trần Lưu Quang, 2024), and Official Dispatch 47/CD-TTg on May 13, 2024, for further management (Phạm Minh Chính, 2024). Additionally, the Ministry of Health issued Document 5680/BYT-KCB on July 16, 2021, to raise awareness of e-cigarette harms (Nguyễn Trường Sơn, 2021).

However, regulatory measures alone are insufficient. The effectiveness of these regulations also hinges on consumer behavior, including potential actions like boycotting. Boycotting, as a form of consumer activism, can influence purchasing decisions and spread awareness about the harms of e-cigarettes (John & Klein, 2003). The broader impact of boycotting includes promoting awareness and potentially altering consumer attitudes and behaviors regarding e-cigarettes (Albrecht, Campbell, Heinrich, & Lammel, 2013).

Thus, investigating the impact of boycotting on e-cigarette purchase intentions and word-of-mouth is crucial. Such research will provide valuable insights for policymakers and social organizations aiming to mitigate e-cigarette use among high-risk groups, particularly students in Hanoi. The study aims to contribute to understanding the role of boycotting and inform strategies for reducing e-cigarette consumption.

** National Economics University; email: hungpt.mkt@neu.edu.vn - minhbn@neu.edu (corresponding author) - lethuyhuongmkt@neu.edu.vn*
*** University of Hai Duong; email: uhdphuongnguyenlan.edu@gmail.com*

2. Literature review

2.1. Key concepts

2.1.1. Electronic Cigarettes and Purchase Intention of Electronic Cigarettes

E-cigarettes are electronic devices that use electricity to heat a liquid, converting it into vapor or smoke for the user to inhale through the respiratory tract. These liquids commonly contain flavoring agents, taste enhancers, and may also include nicotine. Meanwhile, according to Fishbein and Ajzen (1975), behavioral intention is the effort an individual makes to perform a particular behavior. Thus, the intention to purchase electronic cigarettes reflects the individual's effort to acquire this product.

2.1.2. Boycott and boycott e-cigarettes

Consumer boycotting is the deliberate action of consumers against an organization, a business, or a product. By refusing to buy the product or service, consumers express their opposition. Boycott behaviors may stem from individuals' concerns about ethical, social, and political issues or as a means to urge businesses to engage in socially responsible activities (Klein, Smith, & John, 2004). Therefore, in this study, the boycott of electronic cigarettes refers to an individual's action directed at electronic cigarette products in general (regardless of the manufacturer) to express their opposition to this product.

2.2. Hypotheses and research model

The impact of attitude, subjective norms, and perceived behavioral control on the intention to purchase electronic cigarettes

The influence of Attitude, Subjective Norms, and Perceived Behavioral Control on Behavioral Intention was established by Fishbein and Ajzen (1975) and later by Ajzen (1991) and has been validated by numerous researchers. According to this framework, Attitude toward Behavior, Subjective Norms, and Perceived Behavioral Control all positively affect Behavioral Intention. In studies related to addictive substances in general, and specifically regarding cigarettes and electronic cigarettes, the Theory of Planned Behavior (TPB) has been widely utilized. It effectively explains the intention to purchase these products, as demonstrated in research by Fiegel and Frank (2023); Yang (2024); Simpson et al. (2022); Donaldson et al. (2021); Lee, Lin, Seo, and Lohrmann (2018).

Therefore, we propose the following hypotheses:

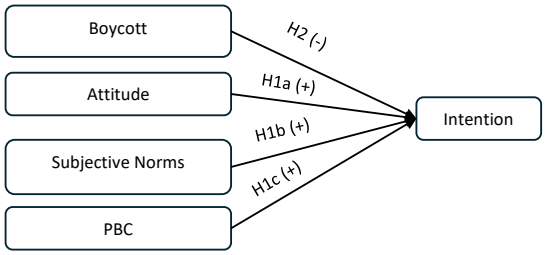
H1: Attitude toward the use of electronic cigarettes (a), Subjective Norms (b), and Perceived Behavioral Control (c) positively influence the intention to purchase electronic cigarettes among students in Hanoi.

The impact of boycott on the intention to purchase electronic cigarettes

Consumer boycott behavior often manifests as a refusal to purchase and negative advocacy against a product. However, in some cases, boycott behavior may not stem from an individual's intrinsic factors. Some individuals engage in boycotts due to the influence of others, such as friends, family, or colleagues. Particularly in the context of Vietnam, an East Asian country with a high level of collectivism, individuals often tend to act under the influence of others. Consequently, participation in a boycott does not necessarily mean that individuals will definitively intend to avoid consuming the product. Therefore, the impact of a boycott on behavioral intention - in this case, the effect of an electronic cigarette boycott on the intention to purchase electronic cigarettes - still needs to be examined. Thus, we propose the following hypothesis:

H2: Electronic cigarette boycott behavior negatively affects the intention to purchase electronic cigarettes among students in Hanoi.

Figure 1: Proposed research model



3. Methodology

To conduct the survey, a questionnaire was developed incorporating scales from previous studies: Attitude (3 items), Subjective Norms (SN) (3 items), and Perceived Behavioral Control (PBC) (3 items) were adapted from Armitage and Conner (1999), while the scales for Boycott (2 items) and Intention (3 items) were adapted from Ajzen (1991). The questionnaire was created as a Google Forms link and distributed to students

at universities in Hanoi. A total of 268 valid responses were received and analyzed. Among these respondents, 148 were male (55.2%) and 120 were female (44.8%); 129 students came from technical institutions (48.1%) and 139 students were from socio-economic institutions (51.9%).

4. Results

4.1. Results of reliability testing using cronbach's alpha and exploratory factor analysis

The results of the exploratory factor analysis show a KMO value of 0.823 and Bartlett's test significance of 0.000. An Eigenvalue of 1.118 was obtained, with 14 observed variables converging into five factors, each with factor loadings greater than 0.5. Additionally, Cronbach's Alpha for all scales was above 0.8, and the Corrected Item-Total Correlation values were all greater than 0.3 (see the table below).

Table 1: Cronbach's alpha and EFA

Items	Code	Factor Loading	Corrected Item-Total Correlation
Boycott's Cronbach's Alpha = 0.924			
I have been continuously boycotting electronic cigarettes for the past four months.	BOY1	.926	.858
How have you been boycotting electronic cigarettes during the past four months?	BOY2	.927	.858
Attitude's Cronbach's Alpha = 0.906			
Purchasing electronic cigarettes is an intelligent action.	ATT1	.850	.811
Purchasing electronic cigarettes is a wise decision.	ATT2	.946	.840
I endorse the act of buying electronic cigarettes.	ATT3	.817	.788
Subjective Norms' Cronbach's Alpha = 0.895			
My friends believe that I should use electronic cigarettes.	SN1	.872	.776
My relatives believe that I should use electronic cigarettes.	SN2	.863	.811
The important people in my life believe that I should use electronic cigarettes.	SN3	.852	.797
Perceived Behavioral Control's Cronbach's Alpha = 0.863			
I can easily purchase electronic cigarettes whenever I wish.	PBC1	.687	.690
Buying electronic cigarettes is entirely within my capability.	PBC2	.846	.739
I have sufficient resources to purchase electronic cigarettes.	PBC3	.916	.792
Intention's Cronbach's Alpha = 0.879			
I will purchase electronic cigarettes in the future.	INT1	.822	.742
I plan to buy electronic cigarettes.	INT2	.936	.808
Whenever necessary, I will buy electronic cigarettes.	INT3	.744	.751

Source: Authors' survey data

4.2. CFA

The results of the Confirmatory Factor Analysis (CFA) indicate that the model fit indices are all acceptable, with Chi-square/df = 1.175 (< 3); CFI, GFI, and TLI values are 0.995, 0.960, and 0.993, respectively, all exceeding 0.9; and RMSEA = 0.026 (< 0.05). Reliability, discriminant validity, and convergent validity indices are all satisfactory, with most Standardized Regression Weights exceeding 0.7. The table below shows that the Composite Reliability (CR) values are all greater than 0.7; the Average Variance Extracted (AVE) values are all greater than 0.5; the Maximum Shared Variance (MSV) values are less than the corresponding AVE values; and the Square Root of AVE values are greater than the Inter-Construct Correlations. Therefore, it can be concluded that the measurement scales have adequate reliability, discriminant validity, and convergent validity (Hair et al., 2014) and are suitable for hypothesis testing.

Table 2: Reliability, discriminant validity and convergent validity

	CR	AVE	MSV	MaxR(H)	PBC	ATT	SN	INT	BOY
PBC	0.89	0.73	0.242	0.904	**0.852**				
ATT	0.91	0.77	0.242	0.916	0.492***	**0.879**			
SN	0.89	0.72	0.125	0.889	0.184**	0.354***	**0.849**		
INT	0.88	0.71	0.004	0.895	-0.044	0.047	0.019	**0.84**	
BOY	0.86	0.75	0.228	0.855	0.129†	0.478***	0.239**	0.06	**0.86**

Source: Authors' survey data

4.3. Testing research hypotheses

The model fit indices for the Structural Equation Modeling (SEM) indicate that the model fits the data well, with Chi-square/df = 1.114 (< 3); CFI, GFI, and TLI values of 0.997, 0.960, and 0.996, respectively, all exceeding 0.9; and RMSEA = 0.021 (< 0.05). The results of the hypothesis testing are presented in the following table:

Table 3: Hypothesis testing results

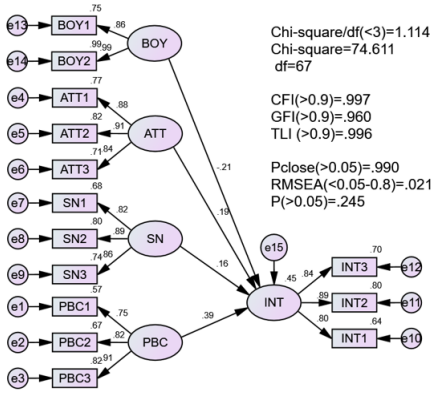
Hypothesis				Estimate	t-value	p	Result
H1a	INT	<---	ATT	0.187	2.766	0.01	Accepted
H1b	INT	<---	SN	0.155	2.409	0.02	Accepted
H1c	INT	<---	PBC	0.394	5.685	***	Accepted
H2	INT	<---	BOY	-0.208	-3.799	***	Accepted

Source: Authors' survey data

The hypothesis testing results indicate that the factors in the model account for 44.5% of the variance in the dependent variable (R^2_{INT} = .445). Additionally, as expected, all the factors in the model significantly influence the intention to purchase electronic cigarettes among students in Hanoi. The strongest positive effect is from Perceived Behavioral Control (PBC) ($\beta_{INT<-PBC}$ =

0.394, t-value = 5.685), followed by the negative effect of Boycott ($\beta_{INT<-BOY}$ = -0.208, t-value = -3.799); Attitude has the third strongest positive effect on Intention ($\beta_{INT<-ATT}$ = 0.187, t-value = 2.766); and finally, Subjective Norms has a positive effect as well ($\beta_{INT<-SN}$ = 0.155, t-value = 2.409). Therefore, hypotheses H1a, H1b, H1c, and H2 are supported.

Figure 2: Structural equation modeling



Source: Authors' survey data

5. Discussion, implications and future research directions

The hypothesis testing results indicate that individuals who have participated in the boycott of e-cigarette use tend to exhibit a decreased intention to purchase e-cigarettes. This finding aligns with the observation that individuals, particularly those with relatively high levels of education, such as students, are typically more aware of the implications of boycott behavior. Consequently, when they engage in the boycott of e-cigarettes, they do so with a heightened awareness of the issue, leading to a reduction in their intention to purchase e-cigarettes. Additionally, the study reveals that when individuals perceive the purchase of e-cigarettes as easy, receive support from their peers, and hold a positive attitude toward the purchase, their intention to buy e-cigarettes increases.

These research findings suggest several policy implications for administrators aiming to reduce the intention of students to purchase e-cigarettes. Firstly, communication strategies should focus on altering users' attitudes by emphasizing that e-cigarettes, despite being less harmful than conventional tobacco, are still toxic substances. Moreover, communication efforts should not only target potential e-cigarette users but also extend to relevant groups such as family members, friends, and relatives. Additionally, limiting the accessibility of e-cigarettes to the public, and specifically to students, by early promulgation of regulations on the purchase and sale of e-cigarettes is also an effective measure.

Despite its significant contributions, this study has several limitations that present opportunities for future research. Firstly, the study employed a convenience sampling method, which is suitable given limited resources; however, future research should utilize probability sampling methods to enhance the representativeness of the sample. Secondly, the study was conducted exclusively in Hanoi, which limits the generalizability of the findings to other regions. Subsequent research should be conducted in various cities to provide a more comprehensive perspective.

References:

Ajzen, I. (1991). The Theory of Planned Behavior. Organizational behavior and human decision processes, 50, 33.

Albrecht, C.-M., Campbell, C., Heinrich, D., & Lammel, M. (2013). Exploring why consumers engage in boycotts: Toward a unified model. Journal of Public Affairs, 13, 180-189.

Armitage, C. J., & Conner, M. (1999). The theory of planned behaviour: Assessment of predictive validity and 'perceived control'. The British Journal of Social Psychology, 38, 10.

Donaldson, C. D., Fecho, C. L., Ta, T., Vuong, T. D., Zhang, X., Williams, R. J., . . . Zhu, S.-H. (2021). Vaping identity in adolescent e-cigarette users: A comparison of norms, attitudes, and behaviors. Drug and Alcohol Dependence, 223, 1. doi:https://doi.org/10.1016/j.drugalcdep.2021.108712

Fiegel, K. A., & Frank, J. L. (2023). The Theory of Planned Behavior and Adolescent Marijuana Use: Examining the Moderating Effects of Cigarette and E-cigarette Co-use. Substance Use & Misuse, 58(6), 812-821. doi:https://doi.org/10.1080/10826084.2023.2191696

John, A., & Klein, J. (2003). The Boycott Puzzle: Consumer Motivations for Purchase Sacrifice. Management Science, 49, 1196-1209. doi:10.1287/mnsc.49.9.1196.16569

Klein, J., Smith, N., & John, A. (2004). Why We Boycott: Consumer Motivations for Boycott Participation. Journal of Marketing - J MARKETING, 68, 92-109. doi:10.1509/jmkg.68.3.92.34770

Lê Nga. (2024). Hơn 1.200 người Việt nhập viện vì thuốc lá điện tử. Retrieved from https://vnexpress.net/hon-1-200-nguoi-viet-nhap-vien-vi-thuoc-la-dien-tu-4741582.html

Lee, H.-Y., Lin, H.-C., Seo, D.-C., & Lohrmann, D. K. (2018). The effect of e-cigarette warning labels on college students' perception of e-cigarettes and intention to use e-cigarettes. Addictive Behaviors, 76, 106.

Tăng cường thực hiện Luật phòng chống tác hại thuốc lá, đẩy mạnh công tác cai nghiện thuốc lá tại cơ sở y tế và phổ biến thông tin về tác hại của các sản phẩm thuốc lá mới 5680/BYT-KCB C.F.R. (2021).

Park, K. (2021). Báo Cáo Khảo Sát Hành Vi Sức Khỏe Học Sinh Toàn Cầu Tại Việt Nam 2019. Retrieved from Việt Nam:

Công điện: Tăng cường quản lý thuốc lá điện tử, thuốc lá nung nóng, 47/CĐ-TTg C.F.R. (2024).

Simpson, E. E. A., Davison, J., Doherty, J., Dunwoody, L., McDowell, C., McLaughlin, M., . . . Giles, M. (2022). Employing the theory of planned behaviour to design an e-cigarette education resource for use in secondary schools. BMC Public Health, 22, 1-22. doi:https://doi.org/10.1186/s12889-022-12674-3

The Centers for Disease Control and Prevention. (2020). Adult Smoking Cessation—The Use of E-Cigarettes. Retrieved from USA: https://www.cdc.gov/tobacco/sgr/2020-smoking-cessation/fact-sheets/adult-smoking-cessation-e-cigarettes-use/index.html

Quyết định Ban hành Chương trình phòng, chống ma túy trong thanh, thiếu niên đến năm 2030, 140/QĐ-TTg C.F.R. (2024).

Yang, Q. (2024). Understanding the Associations Between Adolescents' Exposure to E-Cigarette Information and Vaping Behavior Through the Theory of Planned Behavior. Health Communication, 39(4), 641-651. doi:https://doi.org/10.1080/10410236.2023.2179715

THE FACTORS IMPACT ON ACCOUNTING CONSERVATISM OF LISTED COMPANIES IN VIETNAM STOCK EXCHANGE

MA. Nguyen Thi Hong* - MA. Nguyen Thi Xuan Hong*
Assoc.Prof. PhD. Pham Duc Cuong**

Abstract: ***This study examines the influence of factors of financial characteristics on accounting conservatism of non-financial listed enterprises in Vietnam in the period 2016-2022. This research uses a quantitative research method with data collected from financial reporting of companies listed on Vietnam stock exchange in the period 2016-2022 with 4,029 observations. The dependent variable is accounting conservatism which is measured by Basu (1997) model. The results show that audit quality, financial leverage, liquidity, financial distress, firm size, and Covid-19 have an impact on accounting conservatism. However, sales growth and capital intensity do not affect the accounting conservatism of listed enterprises in Vietnam. This research offers recommendations to relevant parties including state management agencies, auditors, and investors.***

• Keywords: *financial characteristics, accounting conservatism, BIG4, sales growth, covid-19.*

JEL codes: M10, M40, M41

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1. Introduction

The principle of prudence is one of the important basic principles in the bookkeeping and preparation of financial reporting of any business. Prudence is used as one of the measures to ensure the quality and transparency of financial information. Accountants use prudence in accounting to handle transactions under uncertain conditions when preparing financial statements so as not to record an increase in income or a decrease in expenses and obligations of the business. Therefore, accounting conservatism can have a significant influence accounting information. Accounting conservatism is considered one of the important constraints that affect the preparation of financial statements especially in cases where accountants are faced with the problem of choosing between a group of alternatives (Sana'a, 2016). The level of accounting conservatism in financial reporting is considered one of the controversial issues in modern accounting thought. The purpose of accounting conservatism is to protect the interests of shareholders, creditors and other stakeholders. However, accounting conservatism has faced strong criticism for conflicting with some characteristics of accounting information such as neutrality, faithful presentation and relevance (Sana'a, 2016).

Because of the importance of accounting conservatism in preparing financial statements, many scientists have been interested in studying the issue. There have been a number of researchers in Vietnam studying factors affecting accounting conservatism, however, previous researchers mainly focused on factors of management control characteristics such as the size of the company, board of directors, size of the supervisory board, duality of the CEO and chairman of the board of directors, proportion of non-executive board members. However, factors related to financial characteristics also have a significant influence on accounting conservatism in businesses. Stemming from the above issues, the authors have conducted research on factors affecting accounting conservatism at listed companies in Vietnam to contribute to improving the theory and practice of accounting conservatism.

2. Literature review

There have been previous studies on the influence of financial characteristics factors on accounting conservatism around the world. The authors will synthesize previous research works

** Hanoi University of Industry, Vietnam; email: nguyenthihong@haui.edu.vn - nguyenthixuanhong@haui.edu.vn*
*** National Economics University, Vietnam; email cuongpd@neu.edu.vn*

related to the influence of financial characteristics on accounting conservatism.

Table 1: Summarize previous research results

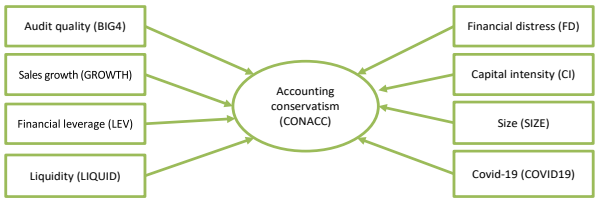
Factor	Research	Result
Audit quality	Reyad (2012), Soliman (2014), Pashiki (2015); Mohammed (2019)	+
Sales growth	Ahmed & Duellman (2011), Rahayu (2018)	+
	Goffar & Muhyarsyah (2018)	-
	Firdaus (2023)	0
Financial leverage	Dang & Tran (2020), Teymouri & Sadeghi (2020)	+
	Khalifa (2020)	-
	Solichah & Fachrurrozie (2019); Noviyanti & Agustina (2021)	0
Liquidity	Noviyanti et al (2021)	0
Financial distress	Rahayu (2018), Pujiono (2023)	+
	Sari (2020), Sholikhah & Suryani (2020)	-
	Putri (2020)	0
Capital intensity	Nadila (2023), Zahro (2021); Achyani & Lovita (2021), Putri (2020)	+
	Augustina (2022)	-
	Christian (2023)	0
Firm size	Wati (2020); Barzideh (2015), Thomas (2020)	+
Covid-19	Cui (2023), Hejranijamil (2020)	+

Source: Summarizing from the authors

3. Hypothesis and model

On the basis of the background theories, literature review of researches, the paper has identified a research model (Figure 1):

Figure 1: Model for the factors affecting financial performance



Based on relevant studies on influencing financial performance, this paper measures the impact of the eight factors on accounting conservatism. Based on the hypotheses given, the general regression model has been designed for testing hypotheses above:

$$CONACC_{it} = \beta_0 + \beta_1 BIG4_{it} + \beta_2 GROWTH_{it} + \beta_3 LEV_{it} + \beta_4 LIQUID_{it} + \beta_5 FD_{it} ++ \beta_6 CI_{it} + \beta_7 SIZE_{it} + \beta_8 COVID19_{it} + \varepsilon_{it}$$

The authors build hypotheses about 8 factors affecting financial performance of companies listed on Vietnam Stock Exchange, including:

Audit quality

The audit quality can affect the reliability and faithful of financial reports. Financial statements audited by good independent auditing companies often have few errors in the accounting system, thereby contributing to limiting profit adjustment actions of managers. Financial statements audited by good independent auditing companies often have few errors in the accounting system, thereby contributing to limiting profit adjustment actions of managers. Hypothesis H1 is assumed as follows:

H1: *Audit quality has a positive impact on accounting conservatism of listed enterprises in Vietnam*

Sales growth

Firm growth is a reflection of the sales growth of this period compared to the previous period. Enterprises with high growth rates reflect the company's ability to operate and generate good profits. Based on the theory of positive accounting and the theory of political costs, companies with high profits will tend to use accounting methods that reduce income, so businesses can report profits lower than actual level. This is a sign of accounting conservatism. The growth of businesses can also be seen from the growth of sales.

H2: *Sales growth has a positive impact on accounting conservatism of listed enterprises in Vietnam*

Financial leverage

Agency theory suggests that managers and creditors may have conflicts of interest. Therefore, the quality of financial reporting will be affected because managers tend to exaggerate profits to increase their salaries. Enterprises with high financial leverage will be closely monitored by creditors. Creditors can protect their interests in many different ways, such as through credit terms when negotiating. Creditors may require the company to apply accounting conservatism when preparing financial statements because the application of accounting conservatism can prevent management from over-reporting income. Overstated profits can reduce the creditor's accuracy in making decisions.

H3: *Financial leverage has a positive impact on accounting conservatism of listed enterprises in Vietnam*

Liquidity

Companies with high liquidity can cover debts with working assets. The theory of political costs based on positive accounting theory suggests that businesses might apply the accounting

conservatism when the liquidity is higher. High liquidity shows the financial strength of a business and can incur many political costs. Political costs can be in the form of taxes or employee benefits. The greater the liquidity, the more likely managers are to implement the accounting conservatism to narrow profits so as not to increase political costs. Good liquidity causes managers to apply accounting conservatism to prevent opportunities for disputes with creditors and principals.

H4: *Liquidity has a positive impact on accounting conservatism of of listed enterprises in Vietnam*

Financial distress

Agency theory explains that conflicts of interest can occur due to an imbalance in information gathering between the agent and the principal, in which when the company faces financial difficulties, the manager will is notified first and sometimes that information is not conveyed to the authorizing person. When companies encounter difficulties, it will encourage managers to increase the level of accounting conservatism as well as in making decisions because if the company makes mistakes in decision making, the survival of the company will be threatened. The higher the financial difficulty, the more conservative the company will be.

H5: *Financial distress has a positive impact on accounting conservatism of listed companies in Vietnam*

Capital intensity

According to the theory of political costs, large enterprises often have high capital intensity. These businesses often receive the attention of state agencies because they will encourage businesses to pay high taxes corresponding to the profits they earn. However, business managers tend to postpone the current period's profits to future periods so that the company can cut political costs. Based on political cost theory, businesses with high capital intensity are often more cautious and tend to prepare financial statements to report lower profits.

H6: *Capital intensity has a positive impact on accounting conservatism of listed companies in Vietnam*

Firm size

Firm size is one of the indicators to monitor the political costs that companies have to pay. Large companies have more complex organizational structures and higher profits, which expose the company to greater risks. In addition, large companies also face high political costs, so large companies tend to use accounting conservatism that can reduce reported profits. The political cost hypothesis in positive accounting states that the larger the company, the government will allocate political costs larger. Therefore, to reduce tax expenses, companies tend to apply accounting conservatism.

H7: *Firm size has a positive impact on accounting conservatism of listed companies in Vietnam*

Impact of the Covid-19 pandemic: The Covid-19 pandemic has severely affected the global economy in general and Vietnam in particular. Liu & Nainar (2022) showed that during the Covid-19 period, banks are more conservatism when preparing financial reports because banks have experienced previous periods of economic crisis.

H8: *Covid-19 has a positive impact on accounting conservatism of listed companies in Vietnam*

4. Research design

4.1. Sample selection

Research data includes 645 listed non-financial companies over a 7-year period (from 2016-2022) with 4,029 observations, including 1,886 observations of businesses listed on the HNX (accounting for 46.81%) and 2,143 observations of businesses listed on HOSE (accounting for 53.19%). The data of these 4,029 observations are used to calculate the independent and dependent variable values.

4.2. Variables

Our research model includes a dependent variable and 8 independent variables. The dependent variable is accounting conservatism. There are some models to measure accounting conservatism. In this study, the authors measure the accounting conservatism according to Basu (1997) model, based on the timeliness of asymmetric information.

Basu model (1997):

$$X_{it} / P_{it-1} = \beta_0 + \beta_1 D_{it} + \beta_2 R_{it} + \beta_3 D_{it} R_{it} + \varepsilon_{it}$$

Where:

X_{it}/P_{it-1} is the earnings per share of company i in year t calculated based on the opening price at the beginning of year t

R_{it} is the stock return of company i in year t

D_{it} is a dummy variable, equal to 1 if the company's stock return is negative and otherwise equals 0

ε_{it} is the error in year t of company i

Measure independent variables

The independent variables of research model include: (1) Audit quality, sales growth, financial leverage, liquidity, financial distress, capital intensity, firm size, covid-19.

Table 2: Variables name and measurement

No	Symbol	Variable	Measure	Source	Expect result
			Dependent variables		
1	BIG4	Audit quality	Dummy variable, equal 1 if the company is audited by a Big 4 auditing company, otherwise equals 0	Fathi (2013) (Mohammed, 2019)	+
2	GROWTH	Sales growth	$\frac{Sale_t - Sale_{t-1}}{Sale_{t-1}}$	Firdaus (2023) Goffar (2022)	+
3	LEV	Financial leverage	Borrowings and finance lease liabilities/ Equity	Mohammed (2016) Dang (2020)	+
4	LIQUID	Liquidity	Curren assets/ Curren liabilities	Noviyanti (2021)	+
5	FD	Financial distress	S-Score = $1{,}03X_1 + 3{,}07X_2 + 0{,}66X_3 + 0{,}4X_4$ X_1 = Working captial/ Total assets X_2 = Earnings before interest and taxes / Total assets X_3 = Earnings before taxes / Current liabilities X_4 = Net Revenue/ Total assets	Septriana (2021)	-
6	CIN	Capital intensity	= Total assets / Total sales	(Sholikhah & Baroroh, 2021)	
7	SIZE	Firm size	Logarit of Total assets	Aminu (2017) Sana'a (2016)	+
8	COVID-19	Covid-19	Dummy variable, equal 1 in the post-Covid 19 period (from 2020-2022), otherwise the value is 0	Al-Qudah (2022)	+

Source: Summarizing from the authors

4.3. Results and discussions

The correlation matrix between variables

Table 3: Correlation matrix results between CONS_ACC and dependent variables

	CONS_ACC	BIG4	GROWTH	LEV	LIQUID	FD	CIN	SIZE	COVID19
CONS_ACC	1.000								
BIG4	-0.025	1.000							
GROWTH	-0.010	-0.022	1.000						
LEV	-0.068	0.016	0.019	1.000					
LIQUID	-0.008	-0.082	0.019	-0.108	1.000				
FD	0.301	-0.017	0.006	-0.162	0.409	1.000			
CIN	-0.021	-0.020	-0.008	-0.012	0.119	-0.024	1.000		
SIZE	-0.024	0.429	-0.024	0.124	-0.197	-0.232	-0.013	1.000	
COVID19	-0.052	-0.012	-0.011	0.004	0.023	-0.035	0.011	0.084	1.000

Source: Stata 15

Table 3 describe the correlation relationship with the variables in the research model, including the dependent variables CONS_ACC and the remaining 8 independent variables. The analysis results will show the correlation between the independent and dependent variables in order to eliminate the variables that may lead to multicollinearity before doing the regression model. According to the results of Table 3 the correlation coefficient between the pairs of independent variables in the model has no pair greater than 0.8, so it is less likely that the phenomenon of multicollinearity between the independent variables. Therefore, it can be concluded that the model does not have serious multicollinearity.

Regression analysis

Regression estimation by POLS, FEM, REM model

Table 4 shows the results of regression of factors affecting accounting conservatism according to 3 models POLS, FEM, REM.

The test results to compare the model pairs POLS and FEM (F-test), FEM and REM (Hausman test), REM and POLS (Breusch-Pagan Lagrange test), the FEM model is the optimal model for the research.

