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THE IMPACT OF GOVERNMENT SPENDING ON ECONOMIC GROWTH IN VIETNAM

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Abstract: *Over the years, the Vietnamese government has made great efforts to implement a reasonable and effective spending policy. This study analyzes the impact of government spending on economic growth in Vietnam. The regression results show that changes in total government budget expenditure and development investment expenditure have a negative impact on GDP growth, but the results are not really conclusive. The study confirms the positive impact of changes in foreign direct investment and trade balance on economic growth. Inflation rate is controlled during the study period and contributes to GDP growth. Based on the results, the author has suggested some recommendations for government spending for the purpose of economic growth in the coming period.*

Tóm tắt: *Trong những năm qua, chính phủ Việt Nam đã có nhiều nỗ lực thực hiện chính sách chi tiêu hợp lý và hiệu quả. Nghiên cứu này phân tích tác động của chi tiêu chính phủ đến tăng trưởng kinh tế ở Việt Nam. Kết quả hồi quy cho thấy thay đổi trong tổng chi NSNN và chi đầu tư phát triển có tác động ngược chiều đến tăng trưởng GDP, tuy nhiên kết quả chưa thực sự thuyết phục. Nghiên cứu khẳng định tác động tích cực của những thay đổi trong đầu tư trực tiếp nước ngoài và cán cân thương mại đối với tăng trưởng kinh tế. Tỷ lệ lạm phát được kiểm soát trong suốt giai đoạn nghiên cứu và góp phần thúc đẩy tăng trưởng GDP. Trên cơ sở kết quả thu được, tác giả đã đề xuất một số khuyến nghị đối với chi tiêu chính phủ nhằm thúc đẩy tăng trưởng kinh tế trong giai đoạn tới.*

• Từ khóa: *chi tiêu chính phủ, chi tiêu vốn, tăng trưởng kinh tế, đầu tư trực tiếp nước ngoài.*

1. Introduction

High and stable economic growth is the goal of many countries, including Vietnam. Financial resources from the budget, from the private sector and from abroad contribute to the growth of the economy. Financial resources from the budget are mainly reflected in government spending, which plays a key role. Keynes (1936) suggested that the state can achieve the goal of creating effective aggregate demand through stimulative public spending measures. Public spending on education, health care, infrastructure, and research and development will have a long-term impact on economic growth. For a developing country, the need for infrastructure investment and government construction projects is enormous to achieve national growth targets. Therefore, public spending plays an important role in the growth of the economy.

Over the years, the Vietnamese government has made great efforts to implement a reasonable and effective spending policy. As a result, the infrastructure as well as public goods have been improved, contributing to the growth of economy. However, in addition to the results achieved, there are still certain limitations. In order to better understand the extent of government spending on economic growth, the topic of "Impact of Government Spending on Economic Growth in Vietnam" was selected to be analyzed and used to develop appropriate solutions for the near future.

Previous studies only examined the impact of government spending on growth in general, but did not consider all characteristics of the

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economy. There are no studies that fully assess and summarize the impact of public spending on economic growth in Vietnam. Therefore, a study is conducted to solve this problem.

2. Literature reviews

Many theories support the view that government spending stimulates economic growth by providing public goods and services.

Keynesian theory states that in times of recession and high unemployment, an increase in government spending stimulates aggregate demand by boosting investment, thereby increasing output, promoting growth and reducing unemployment.

Rostow-Musgrave theory: in the early stages of economic growth, public spending is increased to create infrastructure for the economy. This is the basis for promoting economic growth in any country.

Wagner's Law: emphasizes the role of government spending in the growth of an industrial economy, with a focus on developing countries. Higher government spending is the result of a growing economy, and this spending helps to provide for the social needs of a growing economy. Similarly, the Peacock - Wiseman hypothesis (1986) concludes that the increase in government spending due to an increase in budget revenues is the result of the economic growth process.

Economists who disagree with the Keynesian school argue that reducing the deficit by cutting government spending will boost economic growth. Reducing government spending helps lower interest rates, investment, and productivity, which in turn increases growth.

Barro (1990) model analyzes government spending within the framework of an endogenous growth model. Government spending is financed by taxes; an increase in taxes reduces the marginal product of capital after taxes, which reduces the rate of capital accumulation and economic growth. An increase in tax revenues means an increase in government spending on public goods and services, which increases the marginal product and output of the private sector and has a positive effect on economic growth. An increase in government spending promotes economic growth only if the positive effect of the spending increase is greater than the negative effect of the tax increase or if the tax rate is less than the marginal efficiency of government spending on the economy. total economic output.

Based on theoretical studies, there are numerous empirical studies worldwide on the impact of government spending on economic growth. The role of government spending on economic growth remains a controversial topic and requires further research (Grier and Tullock, 1989). Some researchers believe that the impact of public spending on economic growth is negative or unrelated (Akpan, 2005; Laudau, 1983), while others believe that spending has a positive impact on economic growth (Komain and Brahmasrene, 2007).

Devarajan, Swaroop and Zou (1996) used Barro's (1990) model to examine the effects of structural change in public spending on economic growth. The conditions depend not only on the productivity effects of individual expenditures but also on the original expenditure structure. Using data from 43 developing countries over a 20-year period, the results show that increasing recurrent expenditures have a positive effect on growth, while the components of capital expenditures have a negative relationship with growth. High-profit expenditures such as capital expenditures, if used sparingly, can be inefficient. The results show that developing countries have not effectively allocated between recurrent and investment spending, so the impact on economic growth is not high.

In a cross-country data study, Daniel Landau (2012) found that the ratio of government spending to GDP and the growth rate of GDP per capita are inversely related. Many previous studies have also provided empirical evidence of the relationship between government spending and economic growth. In the study by the author group Wu, Tang and Lin (2010), the causal relationship between government spending and economic growth is analyzed by Granger causality test using panel data for 182 countries

between 1950 and 2004. The results of our study confirm Wagner's law and the hypothesis that government spending has a positive effect on economic growth. This result does not depend on the size of the government or the level of economic growth. However, in countries where the state apparatus is inefficient, the results are not very satisfactory.

In Vietnam, government spending is considered an important financial resource for economic growth. Pham The Anh (2008) studied about government spending and economic growth through theoretical and experimental research, suggesting directions for applied research in Vietnam. Especially against the background that the clean budget deficit is becoming more serious (5% of GDP).

A study by Nguyen Quang Trung and Tran Pham Khanh Toan (2014) on the impact of public spending on economic growth in Southeast Asian countries, including Vietnam, using panel data regression analysis shows that total public spending, public spending on health, security and defense have a positive impact on economic growth and public spending on education has the opposite effect. In addition, during the analysis, the research results also show that the labor force, private investment and foreign direct investment have a positive impact on economic growth and inflation, the openness of the economy have opposite effect.

In a recent study by Nguyen Thi My Linh (2018) on government spending and economic growth in some Southeast Asian countries. Specifically, it deals with 5 countries including Vietnam, Thailand, the Philippines, Indonesia and Malaysia during the period 2000-2016. The study uses a quantitative regression method with panel data, especially the Generalized Method of Moment (GMM) method, to overcome the phenomenon of autocorrelation between errors, the phenomenon of variance of variable errors and potential endogenous problems. The research results show that government spending has a nonlinear impact on economic growth in the studied countries, in particular, the optimal level of government spending for economic growth is

23.23% of GDP. Based on this, the author puts forward some policy suggestions for Vietnamese managers to help promote the positive impact of government spending on economic growth.

The research of Vu Sy Cuong (2009) and Vu Thi Huyen Trang (2018) on the appropriate size of government budget spending for economic growth in Vietnam, the research results show a U-shaped relationship between economic growth and budget spending with economic growth. Using Armey curve theory, Vu Thi Huyen Trang (2018) suggested that the optimal size of investment spending for economic growth is 6.2%-7.8% of GDP, the corresponding size of government budget spending is 21%-25.5% GDP.

3. Methodology, data and research model

Methodology and data

The study is conducted based on the Keynesian aggregate demand model with a data set on expenditures for the growth period 2001-2022. The estimation method used is time series regression.

The model data are obtained from various reliable sources. Specifically:

Table 1: Variables in the model

Variables	Explanation	Source
GDP	Economic growth rate	World Bank
Total expenditure	Total state budget spending	Ministry of finance
CAEX	Capital expenditure	Ministry of finance
FDI	Value of foreign direct investment	World Bank
Inflation	Inflation rate	World Bank
EX	Balance of trade	Finance Stock

Source: Author's compilation

According to the Keynesian model of aggregate demand, the value of GDP depends on household spending, private investment, government spending and the trade balance. In the research model, the dependent variable reflecting economic growth is measured by the GDP growth rate. The dependent variables include: the change in total government spending, the change in development investment spending, the

change in foreign direct investment, the inflation rate - a variable that affects business investment decisions and household spending - and the trade balance (export value minus import value). The research model has the form:

$$GDP = a_0 + a_1.D.G_t + a_2.D.FDI_t + a_3.Inflation + a_4.EX$$

In which: G_t is government spending in year t including total state budget expenditure and capital expenditure.

Data analysis in model

Economic growth and government expenditure

The data show that Vietnam's economic growth fluctuated between 5.4% and 7.5% in the period 2001-2019. Among them, economic growth in the 2008-2012 period was lower than in the other years due to the impact of the global financial crisis. In 2020-2021, the impact of the Covid-19 pandemic will reduce economic growth by more than 2%. In 2022, thanks to a series of measures taken by the government to stimulate the economy, the economy will be restored and it is estimated that the growth rate of the economy will reach about 8%.

Figure 1: Economic growth rate (%) and state budget spending (Mill. VND)
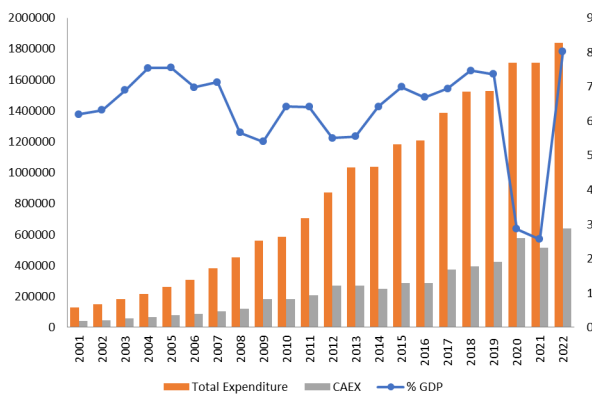
Source: Ministry of Finance and World Bank

The data show that government budget spending has increased steadily over the years (including total spending and spending on development investment). It can be seen that Vietnam followed a broad-based growth model in the first 10 years and expanded government spending to maintain a high growth rate (Vu Sy

Cuong, 2008). The increase in spending over the years can also be attributed to fluctuations in the economy, such as the financial crisis in 2008-2009, which forced the government to adopt loose fiscal policies to repair the economy. In addition, the increase in government spending is also in line with the increasing demands of social security. In general, the increase in capital spending fluctuates along with total budget spending, except in 2021, when total budget spending increases due to the need to spend on the epidemic, while capital spending decreases in that year.

Figure 2: Economic growth, inflation, foreign direct investment and trade balance of Vietnam
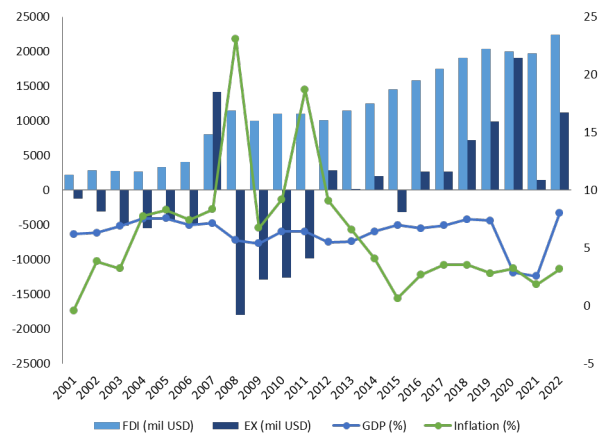
Source: World Bank and Finance Stock

Inflation in Vietnam fluctuated in the period before 2013, the inflation rate rose and fell and was high in many years, especially in 2008 and 2011 with inflation rates as high as 23.12% and 18.68%, respectively. From 2004 to 2012, the inflation rate was continuously above 7%. However, since 2013, inflation has been stable at below 5%. This is the ideal inflation rate for a country's economic growth.

Realized FDI capital has basically trended upward throughout the period, especially after 2007 when Vietnam became a member of the International Trade Organization (WTO). However, realized capital only surged in 2007-2008 and then levelled off in the following three years. From 2012 to the present, realized FDI capital has gradually increased. The increase in

FDI capital plays an important role in promoting economic growth by creating jobs and consumer markets and positively affecting domestic enterprises.

Vietnam was consistently a trade deficit country in 2001-2011, and the trade balance was consistently negative. From 2012 to the present, the trade balance has improved and is in surplus. In addition, Vietnam's import and export turnover has continuously increased over the years, which is a prerequisite for the increase in the GDP value of the economy.

In summary, GDP grows with the increase in total government spending and investment spending, the value of foreign direct investment, the EX value, and a reasonable inflation rate. To clarify the effect of these factors on the GDP rate, a regression is performed to verify the results.

4. Results and discussion

The test results show that the time series are stationary. Therefore, OLS regression is used to assess the impact of the independent variables on economic growth. The regression results are shown in the following table 2:

Table 2: Regression results

	(1) GDP	(2) GDP
D.TotalExp~e	-0.00000570 [-1.21]	
D.FDI	0.000482** [2.29]	0.000478** [2.22]
Inflation	0.0259 [0.46]	0.0184 [0.32]
D.EX	0.0000589* [1.94]	0.0000591* [1.81]
D.CAEX		-0.00000559 [-0.83]
_cons	6.115*** [10.53]	5.863*** [11.22]
N	21	21
R-sq	0.354	0.324

t statistics in brackets
* p<0.1, ** p<0.05, *** p<0.01

Source: Stata

The regression results show that:

Changes in total government budget expenditure and development investment expenditure have a negative impact on GDP growth, but the results are not really clear (not yet statistically significant). Thus, the change in total spending as well as spending on development investment in Vietnam is not meaningful and effective for economic growth. This is due to the poor management of spending, loss of funds, and low efficiency of spending. Total budget expenditure includes recurrent expenditure and development investment expenditure. Recurrent spending has not created a favourable institutional environment for economic growth, public services and administrative procedures are still bureaucratic, and businesses spend a lot of time and money using public services. This reduces business productivity. In terms of development investment spending, the investment situation is inconsistent, and the investment structure is not appropriate, so infrastructure is still limited. In addition, the structure of recurrent spending and development investment spending is not aligned with the actual situation of the economy. As a result, government spending has not yet reached the growth target for the economy.

Changes in foreign direct investment and in the balance of trade have a positive impact on economic growth. In Vietnam, there have been many changes in the investment environment during the period 2001-2022, as well as an expansion of trade with international markets. Foreign direct investment capital has increased greatly during this period, and the value of trade with other countries has also increased greatly over the years, which has contributed to economic growth.

As for the impact of inflation on economic growth, inflation has a positive impact on Vietnam's growth performance, but the results are not really clear (not yet statistically significant). During the period 2001-2022, inflation was highest in 2008 and 2011, at 23.11% and 18.68%, respectively; this is also the year when Vietnam's economic growth slowed down. In the remaining years of the study period, inflation is essentially controlled by the government to ensure economic growth.

In addition to the factors in the model, factors outside the model are also assumed to have a large impact on Vietnam's economic growth. Thus, the budget spending policy in Vietnam is still insufficient, not guaranteed to promote economic

growth in Vietnam, the growth results are mainly due to the open economy to the world, the policy of tissue and other factors.

5. Some proposals

In order to promote economic growth, the government must take measures to reasonably adjust budget spending in the near future. Some of the author's recommendations are as follows:

First, adjust the spending level to Vietnam's economic growth to ensure sufficient revenue to cover spending. The recommended level of appropriate budget expenditure for developing countries like Vietnam is not more than 30% of GDP (Tanzi Vito and Schknecht, 1997). At this level of expenditure, the marginal cost of raising revenue is equal to the marginal benefit of providing the good or service. Maintaining an appropriate level of spending creates fiscal space in case the economy faces uncertainties such as economic and financial crises, epidemics, and natural disasters.

Second, calculate a reasonable structure of public spending, especially the structure between recurrent spending and spending on development investments. Continue to cut recurrent spending to reduce the burden on the state budget. Increase spending on development investment, which is necessary to guide economic development.

Third, improve the transparency and efficiency of government budget spending. Financial and budgetary policies are allocated according to the 5-year financial plan and the 3-year financial and budget plan in accordance with the tasks of each stage of socio-economic development. However, there are still many shortcomings in the implementation, the efficiency of spending is not high, resulting in a lot of wasteful and inefficient spending. In the near future, it is necessary to adjust the specific expenditure in terms of expenditure norms, based on the calculation of expenditure norms and the allocation of recurrent expenditure and development investment expenditure in accordance with the actual situation and needs of the state economy. Inefficient and wasteful expenditure items must be eliminated to ensure budget savings and focus on effective items. This requires improving the efficiency of government budget expenditure management.

Fourth, in parallel with expenditure adjustment measures, the government must maintain an adequate level of budget revenues and expenditures in the long term and find solutions to find a stable source of budget revenues and ensure the sustainable development of the state budget. Securing economic growth is a prerequisite for generating revenue to increase budget spending.

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SOLUTIONS REGARDING INTERNAL FINANCIAL MANAGEMENT MECHANISMS AND POLICIES FOR TERTIARY EDUCATION INSTITUTIONS UNDER THE MINISTRY OF FINANCE

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Abstract: In recent years, Vietnam's higher education sector has made significant progress. There has been a growing presence of public tertiary education institutions, foreign universities, international joint programs, and on-site overseas training programs in Vietnam's higher education services market. While the pilot program for university autonomy has achieved certain milestones, the internal financial management within public tertiary education institutions remains somewhat unclear and ineffective. This has led to challenges and confusion in both theory and practice concerning the management of internal finances to meet society's demands for training quality. In light of this situation, this article aims to propose solutions for strengthening the internal financial management of Vietnamese public universities in the near future. This is an urgent need, particularly for the Ministry of Finance.

Tóm tắt: *Hiện nay, chất lượng giáo dục đại học ở Việt Nam đã thay đổi rất nhiều theo chiều hướng tích cực, ngày càng có nhiều các cơ sở giáo dục đại học công lập, đại học nước ngoài, các chương trình liên kết quốc tế và nhiều chương trình du học tại chỗ của nước ngoài tham gia vào thị trường cung cấp dịch vụ giáo dục đại học ở Việt Nam. Quá trình thực hiện thí điểm về tự chủ đại học đã có thành công nhất định. Tuy nhiên, việc quản lý tài chính nội bộ trong các cơ sở giáo dục đại học công lập vẫn còn khá mơ hồ và chưa thật sự đem lại hiệu quả trong quá trình hoạt động. Từ thực trạng trên, bài báo tập trung nghiên cứu, đề xuất giải pháp góp phần tăng cường công tác quản lý tài chính nội bộ các trường đại học công lập ở Việt Nam trong thời gian tới là một đòi hỏi cấp thiết, đặc biệt đối với Bộ Tài chính.*

• Từ khóa: *quản lý tài chính nội bộ, tự chủ tài chính, hiệu quả quản lý, quản lý nguồn thu, quản lý khoản chi.*

1. Introduction

Deputy Minister of Education and Training, Mr. Hoang Minh Son, stated during a thematic session held on November 19, 2020, by the National Development Council, themed "Autonomy in Higher Education: Current Situation, Difficulties, and Solutions," that implementing autonomy is an ongoing process. Changing awareness and enhancing the capacity of stakeholders are key factors. The pilot program for university autonomy has achieved certain milestones and represents an irreversible and essential trend for improving the education sector. However, financial management at public tertiary education institutions remains vague and ineffective, leading to challenges in both theory and practice in managing internal finances to meet society's demands for training quality. Given this situation, there is an urgent need for research and proposals to strengthen financial management in Vietnamese public universities, particularly for the Ministry of Finance. Despite their limited number, major public universities exhibit high-quality management and governance mechanisms, significant financial autonomy, and training programs with high socialization potential. This has created fierce competition between universities located in favorable regions with high demand for consulting services and enrollment and those in more

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disadvantaged areas. This article examines issues related to internal financial management in tertiary education institutions under the Ministry of Finance, focusing on four units: the Academy of Finance, University of Finance - Business Administration, University of Finance - Accounting, and University of Finance - Marketing.

2. Methodology

The article employs the methodology of dialectical materialism and historical materialism to examine issues comprehensively, systematically, logically, and practically within the context of specific historical circumstances. The thesis also utilizes various economic research methods, including the analytical method, systematization method, comparative method, interpretive method, along with general knowledge in economics.

3. Results and discussion

In recent years, Vietnam's higher education sector has made significant progress. The presence of public tertiary education institutions, foreign universities, international joint programs, and on-site overseas training programs has increased in Vietnam's higher education services market. Consequently, enhancing the training quality and services of domestic tertiary education institutions, especially public ones, is crucial for greater competitiveness in the international market. As the Vietnamese government is moving toward granting autonomy to revenue-generating public service delivery units in the education sector, particularly in tertiary education, it has encouraged proactivity in various aspects, including organizational structure, workload and task assignment, and the utilization of labor and human resources to ensure high-quality tertiary education. The growth and development of higher education heavily rely on effective financial management within universities. This involves decisions regarding funding methods and the responsible allocation and control of financial resources with proper accountability measures. In addition to revamping the financial management mechanism in higher education, there is a need to adjust the expenditure management mechanism for Vietnamese universities to enable proactive and effective fund utilization across various activities.

Many tertiary education institutions under the Ministry of Finance rely on the state budget to sustain their operations. However, as part of the restructuring process, there's a growing need for a more dynamic management mechanism akin to that of enterprises. This shift is essential for diversifying revenue sources, enhancing employee incomes, and attracting top talent. In the past, universities often operated in isolation, primarily focused on their daily activities. However, this approach is no longer suitable, as educational institutions are now subject to society's scrutiny and evaluation. Therefore, university leaders must view their institutions as businesses and continuously adjust their development strategies to thrive in today's competitive environment.

Achievements

First, the State has established a transparent legal framework for universities under the Ministry of Finance to autonomously manage their finances. The global higher education landscape is undergoing significant transformations, and any country that lags in higher education system reform, particularly in updating its perspectives and management mechanisms, risks missing out on opportunities for economic integration and development. Therefore, the renovation of higher education, especially its management mechanisms, is a pressing need for Vietnam.

The Vietnamese government recognizes the importance of educational innovation, particularly in promoting autonomy in higher education. Over the years, the government, along with ministries, departments, and sectors, has issued several legal documents to promote autonomy in public universities. Some legal foundations for higher education innovation and university autonomy include Resolution No. 77/NQ-CP dated October 24, 2014, which outlines the pilot renovation of the operational mechanisms of public tertiary education institutions during 2014-2017; Decree No. 16/2015/ND-CP dated February 14, 2015, which defines the autonomy mechanism for public administrative units; and Decree No. 81/2021/ND-CP dated August 27, 2021, which addresses tuition fees in educational institutions following the national education program, including fee collection and management, policies on tuition fee exemption, reduction, and financing for learning fees.

The State's orientation toward autonomy, especially financial autonomy, in universities provides a comprehensive legal framework,

creating favorable conditions for public universities to develop autonomy practices that align with Vietnam's circumstances and the trend of international integration.

Additionally, the autonomy mechanism has spurred universities to innovate and enhance their performance gradually. While the development orientations, strategic goals, operational conditions, and financial resource mobilization policies vary among the four universities, they have all achieved significant results. Non-business revenue in universities has consistently grown year-on-year, thanks to expanded non-business activities and service diversification. The State has begun to grant more autonomy, particularly financial autonomy, to public universities. Leveraging this opportunity, public universities under the Ministry of Finance have expanded their offerings with new training programs, attracting more students and increasing enrollment and tuition revenues. As a result, tuition fees now constitute a significant portion of the four universities' revenue.

Furthermore, universities are expanding their networks through partnerships to generate short-term revenues. They have also been granted the authority by the State to open bank accounts instead of relying solely on the State Treasury, resulting in additional income from deposit interest compared to previous years. This demonstrates the positive impact of the policy to enhance financial autonomy in public universities, alleviating the burden on the state budget.

Public universities under the Ministry of Finance exercise autonomy in raising capital for investments in facilities and equipment. They secure funds through loans from credit institutions, stimulus loans, and contributions from employees and joint ventures. This approach has led to upgrades in the infrastructure of non-business units, enabling them to support a variety of non-business activities aligned with their assigned functions and tasks. Autonomy in expenditure management, governed by internal spending regulations, has encouraged innovative and cost-effective operational methods, rigorous expenditure control, and efficient fund utilization. Financial autonomy, coupled with organizational autonomy, has driven universities to refine their entire apparatus in a more efficient and economical manner.

Secondly, the financial management mechanism in public universities under the Ministry of Finance has begun to address income distribution equity by aligning contributions and compensation for staff. This approach fosters unity, teamwork, and operational efficiency among team members. Expenditure levels specified in the internal spending regulations have been gradually adjusted to reflect the current situation, moving towards more equitable income distribution based on employees' dedication levels. In addition to the government-prescribed basic salary classification by ranks and positions, universities boost employees' income through alternative funding sources, such as service provision and cost savings. The focus on improving service quality and prudent fund utilization has created favorable opportunities for universities to increase their accumulated income.

Moreover, financial autonomy has encouraged proactive leadership and financial management within public universities. Autonomy, coupled with resource allocation, has empowered these universities to generate their own funds for both welfare and future development. Between 2016 and 2020, all four universities established three specific provisions to address various scenarios, with a significant focus on provisions for the development of non-business activities, accounting for an average of over 50% of the total provision amount. Conversely, provisions for income stabilization have grown steadily, indicating a stable revenue trend for these universities in the near future.

Limitations, shortcomings, and causes

Public universities under the Ministry of Finance face challenges in maximizing financial resources while managing their units. Despite promoting autonomy, these units do not receive the highest priority in the state budget allocation for facilities and scientific research. In the past, before achieving financial independence, these universities received annual state budget funding to enhance facilities, training quality, and research. However, after becoming financially self-sufficient, the state budget support remains unchanged. Consequently, universities lack the facilities and research capacity necessary to boost their reputation and brand value for financial autonomy. Studies have revealed that the financial statements of these universities do not clearly indicate revenue from scientific research

activities, despite research being one of their primary functions. University leaders must implement measures to manage and adjust their scientific research activities. Most universities struggle to fully capitalize on their non-business revenue, leading to issues like capital misappropriation and revenue loss. This situation may arise due to a lack of monitoring of contracts directly negotiated between staff and university partners, leading to underreporting of such contracts.

Moreover, there are several shortcomings in expenditure distribution and content in financial management at public universities under the Ministry of Finance. Each university has its unique financial management approach and expenditure structure. While they have the freedom to determine expenditure levels and additional payments to staff, it is advisable to standardize expenditure categories and align them among universities to prevent disparities in expenditure levels for equally important tasks. Such disparities can lead to demotivation among university staff, negatively affecting their performance.

The shortcomings in the current financial management mechanism indirectly discourage some universities from pursuing financial autonomy. The existing financial autonomy mechanism falls short of ensuring staff equity. It encourages universities to expand their scale and increase financial revenues but does not necessarily correspond with improvements in the quality of education and research. State budget allocations to universities do not always align with the goals of equity and efficiency in tertiary education.

In addition, public university leaders have not fully grasped the concept of autonomy, especially financial autonomy. While they recognize their "rights," they may not fully comprehend the accompanying responsibilities. Advanced management skills linked to financial autonomy have not been adequately nurtured and developed. A strong reliance on state budget funding remains ingrained among public university leaders, hindering their ability to embrace autonomy.

The internal control system at public universities under the Ministry of Finance remains incomplete. The monitoring, supervision, and inspection system for financial management primarily centers on financial accounting and is limited to meeting monitoring requirements. In the context of autonomy, there has been insufficient emphasis on providing regular and ensuring accurate, objective, and transparent financial information.

In the financial autonomy mechanism, there is a lack of sanctions or financial accountability for both universities and state authorities. This deficiency leads to inaccurate and inadequate preparation and allocation of non-business revenue forecasts to universities. For instance, the governing ministry may assign an overly conservative budget forecast for non-business revenues, often unsupported by previous years' revenue data. Some forecasts even omit income sources or underestimate them, resulting in actual revenues significantly surpassing the forecasts. Universities justify their cautious forecasts by fearing that accurate predictions would lead to reduced budget allocations for recurrent and non-recurring expenses or the withdrawal of financial support from the state, forcing them to cover their own operating expenses.

4. Solutions

Solutions for enhancing revenue mobilization and management

(i) Income from the state budget

To reduce reliance on the traditional method of state budget allocation outlined in Chapter II, which primarily relies on state budget allocation and university input factors, public educational institutions must evaluate, research, and implement state budget allocation methods based on outputs. Special emphasis should be placed on the effectiveness of training and research activities.

Specifically, the transformation involves shifting from the current 'subsidy' model for recurrent expenditures to a 'market' mechanism. Under this new approach, the state places orders for specific quantity and quality of services with tertiary education institutions, controlling the outputs. Universities can compete for these 'orders' by bidding for education, training, and research services. In this context, tertiary education institutions must efficiently utilize allocated resources, enhance their competitiveness, and continuously improve service quality.

On one hand, state management agencies and the Ministry of Finance should review and restructure state budget resources allocated to affiliated tertiary education institutions based on their budgetary capabilities. This restructuring

should consider factors like institution size, student and staff numbers, historical state budget allocation, geographical location, student demographics, and university income to ensure a fair allocation of state budget resources for education and training activities.

To promote equitable allocation, governing bodies should encourage tertiary education institutions to accurately report income and establish funds to provide decision-making information.

(ii) For revenue from tuition fees

Revenue from tuition and fees depends on two factors: training scale (number of students, majors, etc.) and tuition ceilings. These factors were traditionally controlled by the state through regulations on annual enrollment quotas and tuition fee limits per major, as outlined in Decree No. 86/2015/ND-CP dated October 2, 2015, and other related documents such as Decision No. 378/QD-TTg dated March 23, 2015, and Official Letter No. 5220/BGD&DT-GDDH dated October 9, 2015, issued by the Ministry of Education and Training. However, recent changes, such as Decree No. 81/2021/ND-CP dated August 27, 2021, have introduced a new approach to tuition fees. This decree outlines tuition fee ceilings for the academic years from 2021 to 2026, with a gradual increase. It also specifies tuition fee limits based on training sectors and the autonomy level of tertiary education institutions (those with and without guaranteed recurrent and investment expenditures). This approach aims to expand revenue autonomy, encouraging tertiary education institutions to adopt higher degrees of financial autonomy to potentially raise tuition and fee revenues. Consequently, institutions with greater financial autonomy may have tuition fee ceilings up to 2.5 times higher than those without self-financed recurrent expenditures.

The new Decree also mandates that tertiary education institutions must publicly announce tuition fees, training costs, and study levels for each academic year, along with the tuition fee increase roadmap (if applicable). This transparency ensures that students have the right to choose institutions and majors that align with their interests. It also empowers management units, the Ministry of Education and Training, and society to supervise and control tertiary educational services effectively.

To effectively implement Decree No. 81/2021/ND-CP, state management agencies, especially the Ministry of Education and Training and the Ministry of Labour - Invalids and Social Affairs, should issue guidelines for its implementation. They should also proactively address any issues or concerns raised by stakeholders during the implementation process.

(iii) Income from services and other non-business activities

Management agencies and governing ministries should facilitate universities in expanding service activities, scientific research, training collaborations, and teaching while collecting revenue to cover their expenses at a reasonable rate, ensuring compliance with relevant laws. To achieve this, it's essential to expedite and broaden the autonomy of tertiary education institutions. They should be capable of self-management, aligning with societal needs, and responding to educational service demands or state-assigned tasks.

In addition, to enhance resource mobilization for the quality improvement of public tertiary education, it is essential to establish a mechanism that promotes the socialization of higher education services and attracts investment, funding, and assistance for higher education institutions. Specifically, governing bodies should strengthen exchanges and fundraising efforts for higher education institutions through international organizations, national development cooperation agencies, and non-governmental organizations. State management agencies should provide tax incentives and streamlined procedures for affiliated organizations and enterprises that invest in training and research services at universities.

Solutions for enhancing the efficiency of expenditure management activities

Review and research to develop and improve legal policies towards contracting and granting autonomy and self-responsibility of tertiary education institutions for expenditures. Review and remove rigid, unnecessary, and context-inadequate management and control regulations, promote and encourage contracting according to normative standards, and enhance publicity, transparency, and responsibility of tertiary education institutions under the Ministry of Finance.

The governing body (the Ministry of Finance) should strictly inspect and supervise the internal

financial management of the affiliated tertiary education institutions with measures, namely:

+ Review and develop regulations on criteria and quotas to supervise, inspect, and control internal financial activities of tertiary education institutions according to the degree of financial autonomy and applicable laws. Review, update, and adjust the quotas and criteria in a timely manner to match reality in the implementation process.

+ In addition to the reports required by law, the governing body (the Ministry of Finance) should encourage affiliated tertiary education institutions to implement management accounting based on their specific characteristics. This approach aims to analyze the underlying causes and develop solutions for internal financial management within these institutions. As for the method of report submission, internal regulations can be applied to tertiary education institutions under the Ministry of Finance. Specifically, these institutions may utilize the eDocTC system to streamline the process, saving time and reducing administrative procedures and paperwork.

+ In the process of inspecting and supervising internal financial management activities, the governing body (the Ministry of Finance) should identify weaknesses and limitations in the implementation process of tertiary education institutions and propose corrective measures. In cases of violations, appropriate actions should be taken in accordance with the current legal provisions.

Solutions for enhancing the efficiency of asset management

The governing body (the Ministry of Finance) develops criteria and quotas to evaluate the outcomes of public asset management at affiliated tertiary education institutions. These criteria include assessing revenue sources relative to the total value of assigned public assets, the market value of current assets compared to the asset value on the payment contract, the level of asset investment needs relative to total assets, and the cost of asset management, repair, and maintenance relative to the asset's capacity.

In addition, tertiary education institutions should develop and improve internal regulations on public asset management and ensure adequate guidance on specific, detailed, and accessible content for the asset management process, including content related to

handling violations of state property management to ensure compliance with applicable laws. The draft regulation on public property management should be consulted by departments and employees within the universities. After being approved, the promulgation should be made public and disseminated to ensure compliance with regulations.

Other solutions

(i) Training and fostering human resources to perfect the internal financial management apparatus

The financial management apparatus within tertiary education institutions has a direct impact on the effectiveness of internal financial management. Therefore, it is essential for financial managers to regularly enhance their professional qualifications, improve their skills, incorporate information technology, enhance problem-solving abilities, and participate in refresher and training courses related to applicable laws, among other measures. This ensures their capability to stay updated and provide advice on changes in state policies and socio-economic factors. Equally important is the creation of a team of capable and ethical consultants for the management field.

(ii) Renovate the expenditure structure and improve the efficiency of financial resources usage:

- Restructure the unit's operational apparatus and organize the organizational structure and staff in a streamlined and efficient manner.

- Review and adjust internal spending regulations with the aim of gradually increasing the proportion of expenditure dedicated to direct teaching, learning, and scientific research activities. These factors are crucial for ensuring the quality of education provided by public tertiary institutions.

- Regarding additional income, individuals and departments that demonstrate better performance and contribute to revenue growth and cost savings should receive higher benefits, while those who perform less effectively should receive fewer benefits. A coefficient for additional income payment, based on rank, position, work performance, etc., should be considered as a way to motivate university staff.

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THE IMPACTS OF GOVERNMENT SPENDING AND INSTITUTION QUALITY ON DIFFERENT LEVELS OF ECONOMIC GROWTH: A CASE STUDY IN VIETNAMESE PROVINCES

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Abstract: *By applying Quantile Regression methods, the impacts of government expenses and institutional quality on economic growth are examined based on the level development of 63 Vietnamese provinces during the period from 2010 to 2020. The results showed that there is a stronger positive impact of both government expenditure and institutional quality on economic growth when the province achieves a higher level of economic development in Vietnam. Moreover, investment spending in Vietnamese provinces is proven to contribute more to improving economic growth than current expenses.*

Tóm tắt: *Bằng việc áp dụng phương pháp hồi quy phân vị, nghiên cứu thực hiện đánh giá tác động của chi tiêu chính phủ và chất lượng thể chế tới tăng trưởng kinh tế, được xem xét dựa trên mức độ phát triển của 63 tỉnh/thành của Việt Nam trong giai đoạn từ 2010 đến 2020. Kết quả cho thấy có tác động tích cực của chi tiêu chính phủ và chất lượng thể chế đến tăng trưởng kinh tế khi tỉnh/thành đạt được trình độ phát triển kinh tế cao hơn. Ngoài ra, nghiên cứu cũng cho thấy chi đầu tư tại các tỉnh/thành của Việt Nam có đóng góp nhiều hơn cho việc cải thiện tăng trưởng kinh tế so với chi thường xuyên.*

• Từ khóa: *tăng trưởng kinh tế, chi tiêu chính phủ, chất lượng thể chế, phương pháp hồi quy lượng tử.*

1. Introduction

The relationship between public spending and economic growth is a topic that has been studied by many researchers around the world. According to Keynesian economic theory, measures to increase government spending effectively stimulate demand, and promote production development through financial subsidies, investment programs, and guarantees, stable profits for the private sector (Keynes & Waeger, 1936). However, the impact of public spending on economic growth is controversial. While government expenditure is recognized as an essential factor contributing to economic development according to the Keynesian viewpoint, the impact of expansionary fiscal policy on economic growth is negatively mentioned in some studies such as Grier and Tullock (1989); Bergh and Henrekson (2011); Seshaiah et al. (2018).

Besides, it cannot be denied that the practice of financial and economic management in one country depends on the intervention of the government (Hoang et al., 2010). Accordingly, the quality of the State's management is reflected in the aspects that always play an important role in all macroeconomic policies. At the end of 2021, when Vietnam enters the "new normal", activities as well as social relations and human behavior after the Covid-19 pandemic will have many changes, especially the State management agencies. In Vietnam, the institutional quality in localities is reflected in the provincial economic management capacity, which is measured by the provincial competitiveness index (PCI) (Su et

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al., 2020), (Nguyen et al., 2021). This is an index established by the Vietnam Federation of Trade and Industry (VCCI) with support from the United States Agency for International Development (USAID) in Vietnam that evaluates and ranks the governments of provinces and cities in Vietnam on the quality of economic management and building a favorable business environment for the development of private enterprises.

The relationship between institutions, especially economic institutions, and growth is evident in the New Institutional Economics theory (NIE) (North, 1990). Therefore, when considering the relationship between government expenditure and economic growth, institutional quality has been included in the research model by previous authors to assess the factors that contribute to the development of the economy such as Butkiewicz and Yanikkaya (2011); Nirola and Sahu (2019); Montes et al. (2019). Some research results show that good institutions contribute to promoting economic development in countries, but the conclusions are still inconsistent and there are not many studies approaching from the perspective of provinces or cities in Vietnam.

It is necessary to study the impact of government expenditure and institutional quality on the level of provincial economic growth in Vietnam to have a detailed assessment of the management capacity as well as the fiscal policy control of local authorities.

2. Literature review

There are different viewpoints about the nexus between government expenditure and economic growth to shape a theoretical framework. According to Nyasha and Odhiambo (2019), the government plays a vital role in making decisions to develop the economy through fiscal policy operations. In this way, the government raises the State revenue by collecting taxes, fees and charges through production and business activities in society (Häge, 2003). The government size can be measured by some indicators reflecting the total amount of financial resources spent on public sectors and government expenditure is categorized into different fields that serve many sectors in the economy (Sedrakyan & Varela-

Candamio, 2019). Therefore, the impact of government expenditure on national economic development is explained through operating the fiscal policy of the State. Accordingly, while the tight fiscal policy means the government decreases spending in the economy, an increase in government expenditure on different public sectors is known as the expansionary fiscal policy.

The first point of view called "Keynesian view" indicates that an expansionary fiscal policy might boost economic activity advantageously, especially during the recession. This view is supported by several empirical studies such as the study of Sedrakyan and Varela-Candamio (2019), Su et al. (2020). By many various methods, these researchers have proved a positive causal relationship from government expenditure on economic growth. In contrast, the Classical and Neoclassical views state that if the government raises expenditure by increasing taxes might cause some drawbacks to the economy. Specifically, the crowding-out effect might be caused by an increase in the amount of government expenditure despite the pressure on private sectors. The negative impact of public expenses on the economic development has been mentioned in the study of Fölster and Henrekson (2001). Moreover, Dar and AmirKhalkhali (2002) also proved that the economic growth of 19 nations in OECD group experienced a significant increase when the level of government spending got higher. By applying the GMM method, Ndambiri et al. (2012) examined factors affecting economic growth in 19 Sub Saharan nations and concluded the negative impact of government expenditure during the period from 1982 to 2000.

Furthermore, the influence of public spending on various sectors might cause different effects on the economy. According to Butkiewicz and Yanikkaya (2011), the impacts of government expenditure are not only analyzed based on the expenditure structure in different fields but also depend on the level of economic growth in countries or regions. Similarly, Di Vita (2017) have concluded the various influences of the government's management on the economy's activities in terms of different economic background. On the other hand, the contribution

of institutional factors to improve the outcome of countries has been confirmed by the NIE theory. In this way, institutional quality plays an essential function in developing the economy. Therefore, institution is an indispensable factor when studying determinants of economic growth. Some empirical studies have examined the effect of government expenditure on economic growth with the contribution of institution factors. As results in the study of Rizvi (2019), if health expenditure is adjusted by the quality of institutions, it can boost the economic growth stronger in East Asian and Pacific developing nations for the period from 1995 to 2017. In another study of Arvin et al. (2021), there are the links between institutional quality, government expenditure and economic growth, which is confirmed in several countries over the period from 2005 to 2019. Moreover, this study also emphasized the difference of interaction effects among macroeconomic factors in countries with various levels of income.

Briefly, previous studies in many countries did not have consistent results about the impact of government expenditure on economic growth. Hence, it is undeniable that in the context of many spending tasks, especially when the pandemic occurs, many countries must ensure both economic goals and spending on health and social security. Therefore, it is necessary to study and evaluate the impact of public spending on economic growth in countries. Accordingly, in addition to determine the relationship between public spending and economic growth in Vietnam, this study also evaluates the influence of institutional quality factors in provinces. However, different from the approach of previous studies, the article will evaluate the influencing factors based on each level of classification of provinces according to the level of economic development in Vietnam by using Quantile Regression methods.

3. Research model and methodology

3.1. Research model

Based on the Cobb-Douglas production function as well as the NIE theory of (North, 1990); (Barro, 1990) and (Cooray, 2009).

Moreover, being inherited from previous studies relating to the effects of government expense and institutions on economic growth such as Rizvi (2019), Su et al. (2020), Arvin et al. (2021), research models have been suggested as follow:

Model (a): $grdp_{it} = \beta_0 + \beta_1 ge_{it} + \beta_2 pci_{it} + \beta_3 Z_{it} + e_{it}$
Model (b): $grdp_{it} = \beta_0 + \beta_1 cur\_exp_{it} + \beta_2 pci_{it} + \beta_3 Z_{it} + e_{it}$
Model (c): $grdp_{it} = \beta_0 + \beta_1 inv\_exp_{it} + \beta_2 pci_{it} + \beta_3 Z_{it} + e_{it}$

In the three models above, i denotes the factors in different Vietnamese provinces. Moreover, t reflects the data of the variables in each year of the research period.

Since this study is not only going to evaluate the impact of total government expense on provincial economic growth in Vietnam, but also examine the influences of two components of government expenditure including current expenditure and investment spending. Hence, three research models above have been established with three different factors of government expenditure play a role of the independent variable.

Accordingly, the dependent variable in all three models above is $grdp_{it}$, which is measured by the gross regional domestic product per capita in each Vietnamese province during the period from 2010 to 2020. The dependent variable describes the provincial economic growth in Vietnam. Similarly, ge_{it}, cur_exp_{it} and inv_exp_{it} reflect total public spending per capita, current expense per capita and public expenditure on investment, respectively.

In general, there are three variables describing aggregated government expenditure as well as two component spending of regions in this study. Besides, pci_{it} in all models is the institutional factor describing the quality of local government operations in Vietnamese provinces. Therefore, pci_{it} is measured by the PCI (%) in Vietnam. On the other hand, Z is denoted as control variables in three models. There are six control variables in three models including (1) Foreign direct investment per capita in provinces (fdi_{it}); (2) Private investment per capita in provinces ($priinv_{it}$); (3) Public investment per capita in provinces ($pubinv_{it}$); (4) Trade openness measured by total amount of export value and

import value over the gross domestic product per capita in provinces (%) ($open_{it}$); (5) Labor rate measured by the ratio of employed people to total population in provinces (%) ($labo_{it}$); (6) Provincial Information & Communications Technologies Index (itc_{it}) which is published by the Ministry of Information and Communications in Vietnam, reflects the level for the development and available application of information and communication technology in the provinces. However, the figures for some variables including three variables reflecting government expenditure (ge_{it}, cur_exp_{it}, inv_exp_{it}), variables describing the capital flow per capita (fdi_{it}, $priinv_{it}$, $pubinv_{it}$) and the dependent variable ($grdp_{it}$) are all adjusted by provincial inflation and presented as in logarithm.

Furthermore, to support Keynesian and NIE theory as well as previous studies such as Su et al. (2020); Rizvi (2019); Arvin et al. (2021). Two hypotheses are proposed as following:

H_1: *Government expenditure has a positive (+) impact on economic growth in Vietnamese provinces.*

H_2: *Institutional quality has a positive (+) impact on economic growth in Vietnamese provinces.*

3.2. Methodology and research data

This study uses the Quantile Regression method. In Ordinary Linear regression (OLS), only the mean value of dependent variable is estimated based on values of independent variables. However, Quantile Regression method can help the researcher predict the value of dependent variable at different quantiles including at the median as well as the percentiles of 5%, 10%, 25%, 75%, 90% and 95% (Koenker & Bassett Jr, 1978). Instead of estimating the parameters of the mean regression function by the OLS method, Koenker and Bassett Jr (1978) proposed the estimation of parameters based on the percentiles of the dependent variable in the condition of regressor values so that the total absolute difference of the regression function at the percentile of the dependent variable is minimal. Therefore, instead of determining the marginal effect of the government expenditure as well as institutional quality on the mean of

economic growth at provincial level in Vietnam, Quantile Regression determines the marginal effect of two independent variables above on per percentile of the dependent variable.

In this study, we combined two methods of Quantile Regression including Residualized Quantile Regression (RQR) model and Conditional Quantile Regression (CQR) model to examine the impacts of government expenditure and institutional quality on economic growth in Vietnamese provinces. Accordingly, RQR model is represented the group of Quantile Treatment Effects (QTE) models to evaluate participation efficiency in each quartile of a dependent variable. Besides, CQR models have been used to estimate the effects of independent variables on the dependent variable with the Bootstrap technique (**bqreg** command).

4. Research results and discussions

Firstly, to evaluate the participation efficiency in different quantiles of Vietnamese provincial economic growth level, the results of RQR model have been illustrated in Figure 1 below:

Figure 1: Results of QTE of government expenditure and institutional quality on economic growth at provincial level in Vietnam
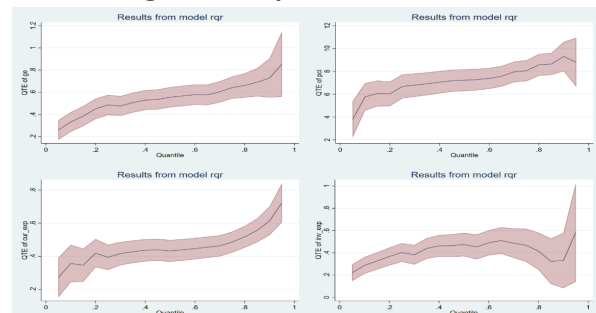
Source: Result analysis from Stata 16.0

As can be seen from Figure 1 which presents the results from RQR model, the curve lines on the graph describes the contribution efficiency to different levels of provincial economic growth in Vietnam of four factors including the total public expenditure (*ge*), the government current expenses (*cur_exp*), the government spending on investment (*inv_exp*) and the institutional quality (*pci*). Accordingly, at a higher level of economic growth in Vietnamese provinces, it is expected

a stronger positive impact of expansionary fiscal policies. Specifically, total government expenditure as well as two components of public expense has been shown to promote the economy more strongly when the Vietnamese province achieves a higher-level growth rate. This point is explained through increasing coefficients (QTE) of three variables consisting of (*ge*), (*cur_exp*) and (*inv_exp*) according to different quantiles of economic growth (*grdp*).

Regarding the effect of local institutions on provincial economic growth, it is justifiable to state that the QTE of (pci) also increases gradually when the province achieves a higher GDP growth rate. However, at the highest quantile of provincial economic growth, the impact of PCI seems to be weaker slightly, with the decreasing value of coefficient.

Secondly, the regression results of three research models suggested above by applying CQR model are presented in Table 1. Accordingly, the effects of independent variables on the dependent variable (grdp) are illustrated through the Bootstrap technique in CQR model.

Table 1: Results of Quantile regresssion from CQR model *(bsqreg command)*

	Q.05	Q.10	Q.25	Q.50	Q.75	Q.90	Q.95
Dependent variable: grdp							
Model (a)							
ge	0.242***	0.282***	0.225***	0.290***	0.258***	0.351***	0.296***
	(4.85)	(5.64)	(5.59)	(5.47)	(4.62)	(4.24)	(2.74)
pci	1.975***	2.012**	3.176***	2.845***	3.468***	4.400***	3.252**
	(3.20)	(2.43)	(7.02)	(6.86)	(5.60)	(6.03)	(2.51)
Model (b)							
cur_exp	0.169***	0.152***	0.136***	0.116***	0.118***	0.158**	0.206**
	(3.00)	(2.72)	(3.64)	(4.43)	(3.86)	(2.45)	(2.34)
pci	2.244***	2.341***	3.227***	3.374***	3.678***	4.198***	3.344***
	(3.95)	(3.01)	(7.49)	(8.01)	(6.66)	(4.67)	(2.82)
Model (c)							
inv_exp	0.225***	0.232***	0.212***	0.308***	0.255***	0.259***	0.176
	(4.89)	(5.40)	(4.36)	(5.81)	(4.32)	(2.65)	(1.45)
pci	1.916***	2.357***	3.336***	3.242***	3.862***	5.081***	4.069***
	(3.13)	(3.18)	(6.86)	(7.87)	(8.49)	(7.77)	(3.40)
N	693	693	693	693	693	693	693

t statistics in parentheses

* p<0.10, ** p<0.05, ***p<0.001

Source: Result analysis from Stata 16.0

The data in Table 1 show that most the coefficients of total government expenditure variable (ge), current expenses (cur_exp), investment spending (inv_exp) and institutional quality variable (pci) are siginificant at different quantiles of provincial economic growth (grdp) in Vietnam. There was a gradual increase in the figure for coefficients of institution factor (pci), total public expenditure (ge) as well as investment expense (inv_exp) which reached a peak at the highest quantile level (Q.90) of (grdp) before decreasing significantly at the highest quantile (Q.95) of provincial economic growth (grdp). Specifically, the positive effects of three factors above on provincial economic growth might be weaker when the provinces attain the percentile of 95%. However, at the highest quantile of economic growth (Q.95), the impacts of total public expenditure (ge) and investment expenditure (inv_exp) are weaker while a stronger effect is seen for current expenses (cur_exp). Furthermore, the positive effect of government spending on investment is stronger than that of current expenditure, according with the larger value of coeffficients seen in Table 1.

In general, the results reflect consistently for QTE and CQR method, which supports two hypotheses (H_1 and H_2) as well as previous studies such as Su et al. (2020); Ahuja and Pandit (2020); Rizvi (2019); Arvin et al. (2021). In this way, if there is an increase in both the amount of public spending and the level of local institution quality, it is expected that provincial economic growth rate is improved in Vietnam. However, the similar results of institutional quality effects as well as current expenditure influence in Figure 1 are most clearly.

5. Conclusion and policy implications

By collecting data from 63 Vietnamese provinces in the period 2010-2020, the article studies on the relations between government expenditure as well as institutional quality and economic growth to determine factors impacting expected growth level by the Quantile regression methods. The research results point out that expectation of economic growth is influenced by institutions and public expenses with different

levels of positive effects in Vietnamese provinces. Accordingly, the impacts of institutional quality and government expenditure vary at different quantiles of economic development. These influences on economic growth increase at higher quantiles, but at countries with the highest quantiles, lower impacts on economic growth are found in the influences of total public expenditure and institutional quality. Government spending on investment did not affect significantly when Vietnamese province got the highest level of economic growth (Q.95).

Based on the research results, some proposed policy implications are suggested to promote the economic development in Vietnamese provinces.

Firstly, the higher the percentiles of economic growth is, the stronger the positive impact from public spending and institutional quality are. Therefore, local government in Vietnamese provinces should always improve their quality administration to boost provincial economic growth.

Secondly, for the provinces or cities in Vietnam with high levle of economic growth, the Government's application of the expansionary fiscal policy makes a stronger contribution to promoting economic growth. Meanwhile, in localities with low economic growth, the increase in government spending has a low impact.

Thirdly, in the process of increasing spending, the Government of Vietnam needs to prioritize increasing the proportion of investment spending over current expenses because the impact of current expenditure does not contribute to the same strong growth as investment spending.

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RELOCATING WORKERS TO FOREIGN COUNTRIES FOR EMPLOYMENT: EXPERIENCES OF SOME LABOR DISPATCH COUNTRIES AND LESSONS FOR VIETNAM

PhD. Nguyen Thanh Thao*

Abstract: *The article helps us understand what is a labor dispatch? Through studying the experiences of a number of labor dispatch countries such as the Philippines, Sri Lanka, China, Pakistan and Thailand, the study has drawn 6 lessons for Vietnam in the process of sending workers to work abroad, specifically: (1) Continuing to improve laws and policies related to labor export; (2) Having appropriate vocational education and training programs; (3) Building a coordination mechanism to organize and guarantee sending workers to work abroad; (4) Building an information management system on migrant workers; (5) Having policies to support workers' reintegration into the labor market after the expiration of their labor contracts; (6) Strengthening international cooperation in labor export activities.*

Tóm tắt: *Bài viết cho ta hiểu được phái cử lao động là gì? Thông qua khảo cứu kinh nghiệm của một số nước phái cử lao động như: Philippines, Sri Lanka, Trung Quốc, Pakistan, Thái Lan, nghiên cứu đã rút ra 6 bài học cho Việt Nam trong quá trình đưa lao động đi làm việc ở nước ngoài, cụ thể: (1) Tiếp tục hoàn thiện về luật pháp, chính sách liên quan đối với xuất khẩu lao động; (2) Có chương trình giáo dục và đào tạo nghề phù hợp; (3) Xây dựng cơ chế phối hợp tổ chức, bảo lãnh đưa lao động đi làm việc ở nước ngoài; (4) Xây dựng hệ thống quản lý thông tin về lao động di cư; (5) Có chính sách hỗ trợ người lao động tái hoà nhập vào thị trường lao động sau khi hết hạn hợp đồng lao động trở về nước; (6) Tăng cường hợp tác quốc tế trong hoạt động xuất khẩu lao động.*

• Từ khóa: *phái cử lao động, đưa lao động đi làm việc ở nước ngoài, xuất khẩu lao động, kinh nghiệm xuất khẩu lao động.*

1. Problem statement

International labor migration is a broad view covering many fields, subjects, and contents including: domestic or foreign labor migration; migrant workers and export workers; migrant workers returning home after working abroad. There is also the issue of: discrimination, method and reason to migrate, occupation and health of migrant workers. Therefore, the study of international experience on sending workers to work abroad needs to be studied on many criteria of international labor migration to draw lessons for Vietnam in labor management to work abroad effectively.

2. Research content

2.1. Labor dispatch

Labor dispatch is understood as considering personnel as resources and for leasing. When the company runs a project that needs people urgently, or only for a certain short time but the current manpower is not enough. They go to dispatch companies to hire people. At the end of the project, the dispatch contract ends, the employee returns to the old company. It can be understood as follows: The employee signs a contract with company A, but will go to work in companies B, C... and follow the working regulations of that company. But all policies and regimes such as salary, bonus, insurance,

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holidays... are paid by Company A. Under this form of labor mobility, companies avoid high human costs and make the best use of idle time (ILSSA, 2023).

2.2. Experience of some labor dispatch countries

2.2.1. Philippine's experience

The Philippines is a country with strengths in exporting workers to work abroad. Labor export is concerned and comprehensively invested by the government in terms of policies and apparatus with all stages: preparing workers for labor export, recruiting and arranging overseas workers, protecting the rights and interests of workers working abroad (ILO, 2017). The Philippines is known as a "managed migration" country; with a full process: before, during and after dispatching until workers return home to integrate into the community. Some of the following experiences can be mentioned:

Firstly, vocational training is oriented. The Philippines provides orientation training courses for workers before going to work abroad, which is mandatory, without this training certificate will not be allowed to exit. The program aims to prepare workers for the best conditions for community integration and how to achieve the highest benefits when working abroad (Philippines, 2022). The program provides knowledge on: The process of traveling from the Philippines to other countries, understanding the labor contract, the work you will do, the do's and don 'ts in the destination country, HIV/AIDS prevention, how to send money home, reintegration plan after returning home, coping with psychological crises if any, many occupations also related to special skills training. In addition, the training program is also divided into different target groups, such as seafarers, domestic helpers, entertainment services...training by different groups of countries (ILSSA, 2023).

Secondly, promulgate a legal system of protection for employees. Legal support for workers and other necessary support when workers return to the country of emergency for any reason. Online welfare support mechanism with an extensive network of

about 250 specialized labor officials working in laboring countries of the Philippines (ILO, 2022). In addition, in order to ensure the rights of employees and the state, most companies providing labor export services must deposit a sum of money in accordance with the law (The Philippines, 2009).

Thirdly, closely coordinate among functional agencies managing foreign workers. Strengthen the management of workers when they work abroad, through many measures in coordination with many relevant agencies to ensure the rights of workers. The state management of labor exports is carried out by the Department of Labor - Employment (DOLE) through two agencies: (1) Philippine Overseas Employment Administration - POEA; and (2) Philippine Overseas Labor Office - POLO. There are 34 offices located in the countries where Filipino workers are working; each POLO has a labor attaché, an assistant attaché and a social welfare officer, in addition to being able to hire local staff to do some other work if necessary. POLO implements a reporting regime through the International Labor Committee. POLO is the unit that maintains and manages the Foreign labor Resource Center of the Philippines (FRC), which is only established in countries where many Filipino workers live and work. The FRC operates 24 hours a day to provide information and support to overseas Filipino workers. Currently, there are 20 FRCs at different points in continents such as Asia, the Americas, Europe and the Middle East (Philippines POEA, 2016).

Fourth, there are specific policies to support labor repatriation. The government implements programs to support returnees such as livelihood and career development, business consulting, business skills training for people with conditions upon returning to their country. POEA collaborates with ILO to have projects and establish training centers in areas with a large number of labor exporters (Philippines, 2022). Through reintegration credit support programs, the government sets the size of the livelihood loan fund: for families it is 1850 USD, repatriation loan 370 USD to 925 USD (Philippines POEA, 2016).

2.2.2. Sri Lanka's experience

Sri Lanka offers many solutions to promote the export of workers abroad, which can be gathered in the following experiences:

First, develop the content of the program and the teaching content on orientation training for workers before going to work abroad. There is an urgent need to train female domestic workers in Middle Eastern countries and pressure from human rights organizations to ensure human rights and protect workers from violence and abuse. The content of the program is developed by the national education agency; In the course of implementation, the Ministry of Foreign Employment has a department to provide information to migrant workers and is responsible for collecting feedback from stakeholders to renovate the training program to suit practical requirements. Regarding specific teaching content: depends on the experience and understanding of the lecturers if they feel that they have to provide more information about the receiving country or at the request of the workers. Workers who have returned to their home countries with intermediate or higher qualifications are given priority in recruitment for teaching/guiding orientation at career-oriented education classes for workers to work abroad (Sri Lanka, 2022). The Overseas Employment Law of 1985 and Srilanka's 1994 amendment stipulate that training for workers before sending them to work abroad is mandatory, especially for female workers. Foreign employment agencies and enterprises that are licensed to send employees to work abroad are responsible for participating in training for employees.

Secondly, building an information management system for overseas workers. Approve the indicators on the number of people moving annually, characteristics, wage levels, labor conditions, travel time, commitments, reintegration services... (Sri Lanka, 2022). From there, understand the total number of migrant workers to have policies to adjust to globalization conditions in the context of the 4.0 technology revolution.

Thirdly, legal support for repatriated workers and policies to help workers reintegrate into the

community. The office representing Sri Lankan workers is responsible for assisting in dealing with the necessary procedures for workers to return to their home country on time when the labor contract expires. The Ministry of Overseas Employment Promotion, through the foreign labor center with specific policies such as: re-evaluating the capacity of workers, helping workers access and information on employment, having preferential loan policies to support production and business, tax exemption and reduction policies, child welfare policies, tuition exemption; policies to encourage enterprises to accept foreign workers to return; strengthen the role of organizations and individuals in supporting conditions for workers returning from abroad to reintegrate into the community (ILSSA, 2023).

2.2.3. China's experience

China is a densely populated country, the policy of encouraging labor export focuses on vocational education orientation and underwriting responsibilities. Details are as follows:

First, the policy of encouraging migration is associated with the responsibility of the leader. As early as 1985, China had implemented policies to open up and encourage migration (Duong Quoc Huy, 2010). China facilitates documents for sending foreign workers but also encourages them to stay abroad for a long time. Priority is given to workers in rural areas or places with high unemployment. The policy applies not only to highly skilled workers but also to unskilled workers. The policy of guaranteeing people to work abroad through the introduction and guarantee of 2 state officials to limit the escape when going to work abroad.

Secondly, career-oriented education policy. According to Chinese regulations, workers must receive vocational training within three months before they go abroad. If the employee voluntarily drops out of school, the full cost of training must be returned. For dispatching companies, they must be responsible for training workers before going to work abroad on contents related to:

jobs, laws, and basic traditional customs of the receiving country (ILSSA, 2023).

2.2.4. Pakistan's experience

In South Asia, Pakistan is a major dispatching country and always has policies to protect workers going to work abroad through the following measures:

First, develop a system of policies to protect workers going to work abroad. Through signing treaties or agreements with recipient countries; providing legal support to workers in difficulty; increasing awareness and dissemination of information related to the rights and interests of workers working abroad in the sending country (ILSSA, 2023). Labor recruitment centers must provide necessary documents and manuals for overseas workers to quickly integrate into the community. There is an information channel to reflect the information of workers' complaints. The relevant officer is responsible for responding within 72 hours of receiving the requested information free of charge. Set up a consultation center to protect workers and provide procedural support when necessary; Overseas workers must register with Pakistani missions abroad through online or in-person registration. For labor management and labor recruitment, the computer database system is set up at district offices and at office offices and is connected to the Ministry of Labor, the airport, and regional offices.

Second, develop policies to promote and protect migrant workers in accordance with the national migration strategy. This system includes: (1) supporting the conditions for effective use of remittances to the country, (2) ensuring the rights of members of the workers' families and (3) ensuring socio-economic reintegration for workers after returning home.

Thirdly, establishing a fund to reintegrate migrant workers abroad. Completing the Overseas Pakistanis Fund (OPF) with the aim of reintegrating migrant workers. The OPF, along with resources in the Jewish community, is responsible for caring for the rights of Pakistani workers.

Fourth, other measures to support workers' repatriation: The necessary information about repatriated workers is collected through the cooperation of the offices through the Ministry of Home Affairs; workers through the information obtained, formulate strategies for workers and their family members to find jobs, or conduct their own business related to their available skills. Have a way to provide financial support to workers and their family members; implement feasible projects that enable workers to operate production and business activities with minimum costs (ILSSA, 2023)... Establishment of business support offices for repatriated workers and their families at regional offices of the Migration and Overseas Employment Bureau as well as at the Overseas Pakistanis Fund.

2.2.5. Thailand's experience

Firstly, perfecting the system of legal documents. With the goal of supporting job search, preventing emigration and illegal immigration, Thailand established the Employment and Job Search Law in 1985. All labor export activities to work abroad are governed by this Code. Thailand stipulates that companies involved in the recruitment process must have an operating license and have a charter capital of over 1 million baht and a deposit of 50 thousand baht (ILSSA, 2023).

Secondly, establish an agency to manage employees going to work abroad. The Overseas Labor Management Department is responsible for managing the organization of sending employees to work abroad; managing information: about labor, protecting rights and obligations for employees, recruiting employees at the request of partners. In order to carry out the task of promoting job creation for foreign workers, providing information and protecting workers, Thailand has established representative offices for overseas workers in 13 countries with large numbers of workers to create information connectivity and close management of overseas workers (ILSSA, 2023).

Thirdly, establishing a labor export support fund. For the purpose of supporting employees in arranging for employees to expire their

contracts, repatriate, improve the quality of export labor resources and expand the labor market. Composition of the fund includes: contributions from the government, recruitment companies, workers and other organizations (ILO, 2022).

Fourth, establish a database of information on the management of workers working abroad. Building a labor export data system, in the context of the 4.0 technology revolution, Thailand has implemented encryption for each object. In order to better manage the number of employees who are working and have returned home, Thailand has developed an information exchange mechanism between the government, domestic partners and Thai representative offices abroad.

Fifth, train before dispatching. Thailand's law on recruitment and sponsorship of job seekers stipulates that for sending workers to work abroad, licensed enterprises must send qualified workers who have been selected by the enterprise to attend necessary knowledge training courses organized by the Department of Employment at the head office or the office of the Department of Employment in the provinces. For vocational skills: the law stipulates that Thai workers working abroad must pass a skills test organized by the Department of Skills Development and Vocational Training (under the Ministry of Labor of Thailand) or by private recruitment enterprises authorized by the Department of Skills Development and Vocational Training.

2.3. Lessons learned for Vietnam

Viet Nam defines labor export as an important political task of all levels of government from the central to local levels. Many policies of the Party and State of Vietnam have been set out related to labor export, for example: Directive 41/CT-TW dated September 22, 1998 of the Politburo on labor export and experts. Decree 152/1999/ND-CP dated September 20, 1999; Decree 81/2003/ND-CP dated July 17, 2003 of the Government and many other circulars and guidelines. In order for labor export activities to be effective and achieve the expected goals,

Vietnam needs to study the experiences of other countries and draw lessons for itself. Through studying the experiences of some countries around the world, we can learn some of the following lessons:

Firstly, continue to improve relevant laws and policies on labor export. Study and amend and supplement inappropriate or missing mechanisms and policies. Specifically: policies on market investment, policies to support training and credit for labor exporters, credit policies for people working abroad, social insurance policies, health insurance, remittance policies, reception policies after repatriation... Strictly apply and implement international conventions and international laws on labor export.

Secondly, there is an appropriate vocational education and training program. Develop a vocational training system with regional and international standard certificates. The orientation training program must be designed in accordance with the requirements of each labor group, depending on the receiving industry and country so that employees have the opportunity to find jobs and improve the competitiveness of Vietnamese workers in the international labor market. Linking training with the labor market and the participation of enterprises, promoting international cooperation in vocational education and training. In addition to professional knowledge, workers need to be equipped with an understanding of the working environment, social culture and legal system of the receiving country so that they can quickly integrate into the environment and work.

Thirdly, building a mechanism to coordinate the organization and guarantee to send workers to work abroad. The experience of the above research countries shows that they all set up an organizational mechanism to send people to work abroad with the interests and responsibilities of the State, the Labor Export Supply Company and employees. The guarantee mechanism aims to strengthen the legal binding on workers and families. However, Vietnamese workers working abroad are mostly from rural, remote and isolated areas; Therefore,

it is necessary to promote the relationships of local unions and associations in guaranteeing the work of sending workers to work abroad to achieve higher efficiency.

Fourthly, building an information management system on migrant workers. In the context of the 4.0 technology revolution, digitalization with participation and closely coordination between stakeholders, such as labor management agencies, labor supply service companies, immigration agencies... Closely coordinate between countries receiving and receiving labor to implement good labor management: before, during and after the expiration of the repatriation contract.

Fifthly, there is a policy to support workers to reintegrate into the labor market after the expiration of the labor contract to return home. Adopt policies on training, retraining, production and business support, credit loan support; improve the responsibility to find jobs for employees after returning to employment service agencies, labor recruitment companies to work abroad.

Sixth, strengthen international cooperation in labor export activities. Through bilateral and multilateral agreements to expand the labor market, reduce the pressure of domestic job creation. International cooperation aims to solve procedures and problems, ensure the rights and interests of employees.

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FINANCING SUSTAINABLE DEVELOPMENT IN VIETNAM

Nguyen Quynh Hoa* - Vu Cuong* - Ngo Quoc Dung*

Abstract: *Purpose:* ***This paper analyzes sustainable development financing sources in Vietnam from 2016 to determine their strengths and weaknesses.***

Design/methodology/approach: ***The paper analyses each funding source for sustainable development in Vietnam using UNDP (2016)'s Development Finance Assessment (DFA) framework and the country's comprehensive financing landscape. The study's primary data came from Vietnam's General Statistics Office (GSO), public budget data from the Ministry of Finance (MOF) and Ministry of Planning and Investment (MPI), and globally recognized agencies and organizations, such as the World Bank, International Monetary Fund (IMF), and OECD Statistical Office, for 2016 (the most recent year available).***

Findings: ***Vietnam's development finance sources have been improving since 2016, with domestic and international public finance decreasing and private finance increasing. This bodes well for Vietnam's economic development, which follows the middle-income trajectory.***

Relevance to practice: ***Private financing, especially domestic private funding, and public financial mobilization and utilization strategies, especially domestic public finance, are essential to achieving SDGs, according to the paper.***

Originality: ***After five years of Vietnam Sustainable Development Goals implementation, this research is the most recent evaluation of sustainable development financing. It also notes the Covid-19 pandemic and other international and domestic issues are changing funding structures.***

• Keywords: *sustainable development, financing sustainability, development finance assessment (DFA), integrated national financing framework (INFF).*

JEL codes: O10, O16, O11, Q01

Tóm tắt: *Mục đích của nghiên cứu: Bài nghiên cứu này tập trung vào việc phân tích nguồn tài chính cho phát triển bền vững (hoặc tài chính phát triển) tại Việt Nam từ năm 2016 trở đi để đánh giá ưu điểm và nhược điểm của chúng.*

Phương pháp/thiết kế/cách tiếp cận: Bài viết sử dụng khung Đánh giá Tài chính Phát triển (DFA) của UNDP (2016) kết hợp với bức tranh tài chính toàn diện tại quốc gia để phân tích từng nguồn tài trợ cho phát triển bền vững ở Việt Nam. Dữ liệu chính được sử dụng trong nghiên cứu được thu thập từ Tổng Cục Thống kê Việt Nam (GSO) và dữ liệu ngân sách công từ Bộ Tài chính (MOF) và Bộ Kế hoạch và Đầu tư (MPI), cũng như từ các tổ chức và cơ quan có uy tín toàn cầu, cụ thể là Ngân hàng Thế giới, Quỹ Tiền tệ Quốc tế (IMF) và Văn phòng Thống kê của Tổ chức Hợp tác và Phát triển Kinh tế (OECD) trong giai đoạn 2016 – năm mới nhất có sẵn.

Kết quả: Cấu trúc của nguồn tài chính phát triển của Việt Nam từ năm 2016 cho đến nay cho thấy một xu hướng chuyển đổi tích cực, tức là tài chính công trong nước và quốc tế đang giảm, trong khi tài chính tư nhân trong và ngoài nước đang tăng. Điều này có thể được xem như một tín hiệu tích cực trong sự phát triển kinh tế của Việt Nam, phù hợp với lộ trình chuẩn khi các quốc gia trở thành quốc gia thu nhập trung bình.

Kết luận thực tiễn: Để hướng tới các Mục tiêu Phát triển Bền vững (SDGs), bài viết đề xuất rằng việc thúc đẩy thêm tài chính tư nhân, đặc biệt là nguồn tài trợ tư nhân trong nước, và việc xây dựng và vận hành các chiến lược huy động và sử dụng tài chính công, đặc biệt là tài chính công trong nước, là rất quan trọng.

Tính mới: Nghiên cứu này là đánh giá mới nhất về tài chính phát triển bền vững tại Việt Nam sau năm năm thực hiện Mục tiêu Phát triển Bền vững của Việt Nam. Nó cũng chỉ ra sự thay đổi trong cấu trúc của nguồn tài trợ do tác động của đại dịch Covid-19 và các vấn đề quốc tế và trong nước khác.

• Từ khóa: *phát triển bền vững, tài chính bền vững, đánh giá tài chính phát triển (DFA), khung tài chính quốc gia tổng hợp (INFF).*

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1. Introduction

Sustainable development is paramount in today's context, underscored by the UN's 2030 Agenda for Sustainable Development. While the Sustainable Development Goals (SDGs) target global challenges from poverty to environmental degradation, their realization demands considerable financial resources. Setbacks from the Covid-19 pandemic and the Ukraine conflict, which disrupted global supply chains and spiked commodity prices, have compounded these challenges. Given the projected economic slowdown and combined external shocks, there's an amplified need to evaluate development financing sources, as developing nations grapple with resource mobilization for SDGs and maintaining welfare (IMF, 2022; Colombage, S.R.N. et.al. 2023; Arora, R.U., Sarker, T. 2023).

Vietnam has made significant efforts since 2016 to reform how development finances are mobilized and used to achieve the Sustainable Development Goals (SDGs). Previous research like UNDP (2018) and Bao et al. (2018) have analyzed the changing landscape of development finance in Vietnam, including challenges in mobilizing sufficient resources from public, private, domestic and international sources and integrating them effectively. While progress has been made on some SDGs, Vietnam faces challenges in achieving all 17 goals by 2030, which may be exacerbated by the impacts of COVID-19. This paper provides a timely analysis of the various dimensions of sustainable development financing in Vietnam, assessing the strengths and weaknesses of domestic and international funding sources. It aims to offer actionable recommendations on how to enhance the effectiveness and efficiency of financing to support Vietnam in getting back on track to achieve the SDGs by 2030.

2. Literature review

Finance is integral to economic growth, as evidenced by foundational studies like those of King and Levine (1993) and Levine (1997). Modern research emphasizes the tie between finance accessibility and sustainable development (Inoue and Hamori, 2016; Hishan et al., 2019). Financial inclusion, as highlighted by studies such as Banerjee and Newman (1993) and van Niekerk (2020), propels poverty alleviation and welfare improvement. Yet, challenges like information asymmetry and adverse selection impede credit allocation, with developing nations facing specific hurdles like high transaction costs and imperfect market structures (Beck and de la Torre, 2006).

The 1980s saw global entities like the IMF and World Bank championing developmental strategies, which paradoxically sometimes increased social disparities by harming biodiversity. This led to calls for a development approach encompassing social and environmental considerations (Basiago, 1999; Ngo Thang Loi, 2021).

The global focus on sustainable development goals has spotlighted the importance of financing in this domain. Resources, both domestic and external, are deemed vital for achieving the 2030 Agenda for Sustainable Development, with UN agencies accentuating the importance of diversifying financial sources to bridge funding gaps (UNCTAD, 2019; SDSN, 2019). Developing nations especially need additional financial inflow to meet their sustainable development aims and strengthen international institutions (United Nations, 2015).

Agendas 21 and 2030 advocate for a fortified global partnership for sustainable development, encompassing areas like technology transfer, education, and financial mechanisms. Public finance is pivotal for sustainable initiatives, with governments mobilizing funds through taxation and public spending to back welfare programs and infrastructure projects (Martin & Walker, 2015; Postula, M., & Raczkowski, K. (2020). The private sector's role is also gaining recognition, with an emphasis on private investments and corporate responsibility (Abalkina, A & Zaytsev, Y, 2020; Shayan, F. et. Al, 2022).

International public finance is vital, especially for countries with constrained domestic resources. Developed nations aim to allocate a portion of their Gross National Income for development assistance (United Nations, 2015). The UN-General Assembly's Seventieth Session affirmed that each nation bears the primary onus for

sustainable development, extending beyond mere financial mobilization to include capacity building and technology transfer (United Nations, 2015). The private sector, civil society, and philanthropic entities are positioned as significant contributors to this end (UN General Assembly, 2015).

In summary, financing is instrumental for sustainable development, requiring a collaborative approach harnessing public, private, and international resources. Given evolving global and national landscapes, a renewed financing strategy for sustainable development is imperative to tap into sustainable resource mobilization opportunities.

3. Analytical Framework and Data of the Development Finance Assessment

3.1. Analytical Framework

Figure 1 illustrates how the Development Finance Assessment (DFA) provides governments with critical insights, enabling them to tailor policies, institutional structures, and strategies to tackle the complexities of sustainable development financing. DFAs enhance the integration of national financing frameworks, making them crucial for effective resource management and allocation

Figure 1: The approach and analytical framework for the DFA

| Use of existing data and policy analysis |
| Focus on linking finance with results |
| An action-oriented diagnostic tool |
| Focus on the role of both the public and private sector in an integrated national financing framework |
| Emphasis on stakeholder engagement |
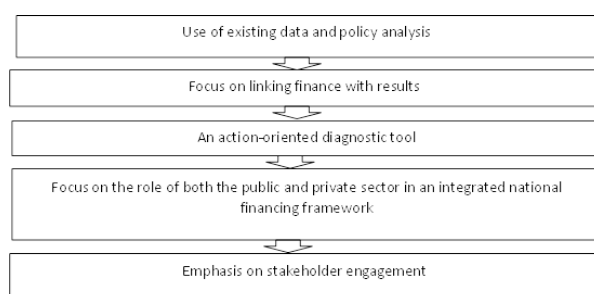
Source: UNDP (2016)

The methodology and analytical structure of the Development Finance Assessment (DFA) are steered by principles that ensure its alignment with stakeholders' expectations and the intricacies of sustainable development financing. These principles include:

(1) Utilizing Existing Data: The DFA doesn't pursue primary research but amalgamates and refines existing data and analyses related to development finance flows. It leverages already available assessments and studies that align with the Integrated National Financing Framework (INFF) and the DFA's aims.

(2) Emphasizing Finance and Outcomes Correlation: The DFA suggests policy alternatives and institutional changes for governments to better use current resources for developmental objectives. It introduces the INFF to help governments adeptly manage different financing methods to meet national and SDG targets.

(3) Serving as a Diagnostic Tool: The DFA helps governments establish a foundation for the INFF and offers a roadmap for recommendation implementation. It taps into various resources, such as the Integrated Financing Solutions, which follows the DFA assessment.

(4) Highlighting Public and Private Sectors in an INFF: The DFA stands out by emphasizing the importance of harmonizing public and private financing sources. It keenly analyzes how private sector strategies are incorporated into the government's overarching finance strategy.

(5) Stressing Stakeholder Engagement: Beyond being an assessment instrument, the DFA promotes collaboration among stakeholders and partners, spearheaded by the government team. It champions discussions around the INFF concept.

Informed by these principles, the DFA offers an evidence-based analysis, shedding light on a country's financing challenges and opportunities. It reviews the government's financing strategy, policies, and institutional frameworks, examining them through the INFF perspective. This results in recommendations designed to guide the government in devising a comprehensive financing strategy, ensuring alignment with development goals and addressing the nuances of sustainable development financing.

3.2. DFA comprehensively mapping

The DFA considers all resources' potential contributions to economic, environmental, and social sustainable development. It creates the most complete picture of the nation's financing landscape.

The financing environment in most nations is becoming more complex. The public and private sectors provide diverse flows and financial instruments domestically and internationally (UNDP, 2016). The table below lists development's many funding sources..

Table 1. The DFA comprehensively maps the financing landscape in a country

	Public	Private
External	• ODA grants • ODA loans • Other official flows • Public or publicly guaranteed borrowing (international lenders) • Multilateral development banks • South-south and triangular cooperation • Climate finance • Vertical funds	• Foreign direct investment • Portfolio equity • Remittances • International NGOs, foundations and philanthropists • Private borrowing (international lenders) • Corporate social responsibility
Domestic	• Direct, indirect and other tax revenue • Mineral-related taxation • Non-tax revenue • Public-private partnerships • Public or publicly guaranteed borrowing (domestic lenders) • Sovereign wealth funds	• Domestic investment • Private borrowing (domestic lenders) • Domestic NGOs, foundations and philanthropists • Corporate social responsibility

Source: UNDP (2016)

Note: The primary focus of the quantitative component of the DFA is on financing flows, though in some circumstances analysis of stocks, such as debt stocks, foreign reserves or FDI stocks, may be relevant. This diagram presents an overview of the wide range of financing types that should be covered when mapping the financing landscape. Not all flows fit neatly into one of these boxes -some flows, for example, are a mixture of public and private sources of finance; others mix domestic and international resources.