Test for Heteroskedasticity and autocorrelation

The authors conduct tests to determine whether FEM model has disadvantages. The result from Heteroskedasticity tesst shows that Prob>chi2 is 0.000 < 0.05. Therefore, we conclude that the FEM model has heteroskedasticity

The result from autocorrelation test show that Prob > F is 0.1287 > 0.05, we conclude that the FEM model has not autocorrelation

Fix the phenomenon of Heteroskedasticity and autocorrelation

To fix the phenomenon of Heteroskedasticity, the authors conduct the FGLS regression. The results show that all variables are statistically

significant (accept all hypotheses H1, H3, H3, H4, H5, H6, H7, H8). The regression model as result:

Table 4: Results of fix the phenomenon of Heteroskedasticity and autocorrelation

CONS_ACC	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]	Sig
BIG4	-0.018	0.005	-3.580	0.000	-0.028	-0.008	***
GROWTH	0.000	0.000	-0.610	0.545	-0.001	0.001	
LEV	-0.001	0.000	-2.020	0.044	-0.002	0.000	**
LIQUID	-0.005	0.000	-9.420	0.000	-0.006	-0.004	***
FD	0.042	0.002	22.310	0.000	0.038	0.046	***
CIN	0.000	0.000	0.420	0.678	0.000	0.000	
SIZE	0.013	0.003	3.760	0.000	0.006	0.019	***
COVID19	-0.011	0.004	-2.750	0.006	-0.019	-0.003	***
_cons	-0.176	0.040	-4.440	0.000	-0.254	-0.099	***

Source: Stata 15

Audit quality (BIG4) has a negative impact on accounting conservatism with a significance level of less than 1%, P-value is 0.000. Companies audited by BIG4 audit firms including Deloitte, Pricewaterhouse Coopers (PwC), Ernst & Young (EY) and KPMG are less accounting conservatism than businesses audited by other firms. This result is contrary to the research results of Reyad (2012), Mohammed (2019).

Sales growth (GROWTH) has no impact on accounting conservatism with a P-value coefficient of 0.545 > 0.05. Companies always want to boost sales to achieve the expected profits of stakeholders. However, the test results show that there is no relationship between the next year's revenue being higher than the previous year's revenue and the application of a conservative policy. This proves that managers only care about maximizing the benefits of shareholders and investors and ignore accounting conservatism. This result is consistent with the research of Firrdaus (2023) but contradicts the research results of Ahmed & Duellman (2011), Rahayu (2018), showing that revenue growth rate has a positive relationship with accounting conservatism, Goffar & Muhyarsyal (2018) found a negative impact of sales growth and accounting conservatism.

Financial leverage ratio (LEV) has a negative impact on accounting conservatism at a significance level of less than 5%, with a P-value coefficient of 0.044. This result is consistent with hypothesis H3. According to agency theory, external capital in the form of debt will create a relationship between managers and creditors. According to the results of this study, the higher the financial leverage ratio businesses use, the less accounting conservatism their managers are. Enterprises with lower financial leverage ratios will be more conservative while preparing financial statements. This shows that managers try to create information asymmetry to hide their ability to manipulate profits or present assets at a higher level than their actual value to demonstrate their ability to pay their debts. This research result is consistent with Khalifa's research (2020).

Liquidity (LIQUID) has a negative impact on accounting conservatism at a significance level of less than 1%, with a P-value coefficient of 0.000. This result is contrary to hypothesis H4. Liquidity is related to the confidence of creditors in the company, so companies increase creditor confidence by implementing certain policies. Creditors will have more confidence in businesses with high liquidity because high liquidity shows the financial strength of the business. According to the results of this research, the more liquid a business has, the more conservative when preparing financial statements. This research result contradicts the research results of Noviyanti et al (2021).

Financial distress (FD) has a positive impact on accounting conservatism at a significance level of less than 1%, P-value is 0.000. This shows that businesses facing financial difficulties will be more conservative than other businesses. Signaling theory suggests that businesses will have to be conservative when facing financial difficulties to minimize information asymmetry and generate quality profits to build trust with creditors and investors. This research result is consistent with the research of Rahayu (2018) and Pujiono (2023) but contradicts the research results of Sari (2020), Herma (2023).

Capital intensity (CIN) has no impact on accounting conservatism with a P-value coefficient of 0.678. This result is not consistent with the political cost theory because according to this theory, revenue-generating assets and high capital intensity will cause large political costs. This result is consistent with the research of Christian (2023) but contradicts the research results of Nadila (2023), Zahro (2021).

Firm size (SIZE) has a positive impact on accounting conservatism with a significance level

of less than 1%, P-value coefficient is 0.000. This result is consistent with the political cost theory because according to this theory, large-scale enterprises will incur many political costs, so they will be more conservative when preparing financial statements. This result is consistent with the research of Wati et al (2020), Thomas et al (2015).

The Covid-19 (COVID19) pandemic has a negative impact on accounting conservatism at a significance level of less than 1%, P-value is 0.006. This result is contrary to hypothesis H8. This result shows that after the Covid-19 pandemic, when the level of uncertainty in the business environment increases, companies tend to be less conservative. When the environment is uncertain with higher risk, information asymmetry and accounting conservatism are reduced and the benefits of debt-related transactions are more apparent. This result is contrary to the research of Cui et al (2023), Hejranijamil et al (2020).

Conclusion

The main objective of this study is to analyze the influence of financial characteristics on accounting conservatism. Research results show that among the 8 factors included in the model, there are 6 factors that affect accounting conservatism including audit quality, financial leverage ratio, liquidity, and financial distress, firm size and the Covid-19 pandemic. The remaining factors that do not affect accounting accounting conservatism include sale growth and capital intensity. Based on the results of this research, the author recommends that state management agencies need to provide specific and clear regulations on the application of accounting conservatism when preparing financial statements, increasing the usefulness of financial statements. Auditors can refer to the results of this research in assessing risks when performing financial statement audits. In addition, this research also serves the decision-making of investors, suppliers, and banks in evaluating the usefulness of accounting information by considering which factors affect accounting conservatism.

References:

Ahmed, A. S., & Duellman, S. (2011). Evidence on the role of accounting conservatism in monitoring managers' investment decisions. Accounting & Finance, 51(3), 609-633.

Al-Qudah, L. A., Ahmad Qudah, H., Abu Hamour, A. M., Abu Huson, Y., & Al Qudah, M. Z. (2022). The effects of COVID-19 on conditional accounting conservatism in developing countries: evidence from Jordan. Cogent Business & Management, 9(1), 2152156.

Basu, S. (1997). The conservatism principle and the asymmetric timeliness of earnings1. Journal of accounting and economics, 24(1), 3-37.

Christian, M. (2023). The effect of financial distress, company size, capital intensity and leverage on accounting conservatism. Paper presented at the Proceeding of International Conference on Entrepreneurship (IConEnt).

Cui, L., Kent, P., Kim, S., & Li, S. (2021). Accounting conservatism and firm performance during the COVID-19 pandemic. Accounting & Finance, 61(4), 5543-5579.

Dang, N. H., & Tran, M. D. (2020). Impact of financial leverage on accounting conservatism application: the case of Vietnam. Custos E Agronegocio On Line, 16(3), 137-158.

Firdaus, V. F., Yulius, Y., Eriyanto, D., & Muksin, A. (2023). Determinant Variables Affecting Accounting Conservatism (In Consumer Goods Sector Manufacturing Companies Listed On The Indonesia Stock Exchange In 2020-2022). Journal of Accounting and Finance Management, 4(3), 243-249. doi:https://doi.org/10.38035/jafm.v4i3

Ghavi, K., Najafi, Y., & Arfai, A. (2013). The study of effects of accounting conservatism on the flexibility of the financial decisions. International Research Journal of Applied and Basic Sciences, 4(1), 131-138.

Goffar, A., & Muhyarsyah, M. (2022). The Effect of Managerial Ownership, Company Growth, Profitability, and Investment Opportunity Set (IOS) On Accounting Conservatism. Budapest International Research and Critics Institute-Journal (BIRCI-Journal), 5(3). doi:https://doi.org/10.33258/birci.v5i3.6934

Khalifa, M., Trabelsi, S., & Matoussi, H. (2022). Leverage, R&D expenditures, and accounting conservatism: Evidence from technology firms. The Quarterly Review of Economics and Finance, 84, 285-304.

Pashaki, M. M., & Kheradyar, S. (2015). An investigation into the effect of audit quality on accounting conservatism in companies listed in Tehran stock exchange. International Letters of Social and Humanistic Sciences, 50, 107-117.

Pujiono, Radityo, E., Kusumaningtias, R., & Putra, R. (2023). An overview fair play regulation in England premier league: Accounting information for leverage and financial distress to conservatism. Cogent Business & Management, 10(1), 2164996.

Putri, R., Wahyuni, W., Tartilla, N., & Pamungkas, M. N. (2020). Analysis of the Factors That Affect the Company's Accounting Conservatism. The Accounting Journal of Binaniaga, 5(2), 101-112.

Rahayu, S., & Gunawan, D. I. (2018). Factors Influencing the Application of Accounting Conservatism in the Company. KnE Social Sciences, 180–197-180–197. doi:10.18502/kss.v3i10.3128

Reyad, S. M. R. (2012). Accounting conservatism and auditing quality: An applied study on Egyptian Corporations. European Journal of Business and management, 4(21).

Sana'a, N. (2016). The effect of accounting conservatism on financial performance indicators in the Jordanian insurance companies. Journal of Internet Banking and Commerce, 21(1), 1.

Septriana, I., Triyono, H., & Prajanto, A. (2021). The Effect of Financial Distress, Firm Size, Leverage and Litigation Risk on The Application of Accounting Conservatism In Manufacturing Companies Listed In Indonesia Stock Exchange. Jurnal Penelitian Ekonomi Dan Bisnis, 6(2), 100-106.

Sholikhah, R. M. a., & Suryani, A. W. (2020). The influence of the financial distress, conflict of interest, and litigation risk on accounting conservatism. KnE Social Sciences, 222–239-222–239.

Solichah, N., & Fachrurrozie, F. (2019). Effect of managerial ownership, leverage, firm size and profitability on accounting conservatism. Accounting Analysis Journal, 8(3), 151-157. doi:10.15294/aaj.v8i3.27847

Soliman, M. (2014). Auditing quality characteristics and accounting conservatism: An empirical study of the listed companies in Egypt. Corporate Ownership & Control, 11(2).

Teymouri, M. R., & Sadeghi, M. (2020). Investigating the effect of firm characteristics on accounting conservatism and the effect of accounting conservatism on financial governance. Archives of Pharmacy Practice, 1, 124.

Thomas, G. N., Aryusmar, A., & Indriaty, L. (2020). The effect of effective tax rates, leverage, litigation costs, company size, institutional ownership, public ownership and the effectiveness of audit committees in accounting conservatism at public companies LQ45. Journal of Talent Development & Excellence, 12(1), 85-91.

THE MODERATING IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON CREATIVE ACCOUNTING DETERMINANTS AND FINANCIAL REPORTING QUALITY: EVIDENCE FROM VIETNAM

MA. Tran Ngoc Thanh Thuy*

Abstract: ***This study aims to investigate the changes in financial reporting quality (FRQ) due to the corporate social responsibility (CSR) as a moderator of relationship between creative accounting determinants and FRQ in the Vietnamese enterprises. The sample size of the study comprises 343 accountants in Vietnamese firms. Simple random sampling was conducted to select the respondents. Structured questionnaire was the data collection instrument used. The data then were analyzed statistically using SmartPLS software. The results indicate that ethical issues, disclosure quality, internal control and ownership structure have significant positive impact on FRQ. The findings also reveal that corporate social responsibility has moderating effect on the relationships between ethical issues, internal control, ownership structure and FRQ, except for disclosure structure.***

• Keywords: *corporate social responsibility, creative accounting determinants, financial reporting quality.*

JEL codes: M40, M41

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1. Introduction

Financial statements are used as decision making basis by the stakeholders as they show actual financial position and performance of businesses. Creative accounting refers to accounting practices that may (or may not) comply with accounting principles or standards but stray from what these principles or standards are intended to achieve in order to provide a desirable picture of the firm to stakeholders (Bhasin, 2016).

Previous studies focused on the impact of creative accounting practices or creative accounting methods on financial reporting quality (FRQ), but did not focus on creative accounting determinants. Some studies found a significant connection between creative accounting on financial performance (Imo, 2022; Okoye Emma & James Obioma, 2020). In addition, several studies showed a significant effect of the creative accounting methods on the reliability and objectivity of FRQ (Ismael, 2017; Shahid, 2016). In Vietnam, there were a few studies related to creative accounting and most of them were qualitative researches. Ha et al. (2019) argued that creative accounting only had a negative effect when its motives is to present deceived information. In addition, many Vietnamese scholars investigated the issues on creative accounting in manipulating financial statements in enterprises. The results argued that creative accounting techniques on the balance sheet include: assets are inflated, assets are underestimated, and liabilities are underestimated (Dang Thu Hang, 2018; Hang & Trang, 2019; Ngoc, 2020)

Even though some studies link creative accounting determinants to FRQ, the results are still not consistent. Abed et al. (2022) stated the positive and significant impacts of creative accounting determinations on the quality of financial reporting. However, Badr & Ezghayer (2022) and Yasser et al. (2017) demonstrated that one of the creative accounting determinants, which was ownership structure, was negatively associated with FRQ. Moreover, most of related studies which focuse on the impact of creative accounting determinants on FRQ are in the context of banking system which may not be compatible with the context of enterprises due to regulation differences. In addition, there is few research on how corporate social responsibility (CSR) affects the influence of creative accounting determination on FRQ. This study examines both

** University of Economics and Law, Ho Chi Minh City, Vietnam; email: ngocttt@uel.edu.vn*
Vietnam National University, Ho Chi Minh City, Vietnam

the direct effect of creative accounting determinants on FRQ and whether CSR may moderate these relationships in context of Vietnamese businesses. Two questions are clarified in current study:

- How do creative accounting determinants affect FRQ in businesses?

- How does CSR moderate the relationship between creative accounting determinants and FRQ?

The paper is organized as follows: section 2 proceeds with the literature review and research hypotheses, section 3 and 4 present the methodology and the results, section 5 is the discussion and, lastly, the conclusions, are presented in the last section.

2. Literature review and hypothesis development

2.1. Creative accounting determinants and FRQ

Creative accounting involves the transformation of financial amounts using selections, accounting estimates permitted by accounting regulations without fraud. It uses the various loopholes in accounting principles or standards to provide the desired results to the stakeholders (Bhasin, 2016). There are four determinants of creative accounting: ethical issues, disclosure quality, internal control and ownership structure (Abed et al., 2022; Badr & Ezghayer, 2022; Salameh, 2019; Škoda et al., 2017; Vâlcu et al., 2019). FRQ refers to the faithfulness of the information presented during the process of financial reporting. It is defined as the level to which financial statements provide information that is relevant and reliable regarding the financial status and performance of an enterprise (Beest et al., 2009).

Agency theory states that managers, who are shareholders' representatives, may make decisions that are not always intended to increase shareholder value. Due to the conflicts of interest, businesses can declare for bankruptcy or engage in creative accounting practices or financial statement manipulation (Okoye Emma & James Obioma, 2020). The result of Mahdavikhou & Khotanlou (2011) shows that professional ethics have a significant impact on FRQ, therefore, developing professional ethics in accounting will promote FRQ. They reveal that creative accounting is negatively significantly correlated with financial reportings and ethics plays a positive important role in financial reporting. As a result, one cannot disregard the vital role of accounting ethics in financial reporting and when performing financial reporting, a just and fair attitude must be maintained (Tassadaq & Malik, 2015). Thus, it is possible to conclude that ethics can influence FRQ. Based on these findings, the following hypothesis can be developed:

H1. Ethical issues have a positive impact on FRQ.

Corporations with lower quality reports seems to hide their reports and will therefore make a low level of corporate disclosures (Alwardat, 2019). Indeed, many researchers believe that improving disclosure quality can reduce information asymmetry and lower level of earnings management, leading in high quality of financial reporting. Therefore, there is a positive relationship between disclosure quality and FRQ (Abed et al., 2022; Alzoubi, 2016). In addition, firms with a poor disclosure quality, on the other hand, display higher degrees of information asymmetry (Alwardat, 2019). From the conceptual framework and existing literature, the author proposes the following hypothesis:

H2. Disclosure quality has a positive impact on FRQ.

It is assumed that high internal control will solve problems related to governance and FRQ. Strong, effective, and high-quality internal control system are essential for producing highly qualified financial statements. In contrast, week internal control can lead to increased levels of material misstatement and false financial information disclosure; this proves the use of creative accounting (Kim et al., 2019). Moreover, previous studies showed that week internal control significantly affects FRQ. Higher unanticipated accruals are associated with inadequate internal control; the authors propose that management weakness is caused by accounting loopholes (Kim et al., 2019). Therefore, the adoption of internal control systems seen as a useful instrument for improving the FRQ. From the literature, the author suggests the hypothesis:

H3. Internal control has a positive impact on FRQ.

Agency theory agrees that increased ownership concentration improves company control and management since large shareholders have more motivation and capacity to monitor management and boost business productivity. In addition, it is widely believed that ownership concentration

lowers agency issues, which strengthens business performance (Jensen & Meckling, 1976). Although the relationship between ownership structure and FRQ has been demonstrated in previous studies, there are no clear results since there were conflicts between scholars. While some scholars explained that the ownership structure improved FRQ by reducing creative accounting behavior and there was a positive relationship bet ween ownership structure and FRQ (Abed et al., 2022; Yasser et al., 2017), others detected a negative relationship between ownership structure and FRQ dimensions (Arthur et al., 2019; Badr & Ezghayer, 2022). Since this issue is still controversial, the hypothesis is as follows:

H4. Ownership structure has an impact on FRQ.

2.2. The moderating role of CSR

According to stakeholder theory, CSR boosts long-term earnings, builds the trust of stakeholders, and takes responsibility for society through ethical behavior. Fahad Daham Hasan (2022) found that social responsibility practices were positively related to managers' ethical behavior, and it was discovered that managers' moral development was related to their participation in social responsibility, lending credence to the idea that social responsibility practices act as moral incentives for managers who want to serve their community. Additonally, legitimacy theory is a tool that assists organizations in adopting and developing voluntary social and environmental disclosures in order to fulfill their social contract, which allows for the recognition of their goals and survival in an uncertain environment (Dowling & Pfeffer, 1975). Martínez-Ferrero (2014) discovered that social responsibility modifies the relationship between earnings management and business value, implying that social responsibility may be used to hide low FRQ. In addition, Kim et al. (2019) discovered that increased CSR initiatives result in improved internal control efficacy for financial reporting. In fact, organizations with high CSR fulfillment have higher quality internal controls in operation CSR fulfillment increases management's sense of mission, motivating them to strongly strengthen internal control systems in order to improve financial performance. As a result, enterprises can improve their social responsibility, increase the effectiveness of internal control, and so improve their financial performance. According to Zhang & Su (2023), ownership concentration and CSR are significantly positively correlated and the greater the concentration of ownership, the more actively corporations perform their corporate social responsibilities. In addition, the results of Abed et al. (2022) showed positive and significant moderating effects of CSR on ethical issues, internal control and ownership structure. However, CSR has a negative and insignificant effect on the relationship between disclosure quality and FRQ (Abed et al., 2022). Based on the above rationale, the author proposes the hypotheses:

H5. CSR positively moderates the relationship between ethical issues and FRQ.

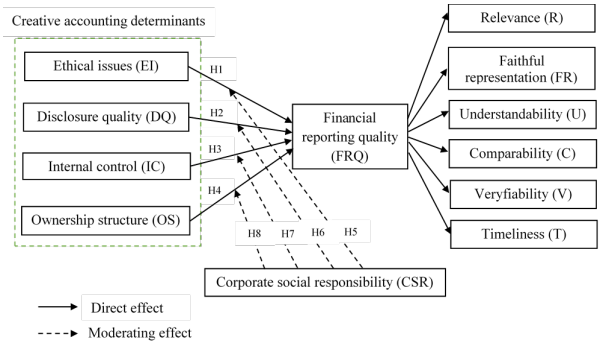
H6. CSR positively moderates the relationship between disclosure quality and FRQ.

H7. CSR positively moderates the relationship between internal control and FRQ.

H8. CSR positively moderates the relationship between ownership structure and FRQ.

Figure 1 illustrates the proposed model in the study

Figure 1 Research model proposed



3. Methodology

This study follows a quantitative approach to test the proposed hypotheses. The survey is split into two sections with 59 questions. The first section includes 7 questions to create profile of the respondents. In section two, there are 52 questions to measure the constructs. The constructs were examined using the 5-point Likert scale to assess survey participants' thoughts: (1) Strongly disagree; (2) Disagree; (3) Neutral; (4) Agree; and (5) Strongly agree.

Firstly, the determinants of creative accounting are measured by Abed et al. (2022). They include ethical issues measured by five items; disclosure quality consists of five items; internal control

has adapted five items and ownership structure is adapted five items. Then, in order to measure FRQ, we use quality characteristics method including six attributes: relevance, faithful presentation, understandability, comparability, timeliness and timeliness and verifiability (IASB, 2008). Relevance is measured by five items, faithful representation consists of six items, understandability has adapted five items, comparability includes seven items and verifiability has two items. All are adapted by Beest et al. (2009); timeliness is measured by two items adapted by Aifuwa et al. (2018). Finally, the five items that measured CSR are adapted by Abed et al. (2022).

The questionnaires then were distributed to respondents who are professional accountants in Vietnamese enterprises. These respondents are considered suitable to share different perspectives on relevant research since they have knowledge and experience in accounting. We performed two surveys: one online using Google Forms and one in person. There were 400 questionnaires delivered to respondents. Total of 362 questionnaires (90.05%) were returned, of which 19 questionnaires (5.25%) were excluded due to incomplete responses or missing data. Finally, appropriate responses were a total of 343 (94.75%). According to the "10-times rule" method, the sample size should be more than ten times the maximum number of inner or outer model links pointing at any latent variable in the model (Hair et al., 2014). Thus, the sample size is adequate for the statistical analysis to be considered sufficiently robust, then, the authors used Smart PLS software to process the data.

4. Results

4.1. Sample characteristics

In total of 343 respondents, there were 255 women (74.3%) and 88 men (25.7%). In term of age, there were 201 respondents at the ages from 18 to 25 (58.6%), 93 respondents were between 26 from 35 years old (27.1%), 44 respondents were from 36 to 45 years old (12.8%) and 5 respondents above 45 years old (1.5%). Concerning to educational qualifications, the majority of respondents were bachelor degree holders with the rate of 75.2%, followed by post graduates degree holders with 12.8%, the remaining were diploma holders with 12%. Regarding to work experience, there are 208 respondents with less than 5 years of work experience, 114 respondents with 11 to 20 years of work experience, and 21 respondents with 5 to 10 years of work experience, with the rate of 60.6%, 33.2% and 6.1% respectively.

4.2. Assessment measurement model

4.2.1. Test the scale reliability

Table 1 demonstrates that the composite reliability (CR) for all variables range between 0.928 and 0.961, all of which were higher than cut-off value of 0.7. In addition, the average variance extracted (AVE) for all variables ranging between 0.699 to 0.0.925 of more than cut-off value of 0.5 and their Cronbach's alpha coefficients were greater than the cut-off value of 0.7 (Hair et al., 2014). Therefore, it can be implied that the reliability of internal consistency was met, and it can improve the accuracy of the presented information.

Table 1. Test the scale reliability results

	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)
C	0.937	0.948	0.724
CSR	0.924	0.937	0.750
DQ	0.934	0.931	0.730
EI	0.932	0.947	0.780
FR	0.915	0.933	0.699
IC	0.936	0.944	0.772
OS	0.930	0.928	0.723
R	0.926	0.944	0.771
T	0.920	0.961	0.925
U	0.938	0.952	0.799
V	0.913	0.958	0.920

Source: Authors' data processing results

4.2.2. Validity (convergent and discriminant) analysis

The results of the tests carried out on the variables used in this study were all displayed values above 0.7, as shown in Table 2. Furthermore, as mentioned above, the average variance extracted (AVE) for all variables were more than the value of 0.5 (Table 3). So, it can be concluded that all the variables confer reliability to the measurement model and convergent validity (Hair et al., 2014).

Based on the Table 3, it was discovered that each variable has an AVE root value more significant than the correlation value. Furthermore, the results in Table 4 showed that all HTMT values are less than 0.85. Thus, the research model has a good discriminant validity value (Hair et al., 2014). Then, the proposed model will be evaluated and the research hypotheses formulated in this study will be tested.

Table 2. Loading factors and cross loadings

	C	CSR	DQ	EI	FR	IC	OS	R	T	U	V
C1	0.861										
C2	0.932										
C3	0.818										
C4	0.870										
C5	0.881										
C6	0.843										
C7	0.738										
CSR1		0.817									
CSR2		0.772									
CSR3		0.844									
CSR4		0.945									
CSR5		0.941									
DQ1			0.725								
DQ2			0.768								
DQ3			0.917								
DQ4			0.958								
DQ5			0.882								
EI1				0.880							
EI2				0.896							
EI3				0.853							
EI4				0.893							
EI5				0.894							
FR1					0.855						
FR2					0.846						
FR3					0.757						
FR4					0.900						
FR5					0.868						
FR6					0.781						
IC1						0.924					
IC2						0.928					
IC3						0.837					
IC4						0.809					
IC5						0.891					
OS1							0.833				
OS2							0.923				
OS3							0.933				
OS4							0.747				
OS5							0.803				
R1								0.875			
R2								0.883			
R3								0.850			
R4								0.899			
R5								0.884			
T1									0.952		
T2									0.971		
U1										0.884	
U2										0.920	
U3										0.947	
U4										0.853	
U5										0.862	
V1											0.964
V2											0.954

Source: Authors' data processing results

Table 3. Fornell Lacker values

	C	CSR	DQ	EI	FR	IC	OS	R	T	U	V
C	**0.851**										
CSR	0.064	**0.866**									
DQ	0.246	0.120	**0.855**								
EI	0.071	0.130	0.084	**0.883**							
FR	0.288	0.287	0.243	0.182	**0.836**						
IC	0.233	0.134	0.216	0.121	0.205	**0.879**					
OS	0.254	0.094	0.141	0.107	0.152	0.324	**0.850**				
R	0.101	0.106	0.225	0.114	0.313	0.209	0.174	**0.878**			
T	0.228	0.069	0.272	0.107	0.226	0.161	0.180	0.169	**0.962**		
U	0.116	0.163	0.222	0.165	0.272	0.245	0.203	0.203	0.186	**0.894**	
V	0.077	0.162	0.193	0.052	0.244	0.131	0.224	0.111	0.309	0.177	**0.959**

Source: Authors' data processing results

Table 4. HTMT ratios

	C	CSR	DQ	EI	FR	IC	OS	R	T	U
C										
CSR	0.085									
DQ	0.230	0.083								
EI	0.078	0.126	0.075							
FR	0.279	0.284	0.208	0.180						
IC	0.295	0.096	0.241	0.114	0.220					
OS	0.297	0.076	0.173	0.073	0.148	0.359				
R	0.128	0.112	0.213	0.102	0.317	0.238	0.234			
T	0.255	0.064	0.274	0.116	0.237	0.206	0.218	0.183		
U	0.128	0.169	0.219	0.160	0.268	0.269	0.172	0.200	0.183	
V	0.089	0.168	0.193	0.053	0.261	0.157	0.251	0.119	0.331	0.181

Source: Authors' data processing results

4.3. Assessment of structural equation modeling

This section focuses on the inner model analysis, using SmartPLS 4 software to examine and validate the causal relationships between the latent variables of the structural model. The value of R2 was 51.2% which showed the independent variables explained the construct of dependent variables by 51.2% while the remaining value was explained by other variables.

The results in Table 5 showed that the ethical issues path coefficient on FRQ is 0.203 with a t-statistics of 5.147 and a significant value of 0.000. It indicated that H1 was accepted. In other words, the influence of ethical issues on FRQ was significant and positive. The results also demonstrated disclosure quality, internal control and ownership structure had the significant values of 0.000, the original samples of 0.231, 0.253 and 0.138, respectively and t-Statistic values of 6.731, 6.512 and 2.843, respectively. Thus, the findings supported hypothesis H2, H3 and H4 which indicated significant positive directions of disclosure quality, internal control and ownership structure on FRQ.

Besides, the results indicated that CSR had a positive and significant moderating effect on the relationship between ethical issues, internal control, ownership structure and FRQ with significant values less than 0.000 for hypotheses H5, H7, H8. The original sample values were 0.250; 0.091 and 0.302, respectively and T-Statistic values were 6.238; 2.502 and 6.437, respectively. However, while testing hypothesis H6, the results demonstrated significant value of 0.410 (greater than 0.05), the original sample of 0.032 and t-Statistic value of 0.824. Therefore, hypothesis H6 was rejected. It can be concluded that CSR had no significant moderating effect on the relationship between disclosure quality and FRQ.

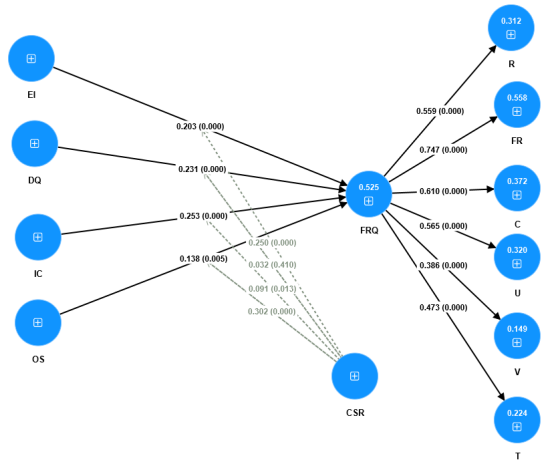
Table 5. Testing PLS path algorithm and bootstrapping

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
EI -> FRQ	0.203	0.204	0.040	5.147	0.000
DQ -> FRQ	0.231	0.231	0.034	6.734	0.000
IC -> FRQ	0.253	0.252	0.039	6.512	0.000
OS -> FRQ	0.138	0.141	0.048	2.843	0.005
CSR x EI -> FRQ	0.250	0.248	0.040	6.238	0.000
CSR x DQ -> FRQ	0.032	0.028	0.039	0.824	0.410
CSR x IC -> FRQ	0.091	0.086	0.036	2.502	0.013
CSR x OS -> FRQ	0.302	0.302	0.047	6.437	0.000

Source: Authors' data processing results

Figure 2 illustrates the findings of the relationship path in the research model.