Djeneba Doumbia and Morten Lykke Lauridsen (2019) and MPI (2014) argue that achieving the SDGs requires a massive increase in development financing from "billions" to "trillions." This paradigm shift implies a large funding gap. Beyond domestic revenue increases, bridging this 'trillions' divide requires significant cross-border inflows, particularly private capital. This highlights the importance of international financial cooperation and private sector engagement in achieving global sustainability goals..

3.3. Data sources

Domestic Vietnamese databases and international organization databases provided the main data for this research. The study used primary data from Vietnam's General Statistics Office (GSO) and public budget data from the MOF, MPI, and other relevant government agencies. Global data sources included World Bank, IMF, and OECD Statistical Office databases.

The paper's study period is 2016-2020 because Vietnam's State Budget Law of 2015 requires budget statistics to be two years behind general statistics. The official budgetary data for 2022 will not be available until July 2023. As more updated data until 2022 becomes available, the narrative will include it with a clear note..

4. Overview of financing for development in Vietnam

4.1. Sources of financing for development in the period 2016 - 2020

All development financial sources in Vietnam have grown and established a solid foundation for investment and expenditure, fostering fast economic growth during the study period. The ratio of total development finance resources to GDP in Vietnam increased rapidly from 2016 to 2020, peaking in 2017, then declining in 2019 before improving slightly in 2020 (Figure 2). In summary, 2016-2020 performance is 55% higher than 2010-2015 performance (UNDP, 2018).

Figure 2. Proportion of Financial Resources for Development in Vietnam's GDP (%)
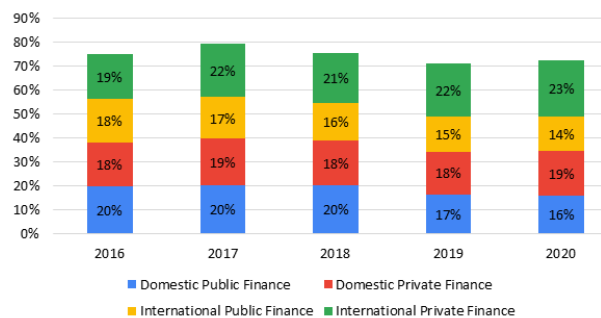
Source: World Bank, OECD, and GSO

A closer look at Vietnam's development finance sources from 2016 to 2020 (Figure 3) shows a positive trend, but some dimensions show unsustainable signals. Public finance (domestic and international) decreased in the past period, but private finance sources compensated. This is a good sign for Vietnam's economic development, which follows the middle-income trajectory.

Figure 3. Financial Structure of Development in Vietnam

4.2. Current issues in financing development in Vietnam

Non-aid government revenues fluctuate. The non-aid budget revenue to GDP ratio fluctuated from over 19% in 2016 to over 20% in 2017-2018 before falling to 15.35% in 2021. The MOF reported 25.5% in 2011, 22.3% in 2012, 22.8% in 2014, and 23.5% in 2015 (excluding non-reimbursable aid) for the 2011-2015 period (GSO, 2021).

The recent decline in non-aid budget revenue to GDP has several explanations. First, the Covid-19 pandemic and natural disasters have devastated the economy, productive sector, and business. Second, tax reduction and deference, urgent business and household support packages, and pandemic-related fiscal interventions have increased public spending. Thirdly, low oil prices and the US-China trade war reduced import-export tariff budget revenues. Due to weak purchasing power and pandemic control, domestic consumption revenue has also decreased.

Government domestic borrowing increased rapidly, posing risks. Despite a GDP share decline, government debt grew rapidly from 2016 to 2021. Government debt rose 1.3 times from VND 2.58 quadrillion in 2017 to nearly VND 3.3 quadrillion in 2021. Domestic borrowing exceeded VND 2.2 quadrillion and foreign borrowing VND 1.075 quadrillion, accounting for 67.2% of government debt (Public Debt Bulletin, MOF, 2021). The MOF says the government's

domestic borrowing grew rapidly and dominated recently. Government foreign debt has gradually decreased, reducing exchange rate risks, ensuring public debt sustainability, and ensuring national financial security.

The 2022 Public Borrowing and Repayment Plan (Decision 448/QD-TTg) and 3-Year Public Debt Management Program for 2022-2024 require the government to raise more money to implement expansionary fiscal and monetary policies to support the Recovery Program app. The government's 2022 borrowing plan ceilings are VND 673.5 trillion, with central government borrowing at 646.8 trillion and local government on-lending at 26.7 trillion.

Promoting the government bonds market reduced commercial banks' holdings from 2010 to 2016. MOF: The credit institution system held VND 793 trillion in government bonds in 2016, 41.86% of the market's value. This suggests Vietnam's domestic debt restructuring is improving.

The average ODA has been decreasing. Vietnam's per capita ODA dropped 15 times from USD 42 in 2015 to USD 5 in 2021 and USD 2.85 in 2022. Except for Cambodia and Laos, this was higher than many ASEAN countries' per capita levels (World Bank, 2021). Vietnam's top development donors are Japan, South Korea, and the World Bank and ADB.

ODA source decreased from 2016 to 2022 for these reasons: Vietnam is no longer eligible for ODA grants or concessional ODA loans from donors after graduating from low-income status; (ii) Vietnam's public debt, including foreign debt, has increased rapidly, putting pressure on controlling external borrowing and foreign debt servicing; and (iii) The government's borrowing strategy restructuring effort to replace external borrowing has become more costly. For instance, the 2019 Public Investment Law amendments require land acquisition during project investment. This provision slows public investment and hinders ODA loans.

Slow disbursement rates, mismatching with agreed funding, wastage, misuse, and corruption have limited ODA funding, which is declining.

Many projects have been delayed or underfunded, increasing implementation costs.

Government's International Commercial Loans. Vietnam's international commercial borrowing comes mostly from the IMF through foreign government bonds. Vietnamese IMF borrowing was stable at over USD 400 million from 2016 to 2020. Vietnam's allocation of USD 1.61 billion USD in Special Drawing Rights (SDR) in the IMF's 11th allocation round almost fivefold increased this figure to USD 1.99 billion USD in 2021.

Foreign Direct Investment (FDI) has slowed recently. Vietnam's recent FDI has exceeded ASEAN averages (World Bank, 2021). Positive results from Vietnam's trade liberalization and FDI attraction are promising. Vietnam has signed many FTAs with regional and global partners. During the study period, the EU-Vietnam Free Trade Agreement (EVFTA), CPTPP, RCEP, and UKVFTA attracted a lot of FDI into key manufacturing sectors. These measures help the domestic private sector enter international markets, become more competitive, and integrate faster.

The above figures also show a slowdown in FDI inflows to Vietnam (FDI inflow peaked in 2019, then gradually returned to 2018 levels in 2021). Some reasons explain this tendency. First, ASEAN manufacturing competition has grown in Vietnam. These countries offer many tax incentives and investment support policies to attract FDI. Some have an even better comparative advantage of cheap labor. Second, the COVID-19 pandemic has disrupted FDI transnational company operations. Factory operations have also been disrupted by pandemic prevention measures. Third, labor and infrastructure shortages affect FDI businesses.

Vietnam relies on remittances for development. Vietnam maintains its current account with remittances. Second, this remittance source balanced Vietnam's current account and balance of payments. Despite the COVID-19 pandemic hurting the global economy, remittances rose 2016-2021. The World Bank and KNOMAD ranked Vietnam 8th in the world and 3rd in Asia-Pacific in 2021 for remittance volume. Since 2011, remittances have exceeded USD 10 billion, growing 7% annually.

They nearly doubled from 2011 in 2022. In 2022, high global inflation reduced remittance volume, which was concerning. Vietnam sent less money abroad due to high oil and food prices. World Bank and KNOMAD reported 5% growth in remittances to Vietnam from 2021 to a record USD 19 billion in 2022. Remittance volume exceeds net export volume but falls short of gross export revenue. Remittances exceeded FDI recently.

Vietnam's policy changes encouraging remittances boosted this funding source. The global economic recovery post-Covid-19 pandemic has increased demand for labor, including Vietnamese expatriates and ASEAN migrant labor to developed countries like the US, Canada, and Australia. According to KNOMAD, Vietnamese workers abroad increased from 4 million in 2019 to 5 million in 2021. Vietnam has one of Southeast Asia's highest migration rates, per KNOMAD. Tax reductions, free money transfers, and utility services have been offered to overseas Vietnamese to encourage remittances. The State Bank of Vietnam expanded international payment transactions, promoted information technology in remittances, and offered high-interest savings accounts, ATM cards for cash withdrawals, loans for production and business investment, and confirmation d. Everything has helped Vietnam increase remittances.

Private financing has increased in Vietnam's development finance structure. Thus, Vietnam's development finance structure is among ASEAN's most stable.

Domestic Private Finance. The GSO reports that Vietnam's domestic private finance, measured by non-state sector investment, has increased from 2016 to 2021. Gross societal investment capital from the non-state sector rose from 38.26% in 2011-2015 to 56.03% in 2016-2020 and 59.49% in 2021 (GSO, 2021). This increase kept the non-state investment capital to GDP ratio up from 2016 to 2021.

Non-state investment capital flow has grown in both its share of gross societal capital and growth rate, as well as its "green" nature. The State Bank of Vietnam reported that by June 2022, green project credit balances exceeded VND 474,464

billion, accounting for more than 4.1% of the economy's total debt stock and 7.08% higher than 2021. Renewable energy project credit balances exceeded VND 212,000 billion, accounting for 47% of the system's green credit balance. Solar and hydropower projects account for 87% of renewable energy debt. Credit for renewable energy projects is still difficult. Clean and renewable energy investment projects have long cost recovery times (5-10 years for rooftop solar power projects and 10-15 years for others). Meanwhile, commercial banks used ordinary funding sources to fund these projects, mostly short- to medium-term credits with a strict short-term to long-term lending ratio.

5. Policy recommendations for sustainable development financing in Vietnam

Development financing mobilization showed that domestic development investment funding is increasingly dominating total development funding. Green credit in renewable energy is a promising solution to meet the 2050 net zero emission target. Policies should be taken to ensure this growth.

Intensively developing a domestic capital market and enhancing domestic capital. Establishing a comprehensive legal framework in which the government sets development priorities in a more transparent and financially accountable manner to boost the domestic financial sector. This will reduce risks, boost investor confidence, and attract development investment capital.

Vietnam must boost domestic revenue and implement progressive taxation to support equity transfer and secure financial resources for inclusive and sustainable growth.

Promoting domestic institutional investor growth: Encouragement of domestic institutional investors like pension funds, insurance companies, and trust funds can boost domestic capital market investment.

Increasing financial literacy and creating new financial products: Financial literacy can improve understanding of domestic capital market investment benefits. This will increase demand for domestic financial products and services and investment resources when combined with

the development of new financial products and services for domestic investors.

Encourage more domestic companies to list on the domestic stock market to deepen the domestic capital market and increase domestic investment opportunities for domestic investors.

Addressing Public Investment Delays and Over dispersion to Improve Efficacy. Improving intergovernmental coordination and information sharing: Public investment projects in Vietnam are fragmented due to government agency incoordination. This can cause project overlap, resource waste, and delayed public facility and output operationalization. A central agency should coordinate public investment projects and share information about ongoing and upcoming projects with relevant departments and units to solve this problem.

Improving project appraisal and selection: The government must establish transparent criteria for evaluating and selecting public investment projects. Projects should be chosen based on economic and financial cost-benefit analysis, not politics. Numerous studies recommend an independent project evaluation body for objectivity. Many countries base their public investment project appraisal on this practice, which allows academia, managers, and practitioners to contribute their expertise.

Enhancing project monitoring and evaluation: Public investment projects must be monitored and evaluated throughout their lifecycle to ensure they are on track, effective, and cost-effective. Establishing a professional or independent monitoring and evaluation unit to oversee projects and report to government agencies may be necessary.

Increasing Private Sector Participation: The private sector can finance and execute public investment projects. The PPP Law was passed to encourage public-private partnership (PPP) investments. The Law overemphasizes Build-Operate-Transfer (BOT) investment and lacks guidance for other PPP modalities. The PPP Law also faces challenges in balancing state, investor, and project user interests. Thus, private investment through PPPs, mostly in transportation infrastructure, has been slow. Leveraging private

sector resources for development requires continuous PPP legal framework improvement.

Enhancing Regional Development Links: Some regions and sectors receive more public investment than others. To address this issue, the government can promote regional development by allocating public funds to regions in need or to infrastructure projects shared by multiple provinces. It can also encourage private investment in underdeveloped areas.

Proactive Climate/Climate Finance Transition Planning. Promoting Green Finance: The government should incentivize private sector green project investment. This can be done with tax breaks, subsidies, and concessional loans.

Enhancing Climate Risk Assessment: Development finance decision-making requires identifying and assessing climate risks. The government should include climate risk assessments in project appraisal and design and regularly update them.

Building Financial Institution Capacity: Financial institutions mobilize and allocate climate finance. Thus, the government should help these institutions manage climate risks, create climate-responsive investment products, and promote green credits.

Leveraging International Development Partners: Vietnam should finance climate change with international aid. Partnering with international organizations, multilateral development banks, and bilateral donors can accomplish this. The government should also build a project pipeline and engage climate investors and donors.

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APPLYING THE FOURTH INDUSTRIAL REVOLUTION IN ACCOUNTING

Prof.PhD. Chuc Anh Tu*

Abstract: *Accounting has passed both the process of formation and development since ancient times and through four industrial revolutions. It always developing and adjusting to meet the requirements of the economy, to be suitable for all types of Entities. Understanding the applications of the 4th industrial revolution in accounting is essential. The main contents of the Article will be present about some industrial applications.*

Tóm tắt: *Kế toán đã trải qua cả quá trình hình thành và phát triển từ xa xưa và trải qua 4 cuộc cách mạng công nghiệp. Nó luôn phát triển và điều chỉnh để đáp ứng yêu cầu của nền kinh tế, phù hợp với mọi loại đối tượng. Việc hiểu rõ những ứng dụng của cuộc cách mạng công nghiệp lần thứ 4 trong kế toán là điều cần thiết. Nội dung chính của bài sẽ trình bày về một số ứng dụng công nghiệp.*

• Từ khóa: *kế toán, cách mạng công nghiệp về kế toán, công nghiệp 4.0 về kế toán.*

1. General Accounting

The development of Accounting is a necessity of human society. The entire process can be described as the following basic stages:

Stage 1, Primitive accounting–the original world accounting: The early development of accounting is closely related to the development of writing, numbers and money. Around 3300 to 3200 BC, In ancient Egypt when people invented writing and numbers, accounting records also followed. I was a record, listing the growth of crops, livestock, paid wages, tribute payments to the King, Pharaoh and property temple…This stage is single accounting.

Stage 2, The Middle Ages and Renaissance Accounting, an invention of Double Entries Accounting: In 1494, Luca Pacioli, an Italian mathematician was the first to publish some documents of a double accounting system… These documents were originally used by Venetian merchants. Almost all of the accounting principles and cycles published by Luca Pacilio are still used today.

Stage 3, The beginning of the formation and setup of Vietnamese accounting before and after the August Revolution, both defending the economic development in the North and fighting for the liberation of the South, the period before 1940 to 1975.

Stage 4, Unifying and completing the Vietnamese Accounting system after unifying the country, focused on Viet Nam socialism, period 1976-1990.

Stage 5, Totally innovated the Vietnamese Accounting system, integrated with International Accounting to build and develop the economy according to the socialist-oriented market mechanism, period 1991-2011.

Stage 6, the development orientation of Vietnamese Accounting, period 2012-2030: The strategic and intergrated Viet Namese Accounting, Figure 1.

Additionally, the development of accounting: specialization into financial accounting and managerial accounting has been formed, and now, there is a division of financial accounting into accounting sectors, Figure 2.

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* *Academy of Finance*

Figure 1. Summary of integration stages of the Vietnamese accounting system
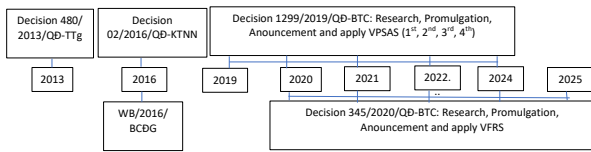
Figure 2. The brief overview of legal Vietnamese accounting system
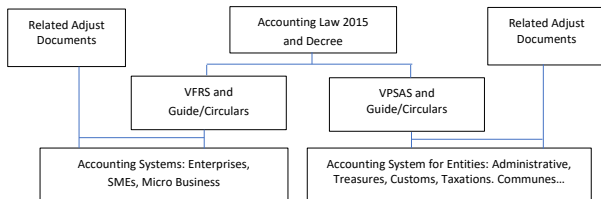
2. General The Fourth Industrial Revolution

The fourth industrial revolution, commonly known as "Industry 4.0" refers to a new digital industrial technology, digital transformation and the fourth phase of technological advancement which creates a digital business combining advanced manufacturing and operating techniques with smart digital technologies. Industry 4.0 has been identified as a major contribution to the digital age. Tools for industry 4.0 adaptation are:

+ The Internet of Things (IoT&IoS);

+ Cyber-Physical Systems (CPS);

+ Big Data or Data Analysis;

+ Cloud Computing;

+ Artificial Intelligence (AI);

+ Blockchain

+ Robotics/Robotic Process Automation

+ Industry 4.0 and ERP-systems

+ Industry 4.0 and Intellectual Capital (IC)

+ Industry 4.0 and Extensible Business Reporting Language (XBRL)

+ Sensors

+ Other tools such as RFID, GPS, SMART-ID…

…

It could be described as applying the 4th industrial revolution in accounting, and auditing works, Figure 3.

Figure 3. Apply the 4th industrial revolution in accounting, auditing works
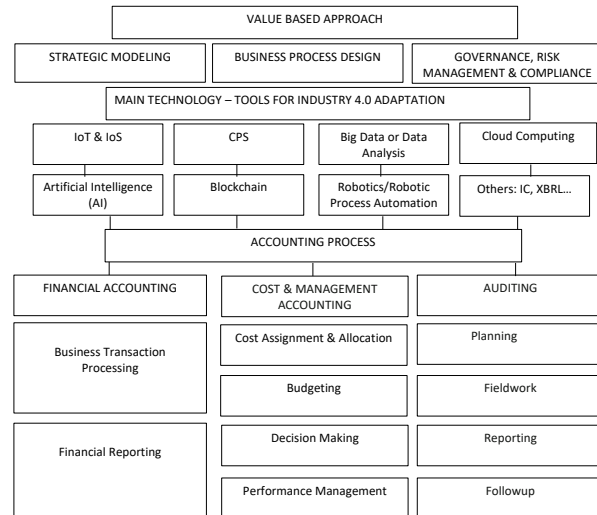
Source: Banu Esra Aslanertik and Bengü Yardımcı, Chapter 27 A Comprehensive Framework for Accounting 4.0: Implications of Industry 4.0 in Digital Era, Springer Nature Switzerland AG 2019 U. Hacioglu (ed.), Blockchain Economics and Financial Market Innovation, Contributions to Economics, https://doi.org/10.1007/978-3-030-25275-5_27 and Author)

The collection of Brief citations from published papers on Accounting applications is as follows:

"The Internet of Things is an intelligent network infrastructure that offers connectivity among devices, systems, and humans. IoT collects and shares information through the value chain, and further enables real-time decision-making Internet of Services gives companies a platform to offer services to their various partners and increases the collaboration between them.

Cyber-physical systems (CPS) are integrated communication networks wired and wirelessly by computer-based algorithms that have an interface between the digital and physical worlds. CPS integrates networks using multiple sensors, actuators, control processing units and communication devices.

Big Data or Data Analysis. The biggest impact on Industry 4.0 accounting will be Data Analytics or Big Data - data analytics associated with relational databases in an accounting information system. Big Data identification allows accounting

and finance to take on a more strategic role and help shape the future. Big data are information assets of great volume, speed and variety, requiring cost-effective, innovative forms of information processing for better understanding and decision-making. Big Data will reduce the time accountants spend collecting, checking and processing data and increase the time for analysis, providing business insight. Big data refers to analytics based on large differently structured data sets often characterized using four Vs: volume (large volume of data), veracity (data from different sources), velocity (analysis of streaming data) and variety (analysis of different types of data structures) that traditional tools are inadequate to process.

Cloud Accounting is one of the advanced forms of digital accounting (Tugui, 2015). Its emergence results from personal platforms created over the past 6–7 years on the Internet, making it easier to access boring data anywhere, anytime and from any type of device that supports the Internet. Cloud accounting is a transformation of accounting applications and a solution for a modernized business environment. Cloud Accounting is a combination of cloud computing and accounting using a web server to create a virtual accounting information system. Cloud accounting services consist of three models: Infrastructure as a Service (IAAS), Platform as a Service (PAAS), and Software as a Service (SAAS). Another major influence of Industry 4.0 on the role of accounting is cloud computing. The evolution of accounting is changing clients' expectations and accountants are forced to adjust how they do it to meet the requirements. Cloud Computing is one of the advanced forms of digital accounting. Its emergence results from personal platforms created over the past 6–7 years (so-called clouds or cloud spaces) on the Internet, making it easier to access boring data anywhere, anytime and from any type of device that supports the Internet.

Artificial Intelligence (AI). Artificial intelligence is the science of designing, creating and constructing a machine (computer) or computer program that would have an intelligence similar to that of a person. Intelligence in this case is the ability to act or solve problems in the way that people use their intelligence. The scope of intelligence covers many aspects of the abilities of the human intellect, such as reflection, knowledge, planning, learning,

natural language processing, and the ability to manipulate objects. With artificial intelligence, the machine is expected to have general intelligence, just like humans.

Blockchain is a digital data storage system consisting of many servers (multiserver). In blockchain technology, data created by one server can be replicated and verified by another server, which is why blockchain is often compared to a bank's cash book containing all customer transaction data. With blockchain, a transaction no longer has to depend on a single server, because the transaction will be replicated throughout the network.

Robotic Process Automation (RPA) is the application of technology that allows employees to configure computer software or «robots» to capture and interpret existing applications for transaction processing, data manipulation, response initiation and communication with other digital systems. Robotic process automation is a combination of related technologies such as stand-alone systems, machine learning, AI and robotics. These latest technologies have shaped the structure of RPA solutions and become the basis for RPA. It works by clearly replicating the actions of today's employees, using existing core programs, accessing websites, and manipulating spreadsheets, documents, and e-mail to complete tasks.

Industry 4.0 and ERP systems. An ERP (Enterprise Resource Planning) system is a business process management software that manages and organizes a company's business processes, all in a single integrated platform. Activities that can be managed with an ERP system include finance, sales, customer relations, manufacturing, inventory management, supply chain management, human resources, payroll... Basically, an ERP system unifies the entire organization into a single package and provides all the necessary information about business activities through a common database, which is accessible to all programs in the system. Therefore, it does not require multiple systems that do not communicate with each other to manage various processes such as accounting, HR, CRM, supply chain…

Industry 4.0 and Intellectual Capital (IC). Under the conditions of Industry 4.0 in the current digital ecosystem, accounting may face the problem of

measuring intangible assets and IC. After all, intangible assets will be focused on big data. As mentioned earlier, the structure of the big data set, which consists of audio, images, and video, will be difficult to record in a traditional accounting system. The problem depends on how to measure intangible assets, which for the most part cannot be reflected in the financial statements.

Industry 4.0 and Extensible Business Reporting Language (XBRL). XBRL (eXtensible Business Reporting Language) is an international standard for providing IFRS financial statements in electronic form. XBRL is a financial reporting language that is rapidly spreading around the world. XBRL is the name of a framework that allows real-time presentation of financial information on the Internet and enables electronic communication. It is believed that for Industry 4.0, real-time credentials will be presented to users with information faster and more efficiently. In today's system, this is visible in real-time when credentials are provided to information users via XBRL.

Sensors have emerged as low-cost, low-power and multifunctional tools in digital electronics at the beginning of the twenty-first century. Data collection, processing and communication functions of sensors have important roles in Industry 4.0. Therefore, instead of people, it is assumed that the sensors will undertake the data collection function.

GPS as location identifiers, *RFID* tags individual identification devices and pacemakers are examples of sensors. RFID can identify an object in the virtual world and determine the status of a product, while GPS is used to monitor products. Additionally, *smart ID* cards may be employed to monitor the locations of workers in a factory.

Simulation uses real-time data to project the physical world in a virtual model that will include machines, products, and people. By this means, operators can test machine settings before they change physically, allowing them to provide optimization, enabling efficient time management and quality improvement in machine settings. On the other hand, Digitalization has an impact on almost all the branches of accounting (such as financial accounting and reporting, cost and management accounting, taxation, auditing, and forensic accounting).

According to Webb (2020), the following factors (five Vs) related to technology can affect the finance and accounting profession:

Velocity: The speed with which the business environment is changing and the need for change is Emerging;

Volume: The increased volume of technology-based transactions;

Value: How important is it to derive the analysis and prediction from the technology-based data (whether the technology-based data analysis can add value to decision making);

Variety: The variety of systems and data sources the company needs to use;

Veracity: It refers to the reliability, quality, truth and prejudice of the data on which we are basing many business decisions".

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THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON CUSTOMER LOYALTY: AN EMPIRICAL STUDY AT VIETNAM DAIRY PRODUCTS JOINT STOCK COMPANY IN HO CHI MINH CITY

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Abstract: *This study aims to examine the impact of corporate social responsibility (CSR) on customer loyalty. The research findings indicate that among the six measurement factors in the proposed model, five factors, namely Ethical Responsibility, Legal Responsibility, Economic Responsibility, Consumer Protection, and Environmental Responsibility, have a positive impact on Customer Loyalty. Among the influencing factors, Ethical Responsibility has the greatest influence, suggesting that consumers believe a company should conduct its business ethically and behave responsibly like a responsible citizen.*

Tóm tắt: *Nghiên cứu này nhằm mục đích kiểm tra tác động của trách nhiệm xã hội của doanh nghiệp đến lòng trung thành của khách hàng. Kết quả nghiên cứu chỉ ra rằng trong số 6 yếu tố đo lường trong mô hình đề xuất, có 5 yếu tố là Trách nhiệm đạo đức, Trách nhiệm pháp lý, Trách nhiệm kinh tế, Bảo vệ người tiêu dùng và Trách nhiệm môi trường đều có tác động tích cực đến Lòng trung thành của khách hàng. Trong số các yếu tố ảnh hưởng, Trách nhiệm đạo đức có ảnh hưởng lớn nhất, cho thấy người tiêu dùng tin rằng một công ty nên tiến hành kinh doanh có đạo đức và hành xử có trách nhiệm như một công dân có trách nhiệm.*

• Từ khóa: *trách nhiệm xã hội của doanh nghiệp, phát triển bền vững, người tiêu dùng Việt Nam.*

1. Introduction

Businesses are considered citizens of the societies they operate in and have responsibilities towards their communities. Corporate social responsibility (CSR) has become a top priority for sustainable development, with businesses emphasizing company values, maintaining a positive image, gaining customer preference, and complying with regulations. Sustainability reporting and environmental initiatives are common among businesses globally. While some argue that social activities result in cost increases and limited financial impact, others believe in the long-term benefits. By integrating CSR as a business strategy, companies aim to enhance customer loyalty and create a favorable public image.

Vietnamese businesses have embraced CSR, with the Corporate Sustainability Index (CSI) measuring their value based on sustainable development criteria. Prominent companies in Vietnam engage in activities that support education, healthcare, and environmental conservation. Vietnamese consumers show a strong interest in CSR, with many supporting businesses that care for the community and the environment. However, limited research exists on CSR's impact on customer loyalty in the Vietnamese market. Recognizing this, the author conducted a study to contribute to this field and help businesses prioritize specific CSR activities to increase customer loyalty. The research findings and recommendations can assist businesses in Ho Chi Minh City in improving their CSR

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practices and fostering customer loyalty, leading to sustainable business growth.

2. Literature review

2.1. Corporate social responsibility

The organization believes that CSR is not just about philanthropy, but also a long-term strategy that integrates social, environmental, and ethical concerns into core business activities. The World Bank also shows that CSR can have positive impacts on business performance, including improving brand reputation, enhancing customer loyalty, and better risk management.

The content of corporate social responsibility includes many aspects related to how businesses behave towards stakeholders in their business operations, including consumers, marketers, suppliers, employees, shareholders, and even their responsibility towards resources and the environment, as well as community benefits. Carroll (1991) shared his analysis of CSR, which includes four elements of economic responsibilities, legal responsibilities, ethical responsibilities, and philanthropic responsibilities.

2.2. Customer loyalty

In an interview with Fred Reichheld (1996), the author of the famous book "The Loyalty Effect: The Hidden Force Behind Growth, Profit, and Lasting Value," he defined customer loyalty as the commitment of customers to a product or brand, based on their satisfaction with their experiences and the responsiveness of the product or brand to their needs. However, repeating a shopping habit may not necessarily indicate a high degree of loyalty, as customers may have limited options and are forced to purchase the only brand they have access to. Therefore, measuring customer loyalty requires the use of both behavioral and attitudinal loyalty criteria, according to Nick Mehta (2016).

A customer begins with no loyalty, then develops to feeling satisfied with the brand's products and services, then commits to the brand, becomes an advocate, a partner, and finally an investor. As customers move up the ladder, they become more valuable, and businesses spend

less to maintain the relationship between the two parties. The higher up the ladder, they are willing to buy more products, spread positive word-of-mouth endorsements, resist competitors' blandishments, pay premiums for extra services, collaborate with the brand, and even invest in it.

3. Research model and hypotheses

3.1. Research model

On the basis of overview domestic and foreign studies, we offer a research model of the impact of corporate social responsibility on customer loyalty: an empirical study at Vietnam dairy products joint stock company in HCMC as Figure 1 below:

Figure 1. Proposed research model
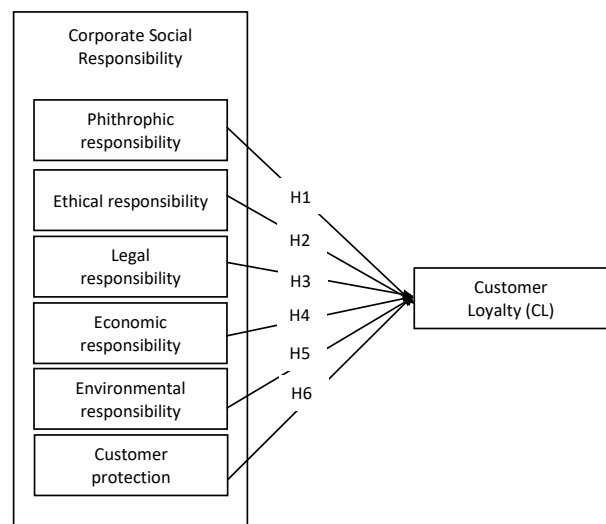
Source: Authors' proposal

3.2. Research hypotheses

Hypothesis H1: Phithrophic responsibility positively affects Customer Loyalty.

Hypothesis H2: Ethical responsibility positively affects Customer Loyalty.

Hypothesis H3: Legal Responsibility positively affects Customer Loyalty.

Hypothesis H4: Economic Responsibility positively affects Customer Loyalty.

Hypothesis H5: Environmental Responsibility positively affects Customer Loyalty.

Hypothesis H6: Customer Protection positively affects Customer Loyalty.

4. Research methodology

The author utilizes quantitative research methods to analyze and synthesize both primary and secondary data. The process involves several steps. In terms of data collection, the author evaluates secondary information from previous studies, research papers, and statistical sources, both domestically and internationally. Through quantitative research, the author evaluates the reliability of the questionnaire by testing the scale on 40 respondents, identifying inappropriate items, and making reasonable adjustments based on feedback from the respondents. This results in a complete and official questionnaire ready for wider distribution.

Table 1. The measurement scales

Item	Code	Statement
Philanthropic responsibility (PR)	PR1	This firm supports culture and art activities of local community
	PR2	Managers and employees participate in charitable activities of their local communities
	PR3	This firm supports private and public educational institutions
	PR4	This firm assists to enhance quality of life in the local community
Ethical responsibility (ER)	ER1	This firm operates in a manner consistent with expectations of societal and ethical norms
	ER2	This firm recognizes and respects new ethical/ moral norms
	ER3	This firm prevents unethical behaviors in order to achieve organizational goals
	ER4	This firm make efforts to be good citizenship
Legal responsibility (LR)	LR1	This firm operates business in a manner consistent with expectations of government and law
	LR2	This firm obeys various federal, state, and local regulations
	LR3	This firm fulfills its legal obligation
	LR4	This firm meets minimal legal requirements related to goods and services
Economic responsibility (ECR)	ECR1	This firm focuses on maximizing earnings
	ECR2	This firm is committed to profitability
	ECR3	This firm has a strong competitive position
	ECR4	This firm seeks a profitable position

The authors collected necessary data for the research through an online survey using Google Forms from March 31 to April 30, 2023. Google Forms facilitated easy access to study participants during this period. The target population consisted of individuals residing and working in Ho Chi Minh City, familiar with Vinamilk and their products, to ensure relevant data collection and filter out unsuitable participants. By using online surveys, the author avoided potential biases that could arise from their direct involvement in data collection, maintaining objectivity in the observational questions.

Online surveys may include observation samples that do not meet the research scope, respondents who misunderstand questions or provide incomplete answers and other issues. Therefore, it is crucial to filter and clean the data before conducting an in-depth analysis. After concluding the survey on April 30, 2023, the author obtained a total of 192 results or observations. However, after filtering out 7 results that did not meet quality requirements, the final sample size for analysis comprised 185 observations (N = 185).

5. Research results

5.1. Descriptive statistics

In terms of gender, among the 185 valid survey responses, the female observation rate was higher than the male observation rate, with 107 out of 185 respondents being female and the remaining 78 being male. This can be explained by the fact that Vinamilk's target audience in its campaigns is often women, who tend to be more concerned about the nutritional value and health of their families. In terms of age group, the majority of the survey respondents were in the age group of 18 to under 25, accounting for 65,4% or 121 out of 185 respondents. Following that were the age groups of 25 to under 35 with 39 respondents and under 18 with 25 respondents, accounting for 21,1% and 13,5%, respectively. In terms of educational background, the majority of respondents (81,1%) have a bachelor's degree, 14,4% have completed high school, and only 4,9% have a degree beyond a bachelors. Bachelor's degree refers to those currently studying at a university or those who have completed the program without pursuing a graduate degree. There is a discrepancy between respondents under 18 years old and the number of

high school degree holders due to one respondent over 18 years old who entered the workforce after completing 12th grade instead of continuing to university. In terms of Social Economic Class, the majority of respondents (31,4%) have a monthly income of less than 5 million VND, which is expected as many of them are students or have low internship support. The proportion of respondents with a salary between 5 to less than 10 million and 10 to less than 15 million VND is equal (17,3%), which is considered average for new graduates or those with 1 to 2 years of experience. About 27% of respondents have a salary range of 15 to less than 20 million VND, and 7% have a salary of over 20 million VND. These higher salary ranges are typically seen in individuals aged 25 to 35 or those with a master's degree. In terms of occupation, it is understandable that students account for the highest proportion with 50,3% of respondents. This is followed by office workers with 47,6%, 1,6% are self-employed, and only 0,5% are currently unemployed.

5.2. Cronbach's Alpha coefficient of reliability testing

After excluding ER3, Cronbach's Alpha reliability test was performed for the Ethical Responsibility variable. The revised Cronbach's Alpha coefficient increased to 0.870. All tests met the criteria, with item-total correlation coefficients above 0.3 and Cronbach's Alpha if Item Deleted lower than the new coefficient. Therefore, except for ER3, all 26 measurement variables were considered suitable for further analysis.

Table 2. Cronbach's Alpha for all variables

No.	Factors	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Philanthropic Responsibility - Cronbach's Alpha = 0,861					
1	PR1	9,96	6,211	0,710	0,823
2	PR2	10,09	6,123	0,716	0,820
3	PR3	9,62	5,933	0,674	0,838
4	PR4	9,94	5,474	0,740	0,810
Ethical Responsibility - Cronbach's Alpha = 0,852					
1	ER1	10,22	5,532	0,773	0,777
2	ER2	10,37	5,453	0,773	0,777
3	ER3	10,30	6,408	0,542	0,870
4	ER4	10,10	5,338	0,695	0,812

No.	Factors	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Legal Responsibility - Cronbach's Alpha = 0,862					
1	LR1	10,94	4,795	0,742	0,810
2	LR2	11,24	4,870	0,699	0,828
3	LR3	10,97	4,700	0,772	0,797
4	LR4	10,85	5,473	0,627	0,855
Economic Responsibility - Cronbach's Alpha = 0,858					
1	ECR1	10,45	7,521	0,602	0,858
2	ECR2	10,62	6,760	0,740	0,805
3	ECR3	10,56	6,118	0,744	0,803
4	ECR4	10,45	6,532	0,734	0,806
Environmental Responsibility - Cronbach's Alpha = 0,814					
1	ENR1	10,00	4,424	0,625	0,771
2	ENR2	9,96	4,857	0,633	0,768
3	ENR3	10,00	4,250	0,684	0,741
4	ENR4	10,15	4,691	0,597	0,783
Consumer Protection - Cronbach's Alpha = 0,846					
1	COR1	10,55	5,456	0,629	0,826
2	COR2	11,02	4,826	0,688	0,802
3	COR3	10,79	4,678	0,740	0,778
4	COR4	10,83	5,024	0,675	0,807
Customer Loyalty - Cronbach's Alpha = 0,838					
1	CL1	6,73	2,677	0,669	0,807
2	CL2	6,82	2,365	0,749	0,727
3	CL3	6,82	2,694	0,690	0,787

Source: Authors' calculation

5.2 Exploratory Factor Analysis - EFA

Table 3. First KMO coefficient and Bartlett's test of sphericity

KMO and Bartlett's Test		
KMO coefficient		0,901
Bartlett's Test of Sphericity	Approx. Chi-Square	2464,066
	df	253
	Sig.	0,000

Source: Authors' calculation

Table 4. First rotated component matrix

Measured variables	Component (Loading factor)					
	1	2	3	4	5	6
ECR2	0,814					
ECR3	0,774					
ECR4	0,774					
ECR1	0,753					
PR3		0,825				
PR1		0,822				
PR4		0,814				
PR2		0,794				

Measured variables	Component (Loading factor)					
	1	2	3	4	5	6
LR2			0,814			
LR3			0,758			
LR1			0,699			
LR4			0,681			
ENR3				0,751		
ENR2				0,729		
ENR1				0,702		
ENR4				0,667		
COR3					0,806	
COR2					0,725	
COR4					0,719	
COR1						
ER4						0,770
ER1						0,748
ER2						0,747

Source: Authors' calculation

For the EFA exploratory factor analysis, the author chose a loading factor of 0,5 (Hair et al., 2010), especially for sample sizes between 150 and below 250 (N = 185). Therefore, in the EFA test, no loading factor below 0,5 will be shown. The first rotation results are shown in Table 4.4, indicating that for the COR factor (COR1 - COR4), the COR1 variable did not load onto any factors. This is considered a poor variable, and the author removed the COR1 variable from the model, leaving 22 remaining variables for the second EFA analysis.

Table 5. Second KMO coefficient and Bartlett's test of sphericity

KMO and Bartlett's Test		
KMO coefficient		0,901
Bartlett's Test of Sphericity	Approx. Chi-Square	2464,066
	df	253
	Sig.	0,000

Source: Authors' calculation

The KMO coefficient for the second test reached 0,897 > 0,5 and the Bartlett test with sig. = 0000 showed that the test is still appropriate, indicating that the observed variables still have correlations with each other.

In the second round of testing, the author identified 6 factors. The Eigenvalues coefficient was 1.091, indicating that each factor explained more than 1 unit of variation. The Total Variance Explained was 73.362%, indicating that the

factors accounted for 73.362% of the variation in the observed variables. A loading coefficient of 0.45 was still used, and the author derived the rotation matrix presented. Notably, no variable had a loading coefficient lower than 0.45, with some exceeding 0.5. Consequently, the author concluded that all 22 observed variables of the independent variables could be further analyzed.

Table 6. Second rotated component matrix

Measured variables	Component (Loading factor)					
	1	2	3	4	5	6
ECR2	0,814					
ECR4	0,774					
ECR3	0,771					
ECR1	0,759					
PR3		0,826				
PR1		0,823				
PR4		0,815				
PR2		0,795				
LR2			0,818			
LR3			0,757			
LR1			0,693			
LR4			0,687			
ENR3				0,755		
ENR2				0,724		
ENR1				0,702		
ENR4				0,676		
ER4					0,773	
ER1					0,753	
ER2					0,750	
COR3						0,801
COR4						0,721
COR2						0,719

Source: SPSS analysis result

Table 7. EFA for Dependent variable

Measured variables	Component (Loading factor)
	1
CL2	0,897
CL3	0,863
CL1	0,849
Eigenvalues	2,268

Source: Authors' calculation

From the 25 observed variables, the EFA resulted in 6 independent variables and 1 dependent variable, which are as follows: Economic Responsibility factor, consisting of 4 indicators: ECR1, ECR2, ECR3, and ECR4. Philanthropic Responsibility factor, consisting of 4 indicators: PR1, PR2, PR3, and PR4. Legal Responsibility

factor, consisting of 4 indicators: LR1, LR2, LR3, LR4. Environmental Responsibility factor, consisting of 4 indicators: ENR1, ENR2, ENR3, ENR4. Ethical Responsibility factor, consisting of 3 indicators: ER1, ER2, and ER4. Consumer Protection factor, consisting of 3 indicators: COR2, COR3, and COR4. Customer Loyalty factor, consisting of 3 indicators: CL1, CL2, and CL3.

The author conducted a Pearson correlation analysis between the dependent variable (CL) and the independent variables in the model (PR, ER, LR, ECR, ENR, COR), with the following results:

Table 8. Pearson correlations matrix

		CL	PR	ER	LR	ECR	ENR	COR
CL	Pearson Correlation	1	0,371	0,743	0,712	0,645	0,621	0,684
	Sig. (2-tailed)		0,000	0,000	0,000	0,000	0,000	0,000
PR	Pearson Correlation	0,371	1	0,351	0,313	0,103	0,409	0,28
	Sig. (2-tailed)	0,000		0	0	0,162	0	0
ER	Pearson Correlation	0,743	0,351	1	0,547	0,526	0,547	0,548
	Sig. (2-tailed)	0,000	0,000		0,000	0,000	0,000	0,000
LR	Pearson Correlation	0,712	0,313	0,547	1	0,497	0,515	0,537
	Sig. (2-tailed)	0,000	0,000	0,000		0,000	0,000	0,000
ECR	Pearson Correlation	0,645	0,103	0,526	0,497	1	0,363	0,463
	Sig. (2-tailed)	0,000	0,162	0,000	0,000		0,000	0,000
ENR	Pearson Correlation	0,621	0,409	0,547	0,515	0,363	1	0,55
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000		0,000
COR	Pearson Correlation	0,684	0,280	0,548	0,537	0,463	0,550	1
	Sig. (2-tailed)	0,000	0,000	0,000	0,000	0,000	0,000	

Source: SPSS analysis result

The results show that the independent variables PR, ER, LR, ECR, ENR, and COR are positively and significantly correlated with the dependent variable CL, with correlation coefficients larger than 0,3 and their sig. of 0.000 was less than 0.05. Among the independent variables, the variables ER, LR, COR, ECR, and ENR have strong correlations with CL, in descending order of strength: 0,743, 0,712, 0,684, 0,645, and 0,621. The independent variable PR has the lowest correlation with CL, with a correlation coefficient of 0,371.

In addition to assessing the correlation between independent variables and the dependent variable, the author examined the correlation among the independent variables. High correlation was observed (sig. 0.000), indicating multicollinearity. Nevertheless, the author proceeded with regression analyses using all variables and checked for multicollinearity using the variance inflation factor (VIF) obtained from the regression model.

To test the level of influence of CSR factors on Customer Loyalty among consumers in Ho Chi Minh City, a multiple regression using the Ordinary Least Square (OLS) method was applied, with the general form as follows:

CL = B1.PR + B2.ER + B3.LR + B4.ECR + B5.ENR + B6.COR + ε

In which:

CL: Customer Loyalty (dependent variable).

PR: Philanthropic Responsibility; ER: Ethical Responsibility; LR: Legal Responsibility; ECR: Economic Responsibility; ENR: Environmental Responsibility; COR: Consumer Protection (independent variables).

ε: The random errors have a normal distribution with a mean of 0 and constant variance

In order to identify the suitability of the proposed research model, the R-square and adjusted R-square is taken into consideration. The R-square value of 0,775 > 0,5 (Table 8) indicates that the proposed model is reasonable and fits the real data well, with Adjusted R-square = 0,767 means that 76,7% of the variation in the dependent variable (Customer Loyalty) explained by the six independent variables PR, ER, LR, ECR, ENR, and COR. The remaining 22,5% of unexplained variation may come from variables outside the model and random errors.

Table 9. Model summary

R	R-Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
0,880	0,775	0,767	0,37276	1,823

Source: SPSS analysis result

To evaluate the validity of the proposed model, the author examines the ANOVA analysis results with the following assumptions:

H0: B1 = B2 = B3 = B4 = B5 = B6 = 0

H1: exist at least one Bi 0 (i = 1,6)

The result of the ANOVA analysis shows that the significance of the F-value is less than 5% with Sig. = 0,000, indicating that the null hypothesis H0 can be rejected. This shows that at least one variable from the model has an impact on Customer Loyalty in HCMC. The model is appropriate for the collected data. The details of the ANOVA analysis are presented in the table below:

Table 10. ANOVA testing

	Sum of Squares	df	Mean Square	F	Sig.
Regression	85,017	6	14,169	101,973	0,000
Residual	24,734	178	0,139		
Total	109,75	184			

Source: Authors' calculation

To determine whether to accept or reject the research hypotheses, the author conducted a significance test of the regression coefficients as follows:

Table 11. Regression result

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	B			Tolerance	VIF
Const	-0,564	0,177		-3,196	0,002		
PR	0,061	0,039	0,063	1,563	0,120	0,782	1,279
ER	0,265	0,046	0,290	5,798	0,000	0,506	1,975
LR	0,271	0,051	0,255	5,324	0,000	0,554	1,806
ECR	0,205	0,041	0,224	4,977	0,000	0,625	1,600
ENR	0,125	0,054	0,111	2,323	0,021	0,551	1,814
COR	0,204	0,047	0,206	4,307	0,000	0,554	1,806

Source: Authors' calculation

Among the 5 significant factors that impact Customer Loyalty in HCM City (Table 10), Ethical Responsibility has the strongest effect with a Beta of 0,290, followed by Legal Responsibility with Beta = 0,255, Economic Responsibility with Beta = 0,224, Consumer Protection with Beta = 0,206, and finally Environmental Responsibility with Beta = 0,111. With positive coefficients, it indicates that the corporate social activities related to any of these factors will have a positive impact and increase Customer Loyalty. As for the Philanthropic Responsibility factor, there is no significant effect on Customer Loyalty as the sig is greater than 0,05.

From the above research results, along with the analysis of the significance of the regression coefficients, the author obtained the standardized equation to represent the impact of each different social activity of the enterprise on customer loyalty in Ho Chi Minh City:

$$CL = 0,290*ER + 0,255*LR + 0,224*ECR + 0,111*ENR + 0,206*COR + \varepsilon$$

6. Implications

The author proposes solutions focusing on two main directions based on the research findings, as well as the opportunities and challenges faced by businesses in sustainable business operations. These directions are: (1) Implementing appropriate CSR initiatives, and (2) Enhancing internal management processes.

This research has several limitations, both subjective and objective. Firstly, convenience sampling was used, leading to sample inadequacy and a lack of representativeness, potentially introducing biases. Online survey responses may also have lower quality compared to in-depth surveys. Future studies should employ more robust sampling methods. Secondly, the model's practical significance is limited, as it explains only 77.5% of the dependent variable's variation. Incorporating additional factors and exploring another research would enhance the model. Reconsidering measurement scales would improve accuracy. Thirdly, the study's scope is confined to Ho Chi Minh City within a specific timeframe. Results may vary at different times. The sample size was also limited, restricting differentiation among demographic groups. Future research should aim for a larger sample size and more diverse demographic representation./.

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APPLYING SEMI-SUPERVISED MACHINE LEARNING METHODS TO PREDICT STOCK PRICES IN THE VIETNAM STOCK MARKET

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Abstract: *This study proposes an approach based on semi-supervised machine learning to predict stock price movement trends in the Vietnam stock market. The proposed algorithm models the relationships between stocks as an influence graph. A set of basic prediction algorithms is used to assign initial labels to a subset of nodes in the graph. The Graph Convolutional Network (GCN) algorithm is then applied to analyze this partially labeled graph to predict the final labels for all nodes. Experimental results on data of 100 stocks listed on the Ho Chi Minh City Stock Exchange (HOSE) and HNX exchange show that the proposed method achieves higher accuracy than current common methods. This is a new approach to applying advanced machine learning technology for financial forecasting in Vietnam.*

Tóm tắt: *Nghiên cứu này đề xuất một phương pháp mới sử dụng các kỹ thuật học máy bán giám sát để dự đoán xu hướng biến động giá cổ phiếu trên thị trường chứng khoán Việt Nam. Thuật toán đề xuất xây dựng mô hình các mối quan hệ giữa các cổ phiếu dưới dạng một đồ thị tác động. Một tập hợp các thuật toán dự đoán cơ bản được sử dụng để gán nhãn ban đầu cho một tập con của các nút trong đồ thị. Sau đó, thuật toán Mạng Convolutional trên Đồ thị (GCN) được áp dụng để phân tích đồ thị đã được gán nhãn một phần này để dự đoán các nhãn cuối cùng cho tất cả các nút. Kết quả thử nghiệm trên dữ liệu từ 100 cổ phiếu được niêm yết trên Sở Giao dịch Chứng khoán Thành phố Hồ Chí Minh (HOSE) cho thấy rằng phương pháp đề xuất đạt được độ chính xác cao hơn so với các phương pháp thông thường hiện tại. Đây là một cách tiếp cận mới đối với việc ứng dụng công nghệ học máy tiên tiến cho dự báo tài chính tại Việt Nam.*

• Từ khóa: *học máy bán giám sát, đồ thị tác động, GCN, dự đoán giá cổ phiếu.*

1. Introduction

The Vietnam stock market has experienced impressive growth over the past decade. According to statistics from the Ho Chi Minh City Stock Exchange (HOSE), the VN-Index has increased 4 times over the period 2009-2019. Liquidity and market capitalization have also increased significantly. However, the Vietnam market still contains many risks due to its high volatility and unpredictability. Therefore, accurately predicting stock price movement trends is a key issue for investors as well as securities companies.

Historically, traditional financial models and technical analysis have been the primary tools used for stock price prediction. However, these methods often fall short in capturing the complex and interconnected nature of today's financial markets. In recent years, machine learning techniques have gained prominence for their ability to analyze vast datasets and uncover hidden patterns. While many studies have applied supervised learning methods to predict stock prices, often using historical data from individual stocks, this approach overlooks the interdependencies among stocks in the same market. Kara et al. utilized Artificial Neural Networks (ANN) and Support Vector Machines (SVM) to forecast the direction of the Istanbul Stock Exchange National 100 index, with ANN outperforming SVM significantly. Zhong and Enke applied ANN to predict the S&P500, demonstrating that incorporating Principal Component Analysis

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(PCA) to create new representations for original feature vectors enhanced ANN-based predictive accuracy

The Long Short-Term Memory (LSTM) model is widely used for time series prediction. Nelson et al. utilized LSTM and Multilayer Perceptron (MLP) to forecast the Brazilian stock market, with LSTM showing superiority over MLP. In a more recent study, LSTM was combined with an attention mechanism to predict stocks based on price data from a few days prior. Although this model only used data from a single stock for prediction, recent research has stressed the importance of incorporating related stocks into training models through simple techniques.

Convolutional Neural Networks (CNN) represent another category of deep learning algorithms applied in stock market prediction. Researchers have explored their ability to extract high-level features from price data extensively. In one study, Di Persio and Honchar employed various deep neural networks, including ANN, LSTM, and CNN, to predict the S&P500 index. The results indicated that CNN outperformed other deep models in terms of prediction.

Although the models mentioned above have achieved satisfactory results, most of them do not leverage stock correlations as a valuable source of information. Additionally, some are limited in their use of a predetermined set of related stocks, as determined by the authors.

The interconnectedness of stocks within a market is a fundamental aspect of modern finance. Stocks influence each other through various channels, including market sentiment, industry trends, and economic factors. Failing to account for these interdependencies can lead to suboptimal predictions. Therefore, there is a growing interest in developing models that consider the relationships between stocks in a comprehensive manner.

Recent research has explored the use of graph-based approaches to model the relationships between stocks. These approaches treat stocks as nodes in a graph and capture influence and correlation between them through edges. While this concept is promising, existing studies often rely on simplistic correlation-based graph structures and basic label propagation algorithms.

In this paper, we present a novel approach to stock price prediction in the Vietnam stock market. Our method builds upon the foundation of Semi-supervised machine learning and leverages the power of Graph Convolutional Networks (GCNs). We introduce the concept of an "influence graph" to comprehensively model the relationships between stocks. We then use GCNs within an Semi-supervised learning framework to propagate information through this influence graph and predict stock price movements. Our approach addresses the limitations of previous studies by providing a more sophisticated and data-driven method for stock price prediction.

The remainder of this paper is organized as follows: Section 2 describes the methodology, including the construction of the influence graph, initial label assignment, and label prediction using GCNs. Section 3 presents the experimental results, comparing our approach to existing methods on real-world data from the Ho Chi Minh City and Ha Noi Stock Exchange. Finally, Section 4 offers conclusions and discusses potential avenues for future research.

2. Research Methodology

2.1. Influence Graph Model

To address the complexity of stock relationships in the Vietnam stock market, we introduce the concept of an influence graph. In this graph, each stock is represented as a node, and edges between nodes denote the degree of influence one stock has on another in terms of predicting price movements. Our goal is to construct this influence graph in a way that accurately captures the interconnectedness of stocks.

Figure 1. Framework
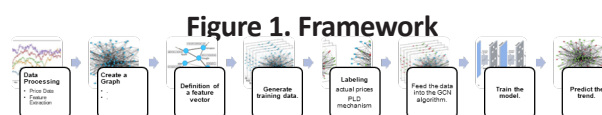
The construction of the influence graph involves several steps:

2.1.1. Calculation of Edge Weights

We start by calculating the edge weights, w_{ij}, which represent the influence of stock i on stock j. To compute wij, we employ a set of fundamental prediction models. For each pair of stocks (i, j), we train these models on historical data, both individually and by combining data from the two stocks.

The key idea is to measure the improvement in prediction accuracy achieved by combining data from two stocks compared to the accuracy achieved by using each stock's data individually. If combining the data leads to a significant increase in accuracy, it suggests a strong influence between the two stocks.

2.1.2. Graph Construction

Edges (i, j) with positive w_{ij} values are added to the influence graph to represent the relationships between stocks. These edges indicate that stock i has a meaningful influence on stock j's price movement. However, to maintain graph sparsity and computational efficiency, we remove weak edges with low w_{ij} values while ensuring that the graph remains connected.

The resulting influence graph offers a clear and intuitive representation of the relationships between stocks in the market. It is important to note that the influence graph can be periodically updated to adapt to changes in market dynamics.

2.2. Initial Label Assignment

In the context of Semi-supervised learning, we face the challenge of assigning initial labels to nodes in the influence graph, as the actual future labels are unknown. Our goal is to make preliminary predictions for the next day's price trends for each stock.

To address this challenge, we propose an algorithm for initial label assignment. This algorithm takes into account two key factors:

2.2.1. Prediction Reliability

We utilize a set of basic prediction models to forecast the price trends of individual stocks. The reliability of each prediction is assessed based on factors such as historical accuracy and model performance. Stocks with the most reliable predictions are selected to be initially labeled with the predictions derived from these base models.

2.2.2. Centrality in the Influence Graph

We also consider the centrality of stocks within the influence graph. Stocks that play a central role in the network are more likely to have a significant impact on other stocks. Therefore, we prioritize stocks with high centrality when assigning initial labels.

The combination of prediction reliability and centrality ensures that the initially labeled nodes represent stocks with a strong potential to influence the overall market dynamics.

3. Label Prediction Algorithm

Once we have the influence graph with a subset of initially labeled nodes, the next step is to predict the final labels for all nodes in the graph. To accomplish this, we employ Graph Convolutional Networks (GCNs), a powerful neural network architecture designed for graph-based data.

Graph Convolutional Networks (GCNs)

GCNs have gained prominence in various applications involving graph-structured data. They are particularly well-suited for scenarios where only a limited set of labeled nodes is available, as is the case in our Semi-supervised learning framework.

The core idea behind GCNs is to learn node representations by aggregating information from neighboring nodes in the graph. This aggregation process is performed through multiple layers of graph convolution, resulting in refined node representations that capture both local and global information.

In our context, GCNs are used to propagate information throughout the influence graph and predict the final labels for each stock. The benefits of using GCNs in this context include:

- The ability to handle graphs with limited labeled data.

- Adaptation of weights based on the current graph structure, optimizing prediction accuracy.

- Learning representations that account for the interconnectedness of stocks.

The application of GCNs within our methodology ensures that we leverage the full potential of the influence graph to make accurate predictions for stock price movements.

4. Experimental Results

In this section, we present the results of our experiments, where we evaluate the performance of our proposed approach for predicting stock prices in the Vietnam stock market. To assess the performance of our method and the baseline algorithms, we utilized a dataset comprising the 100 largest market capitalization stocks on both the HOSE and HNX exchanges. We excluded 7 stocks with insufficient data to support the training and evaluation of all models. For the remaining stocks,

the dataset contains daily records from January 01, 2011, to January 01, 2023, including open, low, high, close, and adjusted close prices, as well as trading volume. Historical data up to each test day were used for model training. The PLD models and supervised label prediction mechanisms were retrained for each prediction day. Data from September 15, 2022, to September 29, 2022, were utilized for validation and hyperparameter tuning. The testing phase extended from September 30, 2022, to December 30, 2022, encompassing 5952 records. The dataset encompasses companies as shown in the figure below. The evaluation metrics used to assess the performance of our approach include Accuracy and Matthews Correlation Coefficient (MCC).

Table 1: Stock data

#	Mã CK 14 mã	Giá đóng cửa (VND)	% Thay đổi 1D (%)	KL khớp lệnh (Share)	GT khớp lệnh (VND)	Vốn hóa thị trường (Triệu đồng)	EPS của 4 quý gần nh... (VND)	P/E cơ bản (Times)
1	DGC CTCP TẬP ĐOÀN HÓA CHẤT ĐỨC GIANG (HOSE)	98,000	4.26	7,370,000	695,918,000,000	37,218,284	19,290.68	3.05
2	ANV CTCP NAM VIỆT (HOSE)	41,100	3.27	5,975,600	241,736,000,000	5,471,556	5,299.74	4.25
3	DBD CTCP DƯỢC - TRANG THIẾT BỊ Y TẾ BÌNH ... (HOSE)	56,000	1.82	71,200	3,904,000,000	4,191,235	3,642.39	10.83
4	PTB CTCP PHÚ TÀI (HOSE)	60,200	3.44	953,200	55,574,000,000	4,029,692	8,090.38	5.18
5	MSH CTCP MAY SÔNG HỒNG (HOSE)	47,300	0.75	410,900	19,050,000,000	3,548,167	5,833.13	5.66
6	GIL CTCP SẢN XUẤT KINH DOANH VÀ XUẤT NHẬP ... (HOSE)	36,000	1.98	2,942,300	106,061,000,000	2,519,974	6,375.5	2.88
7	CSV CTCP HÓA CHẤT CƠ BẢN MIỀN NAM (HOSE)	44,800	6.92	1,889,600	81,148,000,000	1,980,160	8,016.97	3.76
8	LHG CTCP LONG HẬU (HOSE)	30,800	4.58	637,800	18,809,000,000	1,540,370	4,076.83	5.24
9	VGS CTCP ỐNG THÉP VIỆT ĐỨC VG PIPE (HNX)	23,200	1.31	2,245,056	51,139,064,600	1,235,856	2,230.78	4.75
10	TLH CTCP TẬP ĐOÀN THÉP TIẾN LÊN (HOSE)	10,100	6.88	6,895,400	66,495,000,000	1,134,432	53.22	120.62
11	DC4 CTCP XÂY DỰNG DIC HOLDINGS (HOSE)	14,150	0.71	487,200	6,775,000,000	742,871	-36.1	-186.72
12	PTL CTCP VICTORY CAPITAL (HOSE)	6,470	6.07	1,786,100	11,205,000,000	639,657	-1,154.33	-2.82
13	CEN CTCP CENCON VIỆT NAM (UPCOM)	10,400	8.33	2,949,752	30,640,148,600	225,809	0.07	48,250.41

3.1. Data Collection and Preprocessing

We collected data on 100 stocks listed on HOSE and HNX from the information disclosure websites of the respective companies. The data encompassed a wide range of financial, economic, and market-related features. These features were carefully selected to capture relevant information that could influence stock price movements.

The data preprocessing phase involved cleaning, normalizing, and aggregating the data to create a suitable input for our influence graph and GCN-based prediction model.

3.2. Experimental Setup

We compared the performance of our proposed GCN-based approach (GCN-IN) with several baseline algorithms commonly used for stock price prediction. These baseline methods included traditional statistical models, machine learning models, and graph-based approaches.

3.2.1. Baseline Algorithms

Here is a summary in English of the key stock prediction models mentioned:

- STOCKNET: A deep model using a molecular graph encoder to incorporate both price and text information. Price features are modeled sequentially and text is encoded using hierarchical attention over a multi-day sequence. It has three main components: Encoder, Decoder and Time-aware attention Auxiliary module to predict stock price movements.

- HATS: Hierarchical Graph Attention method using graph modeling to consider different relationships between stocks. It uses a relation modeling module with initial node representations. The model focuses selective information about different relation types and integrates this into the representation of each company. Only uses historical stock price data.

- CNN-pred: A deep CNN model using diverse financial variables including technical indicators, stock indices, futures contracts, etc. Constructs three and two dimensional tensor inputs. These inputs are fed into a specific CNN model for prediction. Uses a fixed combination of the target market time-series and several related time-series as input to predict the future of the target time-series.

- Adv-LSTM: Introduces a deep model using adversarial attention LSTM and adversarial training to simulate randomness in training. Proposes using adversarial training to improve model generalization as input features often rely on stock price, are random and continuously changing over time.

- Price Chart: A model transforming the price time-series into a visually perceivable chart. Then extracts structural information and relationships between time points using graph embedding methods. The price chart uses attention layers and a fully connected layer to predict stock price trends.

3.3. Evaluation Metrics

We employed two key evaluation metrics to assess the accuracy and robustness of our approach:

3.3.1. Accuracy

Accuracy measures the proportion of correct predictions made by the model. In the context of stock price prediction, it quantifies the percentage of accurately predicted price movements (increase or decrease) compared to the actual movements.

3.3.2. Matthews Correlation Coefficient (MCC)

The Matthews Correlation Coefficient is a balanced metric that takes into account both true positives and true negatives. It is particularly valuable when dealing with imbalanced datasets, which is often the case in stock price prediction. MCC ranges from -1 to 1, where 1 indicates perfect predictions, 0 suggests random predictions, and -1 signifies total disagreement between predictions and actual outcomes.

3.4. Results

Table 2 presents the results of our experiments, including accuracy and MCC scores for each of the evaluated methods.

Table 2: Prediction Results

Method	Accuracy	MCC
STOCKNET (Xu and Cohen, 2018)	0.7474 ±0.0027	0.0375 ±0.009
HATS (Kim et al., 2019)	0.7512 ±0.0021	0.0618 ±0.007
CNN-pred (Hoseinzade and Haratizadeh, 2019)	0.7342 ±0.0062	0.0366 ±0.015
Adv-LSTM (Feng et al., 2019)	0.7466 ±0.0045	0.0412 ±0.011
Price graphs (Wu et al., 2022)	0.7521 ±0.0032	0.0821 ±0.008
GC-SS-NET (Mô hình đề xuất)	**0.7671** ±0.0049	**0.1013** ±0.011

Our proposed GCN-based approach on the influence graph (GC-SS-NET) consistently outperformed the baseline algorithms in terms of both accuracy and MCC. These results demonstrate the effectiveness of our approach in predicting stock price movements.

Notably, when compared to the GCN model on the conventional correlation-based graph (GCN-CN), our GC-SS-NET approach achieved significantly higher accuracy. This finding underscores the superiority of the influence graph in capturing the relationships between stocks and improving prediction performance.

Furthermore, our approach excelled in predicting both the increase and decrease classes, as evidenced by its high MCC scores. This indicates that our method provides balanced predictions for both upward and downward price movements.

4. Conclusion

In this paper, we have presented a novel approach to predicting stock prices in the Vietnam stock market by leveraging Semi-supervised machine learning methods and graph-based modeling. Our methodology, which involves constructing an influence graph and applying Graph Convolutional Networks (GCNs) for label propagation and

prediction, addresses the limitations of traditional approaches and offers a more sophisticated and data-driven solution.

Experimental results based on real-world data from the Ho Chi Minh City Stock Exchange (HOSE) and HNX Exchange demonstrate that our proposed approach outperforms conventional methods, including statistical models, machine learning algorithms, and graph-based approaches. This research contributes to the field of financial forecasting in Vietnam by introducing a more accurate and robust approach to stock price prediction.

Looking ahead, future research directions include incorporating additional macroeconomic data, news sentiment analysis, and investor behavior modeling to further enhance prediction accuracy. Additionally, our model can be extended to predict market indices, offering valuable insights for both individual investors and financial institutions.

In conclusion, our work represents a significant step toward improving stock price prediction in the dynamic Vietnam stock market, ultimately benefiting investors and contributing to the growth and stability of the financial sector in Vietnam.

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THE EFFECT OF ENTREPRENEURSHIP EDUCATION ON ENTREPRENEURIAL INTENTION AMONG UNIVERSITY STUDENTS IN VIETNAM

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Abstract: *This research explores the influence of entrepreneurship education on the intention of university students to start a business in Vietnam. The study is conducted among full-time students from various universities in Vietnam during the period of May to June 2023 with quantitative and qualitative analysis. Through investigating the relationship between entrepreneurship education components and entrepreneurial intention, this study will serve as a useful guide for universities and state management agencies to design effective training programs with suitable contents and methods, as well as develop a favorable and to motivate the entrepreneurial intentions of students.*

Tóm tắt: *Nghiên cứu này phân tích ảnh hưởng của giáo dục khởi nghiệp đến ý định khởi nghiệp của sinh viên đại học tại Việt Nam. Dữ liệu được thu thập từ đối tượng là sinh viên các trường đại học ở Việt Nam trong khoảng thời gian từ tháng 5 đến tháng 6 năm 2023, xử lý bằng mô hình định lượng và định tính. Nhóm tác giả làm rõ mối quan hệ giữa các thành phần giáo dục khởi nghiệp và ý định khởi nghiệp, đóng góp tài liệu hướng dẫn hữu ích cho các trường đại học và cơ quan quản lý nhà nước trong việc thiết kế chương trình đào tạo hiệu quả, cũng như phát triển môi trường thuận lợi và thúc đẩy ý định khởi nghiệp.*

• Từ khóa: *tinh thần kinh doanh, giáo dục, sinh viên đại học, ý định, Việt Nam.*

1. Introduction

Entrepreneurship, recognized as a key driver of economic growth worldwide, fuels innovation and competition. It generates innovation by fostering new businesses, products, and processes (Gorman et al., 1997). Globally, entrepreneurship education garners attention from scholars, economists, and policymakers for its capacity to empower entrepreneurs and contribute to progress.

Entrepreneurship education and entrepreneurial intentions are subjects of global interest, yet their correlation in Asian countries, especially Vietnam, remains under exploration. Few studies within the past decade have addressed this relationship within Vietnam (Duong, 2022). Thus, this study investigates the impact of entrepreneurship education on students' entrepreneurial intentions.

Given the aforementioned context, this study is titled "The Effect of Entrepreneurship Education on Entrepreneurial Intention among University Students in Vietnam." It aims to assess how entrepreneurship education, along with its distinct components, influences Vietnamese university students' entrepreneurial intentions.

2. Literature review and research hypothesis

2.1. Literature review

Entrepreneurial intentions, explored since 1982, signify aspirations for new ventures

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or innovation in existing organizations (Fitzsimmons & Douglas, 2011). Seen as a predictor and driver of actual actions, they're influenced by factors like age, gender, education, and personality traits (Lüthje & Franke, 2003). Environmental elements like family background, market access, policies, and regional atmosphere also shape intentions, which vary due to cultural and contextual differences.

Research in entrepreneurship education and its impact on entrepreneurial intentions has attracted significant attention. Scholars have found that entrepreneurship education positively influences entrepreneurial success, cognitive development, and competencies. Various studies have revealed a higher start-up rate among entrepreneurship graduates, and the positive influence of entrepreneurship education on graduates' entrepreneurial intentions. However, some studies suggest that entrepreneurship education might decrease individuals' intentions due to increased risk awareness (Laukkanen, 2000). This highlights the complex relationship between entrepreneurship education and entrepreneurial intentions, influenced by factors like cognitive development, attitude, and perceived feasibility (Laukkanen, 2000).

2.2. Research hypotheses

Table 2.1. Research hypotheses

Independent Variables	Research Hypotheses	Built on research by
Entrepreneurship Education (EE)	H1: Curriculum contents are positively related to entrepreneurship education. H2: Pedagogical methods are positively related to entrepreneurship education. H3: Entrepreneurship education has a positive effect on Vietnamese university students' entrepreneurial intentions.	Fayolle & Gailly, 2013 Bae et al, 2014
Perceived Self-Efficacy (SEF)	H4: Entrepreneurship education has a positive effect on Vietnamese university students' perceived self-efficacy. H5: Perceived self-efficacy mediates the relationship between entrepreneurship education and entrepreneurial intentions of Vietnamese university students.	Markman & Baron, 2003 Pihie & Bagheri, 2013

Independent Variables	Research Hypotheses	Built on research by
Perceived Desirability (DSR)	H6: Entrepreneurship education has a positive effect on Vietnamese university students' perceived desirability. H7: Perceived self-efficacy positively influences Vietnamese university students' perceived desirability. H8: Perceived desirability mediates the relationship between entrepreneurship education and entrepreneurial intentions of Vietnamese university students.	Barringer & Ireland, 2010 Fitzsimmons & Douglas, 2011
Attitude toward Entrepreneurship (ATT)	H9: Entrepreneurship education has a positive effect on Vietnamese university students' attitude toward entrepreneurship. H10: Perceived self-efficacy positively influences Vietnamese university students' attitude toward entrepreneurship. H11: Attitude toward entrepreneurship mediates the relationship between entrepreneurship education and entrepreneurial intentions of Vietnamese university students.	Krueger et al, 2000 Bell & Bell, 2016 Liu et al., 2019

Table 2.2. Control variables

Description	Type of variable
Gender	**Nominal** (0 = Male; 1 = Female)
Academic year	**Ordinal** (1 – 4 corresponding to 1st year – 4th year)
Academic major	**Ordinal** (1 = Economics/Business; 2 = Technical/Engineering; 3 = Languages; 4 = Social Sciences)
Family entrepreneurial background	**Nominal** (0 = Family without business background); 1 = Family with business background)
Prior self-employment experience	**Nominal** (0 = No prior self-employment experience; 1 = Have prior self-employment experience)
Place of residence	**Nominal** (0 = Rural; 1 = Urban)

H12: Control variables moderates the relationship between entrepreneurship education and entrepreneurial intentions of Vietnamese university students.

3. Methodology

3.1. Research Overview

Figure 3.1: Research Overview
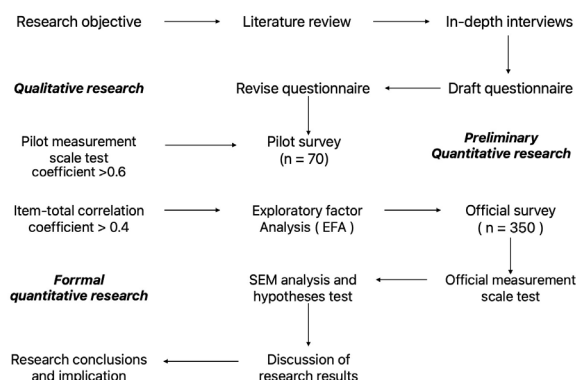
3.2. Qualitative research

In-depth interviews with students, educators, and entrepreneurship experts shape measurement scales and refine the proposed model. Guided by qualitative research goals, the authors develop an interview outline with open-ended questions on the theoretical model and scales, grouped into introduction, observed variables assessment, and opinion-seeking sections. These interactions occur via online platforms (Teams, Google Meet, Facetime), with recorded content used solely for research purposes.

3.3. Quantitative research

3.3.1. Scale and Survey Instrument Development

Based on the proposed research model, the hypotheses will be tested using the partial least squares structural equation model (PLS-SEM). Observed variables in the model use a 5-point Likert scale, common in sociological and behavioral research. Control variables use nominal and ordinal scales. Measurement of Variables is in the Appendix.

Figure 3.2. Proposed research model

Observed variables in the model use a 5-point Likert scale, common in sociological and behavioral research. Control variables (gender, academic year, major, family entrepreneurial background, self-employment experience, residence) use nominal and ordinal scales.

3.3.2. Data Analysis Approach

In qualitative research, secondary data is synthesized and analyzed to establish the study's theoretical foundation and depict student entrepreneurial activities and entrepreneurship education in Vietnam.

Preliminary Measurement Scale Test: Cronbach's Alpha assesses reliability (≥0.6). Item-total correlation eliminates variables below 0.3. Exploratory Factor Analysis (EFA): EFA evaluates latent variable convergence using factor loading (≥0.5), Kaiser-Meyer-Olkin coefficient (>0.5), Bartlett's test (p<0.05), and extracted variance (>50%).

Official Measurement Scale Test: Composite reliability (>0.7) ensures observed variable consistency. Convergent validity is assessed through significant normalized weights and total variance reflection. Discriminant validity employs Heterotrait-monotrait ratio (HTMT) criterion (<0.90). Variance Inflation Factor (VIF) detects multicollinearity (>5). The R-square coefficient (≥0.67) gauges model fit. Path coefficients reveal effects. Multi-group analysis identifies student profile differences in entrepreneurship education's impact on intentions.

4. Research Result

4.1. Qualitative research results

Interview outcomes reveal widespread student awareness of entrepreneurship education both within their universities and external organizations. Although awareness levels vary, student interest in entrepreneurship education initiates early in their academic journey. Universities are perceived as actively integrating entrepreneurship into their curricula, emphasizing business administration through introductory courses, workshops, and events. However, a minority feel that entrepreneurship education has limited impact on their entrepreneurial
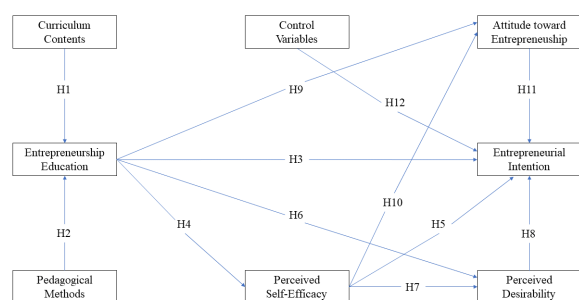
intentions, citing the need for financial resources, networks, capable teams, and favorable business environments.

4.2. Quantitative research results

4.2.1. Descriptive statistics

Table 4.1. Eliminated observed variables after EFA

Criterion	Categories	Number	Ratio
Gender	Male	152	43.43%
	Female	198	56.57%
Academic year	1st year	78	22.29%
	2nd year	97	27.71%
	3rd year	93	26.57%
	4th year	82	23.43%
Academic major	Economics/Business	185	52.86%
	Technology/Engineering	102	29.14%
	Languages	33	9.43%
	Social Sciences	30	8.57%
Family entrepreneurial background	Neither parent is an entrepreneur	244	69.71%
	Either parent is an entrepreneur	64	18.29%
	Both parents are entrepreneurs	42	12.00%
Prior self-employment experience	Have never been self-employed	256	73.14%
	Have been self-employed	94	26.86%
Place of residence	Rural	82	23.43%
	Urban	268	76.57%

4.2.2. Preliminary measurement scale test

Statistical testing confirmed reliability for 39 observed variables. All 7 scales in the model exhibited internal consistency (Cronbach's Alpha > 0.6, item-total correlation > 0.3). However, EFA led to the removal of 4 variables (SEF6, SEF7, DSR6, and DSR7) with low factor loading coefficients from the research model.

After eliminating the aforementioned observed variables, EFA outcomes indicate unidirectional concepts for all 7 factors in the model, with KMO coefficients > 0.5, Bartlett's test p-value < 0.05, total extracted variance > 50%, and convergence to a single factor.

4.2.3. Official measurement scale test

The results of construct reliability and validity revealed Cronbach's Alpha coefficients are all above 0.7, the average extracted variance (AVE) is greater than 50% (the smallest one is 0.640), and the composite reliability (CR) of all factors is

greater than 0.7 (the smallest one is 0.899). Thus, the scales in the model with the official sample achieve the necessary reliability and convergence.

Table 4.2. Construct Reliability and Validity

	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
CC	0.870	0.882	0.906	0.659
PM	0.860	0.864	0.899	0.642
EE	0.898	0.898	0.924	0.709
SEF	0.862	0.866	0.900	0.643
DSR	0.891	0.892	0.920	0.697
ATT	0.859	0.861	0.899	0.640
INT	0.875	0.876	0.910	0.669

4.2.4. SEM analysis and hypotheses test

Bootstrapping allows for testing the significance of estimated path coefficients in PLS-SEM. The authors selected 5000 subsamples to compare with the original estimates. Results showed that at the 95% confidence interval, the bias between the original sample estimate and the bootstrapping estimate was very small (the largest bias value is 0.004).

Table 4.3. Bootstrapping results

	Original sample (O)	Sample mean (M)	Bias (M-O)	Standard deviation (STDEV)	T statistics (|O/ STDEV|)	P values
CC -> EE	0.196	0.201	0.004	0.071	2.750	0.006
PM -> EE	0.297	0.300	0.003	0.069	4.339	0.000
EE -> SEF	0.472	0.473	0.000	0.049	9.542	0.000
EE -> DSR	0.363	0.361	-0.002	0.048	7.630	0.000
SEF -> DSR	0.459	0.461	0.002	0.046	9.972	0.000
EE -> ATT	0.371	0.369	-0.002	0.051	7.312	0.000
SEF -> ATT	0.469	0.471	0.002	0.040	11.585	0.000
EE -> INT	0.271	0.268	-0.003	0.035	7.637	0.000
SEF -> INT	0.206	0.208	0.002	0.043	4.836	0.000
DSR -> INT	0.342	0.341	0.000	0.039	8.693	0.000
ATT -> INT	0.244	0.245	0.000	0.045	5.483	0.000

The relationship regression equations can be reformulated as follows:

Relationship between Curriculum Contents, Pedagogical Methods, and Entrepreneurship Education: $EE = 0.201CC + 0.300PM$;

Relationship between Entrepreneurship Education, Perceived Self-Efficacy, Perceived Desirability, Attitude toward Entrepreneurship, and Entrepreneurial Intention: $INT = 0.268EE + 0.208SEF + 0.341DSR + 0.245ATT$.

In summary, the hypotheses from 1st to 11th are accepted, while the 12th hypothesis is rejected.

5. Discussion

Entrepreneurship Education: The study confirms the substantial role of entrepreneurship education in predicting Vietnamese university students' entrepreneurial intentions, aligning with earlier findings (Gorman et al, 1997). Entrepreneurship education empowers students with skills and expertise, motivating them for post-graduation ventures. It notably influences perceived desirability, self-efficacy, and entrepreneurial intentions, though this contradicts some studies (Laukkanen, 2000).

Attitude toward Entrepreneurship: The study establishes a positive connection between entrepreneurship education and entrepreneurial attitude, supported by earlier research (Pihie & Bagheri, 2013; Fayolle & Gailly, 2013; Bell & Bell, 2016; Liu et al., 2019). Moreover, it identifies attitude's mediating role in linking education and intentions, affirming the effectiveness of the Theory of Planned Behavior (TPB) in Vietnam's developing economy.

Perceived Self-Efficacy: The study affirms the positive impact of entrepreneurship education on students' perceived self-efficacy, consistent with prior studies (Fitzsimmons & Douglas, 2011; Pihie & Bagheri, 2013). Effective programs endow students with relevant skills and knowledge, enhancing confidence to identify opportunities and pursue entrepreneurial success. Perceived self-efficacy mediates the link between education and entrepreneurial intentions, echoing earlier research (Duong, 2022).