Figure 2 Bootstrapping results



Source: Authors' data processing results

5. Discussion

The current findings show the positive effects of the determinants of creative accounting on FRQ within the context of Vietnamese enterprises. H1 finding concludes that maintaining a high ethical standard is critical to a trustworthy and transparent financial report. This finding is consistent with the notions of agency theory and those verified by previous scholars, who confirm the higher the ethical value, the less manipulative the behavior and the higher quality of financial reporting (Abed et al., 2022; Badr & Ezghayer, 2022; Ismael, 2017). The H2 finding demonstrates that disclosure quality has been identified as one of the critical factors that increases public trust in the FRQ. This result is in line with those verified by Salameh (2019) showing that weak internal control might lead to increased errors and erroneous financial disclosure in FRQ. The result of hypothesis H3 argues that adhering to an adequate degree of internal control can improve reporting quality. Same evidence is also obtained in the study by Abed et al. (2022) when they realize a positive significant effect of internal control on quality of financial reportings. Therefore, the executives should focus their efforts on improving their internal control system to enhance quality of financial statements. Moreover, the H4 finding shows that the ownership structure has a positive significant impact on FRQ. This finding supports agency theory since according to this theory, increasing ownership concentration improves company control and management as large shareholders have more motivation and capacity to monitor management and boost business productivity. This result also matches with the research of Abed et al. (2022) suggesting that ownership structure has a significant impact on a faithful representation in financial statements. In contrast, the studies of Arthur et al. (2019), Badr & Ezghayer (2022) and Yasser et al. (2017) demonstrate that ownership concentration is negatively associated with FRQ and that owners must concentrate on regulating the agency problem in order to control manipulative activities.

Hypotheses H5, H7 and H8 are validated by the significance of CSR on the firms' FRQ. These results are suitable to legitimacy theory considering CSR as a tool that assists organizations to fulfill their social contract, which allows for the recognition of their goals and survival in an uncertain environment. Furthermore, these results are consistent with earlier investigation of Abed et al. (2022) considering a moderating effect of CSR on relationships between ethical issues, internal control, ownership structure and FRQ. The

result of hypothesis H5 also supports stakeholder theory, where the moderating mechanism of CSR is adequately displayed and a strong relationship between CSR and the ethical issues is demonstrated. In contrast to expectations, hypothesis H6 indicates that there was no statistical relevance between CSR and disclosure quality. The finding reinforces the argument of Abed et al. (2022). Having the same opinion, Mutuc et al. (2019) ensure that CSR has no significant influence on disclosure quality in the firm in order to retain the financial reporting's faithful presentation and understandability.

6. Conclusion

As noted in previous sections, the current study contradicts some previous studies while being consistent with others. As a result, the current study could serve as a foundation for the source of theory to improve field knowledge. The thorough literature review aided in discovering the key determinants of creative accounting which influence financial reportings in the non-financial enterprise sector. Taken together, the findings suggest that the feature of corporate governance affects the level of creative accounting determinants on FRQ. Particularly, through the moderating role of corporate governance aspect, current study has practical implications for directors, auditors, the profession accountants, regulators, and those in charge of governance. They could use current findings to reduce creative accounting practice to improve FRQ.

Despite making some noteworthy contributions, this study has some limitations. Firstly, the research focuses on a single research context in Vietnam. As a result, the findings are not applicable to other industries with different circumstances. International comparisons highlighting differences in the relationship between creative accounting determinants and FRQ and the influence of different nations' legislation will contribute significantly to future studies. In addition, this study concentrates on four creative accounting determinants, thus, it is also suggested that scholars may conduct future studies to investigate the effect of other creative accounting aspects and corporate governance elements on enhancing FRQ.

References:

Abed, I. A., Hussin, N., et al. (2022). The moderating effects of corporate social responsibility on the relationship between creative accounting determinants and financial reporting quality. Sustainability, 14(3), 1195.

Aifuwa, H., Embele, K., et al. (2018). Ethical Accounting Practices and Financial Reporting Quality. Epitome : International Journal of Multidisciplinary Research, 4, 31-44.

Alwardat, Y. (2019). Disclosure Quality and its Impact on Financial Reporting Quality, Audit Quality, and Investor's Perceptions of the Quality of Financial Reporting: A Literature Review. Accounting and Finance Research, 8(3), 201-201.

Alzoubi, E. S. S. (2016). Disclosure quality and earnings management: evidence from Jordan. Accounting Research Journal, 29(4), 429-456. doi:10.1108/ARJ-04-2014-0041

Arthur, N., Chen, H., et al. (2019). Corporate ownership concentration and financial reporting quality: International evidence. Journal of Financial Reporting and Accounting, 17, 00-00. doi:10.1108/JFRA-07-2017-0051

Badr, H., & Ezghayer. (2022). The relationship between creative accounting determinants and financial reporting quality of listed companies in Iraq. World Economics and Finance Bulletin, 10, 117-125.

Beest, F., Braam, G., et al. (2009). Quality of financial reporting : measuring qualitative characteristics. System Dynamics Review - SYST DYNAM REV.

Bhasin, M. L. (2016). Survey of creative accounting practices: An empirical study. Wulfenia Journal KLAGENFURT, 23(1), 143-162.

Dang Thu Hang. (2018). Kế toán sáng tạo nhằm thao túng Báo cáo tài chính trong doanh nghiệp. Tạp chí Kế toán và Kiểm toán, 5/2018.

Dowling, J., & Pfeffer, J. (1975). Organizational Legitimacy: Social Values and Organizational Behavior. Pacific Sociological Review, 18(1), 122-136. doi:10.2307/1388226

Fahad Daham Hasan, P. D. S. s. h. (2022). The impact of corporate social responsibility on creative accounting practices. Central European Management Journal, 30(4), 839-845. doi:10.57030/23364890.cemj.30.4.81

Ha, D. T. T., Lien, N. T. B., et al. (2019). Tác động của Kế toán sáng tạo trong doanh nghiệp và một số vấn đề đặt ra. Tạp chí Tài chính Online, 2/2019.

Hair, J., Hult, G. T. M., et al. (2014). A Primer on Partial Least Squares Structural Equation Modeling.

Hang, N. K. T., & Trang, N. T. D. (2019). Ảnh hưởng của kế toán sáng tạo đến báo cáo tài chính. Tạp chí Kế toán - Kiểm toán, 3/2019.

IASB. (2008). Exposure draft of an improved conceptual framework for financial reporting: Chapter 1: The objective of financial reporting; Chapter 2: Qualitative characteristics and constraints of decision-useful financial reporting information: IASB London.

Imo, T. O. P. (2022). Creative Accounting and Financial Performance of Food and Beverages Companies in Nigeria. International Journal of Academic Research.

Ismael, A. Y. A. (2017). The Impact of Creative Accounting Techniques on the Reliability of Financial Reporting with Particular Reference to Saudi Auditors and Academics. International Journal of Economics and Financial Issues, 7(2), 283-291.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3(4), 305-360. doi:https://doi.org/10.1016/0304-405X(76)90026-X

Kim, J.-B., Lee, J. J., et al. (2019). Internal Control Weakness and the Asymmetrical Behavior of Selling, General, and Administrative Costs. Journal of Accounting, Auditing & Finance, 37(1), 259-292. doi:10.1177/0148558X19868114

Mahdavikhou, M., & Khotanlou, M. (2011). The impact of professional ethics on financial reporting quality. Australian Journal of Basic and Applied Sciences, 5(11), 2092-2096.

Martínez-Ferrero, J. (2014). Consequences of financial reporting quality on corporate performance: Evidence at the international level. Estudios de economía, 41, 49-88. doi:10.4067/S0718-52862014000100002

Mutuc, E. B., Lee, J.-S., et al. (2019). Doing Good with Creative Accounting? Linking Corporate Social Responsibility to Earnings Management in Market Economy, Country and Business Sector Contexts. Sustainability, 11(17). Retrieved from doi:10.3390/su11174568

Ngoc, D. T. B. (2020). Kế toán sáng tạo và một số vấn đề đặt ra cho các doanh nghiệp Việt Nam. Tạp chí Công thương, 2/2020.

Okoye Emma, I., & James Obioma, N. (2020). Impact of creative accounting techniques on firm financial performance: A study of selected firms in Nigeria. Journal of Accounting and Financial Management, 6.

Salameh, R. S. (2019). What is the impact of internal control system on the quality of banks' financial statements in Jordan? Academy of Accounting and Financial Studies Journal, 23, 1/13.

Shahid, M. (2016). Influence of creative accounting on reliability and objectivity of financial reporting (factors responsible for adoption of creative accounting practices in Pakistan). Journal of Accounting and Finance in Emerging Economies, 2(2), 75-82. doi:https://doi.org/10.26710/jafee.v2i2.41

Škoda, M., Lengyelfalusy, T., et al. (2017). Creative accounting practicies in Slovakia after passing financial crisis. Copernican Journal of Finance & Accounting, 6(2), 71-86. doi:10.12775/CJFA.2017.012

Tassadaq, F., & Malik, Q. A. (2015). Creative accounting & financial reporting: model development & empirical testing. International Journal of Economics and Financial Issues, 5(2), 544-551.

Vâlcu, C., Mârt, R., et al. (2019). The Determining Factors of Creative Accounting. Ovidius University Annals Economic Sciences Series, 19(2), 927-933.

Yasser, Q. R., Mamun, A. A., et al. (2017). The impact of ownership structure on financial reporting quality in the east. International Journal of Organizational Analysis, 25(2), 178-197. doi:10.1108/IJOA-08-2015-0894

Zhang, L., & Su, W. (2023). Corporate social responsibility, internal control, and firm financial performance. Frontiers in Psychology, 13. doi:10.3389/fpsyg.2022.977996

FACTORS AFFECTING CUSTOMER ENGAGEMENT IN ONLINE NONPROFIT COMMUNITIES

MA. Do Minh Diep* - Assoc.Prof.PhD. Le Thi My Linh*

Abstract: ***Although a number of studies have investigated marketing implications in the perspective of virtual environment, inadequate attention has been paid to antecedents of customer engagement in nonprofit organizations. Hence, the main objective of this paper is to examine the impact of social presence and customer involvement on customer engagement in online nonprofit communities. We employed an online survey questionnaire for customers of NPOs who follow their Facebook pages. Findings show that social presence and customer involvement are strong predictors of customer engagement. These research findings contribute to the existing literature about how customer engagement is formed in the particular context of online nonprofit communities, with critical implications for marketing practice.***

• Keywords: *social presence, involvement, customer engagement, nonprofit community.*

JEL codes: L31, M10, M31

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1. Introduction

Nonprofits often focus on addressing social, environmental, or cultural issues that may not receive adequate attention from the government or for-profit sectors; hence, they fill gaps in services and advocate for marginalized or underrepresented communities. Nonprofits bring people together around shared goals and causes, fostering a sense of community and collective action. According to Pope et al. (2009), nonprofit customers fall into three main groups: donors, client, and volunteers. Nonprofit clients receive the service, volunteers seek for experience and contribution while donors focus on effective resources distribution. With the development of digital platforms in facilitating interaction, cooperation, and resource utilization, online nonprofit communities have become a tool to connect and keep an engagement between nonprofits and their customers. Therefore, customer engagement (CE) in these online communities play a vital role in building relationships, fostering a sense of community, stimulating participation and action such as volunteer, word of mouth or donation (Algharabat, 2018).

Despite the benefits of CE in online nonprofit communities, studies on what can stimulate CE in this context are scant and require deeper research. Prior literature tends to focus on antecedents of CE as a unidimensional construct (Sprott et al. 2009). However, when looking at CE from the perspective of a multidimension construct which is composed of cognitive processing, affection factor and activation factor (Hollebeek et al, 2014), whether CE in online nonprofit communities can be stimulated by those antecedents is yet to be empirically tested. Hence, we aim to answer the call by scholars to investigate how CE is facilitated in the particular context of online nonprofit communities.

2.1. Customer engagement in online nonprofit community

CE which was developed as a sub-unit of engagement that focuses on the interactions or participation towards specific brands or services (Vivek et al. 2014). CE is conceptualized as a customer's positively valanced brand-related cognitive, emotional and behavioral activity during or related to focal customer/brand interactions (Hollebeek, 2014). In extant literature, although some studies have investigated CE as a unidimensional perspective, multidimensional perception tends to be more favoured (e.g. Romero, 2017). Cognitive processing, affection and activation tend to be the most applied dimensions of CE (Romeo, 2017) . Firstly, cognitive processing is identified as a customer's level of brand-related thought processing and elaboration in a particular customer/ brand interaction. Secondly, affection indicates a customer's degree of positive brand-related affect in a particular customer/ brand interaction. Thirdly, activation denotes a

* *National Economics University; email: dominhdiep@neu.edu.vn - lmlinh@bsneu.edu.vn*

customer's level of energy, effort and time spent on a brand in a particular customer/ brand interaction. In consistent with previous studies, online CE refers to customers' online, behavioral manifestations of brand engagement that go beyond purchase.

In the context of nonprofits, Akingbola (2019) all posit value congruence as well as rewards and recognition as antecedents of CE. Based on Social exchange theory, these scholars argue that the cognitive, emotional and physical energy that customers bring to their role is dependent on the level of resources and support that the NPOs provide to their customers. As share values are at the core of NPOs, shared values and common concerns in the community espouse themselves in the absorption of NPOs. These nonprofit values and concerns are engaged in problem solving activities. Thus, the mission and goals of a NPO is a by-product of certain values that customers have deemed worthy of their resources. However, while several NPOs apply values that are organizational resources and are related to performance, Helmig et al. (2015) have found no difference in value prioritization and performance across value prioritization groups. Another antecedent of CE in nonprofits is rewards and recognition. Since nonprofit customers stem motivation from the occasions to contribute to a social mission, engage in public good, and gain their values through the values of the organization, extrinsic reward is not a primary driver of motivation for them. Therefore, nonprofit customers tend to have intrinsic motivation from reward and recognition (Akingbola, 2013), which means they are more likely to receive non-monetary rewards. Equal policies and an environment that symbolizes their values, and the opportunity to contribute to social causes are expected as it is the root of nested social exchange in NPOs. Nevertheless, nonprofit customers have been described as being unique in terms of their positioning to rewards and recognition, individuals vary in their perception of the benefits from their contribution and the organization, their engagement can be related to the extent to which nonprofit customers perceive the amount of rewards and recognition (Akingbola, 2019).

2.2. Social presence in online nonprofit community

Social presence (SP), which is the core of the social context has been investigated comprehensively in online communication research (Weisberg et al. 2011). Social presence of a particular communication medium is defined as the degree of positive interpersonal and emotional connection between users of online media. In terms of information richness theory, social presence refers to the extent to which a medium allows a user to experience others as being psychologically present. Social presence theory argues that SP influences one's use of medium (Weisberg et al. 2011). Moreover, prior studies show that social presence also leads to customers' trust, particularly the benevolence, and contributes to subsequent outcomes. Social presence allows customers to engage with others with the perception of psychological presence. Therefore, scholars denote the relationship between social presence and the sense of illusion as well as human presence.

2.3. Customer involvement in online nonprofit community

Customer involvement is conceptualized as "a person's perceived relevance of the object based on inherent needs, values, and interests" (Zaichkowsky, 1985). In consumer behavior study, customer involvement tends to be ambiguous and can be confused with engagement and participation. According to these scholars, unlike engagement, involvement needs a consumption object and relates to a passive state of mental sources towards an active relationship with the consumption object. Additionally, customers with low involvement tend to be more active in sharing stimulating content online than those with high involvement. In contrast, Fan and Miao (2012) posit that highly involved customers are willing to take on opinions from other customers. In view of intangible nature of NPO services, customers may spend much time looking for information provided by NPOs online to support their engagement level during information search stage or after using services. Customer involvement can be stated as the extent of customers that depend on online communities to meet his/her information needs before dealing with specific NPOs.

3. Hypothesis development and research model

Shin and Choo (2011) posit that as long as a medium provides an adequate degree of social presence, it is more likely to convey non-verbal contents such as individual's facial expression, posture or dress. As a result, social presence facilitates more personal cues, transform multiple information cues simultaneously and utilize natural expression, which are different characteristics of media richness function. Regarding media richness theory, these scholars stated that the richer the medium is, the more knowledge that can be absorbed through a medium. Whereas, according to Hollebeek et al. (2014), cognitive process dimension of

CE is defined as customers' acquiring information and how this knowledge is gained or applied. It is on this ground that social presence is positively related to CE cognitive process. It is reported a positive relationship between social presence and enjoyment, since they feel like "entering another world" by the existence of social presence. This enjoyment accelerates affective CE as it denotes customers' positive brand-related impact in their interaction. Gefen and Straub (2003) confirm that social presence significantly contributes to the development of trust. It is well noted that this trust comes along with information rich, customer-oriented contents helps reduce ambiguity, reduce risk and motivate customers to take action with low level of dissonance. As a result, customers are more likely to engage in activation aspect. Hence, we hypothesize that:

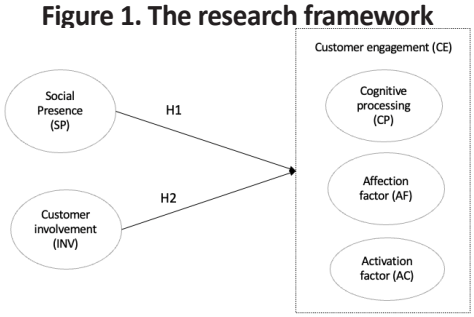
H1. Social presence is positively related to CE in online nonprofit communities.

Customer involvement emphasizes the personal relevance of an object to the individual and performs as the hook for online CE. This object can be a media platform or a brand and its content (Algharabat et al., 2020). Recent research found out that customer involvement may arise in various forms including cognitive, affective, and motivational ones; therefore, it may have the impact on the cognitive, affective, and behavioral engagement of customers (Algharabat et al., 2020). Hollebeek et al. (2014) also find a positive relationship between customer involvement and CE from all these three dimensions. Dwivedi (2015) asserts that customer involvement is a main antecedent of CE. Therefore, we hypothesize that:

H2. Customer involvement is positively related to CE in online nonprofit communities.

From the above discussion, the theoretical framework for this study is as follows:

Figure 1. The research framework



4. Research method

A quantitative survey was conducted in May, 2024 to collect data to help empirically test the research framework in the online communities of nonprofits. All items are evaluated on a 5-point Likert-type scale, from 1 (Strongly Disagree) to 5 (Strong Agree). In fact, we collected a total of 504 valid responses from Vietnamese people who follow Facebook pages of NPOs related to charity foundations, which inform visitors about their activities and seek donations. We filtered the respondents by asking if they follow the news feed of the Facebook page of their favorite NPOs frequently. If they answered yes, they were required to think about their most favorite NPO Facebook page. Then, the specific name of this nonprofit organization was auto-filled for all questions relating to the [Non-profit organization X] in the survey questionnaire. Among 504 respondents, 42.5% were males (214 people) while 55.8% were females (281 people). There are 62.3% of people aged 18-30 years old, 29.4% of those from 31 to 50 years old. The largest proportion of the sample (students) accounts for 48%. Officers and business people accounts for 8.1% and 11.1% , respectively. The sample also includes 58.9%, 5.8%, 20.6% and 14,7% of participants from Hanoi, Da Nang, Ho Chi Minh City and other pronvinces, respectively.

Table 1. Measurement scales

Construct	Authors
Social Presence (SP1-SP4)	Algharabat et al (2018)
SP1: [Non-profit organization X] makes me feel comfortable, as if I am with a friend.	
SP2: I feel included in [Non-profit organization X].	
SP3: There is a sense of sociability on [Non-profit organization X].	
SP4: There is a sense of human warmth on [Non-profit organization X].	
Consumer involvement (INV1- INV4)	Algharabat et al (2018)
INV1: Because of my personal attitudes, I feel that [Non-profit organization X] is the brand that ought to be important to me.	
INV2: Because of my personal values, I feel that [Non-profit organization X] is the brand that ought to be important to me.	
INV3: [Non-profit organization X] is very important to me personally.	
INV4: Compared with other organizations, [Non-profit organization X] is important to me.	
INV5: I'm interested in [Non-profit organization X].	
CE "cognitive processing" (CP1-CP3)	Hollebeek, Glynn and Brodie (2014)
CP1: Following its Facebook page gets me to think about [Non-profit organization X].	
CP2: I think about [Non-profit organization X] a lot when I'm following its Facebook page.	
CP3: Following its Facebook page stimulates my interest in learning more about [Non-profit organization X].	
CE "affection" factor (AF1-AF4)	Hollebeek, Glynn and Brodie (2014)
AF1: I feel very positive when I follow [Non-profit organization X].	
AF2: Following [Non-profit organization X] makes me happy.	
AF3: I feel good when I follow [Non-profit organization X].	
AF4: I'm proud to follow [Non-profit organization X].	
CE "activation" factor (AC1-AC3)	Hollebeek, Glynn and Brodie (2014)
AC1: I spend a lot of time following [Non-profit organization X] compared to other non-profit organizations.	
AC2: Whenever I'm following my non-profit social networking sites, I usually follow [Non-profit organization X].	
AC3: I follow [Non-profit organization X] the most.	

5. Findings

The authors used SPSS and AMOS software to examine both the measurement model (i.e. confirmatory factor analyses) and structural model (i.e. the proposed conceptual model and hypotheses). Cronbach's

alphas for Social presence, Customer involvement, Informational support, Emotional support, Cognitive processing, Affection, Activation are 0.910, 0.856, 0.865, 0.885, 0.801, 0.858, 0.8818 respectively, denoting high reliabilities of the measures.

CE was treated as a second-order construct and the model fit was tested. The results show an adequate level of model fitness due to the fact that all indices captured values within their threshold levels ($\chi2$ = 58.712, df = 31; and $\chi2$/df = 1.894), CFI = 0.987, GFI = 0.977, TLI = 0.982, and RMSEA = 0.042 (Figure 2 and Table 2). The first-order constructs CP, AF and AC all have a significant coefficient value with CE as a second-order construct. Table 3 shows discriminant validity through the Pearson correlation between constructs against the square roots of average variance extracted across diagonal, all of which proved to be acceptable.

Table 2. Discriminant validity of CE

Construct	AF	AC	CP
AF	**0.786**		
AC	0.547***	**0.777**	
CP	0.461***	0.549***	**0.758**

In the next stage of the structural equation modeling analyses, CFA test for all constructs was conducted. All constructs had a coefficient alpha value higher than 0.70. All items were also noticed to significantly load in their targeted constructs with standardized value above 0.89 (Hair et al.,2009). All fit indices related to the measurement model were noticed to be within their recommended level (i.e. $\chi2$ = 414.213, df = 254, and $\chi2$/df = 1.631, CFI = 0.976, GFI = 0.938, TLI = 0.972, and RMSEA = 0.035) (Hu and Bentler, 1999). This result implies that the measurement model adequately fit its observed data.

Table 3. Results of structural equation model

Hypothesis	Direction			Estimate	t-value	P	Result
H1	CE	<---	SP	0.165	3.302	***	Supported
H2	CE	<---	INV	0.477	7.971	***	Supported

To test the hypotheses proposed, structural equation modeling for the research model was conducted. Results show that all constructs have coefficient alpha value > 0.70. Observed items significantly load in their targeted constructs with standardized value above 0.89 (Hair et al.,2009). All fit indices related to the measurement model were noticed to be within their recommended level (i.e. $\chi2$=491.452, df = 262, and $\chi2$/df = 1.876, CFI = 0.966, GFI = 0.927, TLI = 0.961, and RMSEA = 0.042) (Hu and Bentler, 1999). This implies that the measurement model adequately fit its observed data.

The result of hypotheses testing support postulated path for H1 and H2. Customer involvement has the strongest impact on CE in online nonprofit communities with $\gamma_{CE<-INV}$ = 0.477; t-value = 7.971. Social presence also has the impact on CE with $\gamma_{CE<-SP}$ = 0.165; t-value = 3.302.

6. Discussion, conclusion and recommendation

Based on the data analysis and findings, our research makes several contributions. Antecedents of CE, a multidimensional construct, including cognition, affection, and activation, are empirically tested in online nonprofit communities. Results show that social presence, customer involvement and emotional support have a positive impact on CE in online nonprofit communities. This result is consistent with previous studies in different contexts (Algharabat et al 2018). Among these factors, customer involvement has the strongest influence on CE, followed by social presence. This study also shed light on an important context, Facebook group page of NPOs in Vietnam. As a result, we advise NPOs using Facebook page as an engagement tool to design their pages to bring more sense of human warmth. They can keep posting and sharing pictures, videos, reels or updating stories to allow more customer involvement or connection. This research still suffers from several limitations. Cross sectional study applied in this study may only represent a snapshot timing. Only Facebook pages were employed to collect data while NPOs may have various communities on different platforms. Future research may consider other factors reflect the evolving nature of online communities such as virtual experience to be the antecedent of CE (Algharabat, 2018).

References:

Akingbola, K., & van den Berg, H. A. (2019). Antecedents, Consequences, and Context of Employee Engagement in Nonprofit Organizations. Review of Public Personnel Administration, 39(1), 46–74.

Algharabat, R., Rana, N. P., Dwivedi, Y. K., Alalwan, A. A., & Qasem, Z. (2018). The Effect of Telepresence, Social Presence and Involvement on Consumer Brand Engagement: An Empirical Study of Non-Profit Organizations.

Brodie, R. J., Ilic, A., Juric, B., & Hollebeek, L. (2013). Consumer engagement in a virtual brand community: An exploratory analysis. Journal of Business Research, 66(1), 105–114.

Helmig, B., Hinz, V., & Ingerfurth, S. (2014). Valuing Organizational Values: Assessing the Uniqueness of Nonprofit Values. Voluntas, 26(6), 2554–2580.

Hollebeek, L. D., Glynn, M. S., & Brodie, R. J. (2014). Consumer brand engagement in social media: Conceptualization, scale development and validation. Journal of Interactive Marketing, 28(2), 149–165.

Jaakkola, E., & Alexander, M. (2014). The Role of Customer Engagement Behavior in Value Co-Creation: A Service System Perspective. Journal of Service Research, 17(3),

Kahn, W. A. (1990). Psychological Conditions of Personal Engagement and Disengagement at Work. In Source: The Academy of Management Journal (Vol. 33, Issue 4).

Keating, E. K., & Frumkin, P. (2003). Reengineering Nonprofit Financial Accountability 3.

Lee, H. E., & Cho, J. (2019). Social Media Use and Well-Being in People with Physical Disabilities: Influence of SNS and Online Community Uses on Social Support, Depression, and Psychological Disposition. Health Communication, 34(9), 1043–1052.

Suh, J. (2022). Revenue Sources Matter to Nonprofit Communication? An Examination of Museum Communication and Social Media Engagement. Journal of Nonprofit and Public Sector Marketing, 34(3), 271–290. https://doi.org/10.1080/10495142.2020.1865231

Vivek, S. D., Beatty, S. E., Dalela, V., & Morgan, R. M. (2014). A generalized multidimensional scale for measuring customer engagement. Journal of Marketing Theory and Practice, 22(4), 401–420.

Weisberg, J., Te'eni, D., & Arman, L. (2011). Past purchase and intention to purchase in e-commerce: The mediation of social presence and trust. Internet Research, 21(1), 82–96.

Zhang, M., Hu, M., Guo, L., & Liu, W. (2017). Understanding relationships among customer experience, engagement, and word-of-mouth intention on online brand communities: The perspective of service ecosystem. Internet Research, 27(4), 839–857.

DEVELOPMENT OF THE PROCESSING AND MANUFACTURING INDUSTRY IN VIETNAM: CURRENT SITUATION AND SOLUTIONS

MA. Hoang Thi Thuy*

Abstract: ***The processing and manufacturing industry that mainly determines the growth of the entire industrial sector, creates large added value for the industrial sector and is a major driving force for Vietnam's economic growth in recent years. The processing and manufacturing industry has become the one that attracts the largest foreign direct investment out of 18 economic sectors with foreign direct investment. This paper discusses the current situation, thereby proposing a number of solutions to promote the development of the processing and manufacturing industry in the coming time.***

• Keywords: *processing and manufacturing industry.*

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1. Introduction

Unlike other industries, the processing and manufacturing industry is the one that directly creates the material foundation for the economy and society, producing the main material wealth for the country. On the other hand, the development of the processing and manufacturing industry also creates a solid foundation and develops the market for the service and agricultural sectors and vice versa.

In Vietnam, the industrial sector includes four main industries: Mining, Processing and Manufacturing Industry, Production and Distribution of Electricity and Gas, and Water Supply and Drainage. The processing and manufacturing industry is the sector that mainly determines the growth of the entire industrial sector, creates large added value for the industrial sector and has been a major driving force for the Vietnam's economic growth over the past many years. Currently, the Government has set specific targets for the socio-economic development plan for the 2021-2025 period, including 23 targets; including: The proportion of processing and manufacturing industry in GDP reaches more than 25%; the contribution of total factor productivity (TFP) to growth reaches about 45%... These targets show that the manufacturing industry is identified as one of the factors that create growth momentum in the coming period, contributing to promoting the process of transforming the growth model from breadth to depth. Therefore, finding solutions to promote the development of the manufacturing industry is necessary.

2. Overview of the processing and manufacturing industry

2.1. The role of processing and manufacturing industry

- The processing and manufacturing industry plays an important role in socio-economic development. It is an important part of the industrial sector and a part of the national economy. Among the industrial sub-sectors, the processing and manufacturing industry plays a leading role, creating the greatest added value for the industrial sector and having an overall spillover effect on the quality of economic growth. The scale and growth rate of the industry affect the scale, direction and overall growth rate of the entire economy.

- The processing and manufacturing industry provides jobs, attracts workers, and solves a number of social problems. In Vietnam, in recent years, a number of processing and manufacturing industries such as textiles, garments, footwear, clothing, agricultural processing, etc. have developed strongly, partly due to their ability to attract a large number of workers.

- Processing industry activities, especially deep processing industry of raw products from domestic raw materials, allow the processing and manufacturing industries to implement chain linkages and increase the added value of domestic products. Thereby increasing inter-industry and inter-regional connectivity in the country and expanding to strengthen inter-national, inter-regional and international connectivity.

- The processing and manufacturing industry provides production materials for the production process and consumer goods to serve people's lives and serve exports. With that function, the processing and manufacturing industry has created production materials to operate production and service industries in the national economy. The role of providing consumer products to people is increasingly important with the use value of consumer products for life becoming

* *Thuongmai University; email: hoangthuytht@gmail.com*

increasingly rich and diverse.