Perceived Desirability: The study underscores the strong, positive influence of perceived desirability on entrepreneurial intentions, aligning with prior research (Krueger et al, 2000; Fitzsimmons & Douglas, 2011). Perceived self-efficacy further amplifies the appeal of entrepreneurship, as noted in other studies (Duong, 2022). Perceived desirability also mediates the relationship between entrepreneurship education and entrepreneurial intentions, resonating with earlier findings (Duong, 2022).

Demographic Differences: The study finds demographic factors do not significantly influence the impact of entrepreneurship education on entrepreneurial intentions. This suggests that entrepreneurship education should be integrated throughout standard university curricula rather than exclusively targeted at certain disciplines or final-year students.

6. Recommendation

6.1. For Universities

Universities play a key role in promoting entrepreneurship education. It's vital to include entrepreneurship as a core subject in various disciplines, update training programs to match the evolving startup landscape, and connect theory with practical case studies. Combining theory with practical experience is crucial. Offering certificate-granting extracurricular activities like internships and startup competitions helps students gain exposure to real-world projects and enhances their entrepreneurial mindset.

6.2. For state management agencies

The government should establish a standardized entrepreneurship education framework for universities and external organizations to integrate into the startup journey. Nationwide startup centers and hubs can offer practical programs based on past experiences to guide future initiatives. Initiatives like the National Startup Fund can support skill development, contests, and events, enhancing students' startup capabilities. State agencies should lead in formulating policies that make entrepreneurship an aspirational goal for the youth.

7. Limitations and Future Research

7.1. Limitations

In addition to the aforementioned contributions, this study does have certain limitations. Firstly, it

doesn't explore the progression of entrepreneurial intention over time, encompassing the period before and after students' involvement in entrepreneurial activities, nor does it establish a connection between intention and actual entrepreneurial behavior. Secondly, the independent variables within the research model are not exhaustive. The study focuses solely on individual cognitive indicators and demographic factors when assessing entrepreneurial intentions, overlooking significant aspects like personality traits, societal, cultural, environmental, economic, and national influences.

7.2. Future Research

There are potential extensions for this research. Firstly, future studies could track the entrepreneurial outcomes of the students previously surveyed regarding their business intentions in this study. This ongoing assessment could validate or disprove the findings and delve into the factors shaping students' progression from intention to actual entrepreneurial actions. Secondly, upcoming research might assess the influence of entrepreneurship education programs on students' entrepreneurial intentions using a two-stage approach with the same student group: (1) before participating in start-up training; (2) after participating in such programs.

8. Conclusion

Entrepreneurship education holds significant importance in preparing students for the challenges of starting a business, fostering their desire for entrepreneurship in an increasingly uncertain job market. This study examines the impact of entrepreneurship education on Vietnamese students' intentions to start a business, drawing from previous theories and concepts. This study employed qualitative research and quantitative research methods to determine how entrepreneurship education programs influenced Vietnamese students' intentions to start a business and the intermediate benefits that the pursuits offer.

Entrepreneurship education positively impacts students by enhancing their perceptions of business desirability and feasibility, as well as fostering a more positive attitude toward creating new ventures. This positive shift in perception

and attitude encourages students to venture into their own businesses. Furthermore, the study finds that the influence of entrepreneurship education on students' entrepreneurial intentions remains consistent across various demographic profiles, suggesting a broad effectiveness of such programs. The findings suggest that exposure to entrepreneurship education positively influences students' perceptions of business feasibility and desirability, shaping a more favorable attitude toward starting a new venture. The research provides recommendations for government agencies and universities to design effective programs and facilitate a conducive environment for students to realize their entrepreneurial aspirations.

Appendix: Measurement of Variables

Coding	Items	Source
Entrepreneurship Education (EE)		
EE1	1. Entrepreneurship education provided me with the vital knowledge and skills to start a business.	Walter & Block (2016)
EE2	2. Entrepreneurship education enhanced my ability to develop entrepreneurial networks.	
EE3	3. Entrepreneurship education helped me recognise business opportunities in an industry or market.	
EE4	4. Entrepreneurship education provided me with different sources from which I can obtain funding to start a business.	
EE5	5. Entrepreneurship education empowered me to solve economic and social problems in my area.	
Curriculum Contents (CC)		
CC1	1. The entrepreneurship curriculum enhances my ability to generate business ideas and undertake entrepreneurial project.	Developed by the authors
CC2	2. The entrepreneurship curriculum improves my skills to allocate resources and deal with risks.	
CC3	3. The entrepreneurship curriculum increases my understanding of market research and financial planning for venture creation.	
CC4	4. The entrepreneurship curriculum enables me to identify the characteristics of entrepreneurs (i.e., risk-taking propensity, proactivity, innovativeness)	
CC5	5.. The entrepreneurship curriculum provides me with tools for start-ups such as BMC, Lean Canvas, Design Thinking, Customer Persona, etc.	
Pedagogical Methods (PM)		
PM1	1. The lecturers did an excellent job of delivering the entrepreneurship modules.	Developed by the authors
PM2	2. The lecturers have vast experience in mentoring and teaching entrepreneurship.	
PM3	3. The lecturers made extra efforts to assist students in applying the acquired entrepreneurial knowledge.	
PM4	4. I find the entrepreneurship models introduced by lecturers interesting and relevant to the real world.	
PM5	5. I am interested in the entrepreneurship modules because of experiential learning methods.	

Coding	Items	Source
Perceived Desirability (DSR)		
DSR1	1. I desperately want to work for myself.	Krueger et al (2000)
DSR2	2. I am excited about starting my own business.	
DSR3	3. I believe starting my own business is a great idea.	
DSR4	4. The idea of owning my own business is appealing to me.	
DSR5	5. My future career success lies in starting a business.	
DSR6	6. I think starting a business has more growth opportunities.	
DSR7	7. I consider an entrepreneurial career to be very desirable.	
Perceived Self-Efficacy (SEF)		
SEF1	1. To start a business and keep it working would be easy for me.	Liñán & Chen (2009); Nabi & Liñán (2013)
SEF2	2. If I tried to start a business, I would stand a high chance of being successful.	
SEF3	3. I know how to develop an entrepreneurial project.	
SEF4	4. I can identify business opportunities in the market for new products and/or services.	
SEF5	5. I have access to information and funding sources that support me in creating a new venture.	
SEF6	6. I know the necessary practical details to start a business.	
SEF7	7. I can control the process of creating a new venture.	
Attitude to Entrepreneurship (ATT)		
ATT1	1. A career as an entrepreneur is totally attractive to me.	Liñán & Chen (2009); Nabi & Liñán (2013)
ATT2	2. Being an entrepreneur would give me great satisfaction.	
ATT3	3. Being an entrepreneur implies more advantages than disadvantages to me.	
ATT4	4. If I had the opportunity and resources (finances, relationships...), I would love to start a business.	
ATT5	5. Amongst various career options, I would rather be an entrepreneur.	
Entrepreneurial Intention (INT)		
INT1	1. I am ready to do anything legal and morally acceptable to be an entrepreneur.	Liñán & Chen (2009); Nabi & Liñán (2013)
INT2	2. I will make every effort to start and run my own business.	
INT3	3. My professional goal is to be an entrepreneur.	
INT4	4. I am determined to start a business in the future.	
INT5	5. I plan to start my own business in the near future (i.e., within five years after graduating).	

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GLOBAL ENGAGEMENT AND REPUTATION IN HIGHER EDUCATION INSTITUTIONS: THE ROLE OF AI-CHATBOTS

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Abstract: *Chatbot is introduced as the new novel in this study in strengthening the training quality and global standard of High Education Institutions. The paper develops a new framework explaining the role of Chatbots on understanding the global engagement of HEIs in social responsibility and its impact on their service quality and reputation. By applying the quantitative research method, the data was collected by launching surveys to students who are studying at bachelor program and learning master programs at five universities in the North of Vietnam. Structural equation modeling through SPSS AMOS 20.0 was employed to analyze data. The results suggest that building responsible education training and managing the internal organization are the essential elements in implementing global engagement in social responsibility. This study also presents the moderating role of AI Chatbots in enhancing the relationship between global engagement, educational program, and organizational management.*

Tóm tắt: *Chatbot được giới thiệu như một điểm mới trong nghiên cứu này nhằm nâng cao chất lượng đào tạo và tiêu chuẩn toàn cầu của các cơ sở giáo dục trung học. Bài viết phát triển một khuôn khổ mới giải thích vai trò của Chatbot trong việc tìm hiểu sự tham gia toàn cầu của các trường đại học vào trách nhiệm xã hội và tác động của nó đối với chất lượng dịch vụ và danh tiếng của họ. Bằng việc áp dụng phương pháp nghiên cứu định lượng, dữ liệu được thu thập thông qua khảo sát sinh viên đang theo học chương trình cử nhân và học thạc sĩ tại 5 trường đại học phía Bắc Việt Nam. Mô hình phương trình cấu trúc thông qua SPSS AMOS 20.0 được sử dụng để phân tích dữ liệu. Kết quả cho thấy rằng xây dựng chương trình đào tạo giáo dục có trách nhiệm và quản lý tổ chức nội bộ là những yếu tố thiết yếu trong việc thực hiện cam kết toàn cầu về trách nhiệm xã hội. Nghiên cứu này cũng trình bày vai trò điều tiết của AI Chatbots trong việc tăng cường mối quan hệ giữa sự tham gia toàn cầu, chương trình giáo dục và quản lý tổ chức.*

• Từ khóa: *AI Chatbots, chương trình giáo dục, danh tiếng trường đại học, chất lượng dịch vụ.*

1. Introduction

In the era of "education 4.0", the AI integration in high education institutions is necessary under the impact of global changes including environment, economy, society, and technology (Sandu et al., 2019). In this context, universities need to "link ethics and responsibility to quality and their sustainable development" (Fedyunin et al., 2018, p.476). More especially, under the pandemic impact (COVID-19) happening in each country in the world, the AI Chatbot integration is still recognized as a powerful tool for university's survival. Consequently, it becomes urgent to investigate the impact of AI Chatbots on university's global engagement and their reputation.

As emerging economies are becoming globally in the era of artificial intelligence and are facing challenges with the Covid-19 pandemic, managers and policy-makers are forced to move to the online world to successfully connect with public (Aljaroodi et al., 2019; Nguyen, 2021). Service industries are implementing robots to serve customers through desktop interfaces (Forbes, 2017). Chatbot e-services are a good choice for firms to provide online interaction (Lee et al., 2017) and also a good application for high education institutions (HEIs) in their development (Mokmin & Ibrahim, 2021) because they are transfering to "advanced AI-powered autonomous angents". According to Melián-González et al. (2021), a chatbot is "a software program (robot or bot) that has conversations in natural language

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with users (chats)" and can be found in "several places: websites, mobile applications, smart speakers, amongst others". Chatbot is developed for convenience and based on "simple keyword matching techniques" (Shawar & Atwell, 2007). It is necessary to examine the future usefulness of AI Chatbots application in education, especially in social responsibility in HEIs. Unfortunately, the role of AI Chatbots has not been well defined in education theory and practice.

The role of universities in educating and providing outputs for the labor market, conduct as well as producing academic research has been changed (Martí-Noguera et al., 2017). Besides this role, universities currently need to engage with society (Markina et al., 2019). Sánchez-Hernández and Mainardes (2016) and Giuffré and Ratto (2014) later argued that universities need to accomplish four dimensions: education program (teaching), knowledge management (research project), internal management, and social engagement in order to implement social responsibility. From these perspectives, this current study examines the impacts of responsible education programs, social engagement, and organizational management on social responsibility.

One of the consequences of USR global engagement with the world is university reputation which has not been explored in-depth. There are many researches examining the effect of USR on student trust, service quality and student loyalty (Latif et al., 2021; Arambewela and Hall, 2006). They revealed that student satisfaction and loyalty are the best barometers of social responsibility which have been recognized by higher education institutions for obtaining competitive advantage. The main challenges of universities are to understand and deliver their resources to strengthen their reputation (Abouchedid and Nasser, 2002). These studies have discussed public views on USR and service quality and reputation. The ability to balance stakeholders' expectations and university resources has become the USR core value (Gonzalez-Perez et al., 2021). There is also a lack of a comprehensive understanding of how universities adopt the USR principle.

Even though the important role of USR global engagement to the competitiveness of universities is the main reason to seek sustainable development, academic initiatives rarely include all university's stakeholders and meet their expectations. Vietnam is selected as an empirical context to understand global engagement in HEIs. Consequently, this study seeks to contribute to bridging these gaps by understanding how USR global engagement is influenced and what USR global engagement results in. The current study aims to examine the impact of responsible education program, organizational management, and AI Chatbots on USR global engagement; and the association among global engagement, service quality, and university reputation.

2. Literature review and hypothesis development

2.1. USR global engagement

To make clear concept of USR, Vasilescu et al. (2010, p.4178) defined USR as "the need to strengthen civic commitment and active citizenship; it is about volunteering, about an ethical approach, developing a sense of civil citizenship by encouraging the students, the academic staff to provide social services to their local community or to promote ecological, environmental commitment for local and global sustainable development". Otherwise, Giuffré and Ratto (2014, p. 234), USR is "the ability of the University to disseminate and implement a set of general principles and specific values, using 4 key processes: Management, Teaching, Research and Extension, through the provision of educational services and transfer knowledge following ethical principles, good governance, respect for the environment, social engagement and the promotion of values". This is done by harmonizing institutional management and promote transparency and participatory dialogue among all university community members (i.e. government, students, faculty, and administrators) and various stakeholders. More recently, Latif (2018) defined USR as "a university's commitment to recognizing the interests of society and performing in a way that improves the well-being of its members through the provision of quality educational services". He addressed that USR is measured by university ethical responsibility, university research and university commitment to philanthropy.

2.2. Hypothesis development

2.2.1. Responsible education program and organizational management

In terms of responsible education program, to perform USR, universities are required to

improve not only academic services under social diagnosis, but also teaching quality and research projects. Christensen et al. (2007) mentioned responsible education program as a coverage of ethics, sustainable development in courses which are teached in universities. Borja and Rodríguez (2016) suggested that universities must implement their plans in creating associations with society at large, implementing complete integration policy, improve the pedagogical skills of the teaching staff and provide for society with highly qualified, competitive professionals. Universities should manage two effects of social responsibility which are oganizational and academic factors (Vallaeys, 2014). Oganizational factor describes the organizational management (labour and environmental) while academic factor presents educational or student training.

In terms of organizational management, Santos et al. (2020) suggest that organizational management of university or organizational function, similar to any the organization's impact on its workforce, have shapeed social action policies of university. The lack of organizational management in university is the weakness of university social responsibility. In hence, university should disseminate awareness, inculcate the individual value, make automatic conduct and moral obligation of all staff and students (Brdulak et al., 2020). From the findings of Wojciech (2021), the management of internal universities and dialogue with stakeholders are important for conducting social responsibility. His study also argues that universities should enhance the principals of SR in teaching, research, management systems, and internal organizations. In hence, all managerial levels in the university should be encouraged to implement USR programmes (Thanasi-Boçe and Kurtishi-Kastrat, 2021).

Given the above research, the following hypotheses were proposed for the present study:

H1: Responsible education program has a direct impact on global engagement of USR

H2: Organizational management has a direct impact on global engagement of USR

2.2.2. The moderating role of AI Chatbots

Several researches currently propose AI Chatbot application in HEIs. For example, Heryandi (2020) suggested Chatbot application in monitoring academic record for example student attendance, and grades, or records of financial fee. He stated that universities can "provide facilities for students or parents of students to view academic records easily, cheaply, and can be accessed anytime". Otherwise, Sreelaskshmi et al. (2019) demonstrated Chatbot application in education program such as question answering and quizz generation. They suggested "the Question Answering module uses ranking functions and neural networks to extract the most appropriate answer from the knowledge base and the Quiz Generation module identifies key sentences and generates question-answer pairs, which can be used to generate a quiz for the use". Moreover, Hien et al. (2018) stated that AI Chatbots should be used for administrative management and education support. When adopting newly useful technology as AI Chatbot, HEIs certainly increase their status and their ranking under the global education standard. Therefore, the hypotheses are proposed as follows:

H3a: AI Chatbots positively enhance the relationship between responsible education program and USR global engagement

H3b: AI Chatbots positively enhance the relationship between organizational management and USR global engagement

2.2.3. Global engagement, service quality, and university reputation

Service of higher education is long-term, universities need to have strategies for satisfying all their customers (Santos et al., 2020). University services have important role in student's life because student needs more motivation and skills (Subrahmanyam, 2017). Therefore, university quality service encourage students to be happy with their education program. Several previous research have been studied the impact of USR on service quality (Latiff et al., 2021; Kho et al., 2017). They suggested that university social responsibility significantly impact customer perceptions of service quality. USR implementation plays important role in influencing service quality (Vazquez et al., 2016). For improving service quality, universities are required to focus on strengthening their educational program and organizational management. In hence, the hypothesis is proposed:

H4: USR global engagement has a direct impact on service quality

Alessandri et al. (2006) stated that university reputation is considered as "collective representations that the university's multiple

constituents - various internal and external constituents, including the media - hold of the university over time". Several previous researches have demonstrated the positive influence of social responsibility on customers and their trust (Agarwar et al., 2015), and their satisfaction (Su et al., 2016). For potential customers, social responsibility increase the firm's reputation (Park et al., 2014). In terms of higher education institutions, "excellent corporate reputation attracts top tier teachers, good students and affect students' priorities in social and academic life" (Delgado-marquez et al., 2012). Basing on these findings, this study also suggests that higher education institutions having the high level of social responsibility will improve their reputation. Therefore, the hypothesis is proposed as follows:

H5: USR global engagement has a direct impact on university reputation.
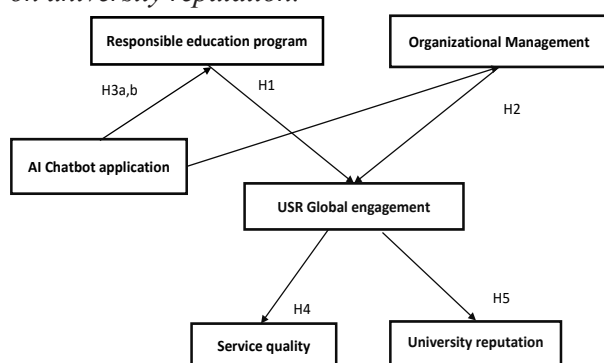
3. Methodology

3.1. Measurement

Responsible education program and organizational management were adapted and modified from Thanasi-Boçe and Kurtishi-Kastrati (2021). The scale included four items for education program, five items for organizational management and four items for social engagement. USR global engagement has three items and were developed based on BoKhari (2017). Service quality has three items and was adapted from Latiff et al. (2021). University reputation has three items and was validated from Ahmad and Ismail (2020). AI Chatbot was measured by four items and adapted from the work of Trivedi (2019). Early studies used a 5-point scale in measuring constructs, this present study consequently employed a five-point Likert scale for measuring study questions which range from (strongly disagree) to 5 (strongly agree) for all items in this study.

3.2. Data collection and sample

This study focuses on students who are studying at bachelor program and students who are learning master programs at five universities in Hanoi capital, Vietnam. Five hundred of students were kindly asked to engage in the survey by the permission of their Dean of Faculty at the end of each class. Three research assistants were trained to approach students. The process was strictly controlled and monitored by one of authors. The large scale survey was conducted on February to April 2021. The valid data available for analysis were 446, yielding an effective response rate of 89.2%. Regarding the information of respondents, the survey was completed exclusively by female (53.6%) and male (46.4%). Specifically, the paper observed that students in bachelor program is higher than those in master program (bachelor: 83.9%; master: 16.1%). The proportion of participants aged first year (25.1%), second year (23.4%), third year (22.1%), last year (21.5%), and master's degree (7.9%).

Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), Structural Equation Modelling (SEM) using SPSS AMOS 22.0 was used to test the research validity. EFA is used to decipher the underlying structure of the data that underpins survey responses (Watterson et al., 2021). In CFA, hypothesised models reflect an approximation to reality (Marsh et al., 1988) and SEM is usually used as a structural analysis for the covariance of a model (Cao et al., 2012). Since the study is a factor-based model, AMOS was used.

4. Results

4.1 Measurement model

The convergent reliability of all factors evaluated in the measurement model is reached with factor loading, average variance extracted values (AVE) of more than 0.5 (Hair et al., 2006), and Cronbach's alpha (CA), composite reliability (CR) values of more than 0.7 (Fornell and Larcker, 1981). Table 1 shows the AVE of the constructs, as well as the FL of items and descriptive statistics covering mean and standard deviation (SD). The measurement model achieved overall fit (Chi-square/df = 3.211; GFI= 0.942, CFI = 0.951; TLI = 0.942; RMSEA = 0.036) (Table 2).

Table 1. The reliability and convergent validity

Constructs/variables	Standard loadings	Cronbach's Alpha	Composite Reliability	AVE
Responsible education program (REP)		0.817	0.857	0.580
Curriculum development	0.779			
Environmental sustainability included in curricula	0.798			
Ethics included into curricula	0.689			
Entrepreneurship education	0.786			
Organizational management (OM)		0.821	0.872	0.600
Accountability	0.823			
Transparency	0.792			
Ethical behaviour	0.764			
Regulations, policies and procedures	0.755			
Facts and figures	0.728			
AI Chatbots (BOT)		0.817	0.866	0.570
I got necessary information about training courses and student management	0.715			
Chatbots provide response to queries as I expect	0.776			
Chatbots provide me a deep knowledge	0.725			
The information I got from Chatbots make me satisfied	0.751			
USR global engagement (SR)		0.915	0.848	0.630
Exploring real world issues	0.874			
Developing global standard for education programs	0.732			
Having environmental education and systems analysis	0.778			
Service quality (SQ)		0.873	0.803	0.570
Quality of teacher	0.646			
Quality of facilites	0.846			
Quality of services	0.845			
University reputation (UR)		0.861	0.892	0.610
The university retains a prestigious place	0.788			
The university has strong prospects for future growth	0.786			
I think highly of the university	0.789			

Table 2. Discriminant validity

Constructs	REP	OM	BOT	SE	SQ	UR
REP	**0.762**					
OM	0.635	**0.775**				
BOT	0.512	0.602	**0.755**			
SE	0.673	0.578	0.639	**0.787**		
SQ	0.559	0.595	0.604	0.626	**0.755**	
UR	0.502	0.610	0.621	0.594	0.587	**0.782**

4.2. Hypothesis testing result

The triple star (i.e. ***) in each table represents the p-value of less than 0.001 and the path coefficient (β) describes the hypothesised relationship between the dependent and independent variables. A p-value of less than 0.05 signifies the acceptance of the

hypothesis (Zaykin et al., 2002). The proposed hypotheses are accepted (Table 3).

Table 3. Path analysis results of the baseline model

Relationships			Path Coefficient	P	Test result
H1: Responsible education program	→	Global engagement	0.511	***	Supported
H2: Organizational management	→	Global engagement	0.217	0.013	Supported
H4: Global engagement	→	Service quality	0.415	***	Supported
H5: Global engagement	→	University reputation	0.523	***	Supported

Note: ***<0.001, *** <0.01. Chi-square/df = 3.219; GFI= 0.912, CFI = 0.911; TLI = 0.912; RMSEA = 0.052

Responsible education program and organizational management all positively affect global engagement. Responsible education program has a highest impact (0.502), following by social engegement (0.303). Organizational management has lowest impact on global engagement (0.218). The effect of global engagement in HEIs on university reputation (0.527) is higher than service quality (0.419).

The results (Table 5) show that the AI Chatbot enhances the relationship between education program and global engagement and has no link with global engagement and organizational management. Therefore, H3a is accepted, H3b is not supported.

Table 5. The results of testing the moderating role of AI Chatbot

Path	ß	t	p	LLCI	ULCI	Moderation
H6a: UCxSR →SQ	-0.017	0.751	0.353	-0.116	0.048	No
H6b: UCxSR → UR	0.251	0.282	0.007	0.139	0.549	Yes

Note: UcxSR: the interaction between university commitment and social responsibility

As can be seen from Table 5, AI Chatbots have a significantly positive impact on global engagement and education program (0.251).

5. Conclusion

This study empirically demonstrates that global engagement of HEIs through underlying mechanisms impacts AI Chatbots. Additionally, this study also contributes empirical evidence that USR global engagement is the credible strategy for HEIs in emerging economy to build and develop their image. In this vein, the theoretical contributions are provided to the extant literature. First, the findings show that responsible education program is found to be largest impact on global engagement. Basing from this finding, the paper highlights that

universities in emerging economies like Vietnam need to make large effort to enhance their teaching and training systems in order to meet the global education standard. Like teaching, researching play important in implementing USR because the research function is integrated across the universities. Second, universities are required to promote global engagement based on organizational management. These findings address the requirement for more internal communication with students and more external communication with society. Thirdly, the AI Chatbot application is important to enhance the university global engagement in both internal and external market. There is no research examining the outcomes of the AI Chatbots adoption in terms of HEIs, especially in developing countries. In hence, this research extends the education literature through the HEIs' ethical activities which create in a high university reputation. This study finally sends messages and guideline to HEIs, policy-makers, and governmental officials in the context of emerging economy.

Otherwise, the paper's findings also contribute some significant implications for practices. Firstly, universities need to facilitate the involvement of all their stakeholders when they adopt USR global engagement. Second, universities should seek funders in society, or funders from the trade agreement between their countries and foreign one to invest research projects. This activity will encourage students, lecturers and staff have motivation to do research. Third, with the IT development, universities have to explore technological innovation in their teaching and training. For example, as there are some issues raising from online education under the Covid-19 pandemic, universities in Vietnam should look for effective platforms (i.e., AI Chatbots) to prevent interrupted training courses. Lecturers at universities have not only ability to impact the intellectual level of their students, but also carry out the duties in the best manner in training, research as well as community responsibility. Fourth, universities have to reform their mission and strategy to implement USR global engagement as a central pillar.

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MEDIATING ROLE OF COMPETENCY FRAMEWORK BETWEEN PERCEIVED ORGANIZATIONAL SUPPORT AND MANAGEMENT PERFORMANCE OF SCIENCE, TECHNOLOGY AND INNOVATION IN VIETNAM

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Abstract: *Research purpose: Human Resource Development for Science, Technology and Innovation (STI) has been discussed by several scholars and previous studies show that perceived organizational support and competency framework forecasting management performance. However, lack of empirical reseach verified the competency framework as a mediator to enhance the extreme performance in STI state management. This study analyze how perceived organizational support affects management performance in Vietnam, especially emphasizing competency framework as an important mediator.*

Research design, approach, and method: This study analyze how perceived organizational support affects management performance in Vietnam, especially emphasizing competency framework as an important mediator. A survey of 188 officers from the Ministry of Science and Technology, Vietnam targeted at managers and seniors was conducted. We used exploratory factor analysis and regression to analyze the latent variables, research model and confirm the hypotheses.

Main findings: The finding implies that perceived organizational support associates with state management performance. This relation is also mediated by competency framework including common competencies and policy competencies to achieve excellence management performance.

Practical/managerial implications: The results contribute some more on the theory on competency framework and state organization performance practices. First, the perceived organizational support in the state organization context has been empirically studied, thereby confirming that is the mediating effect of competency framework between the perceived organizational support and management performance based on MOST' context. Additionally, we confirm a positive impact of the perceived organizational support to management performance in the field of science, technology and innovation in Vietnam.

This study provides practical advice for MOST's managers and leaders in changing their management practices for a better state management performance. Firstly, leaders support officers' competency development through on the job training or encoring self-learning culture. In addition, leaders should promote the perceived organizational support aspects of state officers so that they could be more confident to apply their potential knowledge into practice.

• Keywords: *policy competency framework, management performance, perceived organizational support.*

1. Introduction

Science and Technology plays a key role for social economics development worldwide. It has been affirmed in Vietnamese social-economics development strategy and Vietnamese science, technology and innovation development strategy by the year of 2030 (Vietnamese Government, 2022). To achieve the strategy goals and objectives, the development of human resource for STI management would be one of the important solutions to enhance in quality and quantity perspectives. Recent studies have shown strong relationship between perceived organizational support and performance in both individual and organizational aspects as well as mediating role of competency framework between perceived organizational

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support and extreme performance in enterprises and state organizations. That relationship needs to be analyzed in the context of state organizations and the impacts on the management of STI at the national level.

Competency Framework has been studied and applied in science, technology and innovation management in developed countries to promote both individual and organizational performance. For researcher career development in UK, the Research Development Framework (RDF) has been designed and applied widely in research institutes and universities to enhance the training, career planning, competency profiling and mentoring activities (Vitae, 2011). That would be the best practice of competency-based human resource management for STI development.

In Vietnam, competency framework has been studied and applied in enterprises for long-term performance as well as experimental purposes (Le, 2016). The strategy for science, technology and innovation development by 2030 has recently published and human resource for science and technology, especially management resource would be important success factors. For development of state management human resource, the competency framework has been studied and applied in the ministry of science and technology of Vietnam.

Therefore, it is essential to analyze the direct and indirect effects of perceived organizational support to performance of science, technology and innovation management context to suggest policy makers at the MOST of Vietnam to promote the perceived organizational support and competency framework to achieve the extreme performance and organization development.

2. Literature review and hypothesis development

2.1. Competency and competency framework

Competency was first introduced by McClelland (1973) and later on, different aspects of competency have been further studied and mostly reached a consensus that "competency as behaviors of a specific job to complete its tasks to ensure individual performance" (Tran et al., 2021a). The competency framework was conceptualized as the combination of knowledge and skills for an individual performance (Dubois and Rothwell, 2004).

As the advantages of the competency based HRD approach, competency frameworks for researchers, research managers have been studied and used at different organizations. The core and technical competency framework for managers in policy research and public administration was published (OECD, 2017). In 2010, the competency framework for scientific reseach, research management and personel management was proposed with 20 competencies to meet the successful task requirements in 2020 (APEC & DELOITTE, 2010).

The competency framework for state officers in the Ministry of Science and Technology, Vietnam has been empirically studied by Tran and Tu (2022) with 12 competencies divided into 2 domains: common competencies and policy competencies. This framework based on the policy circle and practical requirements of knowledge and skills for state officers to fulfill required tasks of STI management in Vietnam.

2.2. Perceived organizational support and management performance

According to Robbins (2019) perceived organizational support is the degree to which employees believe the organization values their contribution and cares about their well-being. POS can also be seen as an organizational commitment to employees. If the organization in general values the dedication and loyalty of employees as a form of employee commitment to the organization, then employees in general also pay attention to how the commitment the organization has towards them. POS can produce a perceived obligation to care about the welfare of the organization and to help the organization achieve its goals (Guan et al, 2014).

The effect of perceived organizational support on employee's performance has been tested and confirmed by Muhammad Ridwan, Sitti Rizki Mulyani and Hapzi Ali (2020). The result indicates that supervisor support is needed by employees to pay attention to employee welfare. The support of superiors who pay attention to welfare will ultimately affect the performance of SPMI employees of private universities in West Sumatra. Perceived organizational support had a positive relationship with job performance in the context of Pakistani employees in various organizations (Khan RU and Ghufran H, 2018). Thus, employees

that share their aims with organizational aims will perform their job better, highlighting the important role played by POS in achievement of in-role and extra-role performance.

Therefore, the first hypothesis was proposed as below:

H1: Perceived organizational support improves the management performance of state officer in the Ministry of Science and Technology in Vietnam.

2.3. Mediating role of competency framework between perceived organizational support and STI management performance

Saraswati and Putra (2020) analyze the influence of competence and creativity as a relationship that mediates between perceptions of organizational support for the performance of endek weaving craftsmen in Klungkung Regency, Bali Province. The results of the study show that perception of organizational support has a positive and significant effect on competence and performance. To increase organizational support can be done by improving procedural justice, getting support from superiors and giving awards in the form of increasing salary. To increase the competence and creativity can be done by increasing knowledge and skills with regular training related to tie weaving techniques, coloring and making new designs for craftsmen thus they can improve their competence and creativity. By doing these, it is expected that the craftsmen will be able to improve their performance both in terms of quantity, woven quality, timeliness in weaving and the ability to cooperate.

The relationship between perceived organizational support and management competencies has been verified and confirmed by an empirical study by Brandao et al., (2012). The greatest relative contribution to explain the management competencies came from intrinsic and extrinsic reflection, a learning strategy employed by managers at work. The managers' perceptions regarding the organizational support, appeared as another important predictor. Other learning strategies and dimensions of organizational support, as well as the number of hours spent on training activities, revealed less expressive effects regarding management competencies.

H2: Perceived organizational support positively influences Competency framework among state officers in the Ministry of Science and Technology in Vietnam.

Employee competency is a key factor for individual performance in different contexts and organizations. Some empirical research verified the impact of competency to management performance in different organizations (Cizel et al., 2007).

The results from the study of Sethumadhavan et al (2016) indicated that 'self-management' competency exerted the maximum influence on job performance followed by 'relationship management' and 'analytical skills'. In an Indian context, of the 200 managers surveyed from both public and private sectors, adaptability and flexibility were found to be the most prominent predictors of managerial performance (Bamel, Rangnekar, Stokes, & Rastogi, 2015).

Therefore, we propose the hypothesis as below:

H3: Perceived organizational support mediates the relation between competency framework and performance of state officers in the Ministry of Science and Technology in Vietnam.

3. Methodology

A quantitative research method was mainly applied to confirm the impact of policy competency framework to management performance of state officers in the Ministry of Science and Technology of Vietnam with the mediating role of perceived organizational support. Several discussions with HR professionals and state managers of different organizations were carried out to test the research model and instruments to ensure that the adapted scales are suitable for this context. Moreover, there were some in-depth interviews with state officers to understand the practice of competency framework, manager's support and management performance at their departments in MOST. The theoretical model is illustrated in Figure 1 and used for this analysis.

Fig.1. Research model
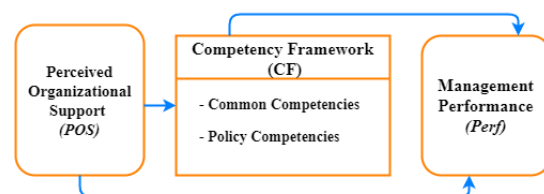
3.1. Samples and questionnaire

Following the data from the Ministry of Science and Technology of Vietnam there are around 600 state officers in more than 20 different departments.

The questionnaires were sent to all departments in MOST and there were 188 respondents, who were managers and officers with different management fields. The questionnaire composes of 36 questions about competency framework, manager's support and management performance, that was sent to officers and managers via google form survey.

3.2. Measurement instruments and scale

Competency framework: Qualitative research was used to analyze the competency requirements for state management tasks for science and technology based on secondary data and in-depth interviews, Tran and Tu (2022) proposed the competency framework for state officers of 2 dimensions such as common comptencies and policy competencies related to policy cycle (establishment, implementation and assessment). The measurement instruments of competency framework in this study was adapted from Tran and Tu (2022).

Perceived organizational support: adapting from previous studies, manager's support is also measured by different indicators showing: manager's willingness to share ideas, to support the difficult tasks, to listen to officers' opinions.

Management performance: as the state management based on polices, Tran and Tu (2022) proposed four indicators for state management performance related to performance by policy cycle: policy planning, policy implementation, policy assessment and other related task performance.

Five-point Likert scale was used for all scales of policy competency framework, self-efficacy and management performance with response options ranging from 1 = "strongly disagreed" to 5 = "strongly agreed".

3.3. Research results

With 188 valid responses, we analyzed and verified the hypotheses. The respondents were state officers working at different departments of MOST and they were directly or indirectly involved in the state management by policies. With respect to job classification, there were 29 high level officers (15%), 56 middle managers (30%) and 103 officers (65%). Regarding to management fields, there are 76 responses in professional authorities, 67 responses in professional departments and 45 responses in other supporting departments.

Reliability and validity tests are conducted for each of the constructs with multivariate measures. To measure the internal consistency of the multivariate scales, Cronbach's alpha was used. In this study, the Cronbach's α of each construct is greater than 0.7 in the table 1, suggesting a strong reliability for our survey instrument (Hair et al., 2006).

Table 1. Internal consitency of the multivariate scales

Construct	Number of items	Cronbach's alpha
Perceived Organizational Support	4	0.869
Competency Framework		
Common Competencies	13	0.941
Policy Competencies	20	0.918
Manangement Performance	4	0.852

In addition, an exploratory factor analysis was performed to ensure the reasonable constructs of the instrument. Using principal component analysis and varimax rotation, factors with eigenvalues greater than one and factor loadings greater than 0.6 were retained. Each variable's Cronbach α coefficient has surpassed 0.7, which manifests a relatively good reliability (Hair et al., 2006).

Table 2 presents the correlation matrix assessing the means, standard deviations, and bi-variate relationships by Pearson correlation among the variables in this study. All the correlations that we are interested in are statistically significant (sig. <0.01) and most of the Pearson correlation coefficients are more than 0.4. As can be seen in this table, the perceived organizational support variable is significantly related to performance (r =0.478, p<0.01). It is also correlated with competency framework (r = 0.361, p <0.01) and the competency framework is also corrrelated with performance (r=0.502, p<0.01). That means there are close relationship between perceived organizational support, competency framework and performance as our hypotheses.

Table 2. Correlation matrix

		Perceived Organizational Support	Performance	Competency_ Framework
Perceived Organizational Support	Pearson Correlation	1	.478**	.361**
	Sig. (2-tailed)		.000	.000
	N	188	188	188
Performance	Pearson Correlation	.478**	1	.502**
	Sig. (2-tailed)	.000		.000
	N	188	188	188

		Perceived Organizational Support	Performance	Competency_ Framework
Competency_ Framework	Pearson Correlation	.361**	.502**	1
	Sig. (2-tailed)	.000	.000	
	N	188	188	188

3.4. Hypothesis testing

Hypotheses testing included examination of regression analyses in predicting perceived organizational support and management performance. For each of the independent variables in the regression models, the square root of the variable inflation factor (VIF) was calculated (Fox, 1991). All of the variables in the analyses felt well within the accepted limits, indicating no problems with multicollinearity.

To analyze the first hypothesis, simple regression analysis was performed to establish the predictive power of perceived organizational support in management performance, the dependent variable in the linear regressions. The resulting linear regression and their corresponding adjusted R Square with standardization coefficients are presented in the above tables. This regression model is statistically significant with p < 0.01, explaining 22.4% (adjusted R^2) of the variation of organizational learning process. The result shows that the perceived organizational support (β=0.45, p<0.01) having positive effect on management performance. Therefore, hypothesis 1 is supported.

In order to test the mediation effect of competency framework between perceived organizational support and management performance, the simple linear regression was used with the dependent variable of performance. This simple regression model is statistically significant with p <0.01, explaining 24.8% of the variation of performance. The result shows that competency framework positively affects management performance (with β=0.436, p<0.01), indicating as significant support for the relationship. In addition to that, the perceived organizational support also positively affects the competency framework (with β=0.437, p<0.01), explanining 12,6% of the variation of competency framework. Therefore, hypotheses 2 and 3 are supported and the competency framework is the mediator of perceived organizational support and management performance.

Table 3. Regression analysis

	Dependent Variables		
	Manangement Performance (Model 1)	Manangement Performance (Model 2)	Competency Framework (Model 3)
Independant Variables			
Perceived Organizational Support		0.478**	0.361**
Competency Framework	0.450**		
R^2	0.229	0.229	0.131
Adjusted R^2	0.224	0.224	0.126
**significant at the 0.01 level (p<0.01)*			

Source: Authors

4. Results and discussion

4.1 Direct effect of perceived organizational support and STI management performance

In this study, we confirm the direct effect of perceived organizational support and state management performance. The result provides empirical evidence for the impacts of organizational supports on management performance directly and indirectly through competency framework. In state organizations, the perceived organizational supports which ensure the fulfillment of the state management functions is an important resource. With strong teams of state officers, MOST would successfully deal with difficulties in policy making and implementation issues. The organizational supports would be in detail of managers' support at work during the state management of STI. Therefore, the perceived organizational support which may learnt from international experiences could be one of the important tools for state officer career development and performance the management.

4.2. Mediating role of competency framework between perceived organizational support and management performance

In addition, the second objective of this research is that the mediating role of competency framework between perceived organizational support and management performance has been tested. It implies that to achieve and sustain the performance in state management context, the competency framework should be taken care beside perceived organizational support so that the confidence would be created that leads potentials of each officer into extreme management performance.

As long as the above competency framework has been perceptionalized properly and effectively, state officers are capable enough to deliver their tasks related to policy with more successful results.

With these above findings, the authors would like to recommend leaders and managers in MOST to pay more attention to the development of perceived organizational support and policy competencies of officers for better state management performance. In addition, perceived organizational support should be promoted and aware within departments and organizational level so that the potentials of each officer will be realized and converted into excellence of management performance.