- The processing and manufacturing industry plays an important role in accumulating material bases for the socio-economic development process. Due to being equipped with modern technology and equipment, some processing and manufacturing industries have high labor productivity, creating higher accumulation than the agricultural, forestry and fishery sectors. The accumulated results from the processing and manufacturing industry will be used for socio-economic development investment projects, building and implementing plans and strategies for the country's long-term socio-economic development.

- The processing and manufacturing industry promotes innovation in growth model, towards industrialization and modernization of the country. Statistics in the recent period show that this industry plays an increasingly important role in the economy, with the contribution in processing and manufacturing increasing from 12.9% in 2010 to 16.7% in 2020. The processing and manufacturing industry is also shifting its structure towards increasing the proportion of high-tech industries in both added value and export turnover.

3. Current situation

3.1. Contribution to the Industry of Vietnam

In industried countries, whether developed or emerging, the processing and manufacturing industry always contributes about 20% to GDP. In Vietnam, the processing and manufacturing industry is the sector that mainly determines the growth of the entire industry, creating great added value for the industrial sector. This is also a major driving force for economic growth as well as creating the premise and foundation for the process of industrial development and modernization of the country over the past years.

Proportion of industry and the processing and manufacturing industry in GDP (%)

Year	2015	2017	2018	2019	2020
Proportion of industry	27.8	27.7	28.4	28.6	27.5
Proportion of processing and manufacturing industry	13.7	15.3	16.0	16.5	16.7

Source: Statistical Yearbook 2021

In terms of proportion in the structure of export goods, the processing and manufacturing industry also plays a very important role. Specifically, the proportion of industrial goods in the processing and manufacturing industry increased from 55.6% in 2010 to 85.2% in 2020, surpassing the target in the Import-Export Strategy for the 2010-2020 period (62.9%). In 2023, exports of products in the processing and manufacturing industry are estimated to reach 313.73 billion USD, accounting for 88.3%. In the first 7 months of 2024, the export turnover of products in the processing and manufacturing industry reached nearly 192 billion USD, accounting for 84.6% of total export turnover and increasing by 15.4% over the same period in 2023. Many product groups achieved high growth rates, including key export items such as: Cameras, camcorders and components increased by 51.5%; Computers, electronic products and components increased by 30%; Plastic products increased by 29.9%; Wood and wood products increased by 23.3%; Machinery, equipment, tools, and other spare parts increased by 19%; phones of all kinds and components increased by 12.3%...

3.2. Growth rate of the processing and manufacturing industry

In fact, if comparing the entire economy, the industrial sector in general and the processing and manufacturing industry in particular has the strongest breakthrough. In fact, statistics in the recent period show that the processing and manufacturing industry plays an increasingly important role in the economy, with its contribution to GDP increasing from 12.9% in 2010 to 16.7% in 2020.

In 2023, although the Vietnam's economy still faces many difficulties and challenges after the COVID-19 pandemic, the processing and manufacturing industry continues to show positive recovery with the Industrial Production Index (IIP) estimated to increase by 3.1%, higher than the overall growth rate of the whole industry. The consumption index of the entire processing and manufacturing industry increased by 1.8% compared to 2022 (increased by 7.1% in 2022); the processed industrial goods group continued to account for the majority (85%) in the export turnover structure. In the first 6 months of 2024, the processing and manufacturing industry continued to be the growth driver of the entire economy. The added value of this industry increased by 8.67% (in the first quarter it increased by 7.21%; in the second quarter it increased by 10.04%), contributing 2.14 percentage points to the total added value growth of the entire economy.

3.3. Driving force for attracting FDI

In Vietnam, the processing and manufacturing industry has become the industry attracting the largest foreign direct investment capital out of 18 economic sectors with foreign direct investment capital.

According to the General Statistics Office (2023), FDI capital in Vietnam's processing and manufacturing industry in 2023 continued to increase sharply, reaching USD 23.5 billion, accounting for 64.2% of the total newly registered capital compared to the corresponding figures in 2022 of USD 16.8 billion and 60.6%. In the first 6 months of 2024, the processing

and manufacturing industry continued to lead with total FDI capital reaching nearly USD 10.69 billion, accounting for 70.4% of total registered investment capital, up 26.3% over the same period.

3.4. Other contributions

Currently, the processing and manufacturing industry accounts for nearly 40% of the total net production and business revenue of the economy. In terms of scale, this industry has 7.5 million workers, generated annual revenue of more than VND 8 million billion, much higher than agriculture, wholesale and retail, or minerals. The processing and manufacturing industry is also shifting its structure towards increasing the proportion of high-tech industries in terms of both added value and export turnover.

4. Difficulties and limitations

The survey results of Report on production and business trends of the processing, manufacturing and construction industry in the second quarter of 2024 and forecast for the third quarter of 2024 show that in the second quarter of 2024, the two biggest difficulties for enterprises in the processing and manufacturing industry are still "low domestic market demand" and "high competitiveness of domestic goods" with the percentage of enterprises choosing 53.4% and 50.4%, respectively (GSO, 2024). In addition, "high loan interest rates" is the difficulty that enterprises assess to have increased the most compared to the first quarter of 2024 (an increase of 3.9 percentage points compared to the first quarter of 2024) with the percentage of enterprises choosing 22.3%. In general, up to now, Vietnam's processing and manufacturing industry has also faced many difficulties and challenges, specifically:

- The processing and manufacturing industry accounts for nearly 40% of the total net revenue from production and business of the economy, but only accounts for nearly 20% of GDP, lower than many countries in the region and in the world.

- The level of development is still far below the requirements of an industrial country. The competitiveness of the processing and manufacturing industry is still weak compared to other countries in the region. The ranking of some indicators of the processing and manufacturing industry of Vietnam is only higher than that of Laos, Cambodia, Myanmar, much lower than that of Malaysia, Singapore, Thailand...

- The localization rate of products is not high yet; while the processing and manufacturing industry depends heavily on imports, lacks initiative and is vulnerable to fluctuations in the world market... Although the processing and manufacturing industry group accounts for the majority of the import-export turnover structure, this industry still has many limitations. Import-export activities continue to depend on a number of markets, products and FDI sectors.

- Technology transfer and scientific research in processing and manufacturing enterprises are still weak; supporting products still lacks variety. Currently, most of Vietnam's industrial enterprises are still using technology that is 2-3 generations behind the world average. In the structure of industrial production value in the processing and manufacturing industry, low and medium technology accounts for more than 60%.

- Most of the processing and manufacturing enterprises are small-scale enterprises, have not proactively built long-term business strategies and diversified product types; have got low production and business efficiency and low competitiveness... vMeanwhile, industrial enterprises, including large state-owned enterprises, have not really paid attention to investing adequately in technological innovation, nor do they have the ability or sufficient resources to invest in technology.

- Investment issues in this field have not gone into depth, attracting and utilizing foreign investment capital is still limited.

- The processing and manufacturing industry is an industry that often has high barriers to market entry. These are natural barriers due to the characteristics of the industry such as large initial investment, long capital turnover time; requirement of high-quality human resources... All these make the processing and manufacturing industry less attractive in attracting social investment than other economic sectors.

5. Some solutions

The processing and manufacturing industry is considered the important driving force in expanding production and export of the economy. In the coming time, to continue promoting the development of the processing and manufacturing industry, the author recommends the following tasks and solutions:

5.1. For central agencies

- Continue to maintain and stabilize the macro economy, control inflation, create confidence for people and businesses in production and business activities; manage credit focusing on production and business sectors to create growth momentum; manage exchange rates appropriately; unblock capital flows and promote credit growth, create capital sources for businesses to overcome difficulties and promote production and business activities.

- Continue to create an open and favorable investment and business environment so that domestic

industrial enterprises can grow, create greater domestic added value, connect with foreign investment sectors, and participate more deeply in the global value chain.

- Continue to have mechanisms, policies and laws to promote rapid development and create breakthroughs in the development of the processing and manufacturing industry so that this industry becomes a pillar of the economy and a foundation, a driving force leading the growth of the entire industry and economy. Accordingly, it is necessary to have policies and solutions to support financial support for industrial enterprises, especially processing and manufacturing enterprises, so these enterprises have stable production and business conditions. Develop and effectively implement industrial and supporting industry development programs in the area, focusing on improving the capacity of small and medium enterprises.

- Research and pilot a number of breakthrough mechanisms and policies to promote the development of emerging industries and fields and new effective business models, creating new momentum for the country's economic growth. Focus on developing important fundamental industries and supporting industries. Prioritize the development of a number of key industries, new technology industries, and high technology industries such as: Chip manufacturing, semiconductors, mining, and mineral processing to become a new driving force for the development of the processing and manufacturing industry in the coming time.

- Focus more social resources on building and improving capacity and productivity for domestic industrial enterprises, forming and developing strong industrial enterprises, domestic supply chains and value chains (including production and service activities throughout the chain), with sufficient global competitiveness.

5.2. For local authorities

- Create and reform the business and production environment in the province as well as directly carry out business support activities (such as support in capital, finance, market...).

- Issue preferential policies and support specific investments (land rent, infrastructure construction, environmental treatment...) of the locality. Local authorities directly allocate resources to promote the development of economic sectors in general and attract investment in industrial projects to promote the development of industries in the locality in particular.

- Paying attention to training and rationally structuring local labor resources (especially skilled labor for industries) is one of the prerequisites to be able to promote investment attraction and thereby promote the development of industry in the area. This is also a major responsibility of the locality.

5.3. For the business community

- It is necessary to closely follow the market to expand activities to find new customers; strengthen the connection between production and consumption chains; balance inventory and consumption to ensure cash flow as well as product quality, and arrange production flexibly to maintain optimal production activities.

- Focus on implementing a number of long-term solutions, such as: Investing in technology, innovation, improving product and service quality, developing brands; Training, attracting and retaining talent, improving workers' skills, cooperating with universities and research institutes; Applying clean technology, saving energy and resources, using environmentally friendly materials, recycling and treating waste; Accelerating the digital transformation process associated with the application of automation, robots, AI, IoT, Big Data, building smart factories...

- Proactively restructure, reduce costs and production prices to enhance product competitiveness, thereby improving efficiency and flexibly adapting to new situations.

6. Conclusion

As a part of the industrial sector and a part of the national economy, the processing and manufacturing industry plays an important role in socio-economic development. To maintain economic growth and avoid the middle-income trap, Vietnam needs to continue pursuing the goal of industrialization with the processing and manufacturing industry as the core. Therefore, it is necessary to focus on synchronously implementing solutions at all levels to promote the processing and manufacturing industry, thereby continuing to contribute positively to the overall growth results of the entire economy.

References:

Le Son (2024). It is necessary for policies to strongly promote processing and manufacturing industry. Government e-newspaper. Access link: https://baochinhphu.vn/can-chinh-sach-thuc-day-manh-me-cong-nghiep-che-bien-che-tao-102240529163548621.htm.

Hoang Xuan Nghien (2024). The rocessing and manufacturing industry - Current situation and development solutions. Journal of Foreign Information and Science.

Phuong Vu (2024). Driving force for manufacturing and processing industry. Electronic Industry and Trade Magazine. Access link: https://tapchicongthuong.vn/luc-day-cho-cong-nghiep-che-bien-che-tao-116146.htm.

Pham Viet Dzung (2022). Current status of processing and manufacturing industry in Vietnam and some issues. Communist Review. Access link: https://www.tapchicongsan.org.vn/web/guest/toa-dam-quang-ninh/-/2018/826813/thuc-trang-cong-nghiep-che-bien%2C-che-tao-o-viet-nam-va-mot-so-van-de-dat-ra.aspx.

The General Statistics Office (2024). Report on production and business trends of the processing, manufacturing and construction industry in the second quarter of 2024 and forecast for the third quarter of 2024.

Vietnamese Government (2021), 5-year Socio-Economic Development Plan 2021-2025.

CORPORATE GOVERNANCE AND FIRM PERFORMANCE: EVIDENCE FROM THE FOOD AND BEVERAGE INDUSTRY

MA. Nguyen Ngoc Khanh Linh* - MA. Dinh Thi Ha*

Abstract: ***This study investigates the impact of corporate governance mechanisms on firm performance in Vietnam. Utilizing a dataset comprising listed companies in the food and beverage industry from 2010 to 2021, the results indicate that board size negatively affect firm performance as valuated by Tobin's Q, whereas board members with economic majors and independent board directors exhibit a positive association. These findings underscore the importance of maintaining an appropriate board size and incorporating non-executive directors in the board. Besides, the presense of board members with expertise in economics is shown to positively influence the firm performance. Based on these primary findings, several suggestions are proposed for firms and managers to enhance the quality of corporate goverance, thereby improving firm performance.***

• Keywords: *corporate governance, firm performance, Vietnamese listed firms, Food and beverage industry.*

JEL codes: G34, G32

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1. Introduction

In recent decades, numerous academic researchers have examined the relationship between corporate governance and firm financial results. Most of these studies have consistently found that well-governed companies globally exhibit superior financial performance (Kyere & Ausloos, 2021). Effective corporate governance enhances a company's ability to compete and maintain its reputation (Christensen et al., 2010). It also enables easier access to capital markets, leading to improved financial performance. The board of directors is often regarded as a vital component of the corporate framework and a significant instrument of corporate governance (Vo & Nguyen, 2014). The major function of the board is to mitigate the agency conflicts that may arise between the owner and the managers, specifically by overseeing the managers' actions on behalf of the shareholders. To establish the connection between corporate governance and business performance, it is essential to examine board characteristics as a representation of corporate governance (Kyere & Ausloos, 2021).

In this research, we explore the intricate relationship between corporate governance, and firm performance in Vietnam, a nation classified as both a developing country and a transitional economy. Vietnam is faced with obstacles arising from inadequate institutional frameworks and insufficient investor protection, as highlighted by the World Bank Group in 2013 (World Bank, 2013). The governance of listed firms in Vietnam is notably deficient, significantly trailing behind neighboring nations such as Malaysia, Singapore, and Thailand, as evidenced by the 2020 survey conducted by the International Finance Corporation (IFC) on the Corporate Governance Scorecard of six ASEAN countries (OECD, 2023). According to the IFC report, Vietnam's average CG score was around 40%, markedly lower compared to other Asian markets. Moreover, recent corporate financial scandals involving prominent listed companies such as Saigon Commercial Bank and Tan Hoang Minh Corporation have underscored the urgency of a comprehensive evaluation of corporate governance within Vietnam's listed companies in the present Vietnamese context.

Our data set is drawn from the food and beverage industry, a sector that plays a crucial role in Vietnam's overall economic and societal development. According to a 2019 report by Vietnam's Ministry of Industry and Trade, the food and beverage industry contributed significantly, up to 15%, to the value of Vietnam's gross domestic product. Consumer expenditures on food and beverage products represent more than 20% of total household expenditures, underscoring the industry's economic significance. Despite favorable conditions such as cheap domestic labor, reasonable input materials, a robust domestic market, and a high proportion of the young population, financial performance limitations persist in Vietnam's food and

** School of Accounting, University of Economics Ho Chi Minh City; email: bqhung@ueh.edu.vn*

beverage industry. To optimize business performance, firms in this sector must navigate effective corporate governance by establishing competent boards of directors. Consequently, it is a need to scrutinize the impact of corporate governance factors on the firm performance of listed companies in the food and processing industry, which offers valuable insights and solutions for industry development.

From a legal point of view, Vietnam has made substantial efforts over the past decade to improve its legal framework for corporate governance, aligning with international best practices. The 2019 Securities Law introduced regulations governing public companies and listed companies, complementing ongoing efforts to promote good corporate governance practices. The Code of Corporate Governance in Vietnam, adhering to best practices, was compiled and published by the State Securities Commission and IFC in August 2019. Given these developments, it is pertinent to investigate whether these new policies have contributed to improved performance in Vietnamese public companies.

This study makes notable contributions to the corporate governance literature on several fronts. First, unlike prior literature primarily focused on Western developed countries, our study examines the impact of corporate governance mechanisms and ownership structure on firm performance in a developing and transitional country, Vietnam. Second, our focus on a specific industry food and beverage, aims to provide more precise results tailored to the unique characteristics of this sector. Third, our study aims to investigate whether listed companies in the food and beverage industry have seen improvements in their financial results following the enactment of new corporate governance regulations.

2. Literature review and research hypothesis

Board size

The study by (Kyere & Ausloos, 2021) establishes a positive correlation between the size of the board of directors and a firm's financial performance. This finding aligns with the perspective put forth by (Christensen et al., 2010), who assert that the number of board members significantly influences changes in corporate strategy. Specifically, a smaller board faces challenges in generating strategic ideas and exhibits lower confidence in adopting new and innovative strategies, consequently impacting the company's financial outcomes. On the contrary, a larger board, characterized by a greater number of members, possesses a wealth of diverse knowledge and experience. As a result, decisions made by such a board tend to be more multidimensional and higher quality. This observation lends support to the following hypothesis.

H1. The size is positively associated with the firm's financial performance.

Boad member's background in economy

Prior research indicates that board members possessing higher education degrees serve as a positive signal to investors, indicating a higher quality board. Specifically, when the board includes members with expertise in the economic field, they are better positioned to make effective business decisions, leading to improved business efficiency (Saerang et al., 2018). Furthermore, the study conducted by (Erin et al., 2019) underscores the importance of economic and financial literacy among board members, regardless of their overall educational attainment. This collective evidence supports the hypothesis that a board member's background in economics has a positive impact on firm financial performance.

H2. The background in economy has positive impact on the firm's financial performance.

Independent director

Previous research has produced inconsistent findings about the impact of board independence on firm performance in terms of accounting and market-based measures. For example, research conducted by (Christensen et al., 2010) has identified a detrimental impact of board independence on firm performance. The findings are corroborated by the stewardship hypothesis, which holds optimistic views on human nature. According to this view, the managers are not driven by their individual objectives. Instead, the agents demonstrated integrity in order to protect the principal's interests, which suggests that there is little or no need for independent directors on the board.

Agency theory presents a contrasting perspective on human behavior, suggesting that managers may prioritize their own interests over those of shareholders (Jensen & Meckling, 1976). Independent directors can play a crucial role in safeguarding the interests of shareholders by overseeing and managing any unforeseen misconduct by management. In addition, non-executive directors have incentives to protect their reputation, which motivates them to assert decision making authority (Christensen et al., 2010; Fama & Jensen, 1983).

H3. There is a favorable correlation between the percentage of independent supervisors and the financial performance of the company.

Female board members

Academics have extensively examined the influence of gender diversity on the financial performance of companies. The study by (Reguera-Alvarado et al., 2017) demonstrated a direct correlation between the number of female board members and the overall success of the firm. The reasons cited to justify gender diversity on the board include inherent differences in traits between women and men. Furthermore, the prevailing financial inclination is towards socially responsible investments, prompting investors to frequently regard gender equality in corporate boards as a criterion for choosing investment portfolios. Consequently, a board of directors that includes a balanced representation of genders will exhibit greater interest from investors, leading to an increased demand for company shares and a favorable impact on the market value of firms.

However, previous studies conducted by (Carter et al., 2010) has discovered a negative correlation between the presence of female board members and the financial performance of companies. Additionally, there are some papers, such as the one by (Rose & Rose, 2007), that do not establish a significant relationship between these two variables.

H4. A greater number of female board members will improve firm financial results.

CEO duality

In some businesses, the CEO holds dual roles: serving as both the chairman of the board and the chief executive officer. Holding these two critical positions simultaneously contributes to an individual's consolidation of power. A study conducted in 1994 by Finkelstein Richard found that this dual role of the CEO is a double-edged sword. On the one hand, when the CEO has control over the board of directors, board meetings may result in decisions that serve the interests of the executive team. Therefore, in corporations lacking close supervision from the corporate governance system, managers may act in their own interests (Fama & Jensen, 1983).

On the other hand, proponents of managerial theory argue that the dual role of CEO and board chairman contributes to superior business performance. Strategy development and execution become more unified and seamless when the same person oversees both areas, contributing to better business results. This conclusion is supported by the research of (Vo & Nguyen, 2014), who analyzed data from 177 publicly listed companies in the Vietnamese stock market during the period 2008 - 2012. The study also underscores the importance of CEOs in the management activities of Vietnamese companies.

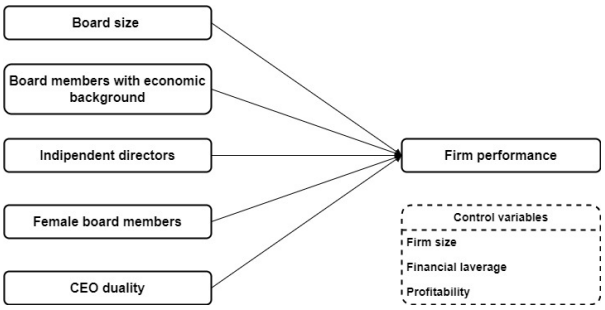
H5. The existence of CEO duality increases firm performance.

3. Research model and methodology

3.1. Research model

Drawing upon the theoretical background and a review of the existing literature, this study introduces the research model depicted in Figure 3.1 below:

Figure 3.1. Research model



Variables in the research models are detailed described in the flowing table.

Table 3.1. The list of variables in models

Index	Variable name	Description	Measure
Dependent variables			
1	Tobin	Tobin's Q	Total market value of the firm / Total assets value
Independent variables			
1	Bsize	Board size	The number of board members of the firm
2	Beco	Board members with economic background	The number of board members with economic major
3	Indi	Independent directors	The number of independent members in the board
4	Gend	Female board members	The number of female members in the board
5	Dual	CEO duality	Dual = 1 if the CEO is also the chairperson, otherwise = 0
6	Size	Firm size	Natural logarithm of the firm's total assets
7	Lev	Leverage	Total debt / total assets
8	ROA	Return on assets	Net income / Total assets x 100%

Source: Author's Calculation

3.2. Research methods

Three commonly used methods for the panel data regression model include the least squares estimate model (Pooled OLS), the Fixed Effect Model (FEM), and the random effect model (REM). The pooled OLS model lacks the ability to account for specific characteristics of each enterprise in the study, whereas the fixed effects model (FEM) and Random Effects Model (REM) address this limitation. Consequently, the authors opt to employ both the Finite Element

Method (FEM) model and the Random Effects Model (REM) in order to ascertain the appropriateness of either model for the research. Subsequently, they utilize the Hausman test to make this determination.

The multivariate regression models for this study are described on the hypotheses and research techniques as follows:

$$Tobin_{i,t} = \beta_0 + \beta_1 Bsize + \beta_2 Beco + \beta_3 Indi + \beta_4 Gend + \beta_5 Dual + \beta_6 Size + \beta_7 Lev + \beta_7 ROA + u_{i,t}$$

4. Data and results

4.1. Data

This study utilized a financial dataset comprising 56 food and beverage firms listed on Hanoi and Ho Chi Minh stock exchanges. These firms were selected based on their relevance and representativeness to the study objectives. However, data for 15 firms were incomplete, either due to non-disclosure or unavailability in annual financial reports. Consequently, after preprocessing, the dataset consisted of 41 firms for analysis. Among these, 15 are listed on the Hanoi Stock Exchange, while the remainder are listed on the Ho Chi Minh City Stock Exchange.

The dataset was compiled and extracted from financial reports and annual filings of firms spanning from 2010 to 2021, representing the most comprehensive period for data collection. Descriptive statistics of the variables are presented in Table 4.1 below.

Table 4.1. Descriptive statistics

Variable	Observation	Mean	Standard deviation	Min	Max
Tobin	492	1.686	1.206	-0.027	8.367
Bsize	492	5.411	1.883	1	11
Beco	492	2.648	1.758	0	9
Indi	492	0.754	1.250	0	8
Gend	492	0.812	0.392	0	1
Dual	492	0.258	0.438	0	1
Size	492	7.071	1.712	4.332	11.745
Lev	492	0.420	0.200	0.034	0.995
ROA	492	0.095	0.094	-0.317	0.722

Source: Author's Calculation

The descriptive statistics table provides insights into the performance of food and beverage firms, revealing a favorable level with a mean Tobin's Q (Tobin) of 1.686. In addion, interms of board characteristics, the maximum number of board members (Bsize) is 11, while the minimum is 1. Regarding economic expertise (Beco), there is variability across boards; some comprise 9 members holding an economics major, while others have none. Similarly, the number of independent directors (Indi) varies, with some companies having up to 8 independent directors, while others have none.

4.2. Results

From table 4.2, it can be seen that there is a similar and difference in the correlation between independent variables and Tobin's Q. To be more specifically, at the 5% significance level, the variables that are strongly correlated with Tobin's Q include Beco, Size, and ROA.

Table 4.2. Correlation matrix

Variables	Tobin	Bsize	Beco	Indi	Gend	Dual	Size	Lev	ROA
Tobin	1.000								
Bsize	-0.014	1.000							
Beco	0.129	0.552	1.000						
Indi	0.098	0.313	-0.032	1.000					
Gend	-0.035	0.023	0.033	-0.066	1.000				
Dual	-0.061	0.091	-0.041	-0.096	-0.107	1.000			
Size	0.224	0.267	0.152	0.205	-0.119	-0.026	1.000		
Lev	0.008	-0.049	-0.038	-0.171	-0.037	-0.035	0.171	1.000	
ROA	0.361	-0.001	0.148	-0.055	-0.111	0.0178	-0.085	-0.298	1.000

In the next step, regression models are implemented with the following results:

Table 4.3. Regression results

Variables	OLS model			RE model			FE model		
	Coef	S.E	P-value	Coef	S.E	P-value	Coef	S.E	P-value
Bsize	-0.134	0.034	0.000***	-0.055	0.021	0.009***	-0.049	0.020	0.015**
Beco	0.106	0.035	0.002***	0.084	0.021	0.000***	0.083	0.020	0.000***
Indi	0.156	0.044	0.000***	0.080	0.024	0.001***	0.087	0.023	0.000***
Gend	0.161	0.126	0.200	0.091	0.110	0.408	0.131	0.109	0.228
Dual	-0.030	0.113	0.789	-0.002	0.073	0.978	-0.033	0.071	0.642
Size	0.172	0.030	0.000***	0.202	0.044	0.000***	0.337	0.049	0.000***
Lev	0.676	0.261	0.010**	0.923	0.161	0.000***	0.939	0.155	0.000***
ROA	5.243	0.551	0.000***	0.134	0.339	0.693	-0.261	0.327	0.425
No. of observations	492			492			492		
Prob > F	0.0000			0.0000			0.0000		

*Notes: ***: 0.01 Sig; **: 0.05 Sig, *: 0.1 Sig*

Firstly, the fixed effect model (FEM) is applied, revealing a Prob>F value of 0.000, indicating that FEM is more suitable than Ordinary Least Squares (OLS) in the Tobin model. Subsequently, the random effect model (REM) is conducted, and the Hausman test yields a low p-value of 0.000, indicating that FEM is preferable to OLS. Further, Wald and Wooldridge tests detect heteroskedasticity and autocorrelation in the model. Following the correction of these model deficiencies using the Feasible Generalized Least Squares (FGLS) model, the results are presented in Table 4.4.

Table 4.4. FGLS regression

	Coefficient	Std. Error	P-value
Bsize	-0.004	0.010	0.018**
Beco	0.003	0.010	0.007***
Indi	0.0163	0.011	0.054*
Size	0.003	0.024	0.088*
Lev	1.026	0.076	0.000***
No. of observation	492		
Prob>chi2	0.0000		

*Notes: ***: 0.01 Sig; **: 0.05 Sig, *: 0.1 Sig*

Table 4.4 shows the final results of the FGLS regression, in which the number of board members has a significantly negative correlation with firm performance. This finding is supported by the research of Cheng (2008); Guest (2009).According to to Fama & Jensen (1983), when the board of directors expands, agency costs and problems in communication arise among board members, which outweigh the potential advantages of having more directors, resulting in lower operational efficiency for the company.

On the other hand, the table 4.4 illustrates positive relationships between the number of board directors who has economic background (Beco) and the number of independent directors (Indi) with firm performance. This implies that the higher percentage of board members holding degrees in economy the better performance of firms in the food and beverage industry in Vietnam. Sharing the same view, (Erin et al., 2019; Saerang et al., 2018) agree that although having a business education background is not obligatory for board members, it is advantageous for them to have a solid understanding of business and economics. In addition, a greater number of outside directors are able to create better organizational results. This result is supported by agency theory, which emphasizes that being independent from the management helps board of directors to monitor effectively and, for that reason, produce better financial results (Christensen et al., 2010; Fama & Jensen, 1983)..

5. Conclusion

This study has investigated the impact of board characteristics as representation for corporate governance to firm performance (evaluated by Tobin's Q ratio). The characteristics of the board to be mentioned in this research are: board size, board members with economic background, independent board members, female members in the board, and CEO duality. The research samples include 41 Vietnamese listed firms operating in the food and beverage industry.

The results of the regression analysis reveal a mixed conclusion. Firstly, the number of female members in the board and CEO duality shows no impact on firm performance. This result is consistent with the findings of (Kyere & Ausloos, 2021; Rose & Rose, 2007; Saerang et al., 2018). However, several corporate goverance characteristics such as the number of board members with economic major and independent board members exhibit predictive power on Tobin's Q ratio. These findings underscore the importance of board members with economic background and suggest that a strong understanding of economy should be a primary requirement for members of the corporate boards in the food and beverage firms. Additionally, companies should prioritize providing basic training courses in Economics and relating fields to ensure better firm performance.

Secondly, the significance of independent board directors is confirmed in this research, which is supported by the agency theory (Christensen et al., 2010; Fama & Jensen, 1983) The rationale is that non-executive directors have incentives to protect their reputation, which motivates them to assert decision making authority. The presence of independent board members within the firm is to oversee the firm's operations and performance. Therefore, it is advisable for companies in the food and beverage industry to appoint non-executive directors in the board, who can effectively fulfill their oversight responsibilities in monitoring governance, internal controls, and risk management.

Thirdly, one intriguing discovery from this study is the inverse relationship between board size and firm performance. Smaller boards tend to be more effective compared to larger ones since agency problems become more serious when the board is too large (Jensen & Meckling, 1976). The optimal board size should be large enough to encompass individuals with the necessary expertise and knowledge to efficiently manage the company, yet small enough to foster meaningful discussions. This highlights the importance of considering performance variability when assessing corporate boards.