Finally, the authors should mention that this research has a number of limitations leading us to possible further studies. Perhaps, its most significant limitation is associated with its' data collection from the ministry. That is difficult to show the representative for all state officers in the science and technology in Vietnam and that promotes the further study in other ministry also. The second limitation of the current study relates to its use of perceptual measures for management performance instead of using both objective measures and perceptual ones.

Conclusion

The results contribute some more on the theory on competency framework and state organization performance practices. First, the perceived organizational support in the state organization context has been empirically studied, thereby confirming that is the mediating effect of competency framework between the perceived organizational support and management performance based on MOST' context. This clarifies the key role of policy competency framework in applying knowledge to enhance management performance through practice. Additionally, we confirm a positive impact of the perceived organizational support to management performance in the field of science, technology and innovation in Vietnam. That indicates the direct impact of managers' supports to management performance and indirectly through competency framework by mediating effect.

This study provides practical advice for MOST's managers and leaders in changing their management practices for a better state management performance. Firstly, leaders support

officers' competency development through on the job training or encoring self-learning culture. In addition, leaders should promote the perceived organizational support aspects of state officers so that they could be more confident to apply their potential knowledge into practice. Through such mechanisms, state officers' capability in terms of individual will be strengthened in the long term.

The strategy for Science, Technology and Innovation development in Vietnam by 2030 had been published and emphasizing the important role of human resource of STI managers at both the ministry and provincial level in promoting the social-economics sustainable development. In such context, state officers' capability development could be very important initiatives for STI development in Vietnam such as: competency-based training, talent attracting and recruitment. Thus, individual and organizational capability could synchronously improve to meet the requirements for supporting and working with enterprises by policy cycle management.

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DETERMINANTS OF UNDERGRADUATE STUDENTS' ADOPTION AND USAGE OF E-WALLETS: A QUANTITATIVE STUDY IN HANOI

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Abstract: *The rapid digitalization of payment methods, particularly the increasing trend of e-wallet adoption among youth, is transforming financial transactions. This study examines the factors influencing the adoption and usage of e-wallets among undergraduate students. It employs techniques like Exploratory Factor Analysis (EFA) and Partial Least Squares Structural Equation Modeling (PLS-SEM) on data collected from 220 valid responses through structured questionnaires in Hanoi, Vietnam. The findings reveal four positive factors impacting students' e-wallet adoption and usage: perceived usefulness, perceived ease of use, rewards, and trust. Notably, trust exhibits the strongest correlation with actual usage, indicating its significant influence compared to other factors. The study contributes to understanding the behaviour of the important customers group for e-wallet providers in Vietnam.*

Tóm tắt: Quá trình số hóa nhanh chóng các phương thức thanh toán, đặc biệt là xu hướng sử dụng ví điện tử ở giới trẻ, đang làm thay đổi các giao dịch tài chính. Nghiên cứu này xem xét các yếu tố ảnh hưởng đến sự chấp nhận và sử dụng ví điện tử của sinh viên đại học. Nhóm tác giả sử dụng các kỹ thuật như Phân tích nhân tố khám phá (EFA) và Mô hình cấu trúc bình phương nhỏ nhất từng phần (PLS-SEM), dựa trên dữ liệu được thu thập từ 220 đối tượng nghiên cứu tại Hà Nội, Việt Nam. Kết quả cho thấy bốn yếu tố sau tác động dương đến việc chấp nhận và sử dụng ví điện tử của sinh viên: nhận thức về tính hữu ích, nhận thức về tính dễ sử dụng, phần thưởng và sự tin cậy. Đáng chú ý, sự tin cậy thể hiện mối tương quan mạnh nhất với hành vi sử dụng thực tế. Nghiên cứu góp phần tìm hiểu hành vi của một nhóm khách hàng quan trọng đối với các bên cung cấp dịch vụ ví điện tử tại Việt Nam.

• Từ khóa: *sự áp dụng, ví điện tử, ý định, mô hình chấp nhận công nghệ, sinh viên đại học.*

1. Introduction

Vietnam's high mobile device ownership (JPMorgan, 2019) has positioned mobile payments as a potential replacement for cash. With robust adoption among youth and a competitive landscape featuring 48 e-wallet providers (SBV, 2022), Vietnam offers a lucrative market for digital wallet services. SBV's efforts during the pandemic spurred cashless and digital transactions culminating in nearly 920 million smartphone transactions, totaling $4.1 billion by Oct 2020 (Decisionlab.co, 2021). E-wallet adoption has continued to soar, driven by convenience and security. Vietnam's e-wallet transactions hit $15 billion in 2021, projected to grow at 15.7% CAGR till 2025 (PwC, 2021).

The research aims to uncover the reasons behind individuals' adoption of new e-wallets and provide insights for foreign e-wallet providers seeking to enter the Hanoi, Vietnam market. It contributes to the technology acceptance literature, particularly in the context of e-wallets and mobile payments. The study focuses on undergraduate students in Hanoi's educational institutions, conducted between June 2020 and June 2023, with the main survey conducted in May 2023.

Employing a quantitative approach, the study collects data through online survey questionnaires shared on social media groups. The questionnaires, aligned with established measurements, cover six dimensions of e-wallet adoption and usage. Analysis involves SPSS 29 for scale reliability, correlation, and multiple regression analysis. The more

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comprehensive Structural Equation Modeling (SEM) using SmartPLS 4.0 assesses variable relationships, ensuring convergence and discriminant validity.

Therefore, the authors propose that the structure of the research paper is organized as following sections: (i) Introduction, (ii) Theoretical Framework and Literature Review, (iii) Methodology, (iv) Research Results, (v) Discussion, (vi) Recommendation; (vii) Limitations and Future Research, (viii) Conclusion.

2. Theoretical framework and literature review

2.1. Theoretical framework

2.1.1. Technology acceptance model (Davis, 1989)

The Technology Acceptance Model (TAM), devised by Davis in 1989, provides a framework to comprehend user acceptance of information technology (IT) systems (Davis, 1989). Rooted in the Theory of Reasoned Action (TRA) by Ajzen and Fishbein (1975), extended by Ajzen as the Theory of Planned Behavior (TPB) in 1985, TAM emphasizes attitude, subjective norm, and perceived behavioral control in shaping usage intention (Ajzen & Fishbein, 1975; Ajzen, 1985).

TAM's applicability spans diverse sectors like healthcare, e-commerce, and education (Marikyan & Papagiannidis, 2021). Central to TAM are perceived usefulness and perceived ease of use (Davis, 1989). Perceived usefulness gauges technology's impact on performance, while perceived ease of use assesses its user-friendliness. TAM's prominence derives from its capacity to discern reasons behind technology acceptance through appropriate metrics, aiding in behavior prediction (Lai, 2017).

2.1.2. Technology acceptance model - extended (Chuttur, 2009)

Chuttur (2009) points out a limitation in the TAM model, as it lacks precise criteria to quantify perceived usefulness and ease of use, hindering the understanding of user perceptions. TAM2, introduced by Venkatesh and Davis in 2000, addresses this by incorporating five exogenous variables (subjective norm, image, job relevance, output quality, and results demonstrability) and two moderators (experience and voluntariness). These additions, encompassing social influences and cognitive aspects, offer a more comprehensive explanation of perceived usefulness for specific technologies.

2.1.3. Unified theory of acceptance and use of technology (Venkatesh et al, 2003)

Alongside TAM, the Unified Theory of Acceptance and Use of Technology (UTAUT) is extensively employed in prior studies (Dwivedi et al., 2020; Ramli & Hamzah, 2021; Esawe, 2022). UTAUT, proposed by Venkatesh et al. (2003), amalgamates constructs from diverse models into a unified framework, elucidating drivers behind technology adoption (Oliveira et al., 2016; Giovanis et al., 2018; Jadil et al., 2021).

UTAUT features four key constructs shaping behavioral intentions and usage: performance expectancy, effort expectancy, social influence, and facilitating conditions (Kwateng et al., 2019; Luo et al., 2010; Oliveira et al., 2016). Performance expectancy gauges technology's task-enhancing potential, while effort expectancy assesses ease of use. Social influence captures societal expectations, and facilitating conditions encompass infrastructure support.

These constructs synergistically influence technology use through direct and indirect pathways (Venkatesh et al., 2003). Esawe's findings (2022) affirm UTAUT's robustness, indicating a notable 70% improvement in predictive accuracy.

2.1.4. Unified theory of acceptance and use of technology - extended (Venkatesh et al, 2012)

Since its inception in 2003, the UTAUT model has been widely applied to understand technology adoption in organizational and consumer contexts (Venkatesh et al., 2012). UTAUT2, an extension of the model, introduced three new constructs: hedonic motivation, price value, and habit, along with refining original relationships (Venkatesh, 2012). Hedonic motivation reflects user satisfaction, price value gauges perceived functional benefit, and habit assesses familiarity.

Notably, UTAUT2 was explicitly designed for predicting consumer technology adoption, distinguishing it from the original model focused on employee adoption (Oliveira et al., 2016). UTAUT and UTAUT2 have been widely employed to study e-wallet adoption across demographics, effectively explaining variables influencing increased service usage (Liang, 2016; Oliveira et al., 2016; Jadil et al., 2021; Esawe, 2022).

2.2. Literature review

Numerous socio-demographic factors exert considerable influence over the adoption and usage of e-wallets in Hanoi. Age and income level have been identified as pivotal determinants (Hoang & Nguyen, 2023). Younger individuals, owing to their technological familiarity and openness to novel payment methods, tend to embrace e-wallets more

readily. Likewise, higher-income individuals, often early adopters of digital payment solutions, are inclined to adopt e-wallets due to their greater disposable income (Hoang & Nguyen, 2023). The significance of users' perceptions regarding the ease of use and usefulness of e-wallets cannot be overstated (Nguyen, 2021; To & Trinh, 2021), consistent with the TAM framework. This sentiment is particularly relevant to undergraduate students, who prefer straightforward interfaces and hassle-free transactions (Do et al., 2020). A well-designed, user-friendly interface not only facilitates rapid comprehension of e-wallet functionalities but also contributes to a positive user experience and heightened adoption rates (Ariffin et al., 2021; To & Trinh, 2021).

Perceived benefits of e-wallets hold notable sway, particularly among undergraduate students (Do et al., 2020; Teo et al., 2020). The allure of consolidating various payment options, loyalty cards, and accessing rewards, discounts, and cashback incentives within a single digital platform contributes to their appeal (To & Trinh, 2021). Trust and security perceptions wield significant influence over e-wallet usage, with apprehensions about personal and financial information safety acting as barriers to adoption (Dang, 2021). Assurances of transactional security and safeguarding sensitive data from unauthorized access are pivotal to user acceptance. Merchant acceptance of e-wallets assumes a pivotal role, impacting their usage. The breadth of businesses, from local shops to small vendors, that accept e-wallet payments influences adoption rates (Ramli & Hamzah, 2021). Enhanced merchant acceptance augments convenience and diminishes reliance on cash transactions.

3. Research methodology

3.1. Research model and hypothesis

Figure 3.1. Research model
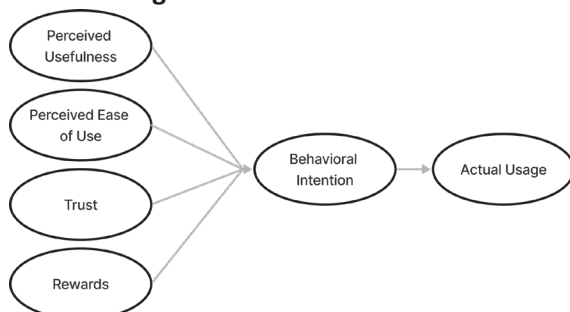
Davis et al. (1989) questioned the effectiveness of social norms scales like those in UTAUT in assessing the impact of such norms on users' behavioral intention, especially for personal and voluntary

technologies like e-wallets. Additionally, TAM was designed to evaluate technology acceptance across diverse contexts (Chau & Hu, 2002). Drawing from these frameworks, our study proposes a model and hypotheses by merging TAM and UTAUT constructs to pinpoint influential factors in consumers' e-wallet use. The model includes four latent constructs with the following hypothesized relationships.

H1: Perceived ease of use positively influences students' behavioral intention of using e-wallets.

H2: Perceived usefulness positively influences students' behavioral intention of using e-wallets.

Prior studies support TAM's effectiveness in explaining e-wallet usage, despite mixed results. Perceived usefulness is key for technology acceptance and intention to use (Turner et al., 2010), while the impact of ease of use varies (Shaw, 2014). High perceived ease of use and usefulness jointly boost behavioral intention and e-wallet adoption (Sarmah et al., 2021; Ming et al., 2020).

H3: Trust positively influences students' behavioral intention of using e-wallets.

Trust plays a vital role in promoting technology adoption (Fukuyama, 1996), particularly for e-wallets where it mitigates social complexity when interacting with vendors (Gefen et al., 2003). Trust is pivotal for the success of online services, influencing both usage intention and actual usage (Duane et al., 2012; Ariffin et al., 2021; Sarmah et al., 2021).

H4: Rewards positively influence students' behavioral intention of using e-wallets.

Rewards significantly enhance user satisfaction with E-wallet services, driving higher behavioral intention and frequent usage (Wang et al., 2019). Ariffin et al. (2021) suggest that customer perception of value, encompassing rewards, security, and time saved, positively impacts continued e-wallet usage.

H5: Behavioral intention positively influences students' actual usage of e-wallets.

Behavioral intention refers to the extent of a person's conscious planning for future behavior (Chai et al., 2014). In line with the UTAUT model, prior research utilizing the UTAUT framework affirms a significant positive association between behavioral intention and actual usage, as noted by Esawe et al. (2022).

3.2. Data

To assess e-wallet behavioral intention and usage among university and college students in Hanoi,

a survey will be conducted using Google Forms, distributed through students' social media groups like Facebook. Anonymous responses will be collected for subsequent analysis. Following the guideline of multiplying indicators for independent latent variables by 10, with a minimum of 100 observations (Hair et al., 1998), a sample size of at least 160 is aimed for. With 225 responses collected over three weeks, 220 were valid, while five were incomplete.

After data collection, responses will be quantified in Google Sheets and imported into SPSS 29. SPSS will provide demographic analysis, descriptive statistics, Cronbach's alpha for convergence validity, and Exploratory Factor Analysis (EFA) to refine the model. SmartPLS 4.0 will conduct Partial Least Squares Structural Equation Modeling (PLS-SEM) to validate hypotheses. The questionnaire, structured with Likert scale statements (1-5), reflects previous e-wallet intention and usage studies. It begins with qualitative demographic questions, followed by scales measuring behavioral intention and e-wallet usage.

4. Research result

4.1. Descriptive statistics

Table 4.1. Descriptive Statistics for Indicators

Variable	N	Min	Max	Mean	Std. Deviation
PU1	220	2	5	4.32	.733
PU2	220	2	5	4.1	.710
PU3	220	2	5	4.25	.672
PU4	220	3	5	4.19	.634
PE1	220	1	5	2.36	1.289
PE2	220	1	5	2.59	1.239
PE3	220	1	5	2.56	1.166
PE4	220	1	5	2.46	1.230
T1	220	1	5	4.05	.930
T2	220	2	5	3.93	.770
T3	220	1	5	3.74	.888
T4	220	1	5	3.86	.993
R1	220	2	5	4.16	.694
R2	220	1	5	4.21	.772
R3	220	2	5	4.13	.748
R4	220	2	5	4.05	.793
Valid N: 220					

Among the 220 responses gathered, the largest portion of participants are currently enrolled at Foreign Trade University, constituting 70 responses. This is followed by students from National Economics University and Banking Academy, contributing 46 and 35 responses, respectively.

The survey examined participants' e-wallet usage. All respondents, comprising 100% of the sample, confirmed prior usage of e-wallets. In terms of the number of actively used e-wallets, the data shows comparable figures for those using one or two e-wallets, with only a minor 5% discrepancy between them. A substantial decline is observed for students using more than two e-wallets, as only around 25% actively utilize three or more mobile wallets.

4.2. Testing

Cronbach's alpha assesses internal consistency and reliability of a scale (Hair et al., 2017). A higher value (ideally > 0.6) indicates better consistency. Cristobal et al. (2007) suggest a threshold of 0.3 for Corrected Item - Total Correlation coefficient, validating indicators. Variables below 0.3 should be excluded.

Table 4.2. Reliability assessment of indicators

No.	Indicator	Corrected Item - Total Correlation	Cronbach's alpha if item is deleted
Perceived Usefulness (Cronbach's Alpha = .787)			
1	PU1	.634	.714
2	PU2	.528	.768
3	PU3	.621	.721
4	PU4	.609	.729
Perceived Ease of Use (Cronbach's Alpha = .771)			
5	PE1	.612	.699
6	PE2	.541	.743
7	PE3	.590	.708
8	PE4	.570	.719
Trust (Cronbach's Alpha = .814)			
9	T1	.618	.775
10	T2	.611	.777
11	T3	.677	.745
12	T4	.634	.765
Rewards (Cronbach's Alpha = .770)			
13	R1	.636	.684
14	R2	.525	.740
15	R3	.553	.724
16	R4	.578	.711
Behavioral Intention (Cronbach's Alpha = .812)			
17	BI1	.619	.771
18	BI2	.631	.768
19	BI3	.670	.746
20	BI4	.616	.773
Actual Usage (Cronbach's Alpha = .791)			
21	AU1	.521	.780
22	AU2	.679	.698
23	AU3	.557	.760
24	AU4	.650	.715

All latent constructs exhibit Cronbach's alpha above 0.7, and indicator coefficients for corrected item-total correlation surpass 0.3, ensuring the validity of all model variables for exploratory factor analysis (EFA). EFA aims to assess convergence and factor discriminant value of the 16 observed variables, optimizing their reduction to more meaningful

factors. Unsuitable variables will be eliminated before conducting EFA for accurate results.

The extracted sums of squared loadings equal = 64.325% (> 50%), implying that one construct extracted from EFA reflects 64.325% of variance from four observed variables.

The extracted sums of squared loadings equal = 61.766% (> 50%), implying that one construct extracted from EFA reflects 61.766% of variance from four observed variables. After having completed EFA for all constructs, the results shows that the following indicators are suitable for further analysis.

4.3. Regression result

The results show that all variables have an outer loading coefficient greater than 0.7, suggesting that all latent constructs in the model can explain at least 50% of the indicators' variance (Hair et al., 2016). Thus, all indicators should be kept as-is. To test whether or not the constructs in the model are interrelated with one another, this study shall employ Fornell - Larcker criterion to assess discriminant validity. According to Fornell and Larcker (1981), the square root of the AVE by a construct must be greater than the correlation between that construct and any other construct.

Table 4.3. Discriminant validity assessment of constructs

	Actual Usage	Behavioral Intention	Perceived Ease of Use	Perceived Usefulness	Rewards	Trust
Actual Usage	0.785					
Behavioral Intention	0.699	0.802				
Perceived Ease of Use	0.447	0.589	0.774			
Perceived Usefulness	0.570	0.659	0.554	0.8		
Rewards	0.421	0.585	0.650	0.482	0.798	
Trust	0.742	0.622	0.418	0.576	0.411	0.852

The AVE of every construct is higher than the correlation between a construct and any other constructs in the model. Therefore, the scales of the research variables all have discriminant values. The results of model estimation by implementing Bootstrapping method with sample size of 220 are shown in the table below:

Table 4.4. Bootstrapping results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Behavioral Intention → Actual Usage	0.625	0.638	0.058	10.829	0.000
Perceived Ease of Use → Behavioral Intention	0.117	0.121	0.049	2.416	0.016
Perceived Usefulness → Behavioral Intention	0.238	0.239	0.066	3.597	0.003
Rewards → Behavioral Intention	0.416	0.415	0.071	5.823	0.003
Trust → Behavioral Intention	0.273	0.273	0.066	4.118	0.000

The results suggest that five out of five hypotheses are statistically significant at p-value < 0.05, meaning all of the hypotheses derived from the model are accepted.

Table 4.5. Correlation among latent constructs

	Actual Usage	Behavioral Intention	Perceived Ease of Use	Perceived Usefulness	Rewards	Trust
Actual Usage	1					
Behavioral Intention	0.699	1				
Perceived Ease of Use	0.447	0.589	1			
Perceived Usefulness	0.570	0.659	0.554	1		
Rewards	0.421	0.585	0.650	0.482	1	
Trust	0.742	0.622	0.418	0.576	0.411	1

The model has established significant correlation among latent constructs, with the highest correlation with coefficient belonging to the relationship between Trust and Actual Usage. In terms of Behavioral Intention, Perceived Usefulness has the highest correlation coefficient of 0.659. Between the mediating variable and the dependent variable, the correlation coefficient between Actual Usage and Behavioral Intention is 0.699, implying a relatively strong relationship and thus verifying the ability of this mediating variable in measuring actual usage of e-wallets among students.

5. Discussion

The study has identified several factors that positively influence the adoption and usage of e-wallets among university students in Hanoi. The study has successfully revealed that perceived usefulness, perceived ease of use, rewards and promotions, as well as trust in the service, all contribute positively to both the actual usage of e-wallet platforms and the intention of Hanoian university students to adopt and utilize such services.

Regarding the correlations, the study has established that behavioral intention significantly and positively affects the actual usage of e-wallet applications. Additionally, perceived usefulness and trust exhibit significant positive relationships with students' intention to adopt e-wallets. These results align with prior literature that has examined intention and usage within the framework of TAM and UTAUT models, thereby contributing to the existing body of

research on this model's capability in analyzing and identifying the intention to adopt and use e-wallets.

Notably, perceived usefulness plays a pivotal role in driving students' adoption and usage of e-wallets. The perception that e-wallets offer value, convenience, and practical benefits in daily life enhances the likelihood of students embracing and actively using these platforms. This perception can be shaped by various factors such as seamless payment experiences, financial management tools, and integration with other services that amplify students' overall convenience and efficiency.

Perceived ease of use significantly impacts e-wallet adoption among university students, driven by their perception of platforms' user-friendliness and navigability. Streamlined registration, clear transactions, and simple instructions foster positive perceptions and higher adoption rates.

Rewards and promotions effectively motivate Hanoian university students to choose e-wallets over traditional methods. The allure of rewards such as cashback and discounts enhances intention to adopt and actively use e-wallets, driving increased usage.

Trust in e-wallet services is critical for adoption. Students need confidence in security and reliability. E-wallet providers must prioritize robust security, transparent communication, and positive experiences to cultivate trust, contributing to sustained usage.

The study innovatively combines elements from TAM and UTAUT, introducing "Rewards," less explored in prior research. Findings align with Wang et al. (2019), confirming rewards' positive impact on intent and usage, with a stronger influence on intent. Targeting Hanoi university students, the research informs tailored strategies for e-wallet providers to boost usage in this segment.

6. Recommendations

E-wallet service providers in Hanoi can strategically target perceived usefulness, perceived ease of use, rewards and promotions, and trust to boost adoption among university students. By improving user experiences, offering attractive incentives, ensuring security, and catering to student needs, providers can effectively engage this important demographic and establish a thriving e-wallet ecosystem within universities. Trust-building efforts, including transparency, strong security measures, and education, are crucial for sustained usage and loyalty. The study underscores the significance of trust in driving adoption and usage. E-wallets should focus on building trust through transparent transactions, privacy policies, and robust security measures. Educational campaigns and clear communication about safety can enhance students' confidence in using e-wallets.

Moreover, the influence of rewards on intention to use highlights the need for sustained engagement strategies. E-wallets should ensure rewards are valuable, frequent, and easy to earn to maintain student interest. Additionally, factors like convenience, merchant acceptance, and usability also impact usage decisions. The study's findings emphasize the importance of highlighting e-wallet usefulness, especially for students facing constraints. By showcasing benefits like convenience and financial access, providers can enhance adoption and loyalty. Customizing marketing and seeking student feedback further enhance satisfaction and engagement.

7. Limitations and future research

The selected sample size exhibits a lack of diversity due to constraints in resources. Focusing solely on high-ranking institutions in Hanoi and top-tier universities narrows the sample to academically oriented and potentially wealthier students, limiting representation of diverse backgrounds and perspectives. Additionally, the small sample of 220 respondents further restricts generalizability. Furthermore, this study concentrates on e-wallet adoption intention among undergraduates, missing potential gaps between intention and actual usage. Limited empirical evidence exists for the correlation between intention and conversion to actions. Thus, the study might not fully capture complexities in translating intentions into consistent e-wallet usage. Control and moderating variables like demographics, income, peer influence, and attitudes towards cashless transactions specific to undergraduates are not thoroughly analyzed.

Considering the outlined limitations, future research should prioritize larger, more diverse samples for increased representativeness. Addressing the intention-usage gap demands deeper exploration. Enhancing realism requires the inclusion of additional control and moderating variables. These steps can contribute to bridging theory and practice in the field.

8. Conclusion

In a competitive market where the top 3 companies dominate 90% of the share (Nhu, 2022), new e-wallet entrants encounter challenges. This study identifies four positive factors shaping university students'

intent and usage of e-wallets in Hanoi: perceived usefulness, ease of use, rewards, and trust. Providers can leverage these insights to attract and retain users among Hanoi's students. Priorities include building trust, devising appealing rewards, and enhancing perceived utility. In the future, this model can be applied to a broader audience for comprehensive insights into e-wallet adoption factors.

Obtaining up-to-date data specifically focused on e-wallet adoption among Hanoi's university students posed a notable challenge. While prior literature laid groundwork for understanding general e-wallet factors, acquiring context-specific insights proved difficult. Subjective constructs added complexity, relying on varying personal perceptions influenced by experiences and culture. Ensuring measurement reliability required careful refinement. Sample selection also presented challenges, striving for diversity yet facing potential self-selection bias. Future studies can enhance measurement by incorporating more UTAUT variables or exploring different demographics like gender and income.

Recognizing these limitations is crucial for refining and advancing future research. Collaboration among researchers, e-wallet providers, and stakeholders can enhance comprehension of adoption factors among university students in Hanoi and extend insights to a broader user base, offering a more holistic view of e-wallet usage dynamics.

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THEORETICAL EXPLORATION OF THE IMPACT MECHANISMS OF SELECTED MACROECONOMIC FACTORS ON THE DEVELOPMENT OF THE CORPORATE BOND MARKET

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Abstract: *In this paper, we focus on exploring the theoretical framework regarding the mechanisms through which certain macroeconomic factors impact the development of the corporate bond market. We construct a comprehensive theoretical framework to gain deeper insights into how factors such as national financial conditions, interest rates, global economic conditions, and other variables can influence the operations and growth of the corporate bond market. The outcomes of this study not only provide insightful perspectives on the impact mechanisms of macroeconomic factors on the corporate bond market but also contribute to identifying crucial factors that require management and adjustment to promote the sustainable development of this market. This can aid financial managers, experts, and policymakers in better comprehending how to foster a positive economic environment through the growth of the corporate bond market.*

• Keywords: *corporate bond market, economic growth, financing, financial markets.*

Tóm tắt: *Trong bài báo này, chúng tôi tập trung khám phá khung lý thuyết liên quan đến cơ chế mà các yếu tố kinh tế tổng hợp cụ thể ảnh hưởng đến sự phát triển của thị trường trái phiếu doanh nghiệp. Chúng tôi xây dựng một khung lý thuyết toàn diện để hiểu sâu hơn về cách các yếu tố như tình hình tài chính quốc gia, lãi suất, tình hình kinh tế toàn cầu và các biến số khác có thể ảnh hưởng đến hoạt động và sự phát triển của thị trường trái phiếu doanh nghiệp. Các kết quả của nghiên cứu này không chỉ cung cấp một góc nhìn thông sáng về cơ chế tác động của yếu tố kinh tế tổng hợp lên thị trường trái phiếu doanh nghiệp mà còn đóng góp vào việc xác định những yếu tố quan trọng cần được quản lý và điều chỉnh để thúc đẩy sự phát triển bền vững của thị trường này. Điều này có thể hỗ trợ các nhà quản lý tài chính, chuyên gia và nhà hoạch định chính sách hiểu rõ hơn cách thúc đẩy môi trường kinh tế tích cực thông qua sự phát triển của thị trường trái phiếu doanh nghiệp.*

• Từ khóa: *thị trường trái phiếu doanh nghiệp, tăng trưởng kinh tế, tài trợ, thị trường tài chính.*

1. Introduction

The corporate bond market plays a pivotal role in fostering economic growth and providing financing opportunities for businesses. Understanding the underlying dynamics that influence its development is of paramount importance for policymakers, financial institutions, investors and corporate entities alike. This paper delves into the theoretical exploration of the intricate interplay between selected macroeconomic factors and the growth trajectory of the corporate bond market. In recent years, the corporate bond market has gained increasing significance as a vital component of the broader financial landscape. Its evolution is shaped not only by micro-level corporate decisions but also by a multitude of macroeconomic forces. Factors such as national economic conditions, interest rate fluctuations, global economic trends, and regulatory changes all contribute to shaping the landscape in which corporate bonds operate.

This study seeks to provide a comprehensive theoretical framework that elucidates the mechanisms through which these macroeconomic factors exert their influence on the corporate bond market. By delving into this nexus of interactions,

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we aim to enhance our understanding of the dynamics that drive the growth and performance of the market.

The implications of this research are far-reaching. By unraveling the complexities of how macroeconomic factors impact the corporate bond market, this study can offer valuable insights for policymakers looking to create an enabling environment for market growth, financial institutions seeking to manage risk and optimize investment strategies, and businesses considering diverse financing options. Moreover, this exploration contributes to the broader academic discourse on the intersection of macroeconomics and financial markets. The subsequent sections of this paper will delve into the theoretical framework, methodology, empirical analysis, and findings, with the ultimate goal of contributing to a deeper understanding of the factors that shape the development of the corporate bond market.

2. Literature review

The study of the interplay between macroeconomic factors and the development of financial markets, particularly the corporate bond market, has garnered significant attention from researchers and policymakers. A growing body of literature has explored the multifaceted relationships between these variables, shedding light on the mechanisms through which macroeconomic dynamics influence the functioning and evolution of corporate bond markets.

Macroeconomic Determinants of Corporate Bond Market Development: Numerous studies have investigated the impact of macroeconomic factors on the corporate bond market. Interest rates, often considered a fundamental driver, have been extensively examined for their effects on bond yields, pricing, and investor behavior (Campbell, 1995; Duffie, 2010). The macroeconomic environment, characterized by inflation, economic growth, and monetary policy, has been found to significantly influence corporate bond issuance and investor demand (Edwards, 1984; Fama, 1984).

Global Economic Trends and Market Integration: Global economic trends and external factors also play a crucial role in shaping corporate bond markets. Research has highlighted the significance of international economic linkages and contagion effects in transmitting shocks across markets (Forbes and Rigobon, 2002; Longstaff and Schwartz, 1995). The degree of market integration and the impact of cross-border flows on local corporate bond markets have been subjects of investigation (Eichengreen and Mody, 2000; Claessens and Forbes, 2001).

Regulatory Framework and Investor Behavior: The regulatory environment and investor behavior constitute integral components of the corporate bond market ecosystem. Studies have examined how regulatory changes, such as financial market liberalization and reforms, influence market development and risk-taking behavior (Levine, 1997; La Porta et al., 1997). Investor preferences, risk appetites, and market sentiment have been shown to interact with macroeconomic conditions, affecting bond issuance and pricing (Baker and Wurgler, 2007; Shleifer and Vishny, 1997).

Methodological Approaches: Methodologically, researchers have employed a variety of approaches to investigate the relationship between macroeconomic factors and corporate bond market development. Time-series analysis, panel data techniques, and event studies have been utilized to examine the impact of macroeconomic variables on bond yields, issuance volumes, and market liquidity (Goyal and Wahal, 2008; Swanson, 1998).

Conclusion: This literature review underscores the significance of understanding the intricate nexus between macroeconomic factors and the development of corporate bond markets. The existing body of research provides valuable insights into the mechanisms through which these factors exert their influence, contributing to a broader understanding of market dynamics. The subsequent sections of this paper will build upon these insights to further explore the theoretical mechanisms underlying the impact of selected macroeconomic factors on the corporate bond market's growth and development.

3. Theoretical framework of the impact mechanisms of macroeconomic factors on the development of the corporate bond market

Researching the impact of certain macroeconomic factors on the Financial Market in general and the Corporate Bond Market (CBM) in particular is not only necessary but also highly

beneficial. It contributes to formulating solutions to address potential negative impacts stemming from macroeconomic factors on the CBM, and it aids in developing the CBM in alignment with the economic context. In recent years, this issue has garnered substantial attention from financial researchers. This study presents foundational theories that explore the relationships between macroeconomic factors and the financial market as a whole, with a specific focus on the Corporate Bond Market. The objective is to shed light on the intricate dynamics between these macroeconomic variables and the CBM, aiming to provide insights into potential avenues for mitigation and development.

3.1. Efficient market theory or the efficient market hypothesis (EMH)

In the realm of financial markets, the Efficient Market Hypothesis (EMH) is built on the premise that the prices of financial assets (such as stocks and bonds) fully and instantly reflect all available market-related information concerning those financial assets. According to Fama (1970), a truly efficient market is one in which stock prices adjust immediately upon the emergence of new information. Stock prices are believed to incorporate both publicly disclosed and implicit information, suggesting that securities, including corporate bonds, are nearly perfect substitutes for each other. Consequently, large-scale buying or selling activities are unlikely to impact stock prices, leading to random and mostly normally distributed returns. In the case of genuine financial market efficiency, the prices of financial assets, including corporate bonds, are rapidly adjusted to all pertinent available information.

This theory has profound implications for policymakers and securities investors. Policymakers can freely implement macroeconomic policies without fearing that such policies will alter the fundamental nature of the stock market. Under the influence of macroeconomic factors on the Stock Market, the EMH theory posits that all present information relevant to macroeconomic shifts will be fully reflected in stock prices. Therefore, investors cannot expect to achieve abnormal returns by predicting future trends in the stock market.

Nevertheless, in stark contrast to the EMH conclusions, numerous studies have demonstrated that the Stock Market (including the Corporate Bond Market) in many countries is inefficient. Particularly, macroeconomic factors such as inflation rates, interest rates, money supply, exchange rates, among others, have shown a considerable influence on stock prices (both stocks and bonds). Several empirical studies, such as Tsoukalas (2003), Liu and Shrestha (2008), Nisa and Nishat (2012), Christopher Gan et al. (2006), Mukherjee et al. (1995), Smaoui et al. (2017), Bhattacharyay (2013), have provided evidence indicating the impact of crucial macroeconomic factors on stock prices. These studies have been instrumental in forecasting the cumulative yield rates. Additionally, the inclusion of macroeconomic variables in research models, as exemplified by Mukherjee et al. (1995), Smaoui et al. (2017), and Bhattacharyay (2013), consistently affirms the influence of macroeconomic factors on the scale and liquidity of the corporate bond market.

3.2. According to the quantity theory of money

According to Mishkin (2013), monetary policy (MP) is a pivotal macroeconomic instrument used by policymakers to achieve predefined economic goals. Managed by the Central Bank (CB), monetary policy (MP) aims to achieve specific objectives, including economic growth, controlling inflation, and ensuring exchange rate stability. MP's influence on the overall economy inevitably affects the Corporate Bond Market (CBM) through its components.

Drawing from the Quantity Theory of Money proposed by Brunner (1961), Friedman and Schwartz (1975), MP can impact the CBM through bond prices and yields by influencing investor portfolio allocation. When the Central Bank loosens the monetary supply, investors shift their holdings from cash to higher-yielding financial assets, including bonds (as per the Fisher effect). Increased demand leads to a rise in bond prices within the market.

Rozeff's (1974) Monetary Portfolio Model applies the Quantity Theory of Money to elucidate the relationship between money supply and stock prices (including bonds) through the conduit of MP. The impact of increased money supply elevates general price levels, subsequently escalating anticipated inflation rates within the economy. This projected rise in inflation (as per the Fisher effect)

contributes to nominal interest rate hikes. The Quantity Theory of Money posits that investors will transition from holding cash to other financial assets (including bonds) to pursue higher returns, thereby fostering an upward push in bond prices within the market.

Consequently, the influence of money supply on bond prices, as per the Quantity Theory of Money, can be expressed as follows, with MS representing money supply:

MS $\uparrow$ $\rightarrow$ due to the impact of the Fisher effect $\rightarrow$ bond demand $\uparrow$ $\rightarrow$ bond prices $\uparrow$.

3.3. According to the dividend discount model

Bonds are valued based on the full discounted cash flow method to be paid to bondholders in the future (Lưu Thị Hương and Vũ Duy Hào, 2013). Herein, the discount rate is the market's average interest rate or the expected investor interest rate at the valuation time. Drawing from Gordon's (1962) dividend discount model and Patelis's (1997) assertion, it is proposed that Monetary Policy (MP) can directly influence bond prices by impacting the discount rate used by investors. Ioannidis and Kontonikas (2008) argue that this influence operates under two assumptions: the discount rate used by market investors is closely related to the market interest rate, and the second assumption is that the Central Bank can affect the market interest rate. When the Central Bank engages in monetary expansion, it lowers market interest rates, thus reducing investor discount rates. This leads to a decrease in bond prices and vice versa.

Consequently, according to the Dividend Discount Model, denoting MS as money supply, r as the market interest rate, and BP as bond prices, the impact of money supply on bond prices can be summarized as follows: MS$\uparrow$ $\rightarrow$ r $\downarrow$ $\rightarrow$ BP $\uparrow$

Asserting changes in money supply beyond expectations aids in forecasting stock prices (including bonds) contrary to Fama's (1970) Efficient Market Hypothesis (EMH). Bernanke and Kutter's (2005) research suggests that unexpected increases in money supply signal future adjustments to MP. If the Central Bank is controlling the pace of money supply growth and investors trust that the Central Bank will counteract the unexpected money supply increase by tightening credit, it will lead to a rise in the

real market interest rate and a decrease in stock prices (including bonds). This is explained by the rise in required returns due to an increase in the real interest rate within the economy, combined with reduced expected cash flows of enterprises. Thus, only unexpected changes in money supply have an effect and can be utilized to predict bond prices:

MS $\uparrow$ beyond expectations $\rightarrow$ expected inflation $\uparrow$ $\rightarrow$ r $\uparrow$ $\rightarrow$ Y $\downarrow$, CF $\downarrow$ $\rightarrow$ BP $\downarrow$ MS $\uparrow$ beyond expectations $\rightarrow$ expected monetary tightening $\rightarrow$ r $\uparrow$ $\rightarrow$ Y $\downarrow$, CF $\downarrow$ $\rightarrow$ BP $\downarrow$ MS $\uparrow$ beyond expectations $\rightarrow$ policy uncertainty $\uparrow$ $\rightarrow$ increased risk $\rightarrow$ BP $\downarrow$ Where: Y is total output, CF is expected cash flow.

Given that the Corporate Bond Market (CBM) is a part of the broader financial market, reflecting economic production and activities, bond prices are sensitive to fluctuations in money supply. Expanding money supply to stimulate economic growth through lower interest rates encourages bond issuance by companies for investment, expansion, and profit increase.

According to the Dividend Discount Model, bond prices in the market will also rise when the market interest rate decreases, reducing the opportunity cost of investing in securities and boosting cash flow into the Corporate Bond Market, leading to higher bond prices. Therefore, each theory presents differences in explaining the relationship between Monetary Policy and bond prices in the Corporate Bond Market. However, collectively, the expansion of money supply (when signaled) affects bond prices in an upward trajectory and vice versa.

In addition to money supply, inflation is also a macroeconomic factor influencing the overall Stock Market and, specifically, the Corporate Bond Market. The value of investment securities (including bonds) is directly affected by inflation's dynamics, representing a fundamental risk in securities investment. Moreover, the operational business activities of companies issuing securities serve as the backbone of the Stock Market and the Corporate Bond Market. These activities are significantly impacted by inflation rates, thereby causing fluctuations in the prices of listed companies in the market. Several theories, such as the Real Business Cycle theory (Fama, 1981) and the Quantity Theory of Money, present various

explanations of inflation's impact on the Stock Market, specifically the Corporate Bond Market.

3.4. According to the real business cycle theory

Fama (1981) and his pioneering research with Gibbons (1982) introduced this theory. In this context, a dynamic and thriving economy generates high returns on invested capital while simultaneously producing a substantial volume of goods and services for the economy. Consequently, this leads to an increase in the supply of goods and services relative to the money supply. In other words, robust economic growth tends to suppress inflation. As a result, the inflation rate and the rate of return in the Stock Market (SM) generally, and the Corporate Bond Market (CBM) specifically, exhibit an inverse relationship.