References:

Carter, D. A., D'Souza, F., Simkins, B. J., & Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. Corporate Governance: An International Review, 18(5), 396-414. https://doi.org/10.1111/j.1467-8683.2010.00809.x

Cheng, S. (2008). Board size and the variability of corporate performance. Journal of Financial Economics, 87(1), 157-176. https://doi.org/10.1016/j.jfineco.2006.10.006

Christensen, J., Kent, P., & Stewart, J. (2010). Corporate Governance and Company Performance in Australia. Australian Accounting Review, 20(4), 372-386. https://doi.org/10.1111/j.1835-2561.2010.00108.x

Corporate finance and corporate governance in ASEAN economies. (2023). https://www.oecd.org/corporate/background-note-corporate-finance-and-corporate-governance-asean-

Erin, O., Arumona, J., Onmonya, L., & Omotayo, V. (2019). Board financial education and firm performance: Evidence from the healthcare sector in Nigeria. Academy of Strategic Management Journal, 18(4).

Fama, E. F., & Jensen, M. C. (1983). SEPARATION OF OWNERSHIP AND CONTROL. http://www.journals.uchicago.edu/t-and-c*

Finkelstein Richard D, S. A. (1994). CEO duality as a double-edged sword: how boards of directors balance entrenchment avoidance and unity of command (Vol. 37, Issue 5).

Guest, P. M. (2009). The impact of board size on firm performance: Evidence from the UK. European Journal of Finance, 15(4), 385-404. https://doi.org/10.1080/13518470802466121

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. In Journal of Financial Economics (Vol. 3). Q North-Holland Publishing Company.

Kyere, M., & Ausloos, M. (2021). Corporate governance and firms financial performance in the United Kingdom. International Journal of Finance and Economics, 26(2), 1871-1885. https://doi.org/10.1002/ijfe.1883

Reguera-Alvarado, N., de Fuentes, P., & Laffarga, J. (2017). Does Board Gender Diversity Influence Financial Performance? Evidence from Spain. Journal of Business Ethics, 141(2), 337-350. https://doi.org/10.1007/s10551-015-2735-9

Report on the Observance of Standards and Codes (ROSC) corporate governance country assessment Vietnam. (2013).

Rose, C., & Rose, C. (2007). Does female board representation influence firm performance ? The Danish evidence . Corporate Governance : An International Does female board representation influence firm performance ? The Danish evidence. Corporate Governance, 15(2), 404-413.

Saerang, D. P. E., Tulung, J. E., & Ogi, I. W. J. (2018). The influence of executives' characteristics on bank performance: The case of emerging market. Journal of Governance and Regulation, 7(4), 13-18. https://doi.org/10.22495/jgr_v7_i4_p2

Vo, D. H., & Nguyen, T. M. (2014). The Impact of Corporate Governance on Firm Performance: Empirical Study in Vietnam. International Journal of Economics and Finance, 6(6). https://doi.org/10.5539/ijef.v6n6p1

DETERMINANTS AND CONSEQUENCES OF ECO-INNOVATION IN AGRICULTURAL COOPERATIVES - A LITERATURE REVIEW

MA. Nguyen Thu Huong*

Abstract: ***Eco-innovation is pivotal for the sustainable development of agricultural cooperatives. However, there is a lack of a literature review that synthesizing the stock of eco-innovation research regarding both the determinants and consequences of eco-innovation comprehensively, especially taking into accounts the research conducted in agricultural cooperatives. Hence, this study reviews the extant researches in eco-innovation in terms of the theories and methodology employed, drivers and consequences of eco-innovation.***

• Keywords: *eco-innovation, agricultural cooperatives, literature review.*

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1. Introduction

Agricultural cooperatives are widely acknowledged as important agents in promoting sustainable agriculture for the purposes of rural development and ensuring food security (Polat, 2010). Technological innovation has been identified as a crucial factor for the competitive advantage and sustainability of agricultural cooperatives in developing nations (Luo et al., 2017). Nevertheless, the increasing levels of agricultural pollution, encompassing soil degradation and climate change, pose challenges for the creation of ecological habitats and the progress of agricultural practices (Jhariya et al., 2021). Therefore, the incorporation of eco-innovation strategies, such as the adoption of water management practices, the reduction of pesticide usage, and the establishment of waste management and recycling systems, holds promise in promoting the progress of sustainability within the agricultural sector.

Eco-innovation is the term used to describe the innovative actions taken by organizations to utilize sophisticated technology in order to achieve economic growth while also prioritizing environmental conservation. In general, firms will focus on the factors that drive and result from eco-innovation while implementing an eco-innovation strategy. Hence, the first major research stream that arises from the literature on eco-innovation include the researches focusing on the antecedents of eco-innovation. The second major research stream concentrates on the impact of eco-innovation implementation on performance and competitive advantage of organizations. However, there is a lack of a literature review that synthesizing and calibrating the stock of eco-innovation research regarding both the determinants and consequences of eco-innovation comprehensively. Hence, this study aims to systematically review extant research related to eco-innovation not only in manufacturing sector but also in agricultural sector and agricultural cooperatives to offer an integrated and panoramic assessment of the phenomenon.

2. Methodology

The analyzed data was sourced from the primary database of Web of Science. Initially, the core collection was chosen by utilizing the fundamental retrieval feature of the Web of Science database. A preliminary search was conducted using "eco-innovation", "environmental innovation" and "green innovation" as the keywords. Subsequently, the "Article" literary category was chosen, and the time period of "2006-2021" was specified utilizing the database's refining tool to filter the data. Based on the literature review and by referencing data processing methods from relevant review articles, the author chose the leading journals in environmental science, green sustainability, enterprise management, environmental engineering, economics, and other related fields. The selection was refined using the search phrase "Antecedents OR Drivers OR

** Banking Academy of Vietnam; email: huongnt@hvnh.edu.vn*

Determinants OR Outcome OR Consequences". A total of 115 primary publications were ultimately chosen that focused on the drivers and effects of eco-innovation. The author conducted manual screening of the 115 main studies by reading the abstract and research design of each literature. Papers that had keywords such as eco-innovation, motivation, or effect, but did not address innovation drivers and effects, were eliminated. As a result, 60 highly relevant literatures were selected as the main sample literature for review.

3. Literature review and findings

3.1. Eco-innovation in agricultural co-operatives

Eco-innovation can be defined as "the production, assimilation, or exploitation of a product, production process, service, management, or business method that is novel to the organization (developing or adopting it) and which results, throughout its life cycle, in a reduction of environmental risk, pollution and other negative impacts of resource use (including energy use) compared to relevant alternatives" (Kemp and Pearson, 2007, p. 7). Within agricultural production, eco-innovation is defined as the innovative process of producing green agricultural products in order to reduce pollution, produce energy-savings, promote waste-recycling, and to protect the environment (Khanh Chi, 2022). Some examples of eco-innovation conducted in agricultural cooperatives include smart agriculture, quality standards or sustainable agricultural practices.

3.3. The major theoretical framework which has been applied in the related works

Resource-based view highlights the importance of resources and capabilities such as absorptive capacity and technical capability (Galbreath, 2019), learning and organizing ability (Albort-Morant et al., 2016), corporate strategy and organizational culture (Rehman et al., 2021), and manager behavior or characteristics (Singh et al., 2020) as drivers for the implementation of eco-innovation in enterprises. Furthermore, eco-innovation, which encompasses improving the performance of organizations in terms of their environmental and social impact, can provide firms with the essential resources and abilities to get and utilize strategic advantages (Ch'ng et al., 2021), as well as gain competitive advantages (El-Kassar and Singh, 2019).

Within the framework of institutional theory, eco-innovation practice of enterprises is driven by two main types of factors: coercive pressures, such as governmental inspections and regulations (Li et al., 2018), and unpredictable market factors, such as market competition and market turbulence (Quan et al., 2023). By implementing eco-innovation, enterprises can enhance their organizational legitimacy and achieve improved environmental performance (Wang, 2020). Additionally, they can also experience strategic benefits such as increased customer cooperation and customer capital (Burki et al., 2018).

It is important to mention that stakeholder theory, natural-resource-based view, theory of planned behaviour, upper echelons theory, dynamic capabilities, and social network theory are not widely used theoretical lens in the study of the driving factors and outcomes of eco-innovation. Nevertheless, contemporary research on eco-innovation consistently validates these theoretical perspectives.

3.4. The major findings of the related works

3.4.1. Drivers of eco-innovation

3.4.1.1. Internal factors

a. Factors related to size and age

The impact of size on eco-innovation is inconclusive, considering its role as a structural component. Size is commonly regarded as an indicator of complementary assets and the internal capability to carry out eco-innovations (Segarra-Oña et al., 2011). Jin and Zhou (2011) also found that cooperative size had positive and statistically significant relationship with the cooperatives decision to adopt standards. In contrast, Wagner (2008) concludes that the size of a corporation does not impact the likelihood of the firm implementing environmental product or process improvements. Other researchers also suggest that small and medium-sized enterprises (SMEs) are hesitant to incorporate environmental considerations into their operations. In contrast, some studies have presented evidence that SMEs have experienced a significant increase in green efforts (Revell et al., 2010) and have shown a tendency for eco-innovation (Bos-Brouwers, 2010).

Regarding the impact of age, prevailing knowledge and established literature on SMEs indicate that young and recently established companies possess inherent benefits in terms of innovation (Acs and Audretsch, 1988). Hence, they suggest that these candidates have the ability to provide solutions to emerging difficulties. Consequently, they should possess enhanced capacity to address environmental concerns. However, there is a scarcity of research that specifically examine the process of innovation in new businesses that are motivated by environmental concerns. One exception to this is the study conducted by Keskin et al. (2013).

b. Factors related to strategy and culture

Yahya et al. (2021) conducted study that demonstrates how implementing an environmental management plan could greatly enhance the assertiveness of small firms towards eco-innovation. Soewarno et al. (2019) validate that implementing eco-innovative practices yields a favorable effect on eco-innovation. Ryszko (2016) demonstrates that preemptive environmental initiatives exert a significant influence on product and process eco-innovation. Furthermore, the alignment of organizational development plays a crucial role in determining the trajectory and emphasis of an organization's future growth. Hence, embracing a green market orientation facilitates the advancement of eco-innovation (Borah et al., 2021). The empirical investigations conducted by Hojnik and Ruzzier (2016) demonstrate that having an environmental orientation has a notable and beneficial effect on the practice of eco-innovation and the resulting environmental outcomes. Moreover, an organization with a green-oriented corporate culture will have greater passion for implementing eco-innovation. Research conducted by Sharma et al. (2021) demonstrates that the flexibility of green organizational culture is beneficial for encouraging eco-innovation practices. The findings of Wang et al. (2021) demonstrated that organizational support, organizational norms, and organizational learning positively influence environmentally friendly technologies.

c. Factors related to resources and capabilities

The study conducted by Ben Arfi et al. (2018) demonstrates that the incorporation of both inside and outside knowledge has a substantial influence on every phase of eco-innovation process. The diversity and comprehensiveness of information sources, along with the exchange and conversion of knowledge among various sources, have a beneficial and substantial influence on eco-innovation (Martínez-Ros and Kunapatarawong, 2019). Furthermore, the influence of human resources on firm eco-innovation is substantial (Jun et al., 2019). Multiple researchers have agreed that green human capital has an impact on promoting eco-innovation (Rehman et al., 2021). Study by Klewitz and Hansen (2014) has shown that collaborating with government authorities and universities is important. Triguero et al. (2013) also discovered that organizations' managers prioritizing cooperation with research institutes, agencies, and universities are more engaged in all types of eco-innovations. When examining the factors that influence eco-innovation in different nations, it appears that eco-innovative activities rely heavily on external knowledge and information, with research and development collaboration being particularly important (De Marchi, 2012). Regarding the technological competencies of enterprises, there is a lack of agreement in the literature. According to Blum-Kusterer and Hussain (2001), new technology is essential in promoting sustainability improvements and eco-change. Horbach (2008) emphasizes that the enhancement of technological capacities, also known as "knowledge capital" through research and development stimulates environmental innovations. However, Cainelli et al. (2011) discovered that R&D activities have a weaker correlation with the implementation of eco-innovation compared to other criteria like foreign ownership or networking. Cuerva et al. (2014) further highlight that in a low-tech industry, technological skills such as research and development and human resources promote traditional innovation but do not support eco-innovation.

d. Factors related to top management's characteristics

Individuals' personal attributes, such as their academic background, environmental consciousness, and preferences, have a substantial impact on the promotion of company eco-innovation (He et al., 2021). Quan et al. (2023) shown a direct correlation between a CEO's worldwide experience and the implementation of environmentally friendly innovations within

corporations. Huang et al. (2020) and other researchers have found that top management with political connections can effectively trigger eco-innovation. Although not focused on eco-innovation, Luo et al. (2017) and Liu and Li (2020) also stresses the influence of chairperson's social networks for the development of innovations in Chinese agricultural co-operatives. Ren et al. (2021) argue that an executive's local identity positively impacts corporate eco-innovation. Furthermore, the concepts of green transformational leadership (Singh et al., 2020), voluntary workplace green behavior (Cai et al., 2020), and sustainable leadership (Iqbal et al., 2021) have a direct or indirect impact on the eco-innovation of companies.

3.4.1.2. External factors

a. Regulatory framework

The study conducted by Qi et al. (2021) demonstrate that regulations exert a beneficial influence on the development of green technology within enterprises. Moreover, the more stringent the environmental restrictions, the more incentivized firms are to adopt eco-innovation (Wang et al., 2020). Research conducted by Liu et al. (2020) suggests that businesses are more likely to engage in eco-innovation endeavors following the rigorous enforcement of China's recently enacted Environmental Protection Law. Previous research has indicated that providing subsidies for research and development can enhance the efficiency of eco-innovation in businesses (Yi et al., 2020). However, many researchers have discovered that support from the government has limited influence on triggering eco-innovation in transportation businesses (Zailani et al., 2014).

b. Market factors

El-Kassar and Singh (2019) established a clear correlation between the demand for environmentally friendly products in the market and the occurrence of innovative practices aimed at promoting sustainability. Zailani et al. (2014) argue that customer demand positively affects eco-innovation initiatives. According to Wong (2013), the presence of customer green demand might indirectly encourage eco-innovation by promoting the exchange of knowledge. Recent researches have shown that market turbulence can stimulate product eco-innovation (Qiu et al., 2020). Furthermore, research has revealed that the pressure exerted by the green market has a favorable impact on radical eco-innovation, both directly and indirectly (Cui and Wang, 2022). In addition, research has demonstrated that the presence of competitors exerts a significant and favorable influence on the adoption of eco-innovation (Weng et al., 2015).

c. Social environment

The presence of uncertainty in the social environment indirectly encourages firms to engage in sustainable development behavior (Ali et al., 2022). The intention to adopt eco-innovation is significantly positively influenced by the social impact of firm development, particularly in the case of e-commerce enterprises (Zhang et al., 2020). Furthermore, since public awareness of the environment continues to grow, public supervision plays a crucial role in fostering the advancement of ecological innovation in firms (Liao, 2018). Enterprises will actively pursue methods to improve eco-innovation and establish their own social networks. The interconnectedness and variety within these networks will subsequently boost the effectiveness of eco-innovation (Chen et al., 2019).

3.4.2. Effects of eco-innovation

3.4.2.1. Internal effect

There is a lack of agreement among experts about the impact of eco-innovation on the financial performance of corporations. Liao (2018) conducted a study using manufacturing and service organizations as research samples and found that the different elements of environmental innovation (eco-product, eco-process and eco-organizational innovation) can enhance the economic performance of organizations. Nguyen et al. (2023) categorized customer-focused eco-innovation into three distinct forms: process initiative, green minimalism, and green initiative and examined how these types of eco-innovation affect the financial performance of enterprises. Their findings demonstrate that process-active organizations have achieved substantial enhancements in economic indicators, such as market share and profit, when compared to other businesses. Aguilera-Caracuel and Ortiz-de-Mandojana (2013) showed a comparative study between organizations that adopt eco-innovation and those which do not adopt eco-innovation. They discovered that the financial performance

of eco-innovation enterprises did not show any improvement when compared to non eco-innovation organizations.

3.4.2.2. External effect

Research indicates that eco-innovation plays a crucial role in improving the competitive advantage of businesses (Wang, 2019). Specifically, product eco-innovation influences competitive advantage through its impact on environmental performance, while process eco-innovation affects competitive advantage through its influence on both environmental and organizational performance (El-Kassar and Singh, 2019). Recent research has demonstrated that market volatility, characterized by intense competition, unexpected client preferences, and technology advancements, amplifies the beneficial effects of organizational eco-innovation on corporate social performance (Ch'ng et al., 2021). Furthermore, the use of eco-innovation has the potential to enhance customer collaboration (Burki et al., 2019). Enhancing customer collaboration is advantageous for enterprises to establish relationships that enable them to enhance their eco-innovation performance and amass customer capital (Leal-Millán et al., 2016). The augmentation of client capital is advantageous for the sustained growth of the firm and the realization of its worth.

3.5. The research methods applied by the related works

The research methods utilized by the previous studies can be examined based on the type of research, the approach of research, and research design. The majority of the papers in this research consisted of empirical investigations, which presented concepts and conducted data analysis. The subsequent prevalent type of research was theoretical/conceptual investigations, which concentrate on abstract notions without engaging in any data analysis. When it comes to research approach, quantitative studies are the most frequently used, followed by qualitative studies and a combination of qualitative and quantitative methods. The primary study designs utilized were surveys/questionnaires, multiple case studies, and individual case studies.

4. Research gaps and conclusion

First, the evaluation of the sectoral emphasis of the studies reveals that the manufacturing sector has been the subject of the most extensive research, followed by the service sector, and a combination of both manufacturing and service. Remarkably, studies in this topic have inexplicably overlooked the agriculture sector, despite the fact that the implementation of eco-innovation approaches in this sector is a crucial driver of competitive advantage.

Second, the majority of studies on drivers of eco-innovation and eco-innovation-performance link have been focused on developed markets. An area that has received very little attention is eco-innovation in newly industrialized and developing countries. Therefore, it is necessary to conduct research in the nations where eco-innovation takes place, and by researchers who have a deep understanding of the broader context and societal processes in which eco-innovation is integrated.

Third, the majority of the studies are limited to large investor-owned firms. Therefore, conducting studies that investigate the impact of company size on eco-innovation activities would be valuable. Moreover, there is a dearth of research about eco-innovation adoption in agricultural cooperatives. The previous researches mainly focused on traditional innovation or some aspects of eco-innovation such as smart agriculture, quality standards or sustainable agricultural practices.

Fourth, the literature assessment reveals that certain theories, such as RBV, and institutional theory, have received excessive attention in the field, while other theories that could be highly relevant have been overlooked.

Fifth, the analysis uncovered a lack of replication efforts by eco-innovation researchers in a significant proportion of surveys and qualitative investigations. There is a limited use of a research strategy that combines both qualitative and quantitative methods. The eco-innovation literature would be enhanced by conducting extensive surveys and doing detailed case studies.

Sixth, the influence of internal elements such as resources, capacities, and competencies on eco-innovation has been rarely examined at the micro level. This is mostly because there is a lack of data to incorporate these components into econometric models. Hence, there is a shortage of comprehensive and inclusive studies.

Seventh, there is a scarcity of study on the elements that drive eco-innovation, particularly

in terms of investigating the mutual impact of internal and external factors. Additionally, the findings of such research have not been validated through comprehensive case studies that account for unique situational aspects. Therefore, it is crucial and essential to consider the interdependencies between components at various levels, such as legislation and enterprises' inventive capacities, from a multilevel standpoint.

References:

Acs, Z.J., Audretsch, D.B., 1988. Innovation in large and small firms: an empirical analysis. The American economic review 678-690.

Aguilera-Caracuel, J., Ortiz-de-Mandojana, N., 2013. Green innovation and financial performance: An institutional approach. Organization & Environment 26, 365-385.

Albort-Morant, G., Leal-Millán, A., Cepeda-Carrión, G., 2016. The antecedents of green innovation performance: A model of learning and capabilities. Journal of Business Research 69, 4912-4917. https://doi.org/10.1016/j.jbusres.2016.04.052

Ali, Adnan, Jiang, X., Ali, Afzaal, 2022. Social ties, absorptive capacity, and the adoption of green innovation: a social capital perspective. International Journal of Manpower 44, 214-230. https://doi.org/10.1108/IJM-10-2021-0597

Ben Arfi, W., Hikkerova, L., Sahut, J.-M., 2018. External knowledge sources, green innovation and performance. Technological Forecasting and Social Change 129, 210-220. https://doi.org/10.1016/j.techfore.2017.09.017

Blum-Kusterer, M., Hussain, S.S., 2001. Innovation and corporate sustainability: An investigation into the process of change in the pharmaceuticals industry. Business Strategy and the Environment 10, 300-316. https://doi.org/10.1002/bse.300

Borah, P.S., Dogbe, C.S.K., Pomegbe, W.W.K., Bamfo, B.A., Hornuvo, L.K., 2021. Green market orientation, green innovation capability, green knowledge acquisition and green brand positioning as determinants of new product success. European Journal of Innovation Management 26, 364-385. https://doi.org/10.1108/EJIM-09-2020-0345

Bos-Brouwers, H.E.J., 2010. Corporate sustainability and innovation in SMEs: Evidence of themes and activities in practice. Business Strategy and the Environment 19, 417-435. https://doi.org/10.1002/bse.652

Burki, U., Ersoy, P., Dahlstrom, R., 2018. Achieving triple bottom line performance in manufacturer-customer supply chains: Evidence from an emerging economy. Journal of Cleaner Production 197, 1307-1316. https://doi.org/10.1016/j.jclepro.2018.06.236

Cai, W., Yang, C., Bossink, B.A.G., Fu, J., 2020. Linking Leaders' Voluntary Workplace Green Behavior and Team Green Innovation: The Mediation Role of Team Green Efficacy. Sustainability 12, 3404. https://doi.org/10.3390/su12083404

Cainelli, G., Mazzanti, M., Zoboli, R., 2011. Environmental innovations, complementarity and local/global cooperation: evidence from North-East Italian industry. IJTPM 11, 328. https://doi.org/10.1504/IJTPM.2011.042090

Chen, Y.-S., Wang, C., Chen, Y.-R., Lo, W.-Y., Chen, K.-L., 2019. Influence of Network Embeddedness and Network Diversity on Green Innovation: The Mediation Effect of Green Social Capital. Sustainability 11, 5736. https://doi.org/10.3390/su11205736

Ch'ng, P.-C., Cheah, J., Amran, A., 2021. Eco-innovation practices and sustainable business performance: The moderating effect of market turbulence in the Malaysian technology industry. Journal of Cleaner Production 283, 124556. https://doi.org/10.1016/j.jclepro.2020.124556

Cuerva, M.C., Triguero-Cano, Á., Córcoles, D., 2014. Drivers of green and non-green innovation: empirical evidence in Low-Tech SMEs. Journal of Cleaner Production 68, 104-113. https://doi.org/10.1016/j.jclepro.2013.10.049

Cui, R., Wang, J., 2022. Shaping sustainable development: External environmental pressure, exploratory green learning, and radical green innovation. Corporate Social Responsibility and Environmental Management 29, 481-495. https://doi.org/10.1002/csr.2213

De Marchi, V., 2012. Environmental innovation and R&D cooperation: Empirical evidence from Spanish manufacturing firms. Research Policy 41, 614-623. https://doi.org/10.1016/j.respol.2011.10.002

El-Kassar, A.-N., Singh, S.K., 2019. Green innovation and organizational performance: The influence of big data and the moderating role of management commitment and HR practices. Technological Forecasting and Social Change 144, 483-498. https://doi.org/10.1016/j.techfore.2017.12.016

Galbreath, J., 2019. Drivers of Green Innovations: The Impact of Export Intensity, Women Leaders, and Absorptive Capacity. J Bus Ethics 158, 47-61. https://doi.org/10.1007/s10551-017-3715-z

Garnevska, E., Liu, G., Shadbolt, N.M. (Eds.), 2011. Factors for Successful Development of Farmer cooperatives in Northwest China. International Food and Agribusiness Management Review, Volume 14. https://doi.org/10.22004/ag.econ.117603

He, K., Chen, W., Zhang, L., 2021. Senior management's academic experience and corporate green innovation. Technological Forecasting and Social Change 166, 120664. https://doi.org/10.1016/j.techfore.2021.120664

Hojnik, J., Ruzzier, M., 2016. The driving forces of process eco-innovation and its impact on performance: Insights from Slovenia. Journal of Cleaner Production 133, 812-825. https://doi.org/10.1016/j.jclepro.2016.06.002

Horbach, J., 2008. Determinants of environmental innovation—New evidence from German panel data sources. Research Policy 37, 163-173. https://doi.org/10.1016/j.respol.2007.08.006

Huang, M., Li, M., Liao, Z., 2020. Do politically connected CEOs promote Chinese listed industrial firms' green innovation? The mediating role of external governance environments. Journal of Cleaner Production 278. https://doi.org/10.1016/j.jclepro.2020.123634

Iqbal, Q., Ahmad, N.H., Li, Y., 2021. Sustainable Leadership in Frontier Asia Region: Managerial Discretion and Environmental Innovation. Sustainability 13, 5002. https://doi.org/10.3390/su13095002

Jhariya, M.K., Meena, R.S., Banerjee, A., 2021. Ecological Intensification of Natural Resources Towards Sustainable Productive System, in: Jhariya, M.K., Meena, R.S., Banerjee, A. (Eds.), Ecological Intensification of Natural Resources for Sustainable Agriculture. Springer, Singapore, pp. 1-28. https://doi.org/10.1007/978-981-33-4203-3_1

Jin, S., Zhou, J., 2011. Adoption of food safety and quality standards by China's agricultural cooperatives. Food Control 22, 204-208. https://doi.org/10.1016/j.foodcont.2010.06.021

Jun, W., Ali, W., Bhutto, M.Y., Hussain, H., Khan, N.A., 2019. Examining the determinants of green innovation adoption in SMEs: a PLS-SEM approach. European Journal of Innovation Management 24, 67-87. https://doi.org/10.1108/EJIM-05-2019-0113

Kemp, R., Pearson, P., 2007. Final report MEI project about measuring eco-innovation.

Keskin, D., Diehl, J., Molenaar, N., 2013. Innovation process of new ventures driven by sustainability. Journal of Cleaner Production 45, 50-60. https://doi.org/10.1016/j.jclepro.2012.05.012

Khanh Chi, N.T., 2022. Driving factors for green innovation in agricultural production: An empirical study in an emerging economy. Journal of Cleaner Production 368, 132965. https://doi.org/10.1016/j.jclepro.2022.132965

Klewitz, J., Hansen, E.G., 2014. Sustainability-oriented innovation of SMEs: a systematic review. Journal of Cleaner Production 65, 57-75. https://doi.org/10.1016/j.jclepro.2013.07.017

Leal-Millán, A., Roldán, J.L., Leal-Rodríguez, A.L., Ortega-Gutiérrez, J., 2016. IT and relationship learning in networks as drivers of green innovation and customer capital: evidence from the automobile sector. Journal of Knowledge Management 20, 444-464. https://doi.org/10.1108/JKM-05-2015-0203

Li, D., Huang, M., Ren, S., Chen, X., Ning, L., 2018. Environmental Legitimacy, Green Innovation, and Corporate Carbon Disclosure: Evidence from CDP China 100. J Bus Ethics 150, 1089-1104. https://doi.org/10.1007/s10551-016-3187-6

Liao, Z., 2018. Social capital and firms' environmental innovations: The moderating role of environmental scanning. Bus Strat Env 27, 1493-1501. https://doi.org/10.1002/bse.2207

Liu, J., Zhao, M., Wang, Y., 2020. Impacts of government subsidies and environmental regulations on green process innovation: A nonlinear approach. Technology in Society 63, 101417. https://doi.org/10.1016/j.techsoc.2020.101417

Liu, Y., Li, H., 2020. The effects of chairmen's social network heterogeneity on cooperative marketing innovation: evidence from Sichuan province in China. Journal of Agribusiness in Developing and Emerging Economies 10, 651-670. https://doi.org/10.1108/JADEE-06-2019-0085

Luo, J., Guo, H., Jia, F., 2017. Technological innovation in agricultural co-operatives in China: Implications for agro-food innovation policies. Food Policy 73, 19-33. https://doi.org/10.1016/j.foodpol.2017.09.001

Martínez-Ros, E., Kunapatarawong, R., 2019. Green innovation and knowledge: The role of size. Business Strategy and the Environment 28, 1045-1059. https://doi.org/10.1002/bse.2300

Nguyen, T.T., Do, M.H., Rahut, D.B., Nguyen, V.H., Chhay, P., 2023. Female leadership, internet use, and performance of agricultural cooperatives in Vietnam. Annals of Public and Cooperative Economics 94, 877-903. https://doi.org/10.1111/apce.12434

Polat, H., 2010. Cooperatives in the Arab World: Reaffirming their validity for local and regional development.

Qi, G., Jia, Y., Zou, H., 2021. Is institutional pressure the mother of green innovation? Examining the moderating effect of absorptive capacity. Journal of Cleaner Production 278, 123957. https://doi.org/10.1016/j.jclepro.2020.123957

Qiu, L., Hu, D., Wang, Y., 2020. How do firms achieve sustainability through green innovation under external pressures of environmental regulation and market turbulence? Business Strategy and the Environment 29, 2695-2714. https://doi.org/10.1002/bse.2530

Quan, X., Ke, Y., Qian, Y., Zhang, Y., 2023. CEO Foreign Experience and Green Innovation: Evidence from China. J Bus Ethics 182, 535-557. https://doi.org/10.1007/s10551-021-04977-z

Rehman, S.U., Kraus, S., Shah, S.A., Khanin, D., Mahto, R.V., 2021. Analyzing the relationship between green innovation and environmental performance in large manufacturing firms. Technological Forecasting and Social Change 163, 120481. https://doi.org/10.1016/j.techfore.2020.120481

Ren, S., Wang, Y., Hu, Y., Yan, J., 2021. CEO hometown identity and firm green innovation. Business Strategy and the Environment 30, 756-774. https://doi.org/10.1002/bse.2652

Revell, A., Stokes, D., Chen, H., 2010. Small businesses and the environment: turning over a new leaf? Business Strategy and the Environment 19, 273-288.

Ryszko, A., 2016. Proactive Environmental Strategy, Technological Eco-Innovation and Firm Performance—Case of Poland. Sustainability 8, 156. https://doi.org/10.3390/su8020156

Segarra-Oña, M., A., P.-S., Albors, J., Miret-Pastor, L., 2011. Impact of Innovative Practices in Environmentally Focused Firms: Moderating Factors. International Journal of Environmental Research 5, 425-434.