According to this theory, a high inflation rate reduces real economic activity and actual demand. When economic activity declines, it negatively affects future corporate profits, subsequently leading to a decrease in bond prices. Supporting this theory, research conducted by Geske and Roll (1983), Barrows and colleagues (1994), Chen (2007), and others, provides additional evidence.

Thus, the Real Business Cycle Theory implies that the inflation rate and the actual growth of the economy play a crucial role in shaping the behavior of the Corporate Bond Market. As inflation rises, it exerts a dampening effect on real economic activity and corporate earnings, resulting in downward pressure on bond prices. This dynamic relationship between inflation, economic growth, and bond prices is a fundamental consideration in understanding the interactions within the Corporate Bond Market.

3.5. According to the money supply theory

This theory posits that investment opportunities within a competitive economy vie for capital resources, especially in markets like deposit, stock, gold, real estate, and foreign exchange markets. Capital will shift from investment opportunities with lower profitability to those with higher profitability (the Fisher Effect). A change in the supply of capital in the deposit market will influence the supply of non-deposit investment capital in general, and the stock market (including the Corporate Bond Market) specifically. Recent studies, as exemplified by Bordo and colleagues

(2008), have confirmed the relationship between capital shifts and government monetary policy. Specifically, when government monetary policy tightens to curb inflation, leading to higher bank interest rates, banks attract deposits, diverting capital away from the Stock Market (SM) in general, and the Corporate Bond Market (CBM) specifically. This decrease in available capital leads to a reduction in stock and bond prices, as well as a decrease in investment returns. Research conducted by Pradhan and colleagues (2018) utilized the VAR regression model to examine the Granger causality relationship between inflation, real interest rates, economic growth, and the development of the bond market and the Stock Market (SM) in the G-20 countries during the period 1991-2016. The results of the regression model reveal a series of noteworthy short-term and long-term causal linkages between these factors. In particular, the authors demonstrate that the development of the bond market, SM development, inflation rates, and real interest rates serve as driving forces for long-term economic growth. The Money Supply Theory is also used to analyze the impact of interest rates on the development of the Corporate Bond Market (CBM). Interest rates represent the cost of borrowing, thus changes in interest rates affect the allocation of investment capital in the market. According to the Dividend Discount Model, interest rates directly influence bond prices. Decreases or increases in interest rates result in corresponding changes in the present value of income from bond investments, as specified in Equation 2.4 (page 19). Lower interest rates resulting from expanded monetary policy by the government have a positive impact on bond prices. Monetary loosening stimulates consumption and investment, thereby driving economic growth. When capital costs are reduced, companies are incentivized to raise funds through bond issuance to execute investment projects, expand business operations, or reduce costs for leveraged companies. Increased company profits raise future expected cash flows and consequently bond prices. Conversely, when monetary policy tightens, interest rates rise, leading to reduced consumer spending and shopping, which negatively affects business operations and profits. This not only restricts credit growth but also makes it difficult for companies to obtain funding due to higher costs. As a result, bonds become

less attractive in the market. Overall, a decrease in interest rates leads to better economic growth, thereby causing the Corporate Bond Market to increase in line with the expectation of this interest rate decrease.

4. The theory of the relationship between economic growth and the development of the corporate bond market (CBM)

Studying the relationship between financial development and economic growth is not a new topic worldwide. Since the early 1990s, studies have paved the way for examining the connection between economic growth and the development of the financial market in general, and the stock market in particular, such as Bencivenga and Smith (1991), King and Levine (1993), Levine and Zervos (1998), Rousseau and Wachtel (1998), Beck and Levine (2002), Rousseau and Xiao (2007), Seetanah (2008), and more. Although various perspectives exist on this relationship, most studies affirm the significance of the financial market, in general, in influencing economic growth based on the following foundational theories:

4.1. The feedback hypothesis

Schumpeter (1911) developed the feedback hypothesis to explain the bidirectional causal relationship between a nation's finance and economic growth, suggesting that financial development and economic growth can complement and reinforce each other, leading to mutual advancement. This theory asserts that a nation with a well-developed financial system (including the development of the corporate bond market) can stimulate economic expansion through technological changes, product innovation, and financial services to cater to diverse economic entities, effectively addressing capital needs for production. Conversely, as the economy develops further, economic entities demand higher flexibility, utility, and returns from financial products and services.

The corporate bond market, a crucial component of the financial system, plays a vital role in promoting economic development through its key functions of capital mobilization and screening, supporting efficient projects. Thus, the positive relationship between these significant variables is manifested in the development of the corporate bond market, which is essential for fostering growth.

The development of financial institutions such as banks, the bond market (including the corporate bond market), the stock market, insurance companies, pension funds, securities firms, investment funds, and more, is essential for supporting fixed capital investment, enhancing firms' access to liquid capital, and solidifying inputs for the production process. A well-operating and developing financial market (including the corporate bond market) encourages savings to be channeled into investments, promoting technological advancement, innovation, and technology adoption, ultimately driving economic growth. Demirgüç–Kunt and Ross Levine (1995) pointed out that the financial market, in general, has a positive impact on economic growth.

Supporting this theory, Levine (1997) proposed a theoretical model for the relationship between the corporate bond market, the stock market, and economic growth, illustrating how the roles of the corporate bond market impact different channels of development, thereby influencing economic growth

Figure: Model of the relationship between financial market, stock market and economic growth

Source: Levine, R. (1997)
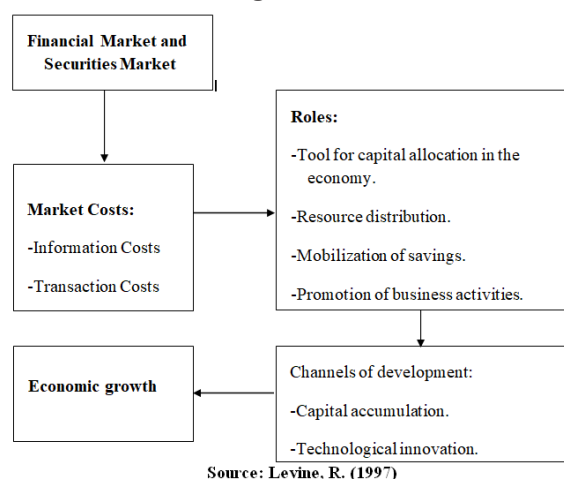
In his study, Khan (2001) argued that when borrowing capital is restricted, businesses in need of capital will access financing through financial intermediaries, aiming to achieve higher returns compared to other firms. As a result, the number of companies accessing capital from the corporate bond market (in general) and the corporate bond market (specifically) increases, leading to higher net

asset value for these firms. Over time, intermediary financial costs decrease, controlled and managed returns increase, driving higher investment returns and subsequent economic growth. This theory has been supported by empirical research conducted by authors such as King and Levine (1993), Jovanovic (1993), Caporale and others (2004), Claessens and Laevens (2002), Hahn (2002), Fink and others (2003), Darrat and others (2006), Pradhan and others (2018), and more.

4.2. The supply-leading theory and the demand-following

Theory Developed by Patrick (1966), these theories aim to illustrate the relationship between financial development and economic growth. The role of economic growth in driving the development of the financial system (including the bond market) varies across different stages of development. According to the Supply-Leading Theory, the relationship between finance and growth may change over time, particularly in the early stages where financial development leads to economic growth. Conversely, the Demand-Following Theory posits that after economic growth, the direction of impact reverses, meaning economic growth influences and propels the development of the financial system (including the bond market). Patrick assumes that businesses participating in the financial market will be agile in seizing profit-enhancing opportunities through financial services and will also issue securities (stocks, bonds) to raise capital for their production and business activities. This, in turn, provides a conducive environment for financial institutions to diversify in terms of quantity and scale, thus creating a diverse financial environment to serve businesses in the economy. Fritz (1984) arrived at a similar conclusion using the Granger Causality test in the case of the Philippines. However, McKinnon (1973), King and Levine (1993), and Levine and Zervos (1998) only support the Supply-Leading Theory, while Smaoui (2017), Bhattacharyay (2013), Eichengreen and Luengnaruemitchai (2004), Gurley and Shaw (1967), Goldsmith (1969), and Jung (1986) favor the Demand-Following Theory.

Therefore, although the theories may not fully capture the complexities, the aforementioned theories demonstrate that economic growth and certain macroeconomic factors impact the development of the financial market in general and the corporate bond market specifically. With the function of mobilizing idle funds from individuals and organizations to increase investment, thereby driving technological innovation. When the financial market in general and the corporate bond market specifically exhibit good liquidity, individual and institutional investors can easily diversify their investment portfolios, providing a multitude of buying and selling options, efficient information screening to minimize risks, and enhance profitability. This, in turn, strengthens the issuing companies of securities and contributes to the overall economic growth. Furthermore, a robust economic growth rate creates favorable conditions for increased savings and investment, thereby promoting the development of the financial market in general and the corporate bond market specifically, in alignment with the level of economic development.

5. Solutions for developing the corporate bond market under the influence of macroeconomic factors

Developing the corporate bond market under the influence of macroeconomic factors requires a comprehensive approach that addresses both the structural aspects of the market and the broader economic environment. Here are some potential solutions to foster the growth of the corporate bond market:

Enhance regulatory framework: A robust and clear regulatory framework is essential to provide investor protection, ensure transparency, and establish a level playing field. Regulatory reforms should aim to simplify issuance procedures, improve disclosure standards, and establish a well-defined legal framework for bondholders' rights.

Market infrastructure: Invest in building and strengthening the necessary market infrastructure, including trading platforms, settlement systems, and credit rating agencies. A well-functioning and technologically advanced infrastructure can enhance market efficiency and boost investor confidence.

Risk management: Develop mechanisms to assess and manage risks associated with corporate bonds. This could involve the establishment of credit enhancement mechanisms, such as guarantee

funds or insurance, to mitigate credit risk and improve bond ratings.

Investor education: Promote financial literacy and educate potential investors about the benefits and risks of investing in corporate bonds. Knowledgeable investors are more likely to participate in the market, increasing demand and liquidity.

Diversification of issuers: Encourage a diverse range of corporations to participate in the bond market, including both large corporations and SMEs. Government initiatives, incentives, and support can incentivize smaller businesses to tap into the bond market for funding.

Government support: Governments can play a crucial role in developing the corporate bond market by issuing bonds themselves, setting benchmarks, and providing tax incentives to bondholders. Government bond issuance can serve as a benchmark for corporate issuers and provide a reference point for pricing.

Market transparency and information: Ensure timely and accurate dissemination of information about bond issuers and the market's performance. Transparency builds investor confidence and attracts more participants to the market.

Liquidity enhancement: Introduce measures to enhance market liquidity, such as creating a secondary market for trading corporate bonds, introducing market-making mechanisms, and encouraging participation from institutional investors.

Collaboration with financial institutions: Strengthen collaboration between regulatory authorities, financial institutions, and market participants to develop innovative financial products and services that cater to the needs of issuers and investors.

Macroeconomic stability: Maintain a stable macroeconomic environment characterized by low inflation, manageable interest rates, and sustainable economic growth. A stable economy provides a conducive backdrop for corporate bond market development.

International Integration: Foster international integration and harmonization of regulatory standards to attract foreign investors and enhance market credibility.

Continuous monitoring and assessment: Regularly monitor the corporate bond market's progress, identify challenges, and make necessary adjustments to the regulatory framework and market infrastructure to ensure sustained growth.

By addressing these factors and implementing a holistic strategy, policymakers, regulators, and market participants can work together to create an enabling environment for the development of the corporate bond market, fostering economic growth and stability.

6. Conclusions

In conclusion, the present study delved into a theoretical exploration of the intricate interplay between selected macroeconomic factors and the development of the corporate bond market. Through an examination of various economic theories, including the Efficient Market Hypothesis, the Money Supply Hypothesis, the Feedback Hypothesis, as well as the Supply-Leading and Demand-Following Theories, we have uncovered valuable insights into the dynamic relationship between economic growth, financial markets, and corporate bond market development.

Our analysis has underscored the pivotal role played by the corporate bond market in facilitating the allocation of resources, capital formation, and investment diversification. The symbiotic relationship between economic growth and financial market development was evident, highlighting the potential for a virtuous cycle where economic expansion fosters a robust financial market, and in turn, a well-functioning financial market spurs further economic growth.

Furthermore, our investigation revealed that the corporate bond market is not only a conduit for funding but also a mechanism for technological advancement and risk mitigation. The liquidity of the market offers investors a platform for efficient portfolio diversification and informed decision-making. As economic growth gains momentum, it creates an enabling environment for increased savings and investment, thereby providing impetus for the corporate bond market's expansion.

While this theoretical exploration provides valuable insights, it is important to acknowledge the complexity of real-world interactions and the potential influence of additional variables that may

impact the relationship between macroeconomic factors and the corporate bond market. Future empirical research is needed to validate and refine the mechanisms proposed here.

In conclusion, this study contributes to the broader understanding of the intricate dynamics that shape the development of the corporate bond market. By shedding light on the nuanced interactions between macroeconomic factors and the financial realm, our findings offer a foundation for policymakers, investors, and market participants to make informed decisions and drive sustainable economic growth.

In conclusion, the study on enterprise reputation ranking presents a comprehensive framework for understanding and enhancing the credibility of businesses within the market. Through an intricate interplay of various strategies and principles, the endeavor to establish a strong and positive reputation emerges as a cornerstone of sustainable business success.

The research underscores the pivotal role of service quality as the bedrock of reputation building. Adherence to stringent quality standards and transparent dissemination of reliable information engender trust and confidence among consumers and stakeholders. Moreover, the establishment of robust customer relations, coupled with ethical business practices, contributes significantly to cultivating a favorable reputation.

The study's insights into the significance of investment in human resource development and engagement in social responsibility initiatives further emphasize the multifaceted nature of reputation enhancement. By aligning business operations with ethical values and environmental stewardship, enterprises are poised to not only enhance their reputation but also contribute positively to society.

The exploration of communication and advertising strategies as tools for conveying an enterprise's values and messaging provides actionable insights into effective reputation management. Leveraging strategic partnerships and active participation in certification and credibility ranking programs further solidify an enterprise's position in the market.

As the business landscape continues to evolve, the pursuit of continuous improvement and innovation emerges as an imperative. By consistently addressing changing market demands and harnessing innovative solutions, enterprises can perpetuate their reputation and resilience.

In essence, the study affirms that the development of enterprise reputation ranking is a dynamic and intricate process requiring unwavering commitment, ethical integrity, and a strategic blend of multifaceted approaches. The insights gleaned from this research contribute to a deeper understanding of how businesses can navigate the intricate realm of reputation to thrive and succeed in a competitive market landscape.

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DETERMINANTS OF FINANCIAL PERFORMANCE: THE CASE OF LISTED FOOD FIRMS IN VIETNAM - QUANTILE REGRESSION

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Abstract: *This study investigates the determinants of financial performance of food manufacturing companies. Data is collected from 41 listed companies in the food manufacturing companies for the period 2015-2022. The quantile regression method is used to test the research hypotheses with the support of Stata 15 software. The research results show that the financial performance is positively impacted by the current ratio, ratio of fixed and assets size, while the financial performance is negatively affected by financial leverage.*

• Keywords: *financial performance, food manufacturing companies.*

JEL codes: G30

Tóm tắt: *Nghiên cứu này tìm hiểu các yếu tố tác động đến hiệu quả tài chính của các doanh nghiệp chế biến thực phẩm. Dữ liệu được thu thập từ 41 công ty niêm yết thuộc ngành thực phẩm trong giai đoạn 2015-2022. Phương pháp hồi quy phân vị được sử dụng để kiểm định các giả thuyết của nghiên cứu cùng với sự hỗ trợ của phần mềm Stata 15. Kết quả nghiên cứu cho thấy hệ số khả năng thanh toán hiện hành, tỷ lệ tài sản cố định có tác động thuận chiều trong khi đòn bẩy tài chính có tác động ngược chiều đến hiệu quả tài chính của doanh nghiệp.*

• Từ khóa: *hiệu quả tài chính, doanh nghiệp ngành thực phẩm.*

Introduction

Financial performance is one of the top goals of a business (Nimalathasan, 2009). Therefore, finding out the factors affecting financial performance is an issue that every business administrator is interested in. A variety of factors influence a firm's financial performance. This influence varies in the short and long term.

Recognizing these factors will be beneficial for every company. There are many studies on this issue. However, in previous studies, OLS, FEM, REM, or GMM regression methods were used to test the impact of different internal factors on the financial performance. Therefore, in this study, a new method was used to study this relationship. That is the Quantile regression method.

As an agricultural country, food production is a vital industry, playing a pivotal role in the economy with a large number of businesses. Therefore, our research team conducted a case study on food manufacturing listed firms on the Vietnamese stock market. This article focuses on the model of factors affecting financial performance and using quantile regression to test hypotheses.

1. Literature review and hypotheses

1.1. Literature review

One of the most common analytical tools chosen by business managers is financial performance. This indicator shows the financial performance of a company (L. J. Gitman et al, 2012). Therefore, it will be the basis for managers

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to make appropriate decisions, ensuring the sustainable development of the business. According to Opler et al (1994), inside factors seem to be the fundamental determinants of financial performance and the main driving force for competitive advantage, making an important contribution to helping businesses survive in the competitive market. In domestic and international studies, the financial performance of enterprises is measured by different criteria such as ROA Maryanee and Don (2006), ROE James and John (2005), and ROS Graham (2007). Most researchers use ROA to represent the financial performance of a business.

In terms of factors affecting financial performance, there are a wide range of variables that are included in the study such as financial structure, current ratio, working capital to total assets…. In addition, researchers are also interested in the effect of lagging profit margins on company's financial performance. According to Yazdanfar (2013), financial performance at present is directly impacted by the financial performance in previous years. Numerous researchers have found that past financial performance can be the principal factor influencing future business performance of enterprises (Geroski et al, 1998; Mueller, 1990; Margaretha et al, 2016). Despite the fact that there are many studies on this issue, the results obtained vary by sample and time of study.

1.2. Hypotheses

* Financial leverage

Financial leverage represents the percentage of debt to total capital of a business. Financial leverage affects the profitability of a business in two ways. On the one hand, enterprises with large debt scale have high financial costs, thus negatively affecting profitability. On the other hand, loans help the company take advantage of business opportunities, which help the company enhance financial efficiency. Previous studies have shown both positive and negative relationships between financial leverage and firm profitability. (Stierwald, A., 2010); Seema Gupta et al, 2011; Burja, 2011). Based on previous studies, the following hypothesis is proposed:

H1: Financial leverage impacts the firm financial performance

* Current ratio

Current ratio indicates a firm's ability to utilize current assets to pay its short-term liabilities. The higher this ratio, the more likely the company is to pay off its debts. According to Fazzari et al (1988), Firms with high current solvency have better financial performance. Similarly, Seema's research (2011) also explored that an increase in this index has a strong impact on the financial performance of companies. Or in the study of Hu et al. (2006), liquidity has a statistically significant positive correlation with the financial performance of the company. To summarize, we propose the following hypothesis:

H2: Current ratio impacts the firm financial performance

* Fixed asset ratio

For manufacturing enterprises, fixed assets play an important role in business performance. Investment in fixed assets, especially technological innovation in production, contributes to improving product quality, improving production productivity, thereby improving the operational efficiency of enterprises. However, according to the results of some empirical studies, enterprises invest too much in this asset, the efficiency of capital use will decrease (Praheepan, 2014). These arguments lead to our hypothesis:

H3: Fixed asset ratio impacts the firm financial performance

* Lagged financial performance

Theoretically, the past financial performance of enterprises is a prerequisite for their current financial performance. Because it is related to existing assets, market share, customer relationships, relationships with credit institutions as well as other factors of the business. Many experimental studies also confirm this relationship. (J. McDonald, 1999); Yazdanfar, 2013); Cobalt, 2014; A. Stierwald, 2009). Thus, our research team propose the following hypothesis:

H4: Lagged financial performance impacts the firm financial performance

* Firm size

Whether a firm's size affects its financial performance is a matter of debate. Many researchers assert that the larger the enterprise, the more advantages it will have in terms of prestige, economies of scale as well as commercial credit. Therefore, the financial performance of these enterprises is better. (Goddard, 2005; Margaretha, 2016; R. Dhawan; 2001). However, there are some studies that show the opposite conclusion. Accordingly, small firms are more flexible and innovative than large firms and thus their profitability is better (A. K. Salman et al, 2012). B. Ramasamy, 2005; R. Dhawan, 2001). Based on the empirical evidence, we propose the fifth hypothesis as follows:

H5: Firm size impacts the firm financial performance

* Investment

The growth rate of fixed assets over the years reflects the increase in investment for fixed assets. This variable positively affects the financial performance of the company as it helps the companies to improve their production capacity and product quality, so that they can improve their revenue and their profitability (Coban, S; 2014); J. McDonald, 1999). We believe that increasing fixed asset investment in the food industry contributes to improving the financial performance of the business. Therefore, we propose the following hypothesis:

H6: Investment impacts the firm financial performance

2. Methodology

2.1. Variables measurement

Based on the research hypotheses, the research model is proposed with ROA as dependent variable and ROA_{t-1}, CR, LEV, FAR, INV and FSIZE as independent variable.

Table 1: Measure of variables

Variables	Measurement
Dependent variable	
Return on total assets (ROA)	Net income/Total assets
Independent variables	

Variables	Measurement
Lagged ROA (ROA_{t-1})	ROA in the previous year
Current ratio (CR)	Current assets/Short-term debts
Financial leverage (LEV)	Total debt/Total assets
Fixed asset turnover (FAR)	Fixed assets (FA) /Total capital
Investment (INV)	$(FA_t - FA_{t-1})/ FA_{t-1}$
Firm size (FSIZE)	Natural logarithm of total assets

2.2. Data

To conduct this study, the research team collected financial data of 41 listed food enterprises on the Vietnamese stock market from 2015 to 2022. Data used in this research is panel data.

2.3. Panel unit root test (PURT)

In time series data analysis, a good model is given when stationary data is used. Therefore, in this research, Unit Root Test was used to check for the stationarity in the panel data. There are different unit root panel tests. The Levin-Lin-Chu test was chosen to check if the panel data contains a unit root. According to the unit test results, all variables in the research are stationary at level therefore time series do not have unit roots. Therefore, all the series to be stationary. So that data is suitable to be used in the next research steps.

2.4. Methodology

2.4.1. Model setting

The research model is represented by the following equation:

$$Y_{i,t} = \beta_0 + \beta_i X_{i,t} + \mu_{i,t}$$

where: β_0 is a constant, $X_{i,t}$ is variables, $\mu_{i,t}$ is the error term

Specifically, the relationship between the variables in the research model is shown in the following equation:

$$ROA_{i,t} = \beta_0 + \beta_1 ROA_{i,t-1} + \beta_2 FAR_{i,t} + \beta_3 INV_{i,t} + \beta_4 FSIZE_{i,t} + \beta_5 CR_{i,t} + \beta_6 LEV_{i,t} + \mu_{i,t}$$

Where: ROA is return on total assets, ROA_{t-1} is lagged ROA, FSIZE is firm size, CR is current ratio, INV is investment, FAR is Fixed asset ratio, LEV is leverage.

Variables	Observations	Mean	Std. Dev	Min	Max
FAR	328	0.2381449	0.1437112	0.0113646	0.884029
INV	328	0.1334024	0.7342698	-0.6252213	8.684442
FSIZE	328	27.45933	1.531287	23.55919	32.46804

Result from Stata 15

2.4.2. Methodology

Quantile regression is a regression method used when the conditions of linear regression are not satisfied. In other words, quantile regression is an extension of linear regression. Koenker & Bassett first introduced the quantile regression method in 1978. Instead of using OLS technique, Koenker & Bassett estimated the regression parameters by ratio on each percentile of the dependent variable. Hence, the total absolute differences of the regression equation at percentile τ of the dependent variable is smallest. Quantile regression method is basically to convert the conditional distribution function into the conditional percentile function by slicing it into small subsets. These small subsets describe the cumulative distribution of the dependent variable Y conditional on the known regressors Xi using the percentile.

The Quantile regression equation for the τth percentile has the following form:

$$Q_\tau(yi) = \beta_0(\tau) + \beta_1(\tau)x_{i1} + \cdots \beta_p(\tau)x_{ip}$$

Unlike the least squares method, minimization is performed for each subset:

$$MAD = \frac{1}{n}\sum_{i=1}^{n} \rho_\tau(y_i - (\beta_0(\tau) + \beta_1(\tau)x_{i1} + \cdots \beta_p(\tau)x_{ip})$$

The percentiles 10, 25, 50, 75, 90 were selected in this study. This selection is also consistent with some other studies using Quantile regression in measuring the level (Fekri AliShawtari et al, 2016; Hoang Thi Viet Ha et al, 2019).

With the support of Stata 15 software, quantile regression is applied in identifying factors affecting financial performance and ensuring statistical significance.

3. Empirical results

3.1. Summary statistics

Table 3: Summary statistics

Variables	Observations	Mean	Std. Dev	Min	Max
ROA	328	0.0328091	0.1564919	-1.626776	0.721911
ROA$_{t-1}$	328	1.05e+12	4.56e+12	1.25e+09	4.08e+13
CR	328	2.246705	3.900208	0.0012212	43.85714
LEV	328	0.8372555	2.253488	0.0336223	23.17927

According to the descriptive statistics table, the variables' value are explained in detail as follows:

ROA reflects the financial performance of the firms in the sample with the average value of 0.0328091 and the rather high standard deviation of 0.1564919 with the range from -1.626776 to 0.721911.

The mean value of CR is 2.24670 and this variable has a standard deviation of 3.900208. This variable's value fluctuates greatly between 0.0012212 and 43.85714.

Financial leverage has the mean value of 0.8372555. The value of standard deviation is 2.253488. the minimum and maximum values being 0.0336223 and 23.1927 respectively. These figures show that listed firms in the industry have high debt ratio and large interest payment burden.

In addition, during the study period, the fixed asset ratio of these companies was high reaching an average value of 0.2381449 along with an impressive increase in fixed asset investment at 0.1334024 during this period. This figure shows that companies in the food industry are interested in investing in fixed assets to boost production productivity and product quality.

3.2. Correlation analysis

Table 4: Correlation between variables

	ROA	ROA$_{t-1}$	CR	LEV	FAR	INV	FSIZE
ROA	1						
ROA$_{t-1}$	0.5864*	1					
CR	0.2987*	0.1523	1				
LEV	-0.3973*	-0.0265	-0.1523*	1			
FAR	0.3622*	0.3462*	-0.1661*	0.4082*	1		
INV	0.1024	-0.0639	0.0219	-0.0485	-0.0118	1	
SIZE	0.2957*	0.5379*	-0.1685*	-0.2980*	0.0128	0.0713	1

Result from Stata 15

Pearson correlation coefficients and sig value of t-test indicate that there is a significant positive correlation between ROA and independent variables in the research model including ROA_{t1}, firm size, current ratio, fixed asset turnover, investment while there exists a negative relationship with corporate financial leverage.

3.3. Checking for multicollinearity

Table 5: VIF result

Variables	VIF	1/VIF
FSIZE	1.68	0.594876
FAR	1.61	0.622073
ROA_{t-1}	1.56	0.639946
LEV	1.47	0.680651
INV	1.47	0.68058
CR	1.25	0.797739
Mean VIF	**1.44**	

Result from Stata 15

According to the multicollinearity test result, the variance inflation factor (VIF) of all variables in the model are less than 10. Therefore, the multicollinearity problem doesn't exist in the research model and all these variables can be used in the regression model.

3.4. Regression outcomes

Table 6: Quantile Regression outcomes

VARIABLES	Quantile 10	Quantile 25	Quantile 50	Quantile 75	Quantile 90
ROA_{t-1}	0.1387947	0.230598***	0.236395***	0.224804***	0.236395***
	(0.12061)	(0.08527)	(0.07209)	(0.06460)	(0.07209)
LEV	-0.113***	-0.0411***	-0.0130***	-0.0125***	-0.0110*
	(0.00615)	(0.00397)	(0.00268)	(0.00288)	(0.00572)
FSIZE	0.0295***	0.0116*	0.00786*	0.00275	-0.00639
	(0.0102)	(0.00657)	(0.00444)	(0.00477)	(0.00946)
FAR	0.0918	0.146**	0.0443	0.0607	0.181*
	(0.108)	(0.0696)	(0.0471)	(0.0505)	(0.100)
CR	0.00125	6.63e-05	0.000798	0.0102***	0.0169***
	(0.00421)	(0.00272)	(0.00184)	(0.00197)	(0.00391)
INV	0.00938	-0.00248	0.00522	0.00392	-0.00154
	(0.0186)	(0.0120)	(0.00812)	(0.00870)	(0.0173)
Constant	-0.811***	-0.320*	-0.180	-0.0172	0.242
	(0.284)	(0.183)	(0.124)	(0.133)	(0.264)
Observations	328	328	328	328	328

Result from Stata 15

According to the Quantile regression results, it can be seen that the variables ROA t-1, FSIZE, Lev, FAR, CR have a statistically significant relationship with the firms' financial performance at different percentiles:

The return on assets of the previous year has a statistically significant positive relationship with ROA in the following year in most of the percentiles Q25, Q50, Q75 and Q90.

Financial leverage shows a statistically significant negative relationship with ROA at all percentiles. This result shows that corporate debt negatively affects return on assets. The result of this experimental study is similar to those of Timan et al (1988), Rajan et al (1995) and Booth (2001).

Total assets size has a statistically significant positive relationship with the financial performance of firms in the sample at percentiles Q10, Q25 and Q50. Therefore, enterprises in this industry that have the advantage of scale will have better financial performance on total assets. Indeed, it is easier for large-scale companies to raise capital, sell favorable goods and have an advantage in trade credit. This result coincides with the conclusions of previous studies (Parmono, 2008; Flamini, 2009; Yang and Chen, 2009).

Current ratio has a positive and statistically significant relationship with ROA of food manufacturing enterprises at the 75th and 90th percentiles. This results once again confirm the argument of Fazzari et al (1988) and Seema et al (2011).

The variable FAR shows a statistically significant positive relationship with financial performance at the 25th percentile. Thus, the Vietnamese food industry in this period has many advantages when investing in fixed assets. Investing in modern machinery and equipment not only helps businesses improve production productivity, but also enhances investors' confidence in businesses, thereby improving operational efficiency. This result contradicts the experimental results of Pratheepan (2014), Hennessy (2002) and Paradogonas (2007).

4. Conclusions

The food production industry assumes a significant part in the Vietnamese economy. Therefore, it is of practical significance to find out about the elements influencing the financial performance of enterprises in this field. According to the research results, there are 3 factors affecting the performance of enterprises, which are leverage, business size, current ratio and fixed asset ratio. Accordingly, firm size, current ratio and fixed asset ratio have a positive relationship with financial performance while financial leverage has a negative relationship with the financial performance of firms in this industry. This research result is the basis for food production enterprises to develop appropriate financial policies to improve business efficiency. In addition, researchers can continue to develop this research direction for enterprises in other sectors of the economy as well.

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IMPACT OF FOREIGN DIRECT INVESTMENT AND GLOBALIZATION ON LABOR SHARE IN VIETNAMESE SMALL AND MEDIUM ENTERPRISES

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Abstract: *The globalization and foreign direct investment trend of declining labor share in output, particularly in developed countries, poses a threat to income equality as labor income is distributed more equitably than non-labor income. This trend may also have adverse effects on social cohesion. As globalization accelerates across all dimensions, organized labor has expressed concerns over its impact, arguing that it benefits firms and profits at the expense of laborers and wages. This study aims to investigate the relationship between globalization and the labor share of small and medium-sized enterprises (SMEs) in Vietnam. Using data from the Vietnam SME Survey from 2009 to 2015, a regression model is employed. The primary finding reveals that while globalization at the macro level is positively correlated with labor share, at the firm level, there is a negative correlation.*

• Keywords: *globalization, labor share, SMEs, Vietnam.*

Tóm tắt: *Toàn cầu hóa và xu hướng đầu tư trực tiếp nước ngoài làm giảm tỷ trọng lao động trong sản lượng, đặc biệt ở các nước phát triển, đe dọa đến bình đẳng thu nhập vì thu nhập từ lao động được phân phối công bằng hơn so với thu nhập phi lao động. Xu hướng này cũng có thể có tác động tiêu cực đến sự gắn kết xã hội. Khi quá trình toàn cầu hóa tăng tốc trên mọi khía cạnh, lao động có tổ chức đã bày tỏ lo ngại về tác động của nó, cho rằng nó mang lại lợi ích cho các công ty và lợi nhuận nhưng gây thiệt hại cho người lao động và tiền lương. Nghiên cứu này nhằm mục đích điều tra mối quan hệ giữa toàn cầu hóa và tỷ trọng lao động của các doanh nghiệp vừa và nhỏ (SME) ở Việt Nam. Sử dụng dữ liệu từ Khảo sát doanh nghiệp vừa và nhỏ ở Việt Nam từ năm 2009 đến năm 2015, mô hình hồi quy được sử dụng. Phát hiện chính cho thấy rằng trong khi toàn cầu hóa ở cấp độ vĩ mô có mối tương quan thuận với tỷ trọng lao động thì ở cấp độ doanh nghiệp, lại có mối tương quan nghịch.*

• Từ khóa: *toàn cầu hóa, tỷ lệ lao động, doanh nghiệp vừa và nhỏ, Việt Nam.*

1. Introduction

Piketty (2014) argues that increasing capital share drives inequality, while Atkinson (2009) believes declining labor share worsens inequality, posing a threat to social cohesion. The labor share has declined in OECD countries (ILO, 2013), reaching a record low before the 2008-2009 financial crisis. Researchers are exploring the relationship between globalization and labor share using macro data (Doan and Wan, 2017; Bockerman and Marilanta, 2011; Guscina, 2006). The lack of studies on this relationship at the micro-level mainly stems from data limitations (Perugini et al., 2017).

Perugini et al. (2017) examined the relationship between globalization and labor share in developed European countries. However, in countries like Vietnam, which have unique characteristics such as a prominent small and medium-sized enterprise sector and labor-intensive production, the dynamics between globalization and labor share may differ from those in developed nations. This study aims to explore the impact of globalization on labor share in the output of small and medium enterprises in Vietnam, considering these distinct features. By focusing on a single country, we can isolate the effects of globalization on labor share and avoid

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complications arising from the interplay of labor market institutions and globalization (Rodrik, 1997; Agell, 1999). Vietnam serves as an excellent case for analyzing the effects of globalization due to its significantly higher degree of globalization in the past decade. Additionally, the labor income share of Vietnamese enterprises shows complex fluctuations.

To empirically examine the relationship between globalization and labor share, we construct a model based on Bentotila and Saint-Paul (2003) and Perugini et al. (2017). Labor share is a function of capital, technological progress, firm characteristics, and aspects of globalization. The equation is tested with data collected from the Vietnam SME Survey for 2009-2015. The research aims to figure out two issues: (i) the trend of fluctuations in the labor share of small and medium enterprises in Vietnam; (ii) the relationship between globalization and the labor share of these enterprises.

2. Literature review

The current literature review has no unified theoretical framework for the relationship between globalization and labor share of income (Doan and Wan, 2017). Previous studies usually explain this relationship between two transmission channels: (i) neoclassical trade theory and (ii) bargaining game framework.

The first transmission channel, neoclassical trade theory, explains the relationship between globalization and labor share through fluctuations in the relative prices of factors of production by shifting production toward industries with comparative advantages. Standard models in traditional trade theories, such as the Heckscher-Ohlin model (2007) and the Stolper-Samuelson theorem (1941), predict that production factors with comparative advantages will increase as a country becomes more open to trade. International trade is expected to reduce labor share in developed countries and increase it in developing countries (Stockhammer, 2013; Giovannoni, 2014). Furthermore, Hamzah et al. (2018) suggest that changes in the market can impact employee job performance, highlighting the role of globalization in the labor market. However, it's worth noting that the neoclassical trading model doesn't always align with statistical data. The decline in labor share also exists in developing countries. Skilled workers in developing countries can benefit from globalization (Stockhammer, 2009).

The second transmission channel, the bargaining game framework (Rodrik, 1997; Slaughter, 1999), posits that enterprises and workers aim to maximize rental prices in production under conditions of imperfect competition. Rent maximization relies on the bargaining power of the involved parties. Those with more bargaining power receive a larger share of the profits. Bargaining power depends on several factors, including the fixed costs of relocating abroad (Harrison, 2005). From this perspective, reducing trade and FDI barriers can lower relocation costs. Rodrik (1997) argues that free movement across borders benefits mobility.

Jamotte and Tytell (2007) found that globalization affects labor share. They observed that higher relative export (import) prices reduce (increase) labor share. Similarly, Guscina discovered that trade openness and increased trade with developing nations negatively impact labor share. Decreuse and Maarek (2015) revealed an inverse relationship between FDI inflows and labor share, with capital outflows having no effect. Guerriero and Sen (2012) provided empirical evidence on the differential impact of trade openness on labor share in OECD and non-OECD countries, noting negative effects in OECD countries and positive effects in non-OECD countries. Rahmana and Senusia (2019) suggested that globalization, especially in the global digital ecosystem, has benefited SMEs. Perugini et al. (2017) combined data from the FIGE and Amadeus surveys, finding that enterprises regularly involved in exporting or foreign investment activities tend to have lower labor shares.

3. Methodology

3.1. Model

To establish an empirical model, we follow Bentotila and Saint-Paul (2003) and Perugini et al. (2017) to assume the general theoretical model of labor share to have the following multiplicative form:

$$LS_i = g(K_i A_i) h(Z_i X_i) \quad (1)$$

Where i presents firms, the function $g(K_i A_i)$ describes the labor share directly derived from the production function, in which K_i is the capital share in income and A_i is technological progress. The function $h(Z_i X_i)$ represents the impact of other factors such as firm characteristics or macro factors likely to affect the labor share. Specifically, Z_i represents aspects of globalization (at the micro and macro-level), the presence of mark-up (the difference between the selling price and the cost of goods), and other factors that can affect the relative prices of capital and labor. Xi represents firm-

specific variables. Assuming that $g(K_iA_i)$ and $h(Z_iX_i)$ also have multiplicative form, and by taking the logarithm of both sides, we have:

$$lnLS_i = \beta_0 + \beta_1 lnK_i + \beta_2 lnA_i + \beta_3 Z_i + \beta_4 X_i + \varepsilon_i \quad (2)$$

Model (2) is tested by the Fixed Effects Method (by a firm and by year) with an adjusted standard deviation for heteroskedasticity. In addition, we also present the regression results of the Random Effects Method. The results of the Hausman test suggest that the Fixed Effects Method is more appropriate for our model. However, the Random Effects Model results can be used to evaluate the stability of the estimated coefficients.

The proxy for LS_i is measured as the ratio of salary costs (including allowances) to the value-added of firms. At the firm level, the cost of wages can be greater than the value-added in periods of economic downturn when the value-added of the firm declines so that LS can exceed 100%. We consider these observations as outliers and exclude them before conducting the test. Technological progress A_i is represented by the total factor productivity of the business (TFP). TFP is measured according to the traditional approach based on the production function of Cobb-Douglas (TFP_1) and Levinsohn and Petrin (2003) (TFP_2), respectively. The capital share in income is measured as the ratio of the value of tangible fixed assets to the added value. Since our sample includes only manufacturing enterprises, it is appropriate to use this proxy.

Regarding the impact of globalization, similar to Perugini et al. (2017), our study also uses 03 variables representing import and export activities including IM - enterprises importing raw materials from abroad, EX - enterprises exporting products abroad, and S_FDI - enterprises selling products to FDI enterprises. We also include a macro-level globalization scale - KOFGI, to capture the under-measured aspects of globalization in the micro scales.

The competitive position is reflected in its ability to adjust the ratio between the selling price and the cost of goods (mark-up). In this study, the mark-up ratio is represented by the variable MAR, which is defined as the ratio of the difference between sales and variable costs (including material and labor costs) to sales. It is part of the vector X_i, which includes control variables.

We add the variable LA_SK, which measures the proportion of skilled workers in the firm's workforce, to the vector X_i. The proportion of regular workers in the enterprise can be positively correlated with the income share because the wages of regular employees are often higher than those of non-regular employees. Therefore, we continue to add the variable LA_RE to the vector X_i.

Additionally, our analysis incorporates control variables such as firm age (AGE) and firm size (SIZE) in the vector Xi. To distinguish firms based on their technological capabilities, we introduce the variable INV, a binary indicator (1 if the firm innovates in terms of product or process during the research period). This control variable allows us to disentangle the impact of innovation from globalization on the labor share, as globalization is commonly recognized as a catalyst for innovation (Altomonte et al., 2013).