Sharma, S., Prakash, G., Kumar, A., Mussada, E.K., Antony, J., Luthra, S., 2021. Analysing the relationship of adaption of green culture, innovation, green performance for achieving sustainability: Mediating role of employee commitment. Journal of Cleaner Production 303, 127039. https://doi.org/10.1016/j.jclepro.2021.127039

Singh, S.K., Giudice, M.D., Chierici, R., Graziano, D., 2020. Green innovation and environmental performance: The role of green transformational leadership and green human resource management. Technological Forecasting and Social Change 150, 119762. https://doi.org/10.1016/j.techfore.2019.119762

Soewarno, N., Tjahjadi, B., Fithrianti, F., 2019. Green innovation strategy and green innovation: The roles of green organizational identity and environmental organizational legitimacy. Management Decision 57, 3061-3078. https://doi.org/10.1108/MD-05-2018-0563

Triguero, A., Moreno-Mondéjar, L., Davia, M.A., 2013. Drivers of different types of eco-innovation in European SMEs. Ecological Economics 92, 25-33. https://doi.org/10.1016/j.ecolecon.2013.04.009

Wagner, M., 2008. Empirical influence of environmental management on innovation: Evidence from Europe. Ecological Economics 66, 392-402.

Wang, C.H., 2020. An environmental perspective extends market orientation: Green innovation sustainability. Business Strategy and the Environment 29, 3123-3134. https://doi.org/10.1002/bse.2561

Wang, C.-H., 2019. How organizational green culture influences green performance and competitive advantage: The mediating role of green innovation. Journal of Manufacturing Technology Management 30, 666-683. https://doi.org/10.1108/JMTM-09-2018-0314

Weng, H.-H. (Robin), Chen, J.-S., Chen, P.-C., 2015. Effects of Green Innovation on Environmental and Corporate Performance: A Stakeholder Perspective. Sustainability 7, 4997-5026. https://doi.org/10.3390/su7054997

Wong, S.K.S., 2013. Environmental Requirements, Knowledge Sharing and Green Innovation: Empirical Evidence from the Electronics Industry in China. Business Strategy and the Environment 22, 321-338.

Yahya, S., Jamil, S., Farooq, M., 2021. The impact of green organizational and human resource factors on developing countries' small business firms tendency toward green innovation: A natural resource-based view approach. Creativity and Innovation Management 30, 726-741. https://doi.org/10.1111/caim.12469

Zailani, S., Iranmanesh, M., Nikbin, D., Jumadi, H.B., 2014. Determinants and environmental outcome of green technology innovation adoption in the transportation industry in Malaysia. Asian Journal of Technology Innovation 22, 286-301. https://doi.org/10.1080/19761597.2014.973167

Zhang, Y., Sun, J., Yang, Z., Wang, Y., 2020. Critical success factors of green innovation: Technology, organization and environment readiness. Journal of Cleaner Production 264, 121701. https://doi.org/10.1016/j.jclepro.2020.121701

IMPACT OF ASSET STRUCTURE ON CAPITAL STRUCTURE OF LISTED FOOD AND BEVERAGE ENTERPRISES ON THE VIETNAMESE STOCK MARKET

PhD. Nguyen Thi Minh Hanh*

Abstract: ***Determining an optimal capital structure for a business is challenging due to the influence of various factors. This study collects data from 30 food and beverage (F&B) enterprises during the period from 2017 to 2023 to analyze the impact of asset structure on the capital structure of these enterprises. The research results show that the ratio of tangible fixed assets is positively correlated with the capital structure of businesses. Additionally, the study indicates that the capital structure is also affected by the Revenue growth rate, Profitability, Firm size, Firm age, and Current ratio.***

• Keywords: *asset structure, capital structure, debt ratio, tangible fixed assets.*

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1. Introduction

Capital structure is one of the critical financial management decisions for a business, directly affecting the stability and sustainable development of the company. Especially in the context of deepening integration with the global economy, identifying factors that influence a company's capital structure has become an urgent and practical task. The F&B sector, characterized by essential production and consumption, large capital demands, and fluctuating business cycles, constantly faces fierce competition and requires appropriate financial strategies to maintain and develop.

Capital structure refers to the combination of debt and equity that a company uses to finance its operations. Seeking an optimal capital structure and understanding the factors affecting it, in general, and the impact of asset structure on capital structure, in particular, are not only the primary concerns of financial managers but also attract considerable research interest worldwide, both theoretically and empirically. The pioneering theory of modern corporate capital structure began with Modigliani & Miller's Capital Structure Theory (1958 and 1963) (known as the M&M theory) and continued to evolve through subsequent theories such as the Trade-off Theory, the Pecking Order Theory, and the Agency Theory. Many studies have indicated that the ratio of tangible fixed assets of a company directly affects its access to capital, borrowing costs, and financial risk levels. An in-depth study of the impact of asset structure on capital structure not only helps businesses develop effective financial strategies but also contributes to optimizing corporate value and enhancing market competitiveness.

Currently, there have been many studies on the impact of asset structure on the capital structure of businesses; however, there is limited research in Vietnam. Notably, in recent times, Vietnam's corporate income tax policy has been adjusted multiple times towards reduction to encourage business activities, significantly impacting the capital structure of companies in general and the F&B sector in particular. The study "Impact of Asset Structure on Capital Structure of Listed Food and Beverage Companies on the Vietnamese Stock Market" aims to analyze the extent of the impact of the tangible fixed asset ratio on the capital structure of F&B businesses during their operations, thereby proposing suggestions for capital structure strategies to enhance financial capacity, ensure sustainable development, and increase market competitiveness.

Besides the introduction, the article includes the following sections: literature review, research methodology, research results, and discussion.

2. Literature review

Some theories in capital structure

The Modigliani and Miller (M&M) Theory: The definition of capital structure originates from

** Thuong Mai University; email: hanhdhtm@tmu.edu.vn*

the modern capital structure theory of Modigliani & Miller (1958). Modigliani and Miller studied the case of companies operating in a tax-free environment. They suggested that the capital market is perfect without bankruptcy costs, agency costs, and financial distress costs. Individuals and organizations can borrow money on equal terms, the market capital is perfect, and no investor has a significant impact on stock prices. The value of the company depends solely on the profitability of its assets and not on its capital structure. This means that whether a company is financed by debt or equity does not affect its total value. Modigliani & Miller (1963) included corporate income tax in their model. In an environment with corporate income tax, the value of a leveraged company is higher than that of a company without debt, as using debt brings tax benefits. The value of a leveraged company equals the value of an unleveraged company plus the present value of tax savings from interest expenses. Hence, the company's value increases with higher debt usage and maximizes when the company is 100% debt-financed. Although the M&M theory laid the foundation for capital structure theories, applying these assumptions in practice is difficult because they are based on the assumption of a perfect market without transaction costs and financial distress costs. This has provided a basis for the development of subsequent theories.

The trade-off theory: Unlike the M&M capital structure theory, the trade-off theory by Kraus & Litzenberger (1973) and Myers (1977) posits that companies using debt benefit from the tax shield from interest expenses, but debt usage incurs additional costs related to debt (financial distress costs and agency costs). Therefore, a company should use a certain level of debt, balancing the benefits of the tax shield with the costs related to debt to achieve the highest company value, which is the optimal capital structure.

The agency theory: This theory addresses the conflict of interest between shareholders and managers. Jensen (1986) pointed out that capital structure is an effective management tool to resolve agency cost issues, helping to reduce agency costs.

Pecking order theory: Myers & Majluf (1984) suggested a hierarchy of financing sources for a company, starting with retained earnings, which are least affected by information and issuance costs, followed by debt financing, and finally, new equity issuance, which bears the highest information costs.

Research on the relationship between asset structure and capital structure of enterprises

The relationship between tangible fixed assets and the debt ratio is determined in two opposite directions. According to the trade-off theory, large tangible assets are an important basis for companies to access borrowing opportunities. In contrast, the agency cost theory argues that companies with more tangible assets have lower agency costs between managers and shareholders (Jensen, 1986), so these companies tend to borrow less. Additionally, according to the pecking order theory, companies with large tangible assets will maintain lower debt levels because they often face lower costs of information asymmetry and equity issuance.

Fixed assets are used as collateral in the company's borrowing process. Most empirical research results indicate a positive relationship between fixed assets and capital structure. Studies by Gaud et al. (2005); Rajan & Zingales (1995); Chen (2004) show that the ratio of tangible fixed assets is positively correlated with financial leverage in countries because creditors often require collateral for loans. Moreover, the liquidation value of a company increases with tangible fixed assets, reducing losses in case of bankruptcy. Titman & Wessels (1988) studied 469 companies in the US from 1974 to 1982. The research results show a positive correlation between asset structure and company size with capital structure. (Wiwattanakantang, 1999) analyzed data from 270 non-financial listed companies in Thailand in 1996. The results show a positive relationship between asset structure and business risk with the debt ratio. Similarly, Huang (2006) conducted research and analysis on 1,200 listed companies in China from 1994-2003. The results indicate that profitability, tax, and growth opportunities negatively affect capital structure; conversely, the correlation between asset structure and capital structure is positive. Companies with high fixed assets have a higher ability to repay debts. This explanation is supported by studies by Frank & Goyal (2009), Chen (2004); Ab Wahab & Ramli (2014).

However, some empirical studies show an inverse relationship between fixed assets and capital structure. Banchuenvijit (2009) researched 81 companies listed on the Stock Exchange of Thailand from 2004 to 2008. The results show that three factors are statistically significant: profitability and the ratio of tangible fixed assets have an inverse

relationship with the debt ratio, while company size has a positive correlation with the debt ratio. Nguyen & Ramachandran (2006) and Phan (2016) have similar research results. These studies indicate that businesses invest in fixed assets mainly using retained earnings or equity rather than prioritizing loans. This shows that different industries and fields have different decisions regarding capital structure.

Research on the impact of other factors on the capital structure of enterprises

The relationship between the size of an enterprise and the debt ratio in its capital structure is determined in two opposing directions. According to the pecking order theory, large enterprises with a good reputation and long operational history tend to use more equity to ensure shareholder control, showing an inverse relationship with the debt ratio (Chen, 2004). Conversely, according to the trade-off theory and the agency cost theory, the size of a company correlates positively with the debt ratio of enterprises because using debt helps shareholders control managerial behavior better (Titman & Wessels, 1988); (Banchuenvijit, 2009)(Kirchler et al., 2008); (Ab Wahab & Ramli, 2014)

Profitability, reflected through the return on total assets (ROA), theoretically has both a positive effect according to the trade-off theory and the agency cost theory and a negative effect according to the pecking order theory. The trade-off theory suggests that higher profitability reduces the risk for creditors, making them more willing to increase lending. Additionally, the tax shield benefits encourage financial managers to use more debt. Similarly, the agency cost theory argues that more profitable companies tend to issue more debt to prevent managers from using cash inefficiently (Jensen, 1986). However, according to the pecking order theory, companies often prioritize internal funding over debt. Empirical studies also yield various results, though most show an inverse relationship between ROA and the debt ratio of enterprises, as seen in studies by Chen (2004); Banchuenvijit (2009); Gaud et al. (2005); Huang (2006).

Revenue growth rate: According to the trade-off theory, companies with more growth opportunities often face higher financial distress costs. Similarly, based on the agency cost theory, shareholders tend to avoid sharing benefits with creditors, leading high-growth companies to maintain low debt levels. These arguments explain the inverse relationship between a company's growth rate and the debt ratio (Huang, 2006). Conversely, the pecking order theory posits that high-growth companies usually need more capital for investment, making borrowing an important financing method, thus showing a positive correlation between debt ratio and growth rate. Empirical studies show consistent results (Chen, 2004), (Phan, 2016).

Liquidity ratio: Anderson & Carverhill (2012) pointed out that liquidity ratio affects an enterprise's capital structure. The trade-off theory suggests that enterprises can use debt for payments, requiring a high liquidity ratio. Thus, a company's liquidity correlates positively with debt. On the contrary, the pecking order theory indicates an inverse relationship between liquidity and debt ratio. If a company maintains a high liquidity ratio, it tends to use its capital rather than borrowing. Empirical results supporting the pecking order theory (Deesomsak et al., 2004); (Myers & Rajan, 1998) show an inverse relationship between liquidity and borrowing.

Firm age is defined as the period from the current year to the year the enterprise was established. Petersen & Rajan (1994) suggested that the debt ratio decreases as enterprises age. Conversely, some studies (Vijayakumaran & Vijayakumaran, 2018); (Tian & Estrin, 2008); show that older enterprises have a higher debt ratio, indicating a positive relationship between the number of operating years and the debt ratio because investors prefer lending to well-known enterprises over unknown ones. In summary, the relationship between the debt ratio and enterprise age remains contentious.

3. Research methodology and research model

3.1. Data and research methods

The research utilizes data from 30 F&B companies listed on the Vietnamese stock market during the period 2017-2023. The data is presented in the form of a panel dataset of company-year observations, with a total of 210 observations.

The study estimates the regression model using three methods: the pooled ordinary least squares (pooled OLS), the fixed effects model (FEM), and the random effects model (REM). Subsequently, the F test and Hausman test are conducted to select the appropriate estimation method for the research data. Finally, if there are issues with autocorrelation and heteroskedasticity, the model is corrected using the generalized least squares (GLS) method.

3.2. Research model

In this study, the author uses capital structure as the dependent variable in the estimation model, which is calculated as the ratio of total liabilities to total assets of the enterprise.

Table 1: Summary of Variables in the model

Variable	Code	Calculation Formula	Expectation	References
Dependent Variable				
Capital Structure	LEV	Total Liabilities / Total Assets		
Independent Variables				
Tangible Fixed Asset Ratio	TANG	Tangible Fixed Assets / Total Assets	+/-	(Gaud et al., 2005); (Chen, 2004); (Banchuenvijit, 2009); (Nguyen & Ramachandran, 2006)
Revenue Growth Rate	GROW	(Current Year Revenue - Previous Year Revenue) / Previous Year Revenue	+/-	(Huang, 2006); (Chen, 2004), (Phan, 2016).
Profitability	ROA	Net Income / Total Assets	-	(Chen, 2004); (Banchuenvijit, 2009); (Gaud et al., 2005); (Huang, 2006).
Firm Size	SIZE	Logarithm of Total Assets	+/-	(Titman & Wessels, 1988); (Banchuenvijit, 2009); (Ab Wahab & Ramli, 2014); (Chen, 2004)
Firm Age	AGE	Duration of Firm's Operation	+/-	(Petersen & Rajan, 1994); (Vijayakumaran & Vijayakumaran, 2018); (Tian & Estrin, 2008)
Current Ratio	CR	Current Assets / Current Liabilities	+/-	(Anderson & Carverhill, 2012); (Myers & Rajan, 1998); (Deesomsak et al., 2004)

Source: Compiled by the author

The proposed multivariate regression model is:

$$LEV_{it} = \beta_1 + \beta_2 TANG_{it} + \beta_3 GROW_{it} + \beta_4 ROA_{it} + \beta_5 SIZE_{it} + \beta_6 AGE_{it} + \beta_7 CR_{it} + u_{it}$$

4. Research results

4.1. Correlation and multicollinearity tests among variables

Table 2: Correlation and Multicollinearity Tests among Variables

	LEV	TANG	GROW	ROA	SIZE	AGE	CR	VIF
LEV	1.0000							
TANG	-0.0033	1.0000						1.08
GROW	-0.0474	-0.0135	1.0000					1.12
ROA	-0.4243***	0.0655	0.0006	1.0000				1.05
SIZE	0.2081***	0.0854	-0.0382	0.0853	1.0000			1.13
AGE	-0.1271*	-0.1508**	-0.1528**	0.0008	0.0602	1.0000		1.08
CR	-0.7171***	-0.2117***	0.2625***	0.1428**	-0.2874***	0.1125	1.0000	1.30

****with p_value <1%, **with p_value <5%,*with p_value <10%*

Source: Results from Stata 17 software analysis

Table 2 shows the correlation and multicollinearity among variables in the model. It can be seen that the LEV variable is correlated with most variables in the model: ROA, SIZE, AGE, and CR. The variance inflation factor (VIF) test shows that the VIF values of the independent variables are all less than 2, indicating that there is no multicollinearity among the independent variables.

4.2. Selection test and model building

The study estimates the model using three methods: pooled OLS, FEM, and REM. The F-test and Hausman test are conducted to choose the most appropriate model. The test results show that the REM model is the most suitable for the research data. The author then tests for autocorrelation and heteroskedasticity. The test results are shown in Table 3.

Table 3: Model selection test results

Test	Result	Conclusion
F_test	Prob > F = 0.0000 < 0.05	FEM model is more suitable than OLS model
Hausman Test	Prob > chi2 = 0.8037 < 0.05	REM model is more suitable than FEM model
Heteroskedasticity Test	Prob > chibar2 = 0.0000 < 0.05	REM model has heteroskedasticity issue
Autocorrelation Test	Prob > F = 0.0014 < 0.05	REM model has autocorrelation issue

Source: Results from Stata 17 software analysis

4.3. Regression model

Table 4: Regression model after correcting for autocorrelation and heteroskedasticity

	Research Hypothesis	Research Results		
		Coeficient	Std. err	Impact direction
TANG	+/-	-.1979745***	.0456845	-
GROW	+/-	.021846***	.005294	+
ROA	-	-.5783293***	.0621393	-
SIZE	+/-	.0056564**	.0033422	+
AGE	+/-	-.0008734***	.0003084	-
CR	+/-	-.0954673***	.0058302	-
_cons		.671518***	.0503747	

**If Pvalue <1)% ; **If Pvalue <5%; ***If Pvalue <1%*

Source: Results from Stata 17 software analysis

5. Discussion

The regression results from the FGLS model in Table 4 show that the factors TANG, ROA, AGE, and CR have an inverse effect on capital structure, while the factors SIZE and GROW positively affect the debt-to-total-assets ratio at statistically significant levels for food and beverage (F&B) enterprises. Specifically:

Asset structure is reflected through the Tangible Fixed Asset Ratio (TANG), which has an inverse effect on the capital structure of enterprises (β = -0.1979745). Typically, companies with high

tangible fixed assets (TSCĐ) increase debt due to the collateral for loans. However, in the F&B sector, companies mainly invest in tangible fixed assets using retained earnings or equity rather than debt. The research indicates that the pecking order theory is more appropriate than other theories in explaining the impact of the fixed asset ratio on the capital structure of F&B enterprises. This finding aligns with Frank & Goyal (2009), Chen (2004); and Ab Wahab & Ramli (2014).

Profitability (ROA) has the strongest inverse effect on the capital structure of enterprises (β = -0.5783293). This suggests that profitable F&B companies tend to finance using internal funds rather than debt, as debt can increase financial burdens. Instead of using debt, they use retained earnings to meet their capital needs. Conversely, less profitable companies must increase debt to ensure business operations. This correlation is supported by the pecking order theory and studies by Chen (2004); Banchuenvijit (2009); Gaud et al. (2005); and Huang (2006).

Firm age (AGE) has an inverse effect on the capital structure, but the impact is not significant (β = -0.0008734). This indicates that long-established F&B enterprises do not have high capital financing needs. This is due to the economic hardships following the COVID-19 pandemic, which led F&B businesses to limit the use of debt to reduce financial burdens (Petersen & Rajan, 1994).

Current Ratio (CR) has an inverse correlation with the capital structure of enterprises (β = -0.0954673). Companies with high liquidity use less debt since they do not need to borrow for current payments and prefer using these assets to finance their projects. This finding is consistent with previous studies by Deesomsak et al. (2004); and Myers & Rajan (1998).

Firm size (SIZE) has a positive correlation with the capital structure with a relatively small impact (β = 0.0056564), consistent with the trade-off theory of capital structure and the findings of Titman & Wessels (1988); Banchuenvijit (2009); Kirchler et al. (2008); and Ab Wahab & Ramli (2014). Larger F&B companies indicate stronger financial capabilities and lower bankruptcy risks. Additionally, larger enterprises have better reputations in the debt market, gain creditor trust, and thus access loans more easily while reducing transaction costs.

Revenue Growth Rate (GROW) positively affects the capital structure of enterprises (β = 0.021846). This correlation aligns with the pecking order theory. When a company has many growth opportunities but retained earnings are insufficient to meet capital needs, it prefers using debt over issuing new shares. Therefore, the debt ratio of a company will be higher when its growth rate is higher. This finding is consistent with the studies of Chen (2004), and Phan (2016).

References:

Ab Wahab, S. N. A., & Ramli, N. A. (2014). The determinants of capital structure: an empirical investigation of Malaysian listed government linked companies. International Journal of Economics and Financial Issues, 4(4), 930-945.

Anderson, R. W., & Carverhill, A. (2012). Corporate liquidity and capital structure. The Review of Financial Studies, 25(3), 797-837.

Banchuenvijit, W. (2009). Capital structure determinants of Thai listed companies. The Clute International Academic Conference, New Orleans Louisiana.

Chen, J. J. (2004). Determinants of capital structure of Chinese-listed companies. Journal of Business Research, 57(12), 1341-1351.

Deesomsak, R., Paudyal, K., & Pescetto, G. (2004). The determinants of capital structure: evidence from the Asia Pacific region. Journal of Multinational Financial Management, 14(4-5), 387-405.

Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: which factors are reliably important? Financial Management, 38(1), 1-37.

Gaud, P., Jani, E., Hoesli, M., & Bender, A. (2005). The capital structure of Swiss companies: an empirical analysis using dynamic panel data. European Financial Management, 11(1), 51-69.

Huang, G. (2006). The determinants of capital structure: Evidence from China. China Economic Review, 17(1), 14-36.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. The American Economic Review, 76(2), 323-329.

Kirchler, E., Hoelzl, E., & Wahl, I. (2008). Enforced versus voluntary tax compliance: The "slippery slope" framework. Journal of Economic Psychology, 29(2), 210-225.

Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. The Journal of Finance, 28(4), 911-922.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. The American Economic Review, 48(3), 261-297.

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. The American Economic Review, 53(3), 433-443.

Myers, S. C. (1977). Determinants of corporate borrowing. Journal of Financial Economics, 5(2), 147-175.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics, 13(2), 187-221.

Myers, S. C., & Rajan, R. G. (1998). The paradox of liquidity. The Quarterly Journal of Economics, 113(3), 733-771.

Nguyen, T. D. K., & Ramachandran, N. (2006). Capital structure in small and medium-sized enterprises: the case of Vietnam. ASEAN Economic Bulletin, 192-211.

Petersen, M. A., & Rajan, R. G. (1994). The benefits of lending relationships: Evidence from small business data. The Journal of Finance, 49(1), 3-37.

Phan, H. T. (2016). Nhân tố ảnh hưởng đến cấu trúc vốn của doanh nghiệp công nghiệp nhìn từ mô hình GMM [Factors affecting the capital structure of industrial enterprises seen from the GMM model]. Retrieved May, 10, 2017.

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. The Journal of Finance, 50(5), 1421-1460.

Tian, L., & Estrin, S. (2008). Retained state shareholding in Chinese PLCs: Does government ownership always reduce corporate value? Journal of Comparative Economics, 36(1), 74-89.

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. The Journal of Finance, 43(1), 1-19.

Vijayakumaran, S., & Vijayakumaran, R. (2018). The determinants of capital structure decisions: Evidence from Chinese listed companies. Vijayakumaran, S., & Vijayakumaran, 63-81.

Wiwattanakantang, Y. (1999). An empirical study on the determinants of the capital structure of Thai firms. Pacific-Basin Finance Journal, 7(3-4), 371-403.

THE NON-LINEAR RELATIONSHIP BETWEEN R&D INTENSITY AND DIVIDEND PAYMENT: AN EMPIRICAL STUDY ACROSS INTERNATIONAL COUNTRIES

PhD. Le Quynh Lien*

Abstract: ***This paper investigates the impact of R&D intensity and dividend payment. The author uses data from the Compustat database, covering 13,448 global firms from 2009 to 2023, resulting in 100,909 firm-year observations. This research performs regression and conducts tests for Pooled PLS to address model issues. The analysis reveals that higher R&D expenditure intensity is associated with lower dividend payouts, as firms investing heavily in R&D often reinvest earnings rather than distributing them as dividends. This finding aligns with the pecking order theory, which prioritizes internal investments over dividend payments. Additionally, there is a positive impact on dividend payout with high R&D intensity, indicating a non-linear relationship. Initially, increased R&D intensity leads to reduced dividends, but at higher levels of R&D intensity, the positive effect suggests that substantial R&D investments can eventually enhance firm performance and increase dividend payouts. These results indicate that while firms with high R&D investments may initially reduce dividends, long-term innovation benefits can lead to increased dividend payments, supporting a balanced approach to investment and returns.***

• Keywords: *compustat; dividend payment; global firms; international countries; R&D intensity.*

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1. Introduction

Research and development (R&D) expenditures are pivotal drivers of economic growth, and global R&D investment has seen substantial increases over time (Yang et al., 2018). Firms investing heavily in R&D often enjoy high growth potential, leading to high valuations by investors (Banker et al., 2019). In an imperfect capital market, where internal financing is less costly than external sources, firms face a dilemma: whether to use these less costly funds for R&D investments or distribute them as dividends. Agency theory suggests that external shareholders prefer dividends over retained earnings because they fear that excess funds may be used by managers to further their own interests rather than being reinvested in the firm (Myers, 2000). This preference is particularly pronounced in emerging markets with weaker investor protections, which can facilitate greater managerial expropriation (Mitton, 2004). In such environments, minority shareholders may exert their rights more aggressively to extract dividends (La Porta et al., 2000).

The dividend policy, a central issue in corporate finance, has been extensively studied since Miller and Modigliani's seminal work (1961). According to dividend signaling theory, dividends serve as a positive signal of a firm's future performance, reducing information asymmetry between managers and investors (Miller and Rock, 1985). An increase in dividends is thus seen as an indicator of favorable prospects. Spence (1973) argues that the cost of signaling through dividends enhances its informativeness. Consequently, loss firms, which have limited information content in their earnings, may use dividend payouts to signal their future potential (Rees and Valentincic, 2013).

The recent rise in R&D intensity has significantly influenced how companies manage their financial strategies, especially in relation to dividend payments. As firms dedicate more resources to innovation, they often reduce the dividends paid to shareholders. R&D investments, known for their high information asymmetry, are risky and long-term (Keupp and Gassmann, 2009). Firms with significant R&D activities may keep sensitive information secret to maintain competitive advantage, exacerbating information asymmetry (Lee and Lee, 2019). Prior research indicates that high R&D investments are positively associated with a firm value, suggesting that R&D should be treated as a valuable economic asset (Dedman et al.,

** National Economics University, Vietnam; email: lienlq@neu.edu*

2009). Loss firms in R&D-intensive industries, despite reporting negative earnings, might be seen as having hidden assets with future payoffs (Darrough and Ye, 2007). Therefore, such firms may opt to pay dividends to signal their growth prospects, particularly when they believe in the profitability of their R&D investments.

Conversely, the Pecking order theory posits that firms with high information asymmetry should prioritize internal financing over external sources and may thus have less available for dividends (Myers and Majluf, 1984). Firms investing in R&D often use internal funds, limiting their capacity for dividend payments. Cash flow, a key determinant of R&D intensity, influences dividend payouts; firms facing cash flow constraints due to dividend policies might reduce their R&D activities (Gugler, 2003). The decision to allocate resources between R&D investments and dividend payouts involves complex trade-offs. Firms must balance the short-term and long-term implications of their financial policies, considering both the potential for growth driven by R&D and the immediate return expectations of shareholders.

This study examines the effects of R&D intensity and dividend payments. There are several key reasons for this research. First, the relationship between R&D intensity and dividend payments has been analyzed through various theoretical perspectives, often yielding mixed empirical results. Since existing data is still inconclusive, this study aims to provide further insights into the issue. Second, while there is some evidence on the link between R&D investment and dividend payments from developed markets (Yang et al., 2018), there is limited data from international contexts, especially given the current globalized accounting landscape. This research seeks to offer a broader view of how cash holdings and R&D expenditures are related, and how this relationship varies across different countries, regions, and industries. This information can help managers create more effective financial and investment strategies tailored to their specific business environments.

The paper is organized as follows: Section 1 provides background and rationale for selecting the topic. Section 2 reviews literature and presents the study's hypotheses. Section 3 outlines the methodology, analytical techniques, and empirical results. Section 4 presents the findings in detail. Section 5 discusses the results, addresses limitations, suggests future research directions, and evaluates the implications.

2. Literature Review and hypothesis development

Previous studies indicate a positive impact of R&D intensity on dividend payment (Fama and French, 2001; Gugler, 2003; Kim et al., 2021). The reputation effect hypothesis suggests that managers pay dividends to build a good reputation in capital markets, making it easier to raise additional funds or prevent hostile takeovers (La Porta et al., 2000). Since R&D investments require long-term funding and R&D-intensive firms are more likely takeover targets, these firms may choose to pay higher dividends than others (Fang et al., 2014; Bernstein, 2015). Loss firms with high R&D intensity are more likely to pay dividends to signal their prospects (Nam, 2018).

Yang et al. (2018) analyzed data from Chinese listed firms between 2007 and 2015 and found that companies investing more in R&D tend to pay higher dividends, thereby implying a positive relationship between R&D intensity and dividend payment. They attribute this to the fact that R&D investments are largely dependent on external equity financing because they are long-term and inflexible. To secure this financing, firms often pay higher dividends as a positive signal to attract external investors. While this behavior may not align with traditional dividend theories, it can be explained by China's semi-mandatory dividend policy and the unique nature of R&D investments. Specifically, unlike capital expenditures, R&D projects are typically long-term and funded through external capital markets. an anticipated need for future equity financing leads these firms to strategically pay dividends to meet the prerequisites for accessing external capital. In China, this pattern is particularly noticeable in companies with lower cash reserves and fewer financial constraints.

In contrast, many researchers have found a negative relationship between R&D investments and dividend payments (Fama and French, 2001; Gugler, 2003; Lee et al., 2011). Kim et al. (2021) argue that paying dividends can strain a company's liquidity, potentially leading to underinvestment in essential R&D projects. Increased R&D intensity often leads to reduced dividend payments, indicating that companies prioritizing R&D do so at the expense of dividends, potentially impacting overall firm value (Fama and French, 2001; Gugler, 2003; Bates et al., 2009). Firms invest in R&D to expand growth opportunities, build competitive advantages, and enhance value. However, R&D-intensive firms face significant information asymmetries with external investors, leading to higher external financing costs. To maintain funding for ongoing R&D, these firms hold larger cash reserves and often reduce dividend payouts (Lee et al., 2011). According to traditional finance theories (Fama and French, 2002; Hasan, 2021a, b, 2022) suggest a negative relationship between R&D investment and dividend payments. These theories argue that in an imperfect capital market, internal funding is less expensive than external capital. When

a firm's internal funds are limited, it may have to choose between investing in valuable projects or paying dividends. According to the classical dividend theorem, this competition for limited internal resources leads to a negative correlation between a firm's dividend policy and its R&D investments.

Additionally, companies with significant R&D needs often rely on their cash reserves to support innovation. However, this reliance can result in cash shortages, pushing firms to seek external financing, which is usually more unpredictable. Consequently, these companies often reduce dividend payments. Research by Brown and Petersen (2011) supports this, showing that growth-oriented firms with high R&D investments typically have lower dividend yields than their non-growth counterparts. Fama and French (2001) observed that U.S. firms with high R&D investments tend to pay little or no dividends, a trend also seen in Austrian firms by Gugler (2003).

Furthermore, Huang and Sattar (2020) found that in Chinese high-tech firms, higher dividend payments can diminish the positive effects of R&D subsidies. This finding further supports the idea that firms heavily invested in R&D may reduce their dividend payouts to allocate more capital to innovation. Their research suggests that prioritizing high dividend payments can weaken the effectiveness of R&D subsidies, leading to slower innovation-driven growth.

Another factor affecting the relationship between R&D investments and dividends is information asymmetry. Firms heavily involved in R&D often keep proprietary information confidential to protect their competitive advantage, which can reduce transparency. This lack of transparency may make external investors or creditors more cautious, leading firms to retain more internal financing and pay fewer dividends. Companies with substantial R&D investments often reduce dividend payments to reinvest profits into growth and innovation. This trend is driven by the need to maintain liquidity, manage cash reserves, address the challenges of external financing, and handle the complexities of information asymmetry.

Additionally, some studies indicate that the relationship between R&D intensity and dividends is non-linear. For example, research on the Japanese market shows that the correlation between R&D intensity and dividend payouts follows an inverted U-shape. This means that R&D intensity is inversely related to dividend payouts for firms with high R&D intensity. However, when R&D intensity is low, dividend distributions and R&D intensity are positively related (Nagasawa and Ito, 2016).

Thus, the research hypothesis is proposed as follow:

H1. R&D intensity has a negative impact on dividend payment.

H2. R&D intensity has a U-shaped impact on dividend payment.

3. Research methodology

3.1. Model specification and variables

3.1.1. The regression model

Equation (1) is developed based on the literature review related to financial structure and R&D intensity as follows:

$$Dividend\ payout_{i,t} = \beta_0 + \beta_1 R\&D\ intensity_{i,t} + \beta_2 (R\&D\ intensity_{i,t})^2 + \gamma Control_{i,t} + Year + \varepsilon_{i,t} \quad (1)$$

Where: Dividend payout$_{i,t}$ is the proxy of dividend payment for firm i in year t; The key independent variable, R&D intensity$_{i,t}$ represents R&D intensity for firm i in year t; β_0, β_1, β_2 captures the impact of R&D intensity on dividend payment. Control refers to the set of control variables described in Table 1.

3.1.2. Variables

Table 1 describes all the variables included in the regressions as follows:

Table 1. Variable descriptions

Variables	Symbol	Description	References	Data source
I. Dependent variables				
Dividend payment	Dividend_ payout	Cash dividend/Net income	Yang et al. (2018), Lee and Lee (2019)	Compustat
II. Independend variables				
R&D intensity	RDEI	R&D expenses/Total assets	Berchicci (2013), Hsu et al. (2015)	Compustat
R&D intensity	RDEI2	(R&D expenses/ Total assets)^2	Berchicci (2013), Hsu et al. (2015)	Compustat
III. Control variables				
Firm size	Size	Natural logarithm of total assets	Yang et al. (2018), Lee and Lee (2019), Hasan et al. (2022)	Compustat
Firm performance	ROA	Return on Assets/ Total assets	Shin et al. (2010), Nam (2018), Yang et al. (2018)	Compustat
Sale growth	Growth	Change in Sales/ Sales	Lee and Lee (2019), Hasan et al. (2022)	Compustat

4.2. Sample and methodology

The study used data from the Global Compustat database, which provides extensive international financial information. Our sample consists of 13,448 non-financial firms from 2009 to 2023. Financial institutions were excluded due to their unique financial activities. To maintain dataset integrity, missing data points were removed, and winsorization was applied to the main variables by trimming the top and bottom one percent of observations to reduce outlier effects. The final dataset includes 100,909 firm-year observations.

First, the auther run ordinary least squares (Pooled OLS) with firm dummies are applied to regress

Equations (1). Subsequently, we perform tests on the Pooled OLS to address potential model issues and conduct bootstrapping with 1,000 replications to assess the robustness of standard errors and ensure the reliability of our estimates. This approach helps validate the consistency of the results and identify any anomalies or biases introduced by the estimation method.

4. Results and discussions

4.1. Summary statistics

Table 2 reports the descriptive statistics of variables included in this study to provide insight into both R&D intensity and dividend payments.

Dividend Payment (Dividend_payout): On average, firms have a dividend payout ratio of 56%, indicating that they distribute more than half of their net income as dividends. However, there is significant variation, with some firms reporting negative payouts, likely due to financial losses or specific accounting adjustments. The range spans from -2.5224, suggesting instances of payouts exceeding net income, to 8.5195, where firms pay out more than eight times their net income.

R&D Expenditure Intensity (RDEI): Firms allocate an average of 4% of their resources to R&D. This measure shows variability in investment strategies, as indicated by a standard deviation of 0.0741. The R&D intensity ranges from near zero to 0.4995, reflecting a wide disparity in how firms invest in research and development, from minimal to nearly 50% of their resources.

Squared R&D Expenditure Intensity (RDEI2): The average squared R&D intensity value is low at 0.0071, reflecting the skewness in R&D expenditure. This variable has a standard deviation of 0.0307, suggesting that most firms have low R&D intensity. The range from near zero to 0.2498 underscores the non-linear nature of R&D intensity, where higher values become increasingly rare.

Firm Size (Size): The average firm size, measured on a logarithmic scale, is approximately 7.52, indicating moderate to large firms. The standard deviation of 3.3074 demonstrates substantial variation in firm sizes, with the range from negative values possibly due to very small or newly listed firms to a maximum of 15.9441, representing very large firms.

Return on Assets (ROA): Firms, on average, achieve a return on assets of 1.15%, reflecting modest profitability. The standard deviation of 0.1958 reveals considerable variability in profitability across firms. The range of ROA values extends from -1.2128, indicating significant losses, to 0.3453, highlighting firms with returns as high as 34.53%.

Firm Growth (Growth): The average firm growth rate is 2.08%, although this figure is skewed by outliers. The standard deviation of 14.3691 points to extreme variability, with growth rates ranging from -1.2230 (decline) to 130.401 (exceptional growth), demonstrating a wide spectrum of growth experiences among firms.

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Dividend_payout	208,682	0.560713	1.211417	-2.522442	8.519481
RDEI	166,195	0.0395928	0.0741456	0.0000309	0.4994864
RDEI2	166,195	0.0070738	0.0307363	1.06E-09	0.2498249
Size	497,256	7.5203	3.307358	-0.0325232	15.94412
ROA	494,149	0.0114948	0.1958279	-1.212795	0.345349
Growth	480,890	2.084566	14.36913	-1.222965	130.4009

Additionally, the author examines the correlation between the variables in the model. The results indicate that all coefficients are below 0.45, suggesting that multicollinearity is not an issue. This implies that the variables are not highly correlated, and each provides distinct information. Typically, multicollinearity becomes a concern when coefficients exceed 0.8. Therefore, the results are robust, with stable and interpretable parameter estimates.

4.2. Empirical results and discussions

Table 3 presents the estimation results of Equation (1). The variance inflation factors (VIF) are all below 1.88, suggesting that multicollinearity is not a significant issue among the variables (Hair et al., 2010).

In table 3, there is a negative impact of R&D expenditure intensity (RDEI) on dividend payout, indicating that higher R&D expenditure intensity is associated with lower dividend payouts. Thus, H1 hypothesis is accepted. Firms investing heavily in R&D may prefer to reinvest their earnings into innovation rather than distributing them as dividends. The negative effect of RDEI on dividend payout supports the theory that firms with high R&D intensity often allocate more resources to innovation rather than dividends. This aligns with the pecking order theory, which suggests that firms prioritize internal investments over dividend payments (Myers, 1984).

These results show that there is a positive effect of the squared RDEI term on dividend payouts, indicating a non-linear relationship between R&D intensity and dividend payments. Initially, there is a negative impact of increasing R&D intensity on dividend payouts. However, as R&D intensity reaches higher levels, there is a positive effect, suggesting that substantial R&D investments can eventually lead to increased dividend payouts due to improved long-term performance and enhanced profitability. Therefore, H2 hypothesis

is accepted. This finding is consistent with Brown & Petersen (2011), which suggests that a balanced approach between investment and returns benefits long-term shareholder value.

Table 3 shows that there is no significant effect of firm size on dividend payouts, as the results show that variations in firm size do not substantially impact dividend distribution. Firm size alone does not appear to significantly influence dividend decisions within this sample.

This result also indicates that there is a negative relationship between ROA and dividend payout, indicating that firms with lower profitability, as measured by ROA, generally distribute fewer dividends. This supports the financial theory that dividend payments are closely related to a firm's profitability, as less profitable firms have less cash available for dividends.

Besides this, there is no significant impact of growth on dividend payouts, suggesting that the growth rate of a firm does not significantly affect its dividend payout decisions in this context. These findings align with the financial constraint hypothesis, which posits that less profitable firms prefer to retain earnings rather than distribute them as dividends (DeAngelo & Masulis, 1980).

Table 3. Multivariate analysis

VARIABLES	(1)	(2)	VIF
	Dividend_payout		
RDEI	-12.159***	-11.233***	3.2
	(3.482)	(3.451)	
RDEI2	22.740***	20.919***	3.14
	(7.200)	(7.085)	
Size	-0.022	0.165	1.04
	(0.075)	(0.128)	
ROA	-2.291***	-2.579***	1.01
	(0.555)	(0.599)	
Growth	-0.002	-0.004	1
	(0.002)	(0.002)	
Constant	1.325*	-0.396	
	(0.710)	(1.186)	
Mean VIF			1.88
Firm FE	Yes	Yes	
Year FE	No	Yes	
Observations	100,909	100,909	
R-squared	0.161	0.161	

*Notes: This table reports the baseline regression results of the impact of R&D intensity and devidend payment. Firm fixed effect is included in the regressions. Standard errors are double-clustered by firm-year. Robust t-statistics are in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.*

The White's test for heteroskedasticity yields a statistic of 16.09 with a p-value of 0.711, indicating that heteroskedasticity is not a significant issue; the residuals have a relatively uniform variance. The skewness statistic of 5.54, with a p-value of 0.3532, suggests that the residuals are approximately symmetrical, meaning there is no significant skewness affecting the model. Additionally, the kurtosis statistic is 3.2 with a p-value of 0.0735, showing that the distribution of residuals does not significantly deviate from normal in terms of kurtosis, indicating balanced tail behavior. The Wooldridge test for autocorrelation produces an F-statistic of 0.681 and a p-value of 0.4094, suggesting that autocorrelation is not a significant concern. This implies that the residuals are not influenced by past values, supporting the assumption of no residual correlation over time.

4.3. Robustness test

Table 4 provides insights into the relationship between R&D expenditure intensity (RDEI) and dividend payouts using bootstrapped standard errors with 1,000 replications.

Table 4. Bootstrapping S.E (1,000 replications)

VARIABLES	(1)	(2)
	Dividend_payout	
RDEI	-12.159***	-11.233***
	(3.684)	(3.607)
RDEI2	22.740***	20.919***
	(7.711)	(7.338)
Size	-0.022	0.165
	(0.077)	(0.130)
ROA	-2.291***	-2.579***
	(0.595)	(0.668)
Growth	-0.002	-0.004
	(0.002)	(0.003)
Constant	1.325*	-0.446
Firm FE	(0.731) Yes	(1.243) Yes
Year FE	No	Yes
Observations	100,909	100,909
R-squared	0.161	0.161

*Notes: This table reports the regression results of the baseline model (Equation (1)) using Bootstrapping S.E. Robust t-statistics are reported in parentheses. *, ** and *** denote statistical significance of 10, 5 and 1% level, respectively.*

The results reveal that higher R&D expenditure intensity is associated with lower dividend payouts, as indicated by the negative and statistically significant coefficients for RDEI in both models. This supports the hypothesis that firms with substantial R&D investments may prioritize reinvestment in innovation over dividend distribution. Conversely, the positive and significant coefficients for the squared RDEI term (RDEI2) suggest a non-linear relationship. Initially, higher R&D intensity reduces dividend payouts, but at elevated levels of R&D intensity, the relationship becomes positive, implying that significant R&D investments can eventually enhance firm performance and increase dividend payouts. This finding aligns with the notion that while high R&D intensity might limit dividends in the short term, it can lead to higher dividends as the benefits of innovation materialize. Firm size and growth do not significantly impact dividend payouts in this analysis, while lower profitability is associated with reduced dividend payments.

5. Conclusions and implications

This study investigates the impact of R&D expenditure on dividend payouts, utilizing a robust

dataset of 100,909 firm-year observations. Our findings show that higher R&D expenditure intensity is associated with lower dividend payouts. This negative relationship suggests that firms with substantial R&D investments often prioritize reinvesting earnings into innovation rather than distributing them as dividends. This supports the pecking order theory, which posits that firms prefer to use internal funds for growth opportunities overpaying dividends. Besides this, the positive coefficient for the squared R&D expenditure term indicates a non-linear relationship. While initial increases in R&D intensity led to lower dividend payouts, very high levels of R&D investment eventually result in increased dividends. This implies that substantial R&D efforts, while initially limiting dividend payments, can enhance firm performance over time and lead to higher dividend payouts as the benefits of innovation are realized.

This study offers valuable insights into the relationship between R&D expenditure and dividend payments, revealing nuanced dynamics that have practical implications for various stakeholders. (1). For Practitioners: Firms should recognize that substantial investment in R&D might lead to lower dividend payouts in the short term. However, such investments are likely to enhance financial performance and increase dividends in the long run. Thus, strategic planning should integrate the long-term benefits of R&D investments when formulating dividend policies. (2). For Investors: Investors should be aware that companies with high R&D expenditures might initially provide lower dividends. Nonetheless, these firms are likely to deliver greater long-term value through improved profitability and potential dividend increases as the benefits of their R&D efforts materialize. (3). For Policymakers: An understanding of how R&D investment influences dividend payouts can aid in developing policies that support innovation while considering shareholder interests. Implementing supportive measures to maximize the long-term benefits of R&D investments can be advantageous.

This study is limited by its reliance on historical data, which may not fully capture the evolving nature of R&D investments and their effects on dividends. Additionally, the focus on non-financial firms may not account for variations in dividend policies across different sectors. Future research could benefit from exploring these relationships in other industries and incorporating more recent data to validate and extend the findings.

References:

Banker, R. D., Huang, R., Natarajan, R., & Zhao, S. (2019). Market Valuation of Intangible Asset: Evidence on SG&A Expenditure. The Accounting Review, 94(6), 61-90. https://doi.org/10.2308/accr-52468

Berchicci, L. (2013). Towards an open R&D system: Internal R&D investment, external knowledge acquisition and innovative performance. Research Policy, 42(1), 117-127. https://doi.org/10.1016/j.respol.2012.04.017

Bernstein, S. (2015). Does going public affect innovation? The Journal of Finance, 70(4), 1365-1403. https://doi.org/10.1111/jofi.12275

Brown, J. R., & Petersen, B. C. (2011). Cash holdings and R&D smoothing. Journal of Corporate Finance, 17(3), 694-709. https://doi.org/10.1016/j.jcorpfin.2010.01.003

Darrough, M., & Ye, J. (2007). Valuation of loss firms in a knowledge-based economy. Review of Accounting Studies, 12(1), 61-93. https://doi.org/10.1007/s11142-006-9022-z

DeAngelo, H., & Masulis, R. W. (1980). Optimal capital structure under corporate and personal taxation. Journal of Financial Economics, 8(1), 3-29. https://doi.org/10.1016/0304-405x(80)90019-7

Dedman, E., Mouselli, S., Shen, Y., & Stark, A. W. (2009). Accounting, Intangible Assets, Stock Market Activity, and Measurement and Disclosure Policy: Views from the UK. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.1435783

Fama, E. F., & French, K. R. (2001). Disappearing dividends: changing firm characteristics or lower propensity to pay? Journal of Financial Economics, 60(1), 3-43. https://doi.org/10.1016/s0304-405x(01)00038-1

Fama, E. F., & French, K. R. (2002). Testing Trade-Off and Pecking order predictions about dividends and debt. Review of Financial Studies, 15(1), 1-33. https://doi.org/10.1093/rfs/15.1.1

Fang, V. W., Tian, X., & Tice, S. (2014). Does stock liquidity enhance or impede firm innovation? The Journal of Finance, 69(5), 2085-2125. https://doi.org/10.1111/jofi.12187

Gugler, K. (2003). Corporate governance, dividend payout policy, and the interrelation between dividends, R&D, and capital investment. Journal of Banking & Finance, 27(7), 1297-1321. https://doi.org/10.1016/s0378-4266(02)00258-3

Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2010) Multivariate Data Analysis. 7th Edition, Pearson, New York.

Hasan, F. (2021a). Dividend changes as predictors of future profitability. The Journal of Prediction Markets, 15(1). https://doi.org/10.5750/jpm.v15i1.1849

Hasan, F. (2021b). Relationship between Orthodox Finance and Dividend Policy: A Literature Review. Indian-Pacific Journal of Accounting and Finance, 5(1), 13-40. https://doi.org/10.52962/ipjaf.2021.5.1.122

Hasan, F. (2022). Using UK data to study the effects of dividends announcements on stock market returns. The Journal of Prediction Markets, 16(2), 47-75. https://doi.org/10.5750/jpm.v16i2.1945

Hasan, F., Shafique, S., Das, B. C., & Shome, R. (2022). R&D intensity and firms dividend policy: evidence from BRICS countries. Journal of Applied Accounting Research, 23(4), 846-862. https://doi.org/10.1108/jaar-02-2022-0027

Hsu, C., Lien, Y., & Chen, H. (2015). R&D internationalization and innovation performance. International Business Review, 24(2), 187-195. https://doi.org/10.1016/j.ibusrev.2014.07.007

Huang, W., & Sattar, M. (2020). Corporate finance policies, subsidies and R&D: Evidence from China. International Journal of Finance & Economics, 26(3), 3875-3891. https://doi.org/10.1002/ijfe.1992

Keupp, M. M., & Gassmann, O. (2009). Determinants and archetype users of open innovation. R and D Management, 39(4), 331-341. https://doi.org/10.1111/j.1467-9310.2009.00563.x

Kim, J., Yang, I., Yang, T., & Koveos, P. (2021). The impact of R&D intensity, financial constraints, and dividend payout policy on firm value. Finance Research Letters, 40, 101802. https://doi.org/10.1016/j.frl.2020.101802

La Porta, R., Lopez-De-Silanes, F., Shleifer, A., & Vishny, R. (2000). Investor protection and corporate governance. Journal of Financial Economics, 58(1-2), 3-27. https://doi.org/10.1016/s0304-405x(00)00065-9

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (2000). Agency Problems and Dividend Policies around the World. The Journal of Finance, 55(1), 1-33. https://doi.org/10.1111/0022-1082.00199

Lee, C., Gupta, M. C., Chen, H., & Lee, A. C. (2011). Optimal payout ratio under uncertainty and the flexibility hypothesis: Theory and empirical evidence. Journal of Corporate Finance, 17(3), 483-501. https://doi.org/10.1016/j.jcorpfin.2011.02.004

Lee, N., & Lee, J. (2019). R & D Intensity and Dividend Policy: Evidence from South Korea's Biotech Firms. Sustainability, 11(18), 4837. https://doi.org/10.3390/su11184837

Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. The Journal of Business, 34(4), 411. https://doi.org/10.1086/294442

Miller, M. H., & Rock, K. (1985). Dividend Policy under Asymmetric Information. The Journal of Finance, 40(4), 1031-1051. https://doi.org/10.1111/j.1540-6261.1985.tb02362.x

Mitton, T. (2004). Corporate governance and dividend policy in emerging markets. Emerging Markets Review, 5(4), 409-426. https://doi.org/10.1016/j.ememar.2004.05.003

Myers, D. G. (2000). The funds, friends, and faith of happy people. American Psychologist, 55(1), 56-67. https://doi.org/10.1037/0003-066x.55.1.56

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics, 13(2), 187-221. https://doi.org/10.1016/0304-405x(84)90023-0

Nagasawa, K., & Ito, A. (2016). R&D Investments and Dividend Policies: Reputation or Flexibility? SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2870129

Nam, H. (2018). The dividend payout policy and R&D for loss firms: evidence from South Korea. Asia-Pacific Journal of Accounting & Economics, 26(1-2), 172-183. https://doi.org/10.1080/16081625.2019.1546564

Rees, W., & Valentincic, A. (2013). Dividend irrelevance and accounting models of value. Journal of Business Finance &Amp Accounting, 40(5-6), 646-672. https://doi.org/10.1111/jbfa.12032

Shin, M., Kwon, J., & Kim, S. (2010). R&D expenditure and dividend smoothing: Evidence from Korean small and medium sized enterprises. Journal of Finance and Accountancy, 5(1). http://aabri.com/manuscripts/10618.pdf

Spence, M. (1973). Job market signaling. The Quarterly Journal of Economics, 87(3), 355. https://doi.org/10.2307/1882010

Yang, B., Chou, H., & Zhao, J. (2018). R&D Investments and Dividend Payout: Evidence concerning the Semi-Mandatory Dividend Policy in China. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3108974

A STUDY ON THE ENABLERS OF FOREIGN DIRECT INVESTMENT INFLOWS FROM THE REPUBLIC OF KOREA INTO HAIPHONG, VIETNAM

MA. Ko Tae Yeon* - PhD. Nguyen Minh Duc - Assoc.Prof.PhD. Dan Duc Hiep*****

Abstract: ***This study aims to identify and prioritize the factors influencing FDI inflows from Korea into Haiphong. Leveraging the Fuzzy Analytic Hierarchy Process (Fuzzy AHP) method, the research incorporates insights from a survey of 30 experts in the field to systematically evaluate and rank the importance of various factors. The findings indicate that infrastructure-related factors, including industrial, transport, and logistics, are the most significant determinants of FDI inflows. Human resources, particularly the availability and quality of skilled labor and the quality of institutional frameworks, though important, is assigned a moderate weight. These results provide valuable insights for policymakers and stakeholders in enhancing Haiphong's attractiveness to foreign investors.***

• Keywords: *FDI, Korea, Haiphong, fuzzy AHP, infrastructure.*

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1. Introduction

Haiphong as Vietnam's third-largest city, is a vital industrial and port city located on the coast of the Gulf of Tonkin. With its deep-water port, Haiphong serves as a critical gateway for trade and investment, particularly for Northeast Asian countries like South Korea. The city has been a major beneficiary of Vietnam's economic reforms, attracting significant foreign investment, particularly from South Korea, which has emerged as one of the top sources of FDI in Haiphong. Korean investors have established numerous factories and industrial zones in the city, contributing significantly to its industrial output and economic growth. The viewpoints and orientations for attracting FDI in Hai Phong, Vietnam, are clearly delineated through several strategic documents (Resolution No. 30-NQ/TW of the Politburo, Resolution 45-NQ/TW of the Politburo and Resolution No. 50-NQ/TW of the Politburo) and action programs (Action Program No. 76-CTr/TU of the Standing Committee of Hai Phong City Party) aimed at fostering economic growth, promoting sustainable development, and enhancing the city's competitiveness in the global investment landscape.

Given the rapid pace of economic globalization and the increasing competition for foreign investment, it is essential to identify the factors that make Haiphong an attractive destination for FDI from the ROK. Despite the steady inflow of investments, there remains a need for a comprehensive analysis that considers both macroeconomic and microeconomic factors, as well as the unique characteristics of Haiphong as a destination for Korean investors. This research is necessary to fill the existing gaps in literature and to provide actionable insights that can guide future investment policies and strategies.

2. Literature review on factors enabling FDI inflows

Recently, many research have put focus on the empirical examination of factors influencing foreign direct investment. The factors that enable FDI attraction differ from one region to another. Moreover, they undergo transformations gradually due to advancements in technology and shifts in policies. Nevertheless, the majority of existing research indicates that the nine following determinants play a significant role in determining the inflow of FDI.

Among the various factors influencing FDI, Gross Regional Domestic Product (GRDP) stands out as a crucial determinant. Coughlin, et al. (1991) found that U.S. states with higher GRDP attracted more FDI, as investors seek large and dynamic markets to maximize returns. Blonigen

** Candidate at Vietnam Maritime University; email: ty.ko@hsnw.co.kr*
*** Vietnam Maritime University; email: ducnguyen@vimaru.edu.vn*
**** danduchiep@gmail.com*

and Piger (2014) also emphasized that regions with substantial economic output offer greater business opportunities and higher consumer demand, making them more appealing to foreign investors. Nguyen and Nguyen (2007) found that provinces with higher GRDP attracted more FDI, as investors seek dynamic markets to maximize returns in Vietnam. The correlation between GRDP and infrastructure development is another critical factor in FDI attraction. Asiedu (2002) demonstrated that well-developed infrastructure, often a byproduct of higher GRDP, significantly boosts a region's attractiveness to FDI.

Secondly, the presence and development of local supporting industries play a significant role in attracting FDI, as they provide necessary inputs, services, and infrastructure that facilitate the operations of foreign firms. According to Caves (1996), regions with well-developed supporting industries attract more FDI as they offer readily available inputs and services, reducing the need for foreign firms to import materials. Nguyen (2017) found that foreign investors are more likely to invest in regions where they can source inputs locally, as it reduces logistics costs and improves supply chain reliability in Vietnam.

Thirdly, the Consumer Price Index (CPI) is an important economic indicator that measures the average change over time in the prices paid by consumers for goods and services. Asiedu (2002), Pham (2011) supported the idea that high inflation discourages FDI in developing countries due to increased uncertainty and reduced real returns on investment.

Forthly, human capital, which refers to the knowledge, skills, and abilities of a country's workforce, is an important factor in attracting FDI. The presence of human capital is widely recognized as a significant determinant of foreign direct investment (FDI) inflows, and it serves as a crucial catalyst for FDI acceleration (Noorbakhsh et al., 2001). Ma and Zhou (2009) found a correlation between the growing of FDI inflows and well educated labour. Ngo et al. (2018) found that labor supply and labor quality exerts a significant, positive, and consistent impact on foreign direct investment inflows into various regions in Vietnam.

Fifthly, wage rate in emerging economies is a significant factor that attracts a substantial portion of FDI. Several studies (Schneider and Frey, 1985) have found evidence of a negative correlation between foreign direct investment FDI inflow and wage rates. In studying the factors that attract FDI in Vietnam, Ngo et al. (2018) found evidence to suggest that the significance of low labor costs as a factor of foreign direct investment in Vietnam is noteworthy.

Sixthly, the other critical factor influencing FDI attraction is the quality and availability of industrial infrastructure. Asiedu (2006) found that countries with better infrastructure tend to attract more FDI. Nguyen and Nguyen (2007) found that provinces with well-developed industrial zones attracted more FDI due to the availability of essential infrastructure and supportive services.

Seventhly, transportation and logistics infrastructure also plays a crucial role in attracting FDI. Studies by Globerman and Shapiro (2002), Asiedu (2006), Blonigen and Piger (2014) demonstrated that countries with better logistics performance, including efficient ports, airports, and road networks, attract higher levels of FDI. In Vietnam, Pham (2011) highlighted that regions with better transportation networks, have attracted higher levels of FDI.

Eighthly, political stability is another enabler for attracting FDI as it provides a predictable and secure environment for investors. Globerman and Shapiro (2002) found that political instability, including government instability, internal conflict, and corruption, significantly deters FDI inflows. In Vietnam, Nguyen and Nguyen (2007), Pham (2011) agreed that the country's stable political environment, characterized by consistent government policies and a secure environment, has been crucial in attracting foreign investors.

Finally, institutional quality which refers to regulatory frameworks, legal regulations and laws and informal social norms also acts as an important factor in attracting FDI. Various research has been carried out to evaluate the effect of institutional quality towards FDI attraction. Ngo et al. (2018) with various prospect of intitutional quality have come to a similar conclusion that a higher degree of control over corruption and a stronger index of voice and accountability lead to an increase in foreign direct investment inflows in Vietnam.

3. Methodology

3.1. Rationality and introduction of Fuzzy AHP method

The purpose of this research is to determine the extent to which the factors that aid international investors in Haiphong in their investment decision-making are significant. The central research question concerns the influential factors that shape the incentive for foreign direct investment in Haiphong. To tackle this inquiry, Multiple Criteria Decision Making (MCDM) arises as a suitable approach frequently utilized to establish criteria priorities. The application of MCDM theory entails the determination of ranking outcomes for selected criteria and the assignment of weights.

A variety of MCDM techniques are utilized in practical applications to allocate weights to various factors. Among them, Fuzzy AHP stands out as a robust MCDM method due to its capacity to handle uncertainties and imprecise information in decision-making processes. The mothod emerges as a compelling choice in the specific context of FDI enablers exploration in dealing with uncertainties of fuzzy judgments and linguistic expressions of decision-makers. FAHP enables decision-makers to express their preferences using linguistic terms, facilitating a more realistic representation of their perceptions.

Fuzzy normal data can be denoted by:

$$\tilde{A}(x) = (l, m, u)$$

Where the membership function is defined as follows:

$$\mu_{\tilde{A}(x)} = \begin{cases} 0, & x < l \\ \dfrac{x-l}{m-l}, & l \le x \le m \\ \dfrac{u-x}{u-m}, & m \le x \le u \\ 0, & x > u \end{cases} \quad (1)$$

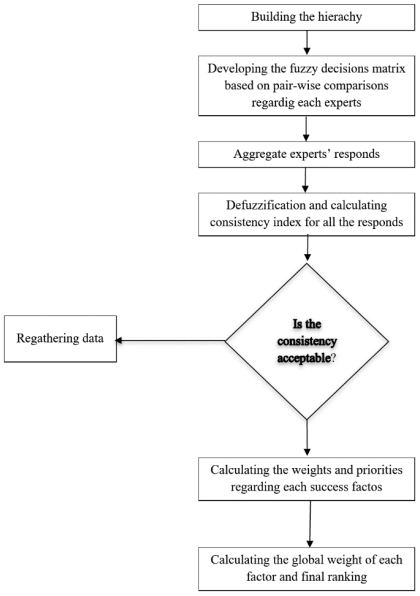
When using the FAHP, it is common to use a numerical scale from 1 to 9 to evaluate how important a criterion is compared to others.

Table 3.1. Scale of importance for the Fuzzy-AHP analysis

AHP scale	Meaning	Convert into triangular fuzzy scale
1	Equally important	(1, 1, 1)
3	Weakly important	(2, 3, 4)
5	Fairly important	(4, 5, 6)
7	Strongly important	(6, 7, 8)
9	Absolutely important	(9, 9, 9)
2	Intermittent values	(1, 2, 3)
4		(3, 4, 5)
6		(5, 6, 7)
8		(7, 8, 9)

The subsequent diagram depicts the sequential procedures that must be executed in Fuzzy AHP.

Figure 3.1 Steps of Fuzzy AHP



3.2. Data collection

This study utilizes a rigorous screening method to identify individuals who are highly knowledgeable and experienced in the area of foreign direct investment by Korean enterprises in Haiphong. These professionals are assigned the responsibility of supplying input data to tackle the research difficulties at hand. In addition, they employ the Fuzzy AHP technique to evaluate and analyze multiple options or factors that impact decisions regarding FDI in Haiphong. The approach to these experts were made by questionnaire survey, personal interviews and group meetings. Based on the examination of available literature, the chosen specialists are as follows.

Table 3.2. Selection of experts for questionnaire survey

No	Experts	Description
1	FDI investors in Haiphong and neighbours	Ones who directly make decisions to invest in Haiphong and neighbours area (Bac Ninh, Thai Nguyen)
2	Researchers & academics	Ones who study FDI and its impacts on economic development, trade, environment, etc.
3	Consultants & practitioners	Ones who advise FDI investors in Haiphong or recipients on the best locations, sectors, policies, etc.
4	Policy makers & regulators	Ones who design and implement FDI policies and regulations (HEZA, MOIT)

HEZA: Haiphong Economic Zone Authority

MOIT: Ministry of Industry and Trade

The demographic characteristics of respondents are further explained in the following table.

Table 3.3. Demographic characteristics of respondents

Characteristics	Details	No of respondents	Percentage of respondents
Response rate	Questionnaire survey	20	100%
	Interview	10	60%
Affiliations	Investors	18	60%
	Researchers	5	17%
	Advisors	4	13%
	Policy makers	3	10%
Working seniority	Less than 5 years	0	-
	5-10 years	15	56%
	More than 10 years	12	44%

The weight of experts' ideas based on work experience is described in the following table.

Table 3.4. Weight of experts' ideas

Working seniority	< 5 years	5~10 years	>10 years
Weight	1	2	3

Out of the 30 responses received, a careful review was conducted to ensure the quality and consistency of the provided data. It was identified that three responses exhibited inconsistencies in the information provided. In order to maintain the integrity and reliability of the dataset, a decision was made to omit these three responses from the analysis and the total number of replies chosen is 27. The decision to omit inappropriate data was guided by the principle of upholding the accuracy and coherence of the information gathered. This meticulous approach ensures that the analysis and insights derived from the questionnaire responses are robust and reflective of the genuine trends and perspectives within the diverse expert groups.

4. Results and analysis

This study uses interviews and questionnaires as data collection methods to obtain information from participants. Interviews are conducted in order to examine and determine the elements that contribute to the motivation for FDI, as well as to solicit any recommendations or comments. Questionnaire surveys are specifically developed to efficiently gather data from respondents from various agencies regarding the importance of determinants to FDI promotion in Haiphong.

By consulting with experts, an average pair-wise comparison matrix has been created based on the weight of each response to determine the weight assigned to each factor. The following table illustrates the matrix acquired.

Table 4.1. Pair-wise comparison matrix

Factors	Social	Economic	Political
Social	(1, 1, 1)	(5,6,7)	(2,3,4)
Economic	(0.14,0.17,0.2)	(1, 1, 1)	(0.33,0.5,1)
Political	(0.25,0.33,0.5)	(1,2,3)	(1, 1, 1)

The calculation of the fuzzy geometric mean values of the factors involves the multiplication of matrix vectors that represent fuzzy integers.

Table 4.2. Fuzzy geometric mean value of each factor

Factors	Fuzzy geometric mean value $\tilde{r}_i$	Mean value
Social	$\tilde{r}_1 = ((1 * l_{12} * l_{13})^{\frac{1}{3}}, (1 * m_{12} * m_{13})^{\frac{1}{3}}, (1 * n_{12} * n_{13})^{\frac{1}{3}})$	(2.15,2.62,3.04)
Economic	$\tilde{r}_2 = ((\frac{1}{n_{12}} * 1 * l_{23})^{\frac{1}{3}}, (\frac{1}{m_{12}} * 1 * m_{23})^{\frac{1}{3}}, (\frac{1}{l_{12}} * 1 * n_{23})^{\frac{1}{3}})$	(0.36,0.44,0.58)
Political	$\tilde{r}_3 = ((\frac{1}{n_{13}} * \frac{1}{n_{23}} * 1)^{\frac{1}{3}}, (\frac{1}{m_{13}} * \frac{1}{m_{23}} * 1)^{\frac{1}{3}}, (\frac{1}{l_{13}} * \frac{1}{l_{23}} * 1)^{\frac{1}{3}})$	(0.63,0.87,01.14)
Sum	(3.15,3.93,4.77)	
Inverse	(0.32,0.25,0.21)	
Increasing order	(0.21,0.25,0.32)	

Upon performing the computation of the fuzzy geometric mean values, the subsequent step involves the determination of the fuzzy weight for each factor. The comprehensive procedure for this calculation is elucidated in the subsequent table.

Table 4.3. Fuzzy weight of each factor

Factors	Fuzzy weight $\tilde{w}_i$	Fuzzy weight value
Social	$\tilde{w}_1 = \tilde{r}_1 \otimes (\tilde{r}_1 \oplus \tilde{r}_2 \oplus \tilde{r}_3)^{-1}$	(0.45,0.67,0.96)
Economic	$\tilde{w}_2 = \tilde{r}_2 \otimes (\tilde{r}_1 \oplus \tilde{r}_2 \oplus \tilde{r}_3)^{-1}$	(0.08,0.11,0.19)
Political	$\tilde{w}_3 = \tilde{r}_3 \otimes (\tilde{r}_1 \oplus \tilde{r}_2 \oplus \tilde{r}_3)^{-1}$	(0.13,0.22,0.36)

After obtaining the fuzzy weight of all criterion, the de-fuzzification procedure known as Centre of Area is utilized to determine the measured weight of each element. Table 3.13 provided illustrates the aforementioned method.

Table 4.4. Weight of each factor

Factors	Weight w_i	Weight value
Social	$w_1 = \frac{w_1^l + w_1^m + w_1^n}{3}$	0.69
Economic	$w_2 = \frac{w_2^l + w_2^m + w_2^n}{3}$	0.12
Political	$w_3 = \frac{w_3^l + w_3^m + w_3^n}{3}$	0.24

The weights calculated above represent the degree of significance assigned to each factor enabling FDI inflows from Korean enterprises in Haiphong based on expert opinions and fuzzy logic calculations. The highest weight among the three factors is assigned to the social factor, indicating that experts perceive social considerations as the most influential in attracting FDI to Haiphong. This suggests that social

conditions, such as infrastructure, human and other related social indicators, are considered pivotal in the decision-making process of FDI investors. The economic factor has the lowest weight among the three factors, implying that, in the context of Haiphong, economic considerations have a relatively lower impact on FDI inflows compared to social and political factors. The lower weight suggests that these aspects are considered less critical by experts in influencing FDI decisions. The Political factor falls between the Economic and Social factors in terms of weight, indicating that political stability, government policies, and regulatory frameworks play a significant but intermediate role in attracting FDI to Haiphong. The moderate weight suggests that political considerations are important, but not as dominant as economic factors, in the decision-making process for FDI investors in Haiphong.

The last stage of the FAHP approach involves calculating the normalized weight for each factor, resulting in a total weight of one for all factors combined. The computation is delineated in the subsequent table.

Table 4.5. Normalized weight of the criteria

Factors	Normalized weight N_i	Normalized weight value	Rank
Social	$N_1 = \frac{w_1}{w_1 + w_2 + w_3}$	0.66	1
Economic	$N_2 = \frac{w_2}{w_1 + w_2 + w_3}$	0.12	3
Political	$N_3 = \frac{w_3}{w_1 + w_2 + w_3}$	0.23	2

Following the determination of the weights of the components, a consistency test was conducted. In the context of FAHP, the pair wise comparison matrix is represented by triangular fuzzy numbers. In order to calculate the consistency ratio, it is necessary to convert these numbers into crisp numbers (Freselam et al., 2014). Defuzzification is required for this. After the defuzzification process is carried out, the computation of the consistency ratio is performed according to the AHP technique. The table below demonstrates the computation of the consistency ratio for the weight assigned to each enabler in relation to FDI inflows.

Table 4.6. The calculation of consistency ratio

Factors	Social	Economic	Political	Weighted Sum	Priority	λ
Social	1	6	3	2.04	0.66	3.11
Economic	0.17	1	0.61	0.37	0.12	3.13
Political	0.36	2	1	0.70	0.23	3.09

Consistency index and consistency ratio are calculated as blow:

$$CI = \frac{\boldsymbol{\lambda}_{max} - n}{n - 1} = \frac{\sum \frac{\boldsymbol{\lambda}}{\mathbf{3}} - 3}{2} = 0.05$$

$$CR = \frac{CI}{RI} = \frac{0.05}{0.58} = 0.09$$

According to the result of consistency ratio calculated above, the value less than 0.1 indicates that the expert judgments are in good agreement, and the pairwise comparisons are consistent with the principles of the AHP method. This enhances the credibility of the derived weights, contributing to a more reliable and robust decision-making process based on the fuzzy AHP analysis.

The sub-criteria weights are consistently computed using the identical methodology. Subsequently, the overall significance of each factor on a global scale is determined by multiplying the local weight of each sub-factor with the corresponding weight of the relevant factor. The subsequent table demonstrates the methodology for calculating.

Table 4.7. Local and global weights of the criteria

Criteria	Sub-criteria	Local weight	Global weight	Rank
Social	Industrial infra	0.31	0.20	1
0.66	Trans&Log infra	0.28	0.18	2
	Human capital	0.24	0.16	3
	Wage rate	0.17	0.11	5
Economic	GRDP	0.26	0.03	9
0.12	Local supporting industries	0.31	0.04	8
	CPI	0.43	0.05	7
Political 0.23	Institutional quality	0.64	0.15	4
	Political stability	0.36	0.08	6

In interpreting the results of the Fuzzy AHP for finding the weights of factors affecting FDI inflows in Haiphong, the provided weights for each factor offer insights into their relative importance in influencing FDI decisions. The highest weight is assigned to infrastructure factors including industrial, transport and logistics ones, suggesting that experts believe that the development of infrastructure plays a significant role in attracting FDI to Haiphong. Human resource is the following most influential factors, indicating that the supply of workers and quality of workers are crucial in shaping FDI inflows in Haiphong. The institutional quality has a moderate weight, suggesting that the effectiveness, efficiency, and reliability of a region's legal, regulatory, and governance frameworks is considered important but not as decisive as infrastructure and human factors in influencing FDI decisions. Other Factors (wage

rate, CPI, political stability and local supporting industries) are positioned between the higher and lower weights, indicating their intermediate level of influence on FDI inflows. The specific positioning of these factors in terms of weights provides valuable information about their comparative importance within the context of the study. GRDP has the lowest weight, suggesting that, according to expert opinions, the level of emphasis on GRDP is relatively low compared to other factors in attracting FDI to Haiphong.

Overall, the Fuzzy AHP results provide a clear hierarchy of factors based on their perceived importance in influencing FDI inflows. Infrastructure and human resources are identified as the most critical factors, while GRDP is considered least influential. Policymakers and stakeholders can utilize this information to prioritize efforts and policies that enhance the identified crucial factors, fostering a more favorable environment for FDI in Haiphong.

5. Conclusion

This study provides a comprehensive analysis of the factors influencing FDI inflows from the Republic of Korea into Haiphong, Vietnam. In this research, Fuzzy AHP method was utilized to weigh the importance of each factor. The data collection was done using ideas from experts in the field via interviews and questionnaire surveys. The results reveal that infrastructure factors, including industrial, transport, and logistics, are the most significant determinants of FDI attraction. Following closely are human resource factors, underscoring the importance of a well-trained and accessible workforce in influencing investment decisions. Institutional quality, while still important, holds a moderate weight, indicating that the effectiveness of legal, regulatory, and governance frameworks is crucial but not as critical as infrastructure and human resources in shaping FDI inflows.

The study's findings offer clear guidance for policymakers and stakeholders in Haiphong to enhance the city's attractiveness as a destination for Korean FDI. Basing on the results concluded above, key recommendations to promote the attraction of Korean FDI into the city may include the ensuring the availability of land within industrial parks and accelerating the development of the Southern Coastal Economic Zone to drive growth. Sustainable and environmentally friendly industrial parks should also be prioritized. In transportation and logistics, it is crucial to develop a multimodal system that connects Haiphong seaport with the hinterland and to strategically plan logistics centers that offer diverse value-added services. Human resource development is another critical area, where incentives should be provided to businesses for training and education, investments should be increased in educational infrastructure, and collaboration between businesses and training institutions should be strengthened. Additionally, expanding Korean language programs and ensuring social housing supply are essential for attracting and retaining the workforce. Public administration efficiency should be improved through digital transformation, while policy mechanisms should be continuously refined to create a stable, transparent, and investor-friendly environment. Implementing these solutions will not only strengthen Haiphong's infrastructure, human resources, and institutional quality but also enhance the city's competitiveness and contribute to sustainable economic growth.

By implementing these solutions, Haiphong can strengthen its infrastructure, develop its human resources, and improve its institutional quality, thereby creating a more favorable environment for attracting FDI from the Republic of Korea. This strategic approach will not only enhance Haiphong's competitiveness but also contribute to sustainable economic growth in the region.

References:

Asiedu, E. (2002). On the determinants of foreign direct investment to developing countries: Is Africa different? World Development, 30(1), 107-119.

Blonigen, B. A., & Piger, J. (2014). Determinants of foreign direct investment. Canadian Journal of Economics/Revue canadienne d'économique, 47(3), 775-812.

Caves, R.E. (1996), Multinational Enterprise and Economic Analysis, 2nd ed. Cambridge: Cambridge University Press.

Coughlin, C. C., Terza, J. V., & Arromdee, V. (1991). State characteristics and the location of foreign direct investment within the United States. The Review of Economics and Statistics, 675-683.

Globerman, S., & Shapiro, D. (2002). Global foreign direct investment flows: The role of governance infrastructure. World Development, 30(11), 1899-1919.

Ma, Ling Ling and Zhou, Xue Chun. (2009). FDI in China (1981-2006). Beijing: University Press.

Ngo V. D., Dao T. B. T., Nguyen N. T. (2018). Economic and non-economic determinants of FDI inflows in Vietnam: a subnational analysis. Post-Communist Economies, Vol. 30, No. 5, pp. 693-712.

Nguyen, T. Q. (2017). Attracting FDI in supporting industries: A case study of the electronics and automotive sectors in Vietnam. Journal of Economics and Development, 19(2), 85-95.

Nguyen, T. D., & Nguyen, T. T. (2007). The Determinants of Provincial Foreign Direct Investment in Vietnam: An Empirical Analysis. ASEAN Economic Bulletin, 24(2), 211-226.

Noorbakhsh, F., Paloni, A., & Youssef, A. (2001). Human capital and FDI inflows to developing countries: New empirical evidence. World Development, Vol. 29, No. 9, pp. 1593-1610.

Pham, L. (2011). Inflation and FDI: The Vietnamese case. Journal of Economics and Development, 13(2), 23-39.

Schneider, F and B. Frey (1985). Economic and Political Determinants of Foreign Direct Investment. World Development. Vol.13, No. 2, pp. 225-250.

IMPACT OF ECONOMIC GROWTH ON CLIMATE CHANGE IN ASIAN COUNTRIES

PhD. Cao Tan Huy* - MA. To Thi Hong Gam*

Abstract: ***TThis article studies the relationship between climate change and economic growth in Asian countries. Data collected from 47 Asian countries during the period 2004 -2023 with 940 observations are included in the model. The authors use quantitative research methods with OLS, FEM, REM, and FGLS regression methods. The results show that the amount of electricity from renewable energy, forest density, service industry, and trade openness have a positive impact on climate change. Meanwhile, agriculture, manufacturing, foreign direct investment, labor force, and investment capital have opposite impacts on climate change. Based on the research results, the authors draw conclusions and policy implications to limit climate change and promote Asian economic development.***

• Keywords: *climate change, economic growth, Asia*

JEL codes: Q54, R11, N15

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1. Introduction

Asia has the largest population in the world, so Asia's labor force is abundant and costs are low, thus attracting investors from different continents to set up factories and enterprises here to serve domestic and world needs. Besides, along with the industrialization revolution, modern technological equipment is used in some countries to apply production models and exploit rich natural resources. From there, the Asian region became more bustling and more developed than ever.

However, environmental risks and the expanding effects of climate change on Asia come along with that development. The population is growing at an exponential rate, which is contributing to the loss of forest land due to lack of living space, the expansion of transportation options, the pressure from resource extraction, and the heavy operation of factories, which worsen air quality and raise atmospheric CO2 emissions. This is the main cause of global warming, climate change, and impact on the global environment. Besides, extreme weather such as droughts, floods, and natural disasters mostly exist in Asia. These weather changes affect not only poor, underdeveloped, low-income countries but also developed and developing countries, causing a loss of a huge source of income for these Asian countries.

Therefore, climate change is currently a difficult problem for Asia, receiving top priority in the economic stability and development policies of countries. The author chose the topic "The impact of economic growth on climate change in Asian countries" to verify the urgency of the problem on an Asian scale during the past 2 decades.

2. Literature review

Over the past several decades, many economists have examined the relationship between climate change and economic growth.

Pao and Tsai (2010) examine the causal relationship between pollution emissions, energy consumption, and output in emerging economy countries (BRICS) during the 1971- 2005 period. The authors have proven the existence of the EKC curve in environmental issues. Research indicates a transition threshold at an income level of approximately 5,393 (logarithm). In addition, the causality results of the table indicate that there is a strong two-way causality relationship in energy consumption-emissions and energy consumption-output in the long run, along with other long-term relationships. both strong and short-run unidirectional causality from emissions and energy consumption to output.

Martinez-Zarzoso and Maroutti (2011) researched on the impact of urbanization on CO2 emissions in 88 developing countries from 1975 to 2003. Research results from the FGLS model show the elasticity of emissions levels with due to urbanization in the group of low-income countries is higher than in other countries and negative for high-income countries.

Khalid Ahmeda & Wei Long (2012) studied the relationship between CO_2 emissions, economic growth, energy consumption, trade liberalization and population density in Pakistan with annual data from 1971 to 2008. Cointegration analysis using the ARDL method of bounds

** University of Finance and Marketing (UFM); email: caohuy@ufm.edu.vn - togam@ufm.edu.vn*

checking is combined. The results support the hypothesis both in the short and long run and find an inverted U-shaped relationship between CO2 emissions and growth.

Shahbaz et al (2013) explores the effects of financial development, economic growth, coal consumption and trade openness on environmental performance using time series data for South Africa over the period 1965–2008. The ARDL bounds test method for cointegration has been used to examine the long-run relationship between the variables while the short-run relationship has been studied by applying the error correction method (ECM). Research results show that an increase in economic growth increases energy emissions.

Alvarado & Toledo (2017) examines the relationship between economic growth and environmental degradation in Ecuador from 1971 to 2010. The authors estimate this relationship in a country heavily dependent on revenues from natural resource exploitation, the decline of vegetation in recent decades and the low level of industry participation in GDP. The results of the study show the existence of an inverse relationship between real GDP and vegetation cover, suggesting that the country's output is based on environmental degradation. Through Johansen cointegration tests, the authors test whether there is a long-run equilibrium relationship between first differences in real GDP, vegetation cover, and urbanization rate. ECM shows that there is a short-term relationship between vegetation cover, GDP and urbanization rate. In addition, no Granger causality was found between the variables.

Tenaw & Beyonce (2021) Investigating the Development - Environment in EKC framework in 20 sub-Saharan African (SSA) countries over the period from 1990 to 2015. Common Correlated Effects - Pooled Mean Group (CCE- PMG) in the context of an Autoregressive Distributed Lag (ARDL) model augmented with a cross-sectional average is used as the preferred estimation technique. Additionally, the results confirm the existence of the EKC hypothesis in SSA, but the association depends on the level of natural resources.

3. Models and methods

3.1. Research model

From previous studies, the author tests the relationship between emissions and economic growth using the following model:

$$CO_{2it} = \beta_0 + \beta_1 LnGDP_{it} + \beta_2 ENG_{it} + \beta_3 JUN_{it} - \beta_4 S_{it} - \beta_5 AR_{it} - \beta_6 MN_{it} - \beta_7 TM_{it} + \beta_8 FDI_{it} + \beta_9 LD_{it} + \beta_{10} V_{it} + e_{it}$$

Where i = 1, 2,.., N; t = 1, 2, …, T (N is the number of countries and T is the period observed in the model); μi is the fixed effect of country i and the errors are similarly independently distributed $e_{it} \approx iid\ (0, \sigma_e^2)$, $E(\mu_i/e_{it}) = 0$

Table 1: Description of variables in the model

No	Variable	Specifically	Source	Expected	Inheritance research
1		Emissions CO_2	Our World In Data		Pao and Tsai (2010) .
2	GDP	Per capita income	World Bank	+	Shahbaz et al (2013)
3	FDI	Foreign Direct Investment	World Bank	+	Demena & Afesorgbor (2020).
4	ENG	Recycled energy	Our World In Data	-	Raza et al (2020)
5	JUN	Forest area	World Bank	-	Theodore Panayotou (1993)
6	TM	Trade openness	World Bank	-	Khalid & Long (2012)
7	V	Investment	World Bank	+	Al-Mulali et al (2015).
8	LD	Labor force	World Bank	-	Lasisi et al (2020).
9	S	Service	World Bank	-	Akram, N. (2013)
10	AR	Agriculture	World Bank	-	Akram, N. (2013)
11	MN	Manufacture	World Bank	-	Akram, N. (2013)

Source: Compiled by author

3.2. Research methods

In this study, the author uses the Pooled-OLS regression model, fixed effects model (FEM), and random effects model (REM) in the research model. In order to overcome the phenomenon of heteroscedasticity and endogenous variables in the research model, the author also uses the FGLS method.

4. Results and discussion

Table 2: Model regression results

	Pooled - OLS	FEM	REM
LnGDP	56.1794	36.6588	37.9659
ENG	0.023377	0.077598	0.036294
JUN	-0.14274	0.502303	0.067854
S	-0.10731	0.055105	0.048379
AR	-0.01227	-0.03662	-0.01167
MN	0.389854	0.033248	0.04569
TM	-0.01949	-0.00264	-0.001
FDI	0.061267	-0.00099	-0.00058
LD	0.151431	-0.25464	-0.20745
V	0.112418	0.061727	0.054121
_cons	659.7493	422.9721	445.7251

Source: Data processing results from Stata 16.0 software

After using the F and Hausman tests to compare the Pooled-OLS and FEM, FEM and REM, it shows that the FEM method is more optimal, from which it can be concluded that the FEM method is the most optimal of the three methods.

Table 3: Wald test results

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model	
H0:	sigma(i)^2 = sigma^2 for all i
Prob>chi2 =	0.0000

Source: Data processing results from Stata 16.0 software

The Wald test is used for the model to test the phenomenon of heteroscedasticity. The results from Table 3 show that the value chi2 (46) = 4921.71 and Prob > chi2 = 0.0000, thereby rejecting the hypothesis H0 (H0: The error variance is constant), the model has the phenomenon of variable error variance.

Table 4: Wooldridge test results

F(1.45) =	452,164
Prob > F =	0 , 0000

Source: Data processing results from Stata 16.0 software

The model was conducted using the Wooldridge test to check whether autocorrelation occurs in the model. Table 4 shows the statistical results F (1.45) = 452.164 and Prob > F = 0.0000, this result shows that the model has an autocorrelation phenomenon.

Thus, the way to overcome heteroskedasticity and autocorrelation is to choose a generalized least squares regression model - Generalized Least Squares (GLS).

Table 5: Regression results after overcoming defects of the GLS model

	Coefficient	Standard deviation	z	P-value
LnGDP	5.510766	0.9797791	5.62	0.000
ENG	-0.001982	0.0022769	-4.41	0.000
JUN	0.0028393	0.0062305	-5.96	0.000
S	0.0041874	0.0054362	-3.87	0.000
AR	0.0044006	0.0079953	2.49	0.000
MN	0.0099541	0.0107901	11.59	0.000
TM	-0.0011037	0.0013321	-5.07	0.000
FDI	0.0000316	0.0007922	5.52	0.000
LD	-0.0057289	0.0099643	4.09	0.000
V	0.0018948	0.0031723	7.06	0.000
_cons	60.90969	11.41581	6.83	0.000

Source: Data processing results from Stata 16.0 software

The results from Table 5 show that the FGLS method is statistically significant with the value Prob>chi2 = 0.0000. The method showed that 10 variables all had an impact on CO_2

The research results using the GLS method are that GDP has a positive impact on climate change and is statistically significant at the 1% level. This result is consistent with the research hypothesis and the research works of Shahbaz et al. (2013), Al-Mulali et al. (2015). Similarly, the factors net agricultural output (AR), net manufacturing output (MN), foreign direct investment (FDI), labor force (LD), and investment capital (V) also have a negative impact on climate change. Meanwhile, the variables of electricity from renewable energy (ENG), forest density (JUN), service sector net output (S), and trade openness (TM) have opposite impacts on climate change, showing that increasing these factors can reduce emissions of CO_2.

5. Conclusion and policy implications

Research results in the period 2004 - 2023 in 47 Asian countries show that economic factors affected by climate change represented by emissions CO_2 in Asian countries include 10 variables as a total domestic product, electricity from renewable energy, forest density, service sector, agriculture sector, manufacturing sector, trade openness, foreign direct investment capital, labor force and investment capital.

As the economy grows, it leads to an increase in the number of productive workers in the process of industrialization. Besides, the agricultural industry also hurts the environment. Therefore, to overcome this situation, Asian countries need to promote the development of service industries instead of industrialization and instead of unspecialized agriculture.

Furthermore, research results show that economic growth in a country causes emissions of CO_2 to increase. First, increasing the country's trade openness will cause the amount of foreign investment capital to increase sharply. Although this is beneficial for increasing the GDP of Asian countries, however, a large amount of capital flows in Factories and enterprises increase gas emissions beyond the allowed capacity, leading to an increase in the number of workers and increased means of transportation. Additionally, the amount of domestic investment capital has the same impact as the amount of gas emissions. Concluding that although attracting many investors to the country is good, it is necessary to limit the focus on industries with a high risk of environmental pollution and instead encourage the development of automation and service industries. commercialization.

In addition, a highlight in the current work of limiting climate change is increasing the use of renewable energy sources including solar, water, and wind energy. Countries should gradually change how they produce electricity from coal and oil sources to using "clean" raw materials that can reduce emissions of CO_2 into the environment, making the most of energy sources from the sun, wind, and water to produce electricity. Currently, countries are making good use of this material source, but need to promote its popularity more widely, regularly organize forums and seminars on the importance of renewable energy, and promulgate appropriate policies. Countries need to have policies to protect energy sources, use renewable energy sources, and develop green economies to ensure sustainable development of the environment and the whole economy.

References:

Ahmed, K., & Long, W. (2012). Environmental Kuznets curve and Pakistan: an empirical analysis. Procedia Economics and Finance, 1, 4-13.

Alvarado, R., & Toledo, E. (2017). Environmental degradation and economic growth: evidence for a developing country. Environment, Development and Sustainability, 19, 1205-1218.

Al-Mulali, U., Saboori, B., & Ozturk, I. (2015). Investigating the environmental Kuznets curve hypothesis in Vietnam. Energy policy, 76, 123-131.

Demena, BA, & Afesorgbor, SK (2020). The effect of FDI on environmental emissions: Evidence from a meta-analysis. Energy policy, 138, 111192.

Lasisi, T.T., Alola, A.A., Eluwole, K.K., Ozturen, A., & Alola, U.V. (2020). The environmental sustainability effects of income, labor force, and tourism development in OECD countries. Environmental Science and Pollution Research, 27, 21231-21242.

Martínez-Zarzoso, I., & Maruotti, A. (2011). The impact of urbanization on CO2 emissions: evidence from developing countries. Ecological economics, 70 (7), 1344-1353.

Akram, N. (2013). Is climate change hindering economic growth of Asian economies?. Asia-Pacific Development Journal, 19 (2), 1-18.

Pao, H.T., & Tsai, C.M. (2010). CO2 emissions, energy consumption and economic growth in BRIC countries. Energy policy, 38 (12), 7850-7860.

Raza, S.A., Shah, N., & Khan, K.A. (2020). Residential energy environmental Kuznets curve in emerging economies: the role of economic growth, renewable energy consumption, and financial development. Environmental Science and Pollution Research, 27, 5620-5629.

Tenaw, D., & Beyene, A.D. (2021). Environmental sustainability and economic development in sub-Saharan Africa: A modified EKC hypothesis. Renewable and Sustainable Energy Reviews, 143, 110897.

Shahbaz, M., Tiwari, A.K., & Nasir, M. (2013). The effects of financial development, economic growth, coal consumption and trade openness on CO2 emissions in South Africa. Energy policy, 61, 1452-1459.