3.2. Data

The study uses the Viet Nam Small and Medium Enterprises Survey (Vietnam SME Survey) database to examine the relationship between globalization and labor share in small and medium-sized enterprises. The Viet Nam SME survey has been conducted biennially since 2005. The survey was carried out at more than 2,500 enterprises. The data are based on face-to-face interviews with firm owners or managers. The survey uses a questionnaire with more than 130 questions about many aspects of the business.

Our data cover information of SMEs in 2004, 2006, 2008, 2010, and 2012. Despite the lack of updating due to unpublished 2017 survey data and the omission of 2015 data, the research findings are still valuable in examining the relationship between globalization and labor share because the Vietnam SME Survey is the only data source that provides information on the labor share in the income of Vietnamese SMEs (Nguyen et al., 2010).

Besides microdata on SMEs, the study uses globalization data according to the KOF Globalization Index provided by the Swiss Institute of Technology. With its multidimensionality, this scale can help our research to examine the influence of different aspects of globalization on innovation, including economic, social, and political fields.

The study's primary results are based on the regression results with all observations (9,420 total observations of 3,813 enterprises over 05 years). We also test the model with a subsample that only contains firms with 05 observations (2,585 total observations of 517 enterprises).

4. Findings and conclusions

Table 1. Descriptive statistics

Variables	No. of observation	Average	Deviation	Min	Max
Dependent variable					
LS	9,420	0.43	0.18	0.00	0.99
Explanatory variables					
TFP_1	9,420	7.65	0.78	4.43	12.33
TFP_2	9,420	4.31	0.58	1.47	7.61
KA	9,420	6.10	8.79	0.01	99.19
KOFGI	9,420	50.87	4.09	44.76	56.03
IM	9,420	0.04	0.19	0.00	1.00
EX	9,420	0.07	0.26	0.00	1.00
S_FDI	9,420	0.04	0.21	0.00	1.00
Control variables					
MAR	9,420	0.26	0.14	-0.99	0.95
LA_RE	9,420	0.94	0.15	0.04	1.00
LA_SK	9,420	0.47	0.38	0.00	1.00
SIZE	9,420	19.54	33.33	1.00	300.00
AGE	9,420	12.76	9.46	2.00	77.00
INV	9,420	0.51	0.50	0.00	1.00

Source: Conducted by the authors

Table 1 reports the descriptive statistics for the entire study sample. The labor share in the income of enterprises accounts for an average of 43% and has a relatively large fluctuation of 18%. The rate of SMEs participating in import-export activities and selling goods to FDI enterprises is not high, averaging 4% - 7%. The rate of regular employees in the enterprises in the sample is quite high, with a mean of 94%. Skilled workers make up 47% of SMEs' total workforce. The average mark-up rate for enterprises is 26%, which is highly volatile. Most enterprises have a relatively short operating life, averaging 13 years. This is since Vietnam's market economy was just formed from the Doi Moi process in 1986. The majority of the enterprises are small-scale, with an average total workforce of 20 employees and 51% of enterprises carry out product/ process innovation activities.

Table 2. The results of estimation and testing of the model

Variables	(A) FEM	(B) REM	(C) FEM	(D) REM
TFP_1	-0.130***	-0.122***		
	[-27.370]	[-33.520]		
TFP_2			-0.083***	-0.057***
			[-14.480]	[-12.400]
KA	-0.003***	-0.002***	-0.001**	-0.001
	[-4.361]	[-3.836]	[-2.566]	[-1.556]
KOFGI	0.012***	0.012***	0.006***	0.0044***
	[16.140]	[20.190]	[8.235]	[7.423]
IM	-0.016	-0.050***	-0.025	-0.067***
	[-1.121]	[-4.858]	[-1.571]	[-5.667]
EX	0.002	-0.025***	-0.013	-0.038***
	[0.128]	[-2.948]	[-1.028]	[-3.946]

Variables	(A) FEM	(B) REM	(C) FEM	(D) REM
S_FDI	0.005	-0.009	0.004	-0.0213**
	[0.468]	[-1.150]	[0.353]	[-2.281]
MAR	-0.041***	-0.043***	-0.022**	-0.028***
	[-4.042]	[-4.489]	[-2.507]	[-3.355]
LA_RE	0.079***	0.059***	0.100***	0.062***
	[5.450]	[4.816]	[6.477]	[4.868]
LA_SK	0.011**	0.012***	0.011**	0.014***
	[2.248]	[2.770]	[2.042]	[3.110]
SIZE	0.112***	0.095***	0.100***	0.070***
	[18.900]	[37.900]	[16.590]	[27.57]
AGE	-0.006	-0.016***	-0.007	-0.010***
	[-1.247]	[-5.853]	[-1.468]	[-3.462]
INV	-0.003	0.005	-0.008*	-0.001
	[-0.759]	[1.612]	[-1.881]	[-0.197]
Fixed effect according to enterprise Fixed effect by year	Yes Yes	No No	Yes Yes	No No
Number of observations	9,420	9,420	9,420	9,420
Number of businesses	3,813	3,813	3,813	3,813

Notes: The z-statistics are shown in square brackets. ***, ** and * represent the 1%, 5%, and 10% significance levels, respectively.

Source: Conducted by the authors

Table 2 presents the results of the estimation and testing of the model (2) with the entire study sample using the Fixed Effects Model and Random Effects Model and for each measure of total factor productivity. The results in Table 2 show that TFP is negatively correlated with labor share in all model settings. The negative relationship between TFP and the labor share is consistent with the theoretical assumption because TFP increases labor productivity. Our result is also consistent with Fukao et al. (2019), Perugini et al. (2017), Bassanini and Manfredi (2012), Technological advancements also increase the possibility of capital accumulation, and therefore, the capital share is also negatively related to the labor share. Due to data limitations, our study was unable to separate investment capital into tangible and intangible capital, as suggested by Perugini et al. (2017).

The coefficients of the variables KOFGI, IM, EX, and S_FDI represent the influence of globalization. In general, the group of micro-level globalization variables such as IM and EX negatively correlates with the labor share. This result is consistent with Elsby et al. (2013), Ikao et al. (2019), and Perugini et al. (2017). Thus the labor share of these enterprises is likely to decline. Although the mass media often emphasizes the negative relationship between globalization and labor share, this relationship does not always have much empirical evidence to support the theoretical basis (Perugini et al., 2017). KOFGI has a statistically significant positive correlation with the labor share. This finding indicates that globalization has a beneficial impact on workers' wages during the study period.

Table 3. Results with sample including enterprises with full 5 years of observation

Variables	(E)	(F)	(G)	(H)
	FEM	REM	FEM	REM
TFP_1	-0.136***	-0.137***		
	[-17.320]	[-19.080]		
TFP_2			-0.100***	-0.078***
			[-9.911]	[-8.243]
KA	-0.003**	-0.003***	0.001*	0.001**
	[-2.385]	[-2.697]	[1.707]	[2.063]
KOFGI	0.013***	0.013***	0.007***	0.006***
	[10.900]	[12.040]	[5.966]	[5.160]
IM	-0.0350	-0.039	-0.058*	-0.073***
	[-1.229]	[-1.610]	[-1.790]	[-2.660]
EX	0.035*	0.003	0.022	-0.008
	[1.764]	[0.209]	[0.976]	[-0.392]
S_FDI	0.043***	0.020	0.047**	0.016
	[2.601]	[1.178]	[2.408]	[0.840]
MAR	-0.081***	-0.075***	-0.054**	-0.057**
	[-2.664]	[-2.676]	[-2.454]	[-2.502]
LA_RE	0.103***	0.061***	0.129***	0.0742***
	[4.116]	[2.707]	[4.783]	[3.111]
LA_SK	-0.004	0.002	-0.007	0.002
	[-0.480]	[0.269]	[-0.816]	[0.190]
SIZE	0.104***	0.089***	0.095***	0.068***
	[10.980]	[18.560]	[9.503]	[13.080]
AGE	0.005	0.002	0.003	0.005
	[0.669]	[0.348]	[0.371]	[0.904]
INV	-0.000467	0.006	-0.006	0.001
	[-0.0712]	[0.932]	[-0.794]	[0.119]
Fixed effect according to enterprise Fixed effect by year	Yes	No	Yes	No
	Yes	No	Yes	No
Number of observations	2,581	2,581	2,581	2,581
Number of businesses	517	517	517	517

*The z-statistics are shown in square brackets. ***, ** and * represent the 1%, 5%, and 10% significance levels, respectively.*

Source: Conducted by the authors

Our research results show that the variable LA SK, the difference in workforce levels reveals a positive association between the percentage of skilled workers and the labor share. This result is in line with expectations because the average salary of skilled workers is generally higher than that of unskilled workers.

Firm size (SIZE) is positively correlated with labor share for other control variables, and this result implies that large-scale enterprises have a higher labor share in income. In contrast, the operating time of firms (AGE) is negatively correlated with the labor share. This means that enterprises with a longer operating time have a lower labor share than newly established enterprises. The innovation factor (INV) is also likely to reduce the labor share by increasing labor productivity, as discussed in Perugini et al. (2017).

To ensure the robustness of the research results and model regression with the whole sample, we conduct model regression (2) with the sample including only enterprises with a total of 05 years of observation. Using the sample of firms with sufficient observations during the research period will ensure the stability of the sample.

5. Conclusion

The labor share in output is declining worldwide, especially in developed countries. A decline in the labor share is likely to exacerbate income inequality, as income from labor is often more evenly distributed than income from other activities. As a result, the decline in labor share poses a risk to social cohesion. The process of globalization is now taking place strongly in all economic, political, and social fields. Groups that fight for workers' rights often negatively affect globalization, and they claim that globalization only benefits enterprises and enterprises' profits rather than workers' wages. The above statement is supported by the coincidence of the increase in the degree of globalization and the decrease in the labor share to output in recent years.

This study is conducted to examine the relationship between globalization and labor share to output in small and medium enterprises in Vietnam. The study's findings reveal that, depending on the specific factors considered, globalization can either positively or negatively impact the labor share of SMEs' income in Vietnam.

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APPLICATION OF DERIVATIVE INSTRUMENTS IN CREDIT RISK MANAGEMENT AT COMMERCIAL BANKS IN VIETNAM

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Abstract: *This article examines the utilization and management of Credit Derivatives (CDs) in credit risk management among commercial banks in Vietnam. It highlights the significance of CDs as tools for mitigating credit risks and their evolving role in the financial system. The research delves into the legal framework, regulations, and practical applications of CDs within Vietnamese banks. It evaluates the effectiveness of CDs for hedging credit risks and assesses the alignment between regulatory mechanisms and their practical implementation. The study aims to provide insights into the current state of credit risk management practices and opportunities for improvement in Vietnam's financial sector.*

• Keywords: *credit derivatives, credit risk, commercial banks.*

JEL codes: G19, G29

Tóm tắt: *Bài nghiên cứu xem xét việc ứng dụng Công cụ Phái sinh trong quản trị rủi ro tín dụng tại các ngân hàng thương mại tại Việt Nam. Chỉ rõ tầm quan trọng của phái sinh tín dụng như là các công cụ giảm thiểu rủi ro tín dụng và vai trò đang phát triển của chúng trong hệ thống tài chính. Nghiên cứu đi sâu vào khung pháp lý, quy định và ứng dụng thực tế của phái sinh tín dụng trong các ngân hàng Việt Nam. Đánh giá hiệu quả của phái sinh tín dụng trong việc bảo vệ khỏi rủi ro tín dụng và sự phù hợp giữa các cơ chế quản lý và thực thi chúng. Nghiên cứu nhằm cung cấp cái nhìn về thực trạng của các phương pháp quản trị rủi ro tín dụng và cơ hội hoàn thiện chúng trong lĩnh vực tài chính ngân hàng của Việt Nam.*

• Từ khóa: *phái sinh tín dụng, rủi ro tín dụng, ngân hàng thương mại.*

1. Introduction

In the context of economic globalization and the continuous development of financial markets, credit risk management has become a significant challenge for financial institutions, especially commercial banks. To address the demand for effective credit risk management, financial derivatives have emerged as an indispensable part of the toolkit for banks. Among these instruments, Credit Derivatives (CDs) have risen as a means to mitigate and manage credit risk.

The utilization of CDs not only impacts the business operations of banks but also exerts influence on the global financial system. In Vietnam, amid the process of economic reform and development, the application of CDs in credit risk management has become a noteworthy and extensively studied topic. This underscores the necessity and significance of exploring how commercial banks in Vietnam have approached and managed CDs in their credit risk management processes.

Given the importance of this issue, this article aims to research and analyze the usage and management of CDs in commercial banks in Vietnam. The following sections will present specific segments related to the theoretical foundation of CDs and the credit risk management situation in banks. This will lead

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to the formulation of research questions and a detailed analysis within the scope of this article.

2. Literature review

Studies related to the application of derivative instruments for credit risk management in banks have attracted significant attention from both domestic and international research. These studies have pursued a diverse range of objectives in both theory and practice.

The research by Duffee and Zhou (2001) focused on the benefits that banks can gain through using CDs to manage credit risk, particularly risk transfers. By employing a counterfactual selection model, the study demonstrated the role of lending derivative instruments as risk transfer mechanisms, aiding banks in mitigating latent risks. However, the effectiveness of this tool depends on the level of information asymmetry. With higher information asymmetry, the market for lending transactions becomes constrained for banks, leading to a substantial value of lending derivative instruments. Conversely, the use of these instruments may negatively impact the lending market.

Bedendo and Bruno (2012) conducted research on the benefits of selling loans, securitization, and CDs in commercial banks in the United States during the period from 2001 to 2009, particularly in the context of the financial crisis. Using the Generalized Method of Moments (GMM) approach, the study proved that transferring credit risk brings value to the economy. However, the research also indicated higher risk-taking behavior at robust banks, encouraging the sale of loans and securitization, resulting in higher default rates during financial crises. The advantages and limitations of transferring credit risk through selling loans and securitization were significantly higher compared to CDs.

Shearman & Sterling (2018) examined the regulation of various derivative instruments. Their research highlighted that the Dodd-Frank Act in the United States divided the OTC derivative market into two main categories: "exchange-traded" - regulated by the Commodity Futures Trading Commission; and "security-based" - regulated by the Securities and Exchange Commission. "Exchange-traded" includes contracts based on interest rates, foreign exchange rates, commodities, stock indices, or broad credit, along with other financial instruments. "Security-based" encompasses transactions based on loans, individual securities, stock indices, or narrow credit, along with other types.

In sum, the synthesis of previous studies shows that researchers have addressed various aspects related to the use of CDs in credit risk management at commercial banks. They have explored the benefits and risks of using CDs, underlying motivations, as well as solutions to mitigate ethical risks for both buyers and sellers. The research methods employed have also been diverse, ranging from the application of theoretical models combined with economic mathematics to the utilization of qualitative, quantitative, or mixed methods.

3. Methodology

Based on the synthesized outcomes of previous studies presented in the preceding section, the research methods concerning the application of CDs in credit risk management at commercial banks exhibit diversity. These methods encompass a combination of theoretical economic models and economic mathematics, qualitative and quantitative methodologies, or hybrid approaches. However, apart from analyzing the current utilization of CDs in credit risk management at commercial banks in Vietnam, the principal objective of the thesis research is to uncover the conditions for employing CDs in credit risk management at commercial banks in Vietnam. This is not merely a novel research issue; rather, in Vietnam, quantitative data on CDs are largely absent. Consequently, to conduct research on this topic, the research has opted for a qualitative research approach based on secondary data.

To enhance the reliability of research findings, the research has also engaged in the collection and analysis of secondary data, including publicly published documents relevant to the research issue.

Table 3.1. Types of documents and sources for secondary data collection

No.	Document Type	Original Source of Document	Purpose of Analysis
1	Legal documents in Vietnam related to the research content	Source: Government's official websites, State Bank of Vietnam (SBV), relevant Ministries of Vietnam.	- Evaluate the current usage of CDs in credit risk management at commercial banks in Vietnam; - Assess the current usage of various tools in credit risk management at commercial banks; - Provide an overall assessment of the improvement of conditions for using CDs in credit risk management at commercial banks.
2	Financial Statements of SBV		
3	Audited Financial Statements and Financial Statements of Commercial Banks in Vietnam	Source: Official websites of Commercial Banks in Vietnam, Cafef (financial news website).	
4	Other types of reports related to the research content	Source: Official websites of relevant Ministries.	

Source: Compiled from the collected document results.

After being collected, the documents will be analyzed and compared based on the constructed theoretical framework and the research approach. Consequently, the research will provide observations and assessments regarding the current utilization of CDs, other tools in the credit risk management process, and the enhancement of conditions for employing CDs in credit risk management at commercial banks in Vietnam.

4. Results and discussion

4.1. Current status of using credit derivatives in credit risk management at Vietnamese commercial banks

Currently, CDs have been mentioned in some legal documents in Vietnam. Specifically, CDs are referred to in Circular No. 41/2016/TT-NHNN dated December 30, 2016, and Circular No. 22/2019/TT-NHNN dated November 15, 2019. According to the regulations of these two Circulars, *"CDs products include credit insurance contracts, credit risk swap contracts, investment contracts related to credit risk, and other CDs contracts as prescribed by the law"*

(SBV, 2016b, page 6; 2019, page 5). Circular No. 41/2016/TT-NHNN also provides provisions for reducing credit risk through CDs products. This Circular sets out conditions that commercial banks need to comply with in order to be eligible for the adjustment of debt value using CDs products. Furthermore, Circular No. 41/2016/TT-NHNN also stipulates the calculation of counterparty risk, and the value of CDs products is adjusted based on the maturity mismatch and the currency mismatch factor between the debt, transactions, and CDs products.

The use of CDs was first introduced in Vietnam through investment contracts related to credit risk. Specifically, in 2006, the State Bank of Vietnam approved the trial provision of investment products linked to credit risk for customers by Hongkong and Shanghai Banking Corporation Limited (HSBC) Ho Chi Minh City Branch - funded credit default swaps (State Bank of Vietnam, 2006).

According to Official Letter No. 3324/NHNN-CSTT, HSBC Ho Chi Minh City Branch is authorized to offer investment products linked to credit risk. The pilot period for this product shall not exceed one year from the date of issuance of this Official Letter. The investment product linked to credit risk provided by HSBC Ho Chi Minh City Branch includes the following key features: It is exclusively linked to the credit risk of the Government of Vietnam and Vietnamese enterprises that have issued bonds in the international market. Customers using this investment product linked to credit risk are banks or financial institutions operating in Vietnam under the Law on Credit Institutions of Vietnam. The investment transaction term linked to credit risk shall not exceed five years. Furthermore, in order to provide investment products linked to credit risk, HSBC Ho Chi Minh City Branch must have a process for offering such products that aligns with international practices and is not in violation of Vietnamese laws. This process should include risk prevention measures. Additionally, HSBC Ho Chi Minh City Branch must adhere to the current regulations of

Vietnamese law concerning investment, foreign exchange management, interest rates, capital adequacy ratios, and provisioning for risk.

The implementation steps related to the investment product linked to Credit risk of HSBC Ho Chi Minh City Branch with customers and HSBC Hong Kong Branch - this is the case where corresponding transactions are applied with HSBC Hong Kong Branch after HSBC Ho Chi Minh City Branch sells investment products linked to Credit risk to customers in Vietnam (as shown in Figure 1); in which:

Figure 1. Diagram of the transaction process of investment products linked to Credit risk with HSBC Branch in Ho Chi Minh City with customers and HSBC Branch in Hong Kong
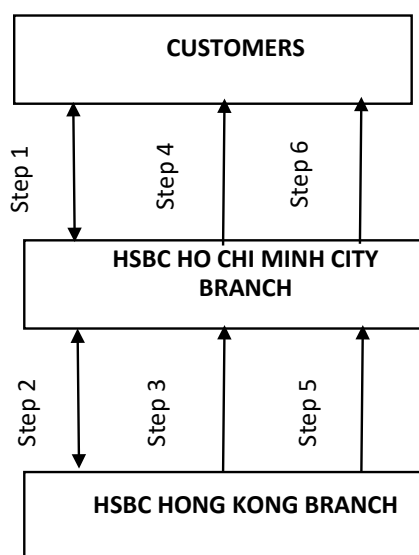
Source: SBV

Step 1: Transaction when customers (banks or financial institutions operating in Vietnam under the Law on Credit Institutions of Vietnam) purchase investment amounts issued by HSBC Branch in Ho Chi Minh City, linked to the credit event of the Government of Vietnam or Vietnamese enterprises issuing international bonds.

Step 2: Transaction when HSBC Branch in Ho Chi Minh City purchases investment amounts issued by HSBC Branch in Hong Kong, linked to the credit event of the Government of Vietnam

or Vietnamese enterprises issuing international bonds. This is the offset transaction after HSBC Branch in Ho Chi Minh City sells credit risk-linked investment products to customers in Vietnam.

Step 3: HSBC Branch in Hong Kong periodically pays interest to HSBC Branch in Ho Chi Minh City based on the investment amount.

Step 4: HSBC Branch in Ho Chi Minh City periodically pays interest to customers according to the appropriate interest rate based on the interest amount received from HSBC Branch in Hong Kong.

Step 5: HSBC Branch in Hong Kong pays the investment amount to HSBC Branch in Ho Chi Minh City.

Step 6: HSBC Branch in Ho Chi Minh City pays the investment amount to customers, in line with the investment payment received from HSBC Branch in Hong Kong

In the aforementioned steps, specifically steps 5 and 6, the payment of the investment amount depends on the occurrence of a credit event. If no credit event occurs, the payment in steps 5 and 6 will be executed upon the maturity of the investment, and the payment amount will consist of the principal portion of the investment. In the event of a credit event, the payment in steps 5 and 6 will be made immediately upon the occurrence of the credit event. Customers will receive only the difference between the initial principal investment and the portion allocated for losses resulting from the markdown of bonds issued by the Government of Vietnam or Vietnamese enterprises referenced in the transaction.

The form of payment can be in cash, bonds, or a right to claim against an organization affected by the credit event. The credit risk-linked investment product of HSBC Branch in Ho Chi Minh City, which SBV allowed to be implemented in 2006, is essentially a transaction of Funded CDs. In the Asian market, credit events referenced in CDs transactions are only related to the bonds and/or loans of specific

entities, known as reference entities, and these reference entities must be pre-agreed upon in the contract. In this context, credit events related to reference entities often include the following cases:

For government reference entities, a credit event could be the government defaulting, delaying debt payment (due to an inability to meet payment deadlines), or restructuring related debt.

For corporate reference entities, a credit event could be the corporation defaulting, going bankrupt, or restructuring related debt.

Alongside the credit risk-linked investment product presented above, HSBC Branch in Ho Chi Minh City is also allowed by SBV to provide an accelerated interest-linked investment product associated with credit risk. In this case, the interest rate that HSBC Branch in Ho Chi Minh City pays to investors is the agreed interest rate in a typical credit risk investment transaction, multiplied by a pre-agreed factor "k"; conversely, the risk that investors must bear is also multiplied by factor "k". This means that in the event of a credit event, the invested capital lost by the investor will be calculated as the portion allocated by the loss resulting from the markdown of bonds issued by the Government or bonds of enterprises with credit events referenced in credit risk-linked derivative transactions, multiplied by factor "k", but not exceeding the total initial investment capital. The portion of loss due to credit risk – the difference in loss related to the principal between the investor's investment capital and the total investment capital at risk due to the credit event – will be borne by HSBC Branch in Ho Chi Minh City.

Furthermore, with document number 6749/NHNN-CSTT dated July 23, 2008, the Governor of SBV approved HSBC Branch in Ho Chi Minh City and HSBC Branch in Hanoi – collectively referred to as HSBC Vietnam – to continue implementing the credit risk-linked investment product approved in Official Letter

number 3324/NHNN-CSTT dated April 27, 2006, and Official Letter number 6510/NHNN-CSTT dated June 19, 2007. At the same time, SBV also allowed HSBC Vietnam to expand the customer base and credit events related to reference entities. Specifically, the customer base was expanded to include businesses and investment funds established under Vietnamese law. As for credit events related to reference entities, the scope was expanded to include credit risk-linked investment products related to bonds and other securities issued within the territory of Vietnam.

In transactions related to credit risk-linked investment products, which SBV has allowed HSBC Vietnam to implement as part of the pilot program, as indicated in Official Letter numbers 3324/NHNN-CSTT, 6510/NHNN-CSTT, and 6749/NHNN-CSTT, these involve activities related to Credit Derivatives (CDs) in Vietnam. Within these CD transactions, HSBC Vietnam either acts as the seller of CDs or serves as an intermediary bank for providing CDs. This scenario applies similarly in transactions involving HSBC Branch in Hong Kong. Vietnamese Commercial Banks, on the other hand, play the role of customers who purchase credit risk-linked investment products issued by HSBC Vietnam, thus assuming the position of buyers of CDs. Among these Vietnamese Commercial Banks, many utilize CDs as tools to mitigate credit risk within their credit risk management strategies. It's worth noting that Vietnamese Commercial Banks have been using CDs for credit risk management since 2006. However, the adoption of CDs as credit risk management tools in Vietnamese Commercial Banks remains somewhat limited at present.

4.2. Evaluation of CDs in credit risk management of commercial bank

The state's involvement in the regulation of Credit Derivatives (CDs) activities in Vietnam, while not explicitly detailed in Vietnamese legal documents, has been gradually evolving and improving in recent years. With over two decades of experience, the State Securities

Commission has been handling regulatory functions for securities activities, the securities market, and derivatives securities, including the derivative securities market. The Vietnam Stock Exchange and the Vietnam Securities Depository Center have also contributed their expertise to governing these activities. These institutions have substantial advantages in executing state management functions as Vietnam continues to develop its activities related to CDs. However, it's important to note that the current state management of CDs in Vietnam still reveals certain areas that need further refinement:

Firstly, the legal framework for CDs and related fields is not yet fully articulated in Vietnamese legal documents. Specific regulations directly addressing CDs, such as those pertaining to the responsible state management authority, trading and settlement methods, and criteria for entities participating in CDs trading, are notably absent.

Secondly, while there have been positive changes in inspection and supervision activities, with increased frequency and rigor, the State Bank of Vietnam (SBV) still predominantly relies on compliance-based approaches. The inspection and supervision activities could benefit from a more risk-assessment-oriented approach, providing early warnings for Credit Risk Management, although improvements have been made in this area.

5. Conclusion and implications

In summary, this article investigates and analyzes the utilization and management of CDs in commercial banks in Vietnam. By examining legal documents, circulars, and current State Bank of Vietnam regulations, the article paints a picture of the management structure and CD activities within these banks.

The research findings reveal that while CDs are mentioned in Vietnamese legal documents, comprehensive regulations covering various aspects related to CDs are still lacking. Despite the initiation of the use of CDs in Credit Risk Management (CRM) since 2006, practical

applications remain limited and require further optimization.

Experienced institutions, such as the State Securities Commission and the Vietnam Stock Exchange, have a long-standing track record in managing securities markets and related activities, which could be advantageous for the implementation of CDs in Vietnam. However, the article also points out several areas that need enhancement, such as the need for specific legal frameworks and transaction methods concerning CDs.

In conclusion, this article has provided an overview of the current status of CD usage and management in commercial banks in Vietnam. Improvements in legal systems, enhancements in audit and supervision practices, along with leveraging the experience of existing regulatory bodies, could propel Vietnam further in developing and efficiently utilizing the tool of CDs for Credit Risk Management.

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RELATIONSHIP BETWEEN INNOVATION CAPABILITY, LOGISTICS SERVICE QUALITY AND PERCEIVED PERFORMANCES IN VIETNAM LOGISTICS SERVICE INDUSTRY

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Abstract: The proposed model, which is based on innovation theory and the logistics service quality framework, integrates personal contact quality, order fulfillment, information quality and social responsibility, and customer satisfaction to study perceived performances. Data is collected from an online survey through questionnaires was sent to 470 customers who have been using logistics services in Vietnam and 458 valid responses were received. This study discovered that innovation capability has a positive impact on personal contact quality, order fulfillment, information quality and social responsibility. Personal contact quality, order fulfillment, information quality and social responsibility positively affect the customer satisfaction, while customer satisfaction positively affects perceived performances. This study provides insights into the importance of customer satisfaction and perceived performances of customers in the logistics industry and highlights the need for logistics companies to prioritize customer satisfaction and improve their overall performance as well as their competitiveness.

Tóm tắt: *Mô hình đề xuất dựa trên lý thuyết đổi mới và chất lượng dịch vụ logistics, tích hợp chất lượng quan hệ cá nhân, thực hiện đơn hàng, chất lượng thông tin và trách nhiệm xã hội cũng như sự hài lòng của khách hàng để nghiên cứu cảm nhận hiệu quả. Dữ liệu được thu thập từ một cuộc khảo sát trực tuyến thông qua bảng câu hỏi được gửi tới 470 khách hàng đang sử dụng dịch vụ logistics tại Việt Nam và nhận được 458 phản hồi hợp lệ. Nghiên cứu này phát hiện ra rằng năng lực đổi mới có tác động tích cực đến chất lượng quan hệ cá nhân, thực hiện đơn hàng, chất lượng thông tin và trách nhiệm xã hội. Chất lượng quan hệ cá nhân, thực hiện đơn hàng, chất lượng thông tin và trách nhiệm xã hội ảnh hưởng tích cực đến sự hài lòng của khách hàng, trong khi sự hài lòng của khách hàng ảnh hưởng tích cực đến cảm nhận hiệu quả. Nghiên cứu này cung cấp cái nhìn sâu sắc về tầm quan trọng của sự hài lòng của khách hàng và hiệu quả cảm nhận của khách hàng trong ngành dịch vụ logistics, đồng thời nhấn mạnh sự cần thiết của các công ty Logistics phải ưu tiên sự hài lòng của khách hàng và cải thiện hiệu suất tổng thể cũng như khả năng cạnh tranh của họ.*

• Từ khóa: *năng lực đổi mới, chất lượng dịch vụ logistics, hiệu quả cảm nhận.*

1. Introduction

Logistics has become one of the most important parts of the service sector. In recent years, the supply chain has become quite complex with the increase in international trade, innovation capability and the differentiation of customer requests as a result. In general, the quality of logistics services in Vietnam is experiencing significant changes in a positive direction in recent years. In 2022, the total volume of goods reach more than 2 billion tons, increase 23.7% compared to 2021. According to the rankings of Agility 2022, the Vietnamese logistics market is ranked 11ᵗʰ in the group of 50 global emerging logistics markets.

Today, businesses are in a race to perfect themselves to gain an edge over their competitors in the global competitive environment. Therefore, they are trying to develop their innovation ability to be faster and more flexible to meet market expectations. Innovations and developments in information technology allow companies to improve service quality and offer the most precise solutions to meet customer needs. Providing innovative solutions to meet changing conditions and customer expectations quickly and accurately has become essential for

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providing quality service in the logistics sector. According to Thai (2008), satisfaction is the first step to increase harmony in relationship and is a strategic approach in improving efficiency. Another possibility, customer satisfaction has a significant positive impact on organizational performance. Customer satisfaction leads to retaining existing customers and attracting potential customers, thereby improving operational performance. Thereby, it gives management implications to improve the logistics quality services and perceived performances for Vietnam's logistics service industry. The study contributes to providing practical information and scientific arguments as a basis for business leaders and managers orient to improve satisfaction and perceived performances through innovation in the logistics service industry in Vietnam.

2. Literature review and hypothesis

Innovation allows companies to increase the quality of products and services, compete in global markets, and reduce costs (Uzun, 2001). With society's growing demand for service activities, the issue of innovation has become one of the most important issues in the service sector (Toivonen and Tuominen, 2009). The results study of Mentzer et al. (1999) showed that, personal contact quality, order release quantities, information quality, ordering procedures, order accuracy, order condition, order quality, order discrepancy handling, and timeliness are the elements of logistics service quality.

H1: Innovation capability has a positive impact on personal contact quality

H2: Innovation capability has a positive impact on order fulfillment

H3: Innovation capability has a positive impact on information quality

H4: Innovation capability has a positive impact on social responsibility

Perceived performances is defined as the extent to which customers perceive the quality of a product or service relative to the price they pay (benefits versus costs). Sink et al. (1984) gave a definition of performances including the following criteria: effectiveness, efficiency, quality, productivity, quality of work life, innovation, and profitability. According to Lin and Hsieh (2006), customer satisfaction is the state or feeling of a customer towards a service provider after using service. According to Zeithaml and Bitner (2000), customer satisfaction is the customer's evaluation of a product or service that meet their needs and expectations.

H5: Personal relationship quality has a positive impact on satisfaction

H6: Order fulfillment has a positive effect on customer satisfaction

H7: Information quality has a positive impact on customer satisfaction

H8: Social responsibility has a positive effect on satisfaction

According to Baker and Crompton (2000), service quality has become an effective strategy to assess perceived satisfaction and is considered an important premise to determine customer satisfaction. In addition, customer satisfaction has a significant positive impact on organizational performance. Customer satisfaction leads to retaining existing customers and attracting potential customers, thereby improving operational performance. Schneider and White (2004) argue that satisfaction is mainly a customer's evaluation of the emotional impact of service delivery. Satisfaction is when the consumer feels that past purchases and consumption, the expected benefits from the product or service brand meet the consumer's goals (Bergman and Klefsjo, 2010).

H9: Satisfaction has a positive effect on perceived performance

The proposed research model is based on a combination of the preceding findings related to innovation capability, logistics service quality and perceived performances. Gao et al. (2017) showed that the innovation affected the logistics service quality positively. Research by Sachdev & Bello (2014) on the market of U.S.A logistics service providers shows that satisfaction has an impact on operational performances. Therefore, the study proposes a research model framework as follows:

Figure 1. Proposed model
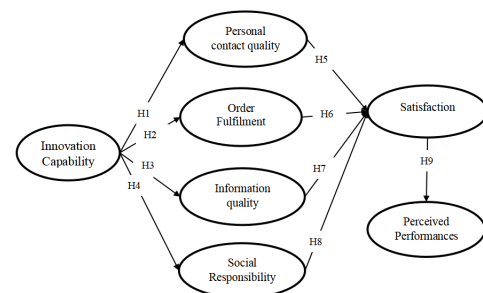
3. Research Methods

Data is collected from two sources: secondary data and interviews with experienced experts in the field of logistics services to build and complete the research variables, thereby completing the questionnaire and primary data through questionnaires was sent to 470 customers who have been using logistics services in Vietnam, focusing on major economic regions such as Hanoi Capital, Hai Phong City, Da Nang City, Ho Chi Minh City, Binh Duong, Dong Nai and Can Tho. To measure innovation capability, the scales adopted by Panayides and Venus Lun (2009) were used. The logistics service quality dimension was measured with scale developed by Thai (2013). The scales which were developed by Lin et al. (2023) were used to measure satisfaction. The dimension of the perceived performance was measured with scale developed by Aslan et al. (2018). Table 1 will show all detailed measurement items

Table 1. Constructs and measurement items

Construst	Items	Measures	Supporting Refences
Innovation capability	IC1	Frequently having new ideas in the supply chain context	Panayides and Venus Lun (2009)
	IC2	Creative in the methods of operation the supply chain	
	IC3	New ways of servicing are often introduce the supply chain	
	IC4	New process introduction in the supply chain has increased	
Personal contact quality	PC1	Staff's attitude and behavior in meeting customers' satisfaction	Thai (2013)
	PC2	Responsiveness to customers' needs and requirements	
	PC3	Knowledge/understanding of customers' needs and requirements	
	PC4	Staff's competence	
Order fulfillment	OF1	Order accuracy (meeting customers' requirements)	Thai (2013)
	OF2	Order condition (free of damage, fault or loss)	
	OF3	Order discrepancy handling	
	OF4	Consistency in order handling process	
Information quality	IQ1	Reliability of order information	Thai (2013)
	IQ2	Application of information technology in customer service	
	IQ3	Availability of order information	
	IQ4	Shipment tracing capability	
Social responsibility	SR1	Socially responsible behavior and concerns for human safety	Thai (2013)
	SR2	Environmentally safe operations	
	SR3	Record of engagement in community activities	
	SR4	Performance statement and vision towards community responsibility	

	ST1	I am delighted with the performance of my logistics service provider.	
Satisfaction	ST2	The services offered by the logistics service provider meet my expectations.	Lin et al. (2023)
	ST3	The services provided to you through the logistics service provider are good.	
	ST4	My feelings towards the logistics service provider are very positive.	
Perceived performance	PP1	The logistics company I work with complies with the promised dates regarding my orders	Aslan et al. (2018)
	PP2	The logistics company I work with delivers the products it carries without any damage	
	PP3	The logistics company I work with gives importance to our needs	
	PP4	The logistics company we work with is in contact with us to do the job right	
	PP5	The logistics company we work with is in contact with us to do the job right	

4. Results and findings

The questionnaire was distributed to 470 respondents using a Google form and 458 valid responses were received. The 12 invalid responses were because the respondents incorrectly answered the reverse-scale questions.

Table 2. Response rate of groups

Category	Number of respondents	Percentage
Gender		
Female	222	49%
Male	236	51%
Age		
18 - 22	86	19%
23 - 35	251	55%
36 - 45	98	21%
Above 45	23	5%
Education		
High school or below	88	19%
University	279	61%
Masters or Doctoral studies	91	20%
Occupation		
Student	31	7%
Office staff	239	52%
Business	115	25%
Others	73	16%

The demographic statistics are shown in Table 2. The genders were equally divided; however, most respondents were younger than 35 years. Occupation of respondents most is office staff and business.

Table 3. Confirmatory factor analysis

Measure	Threshold	Results	Source
Chi-square/df (cmin/df)	≤ 2: good; ≤ 5: acceptable	1.189	Hair et al. (2010)
Goodness of fit index (GFI)	≥ 0.9: good; ≥ 0.95: very good	0.942	Hair et al. (2010)

Measure	Threshold	Results	Source
Comparative fit index (CFI)	≥ 0.9: good; ≥ 0.95: very good; ≥ 0.8: acceptable	0.992	Hair et al. (2010)
Root mean squared error of approximation (RMSEM)	≤ 0.08: good; ≤ 0.03: very good	0.020	Hair et al. (2010)
Tucker Lewis Index (TLI)	≥ 0.9: good	0.991	Hair et al. (2010)

According to the results of Table 3, all variables in this study were within the acceptable range. Specific, chi-square/df (cmin/df) = 1.189 less than 3 is good, goodness of fit index (GFI) = 0.942 greater than 0.9 is good, comparative fit index (CFI) = 0.992 greater than 0.95 is very good, root mean squared error of approximation (RMSEM) = 0.020 less than 0.06 is good, and Tucker Lewis Index (TLI) = 0.991.

Table 4. Confirmatory factor analysis (CFA) fitting Indices

	Estimate	Cronbach	CR	AVE
Innovation capability		0.841	0.842	0.572
IC1	0.654			
IC2	0.795			
IC3	0.786			
IC4	0.783			
Personal contact quality		0.838	0.839	0.565
PC1	0.783			
PC2	0.710			
PC3	0.750			
PC4	0.763			
Order fulfillment		0.910	0.910	0.718
OF1	0.832			
OF2	0.873			
OF3	0.860			
OF4	0.822			
Information quality		0.930	0.931	0.773
IQ1	0.801			
IQ2	0.907			
IQ3	0.909			
IQ4	0.894			
Social responsibility		0.831	0.832	0.554
SR1	0.792			
SR2	0.751			
SR3	0.735			
SR4	0.696			
Satisfaction		0.878	0.879	0.644
ST1	0.834			
ST2	0.828			
ST3	0.752			
ST4	0.793			
Perceived performance		0.896	0.896	0.633
PP1	0.844			
PP2	0.823			
PP3	0.761			
PP4	0.771			
PP5	0.776			

The reliability of all the variables, including Innovation capability, Personal contact quality, Order fulfillment, Information quality, Social responsibility, Satisfaction, Perceived performance, ranged from 0.831 to 0.930 (see Table 4), greater than 0.5, therefore, the reliability of these findings is satisfactory.

The factor loading of all items exceeded 0.5 (Hair et al., 2010). All the variables ranged from 0.654 to 0.909 (see Table 4), greater than 0.5. Moreover, AVE for each construct was greater than 0.5, and the construct reliability (CR) of all the latent variables was higher than 0.7. All indicators had significant loading into the respective latent constructs, with values between 0.554 and 0.773. Therefore, the results were acceptable and could explain over 50% of the variance (see Table 4).

Table 5. Discriminant validity

	PP0	IQ0	OF0	PC0	SR0	IC0	ST0
PP0	**0.796**						
IQ0	0.611***	**0.879**					
OF0	0.661***	0.664***	**0.847**				
PC0	0.406***	0.471***	0.442***	**0.752**			
SR0	0.513***	0.588***	0.616***	0.501***	**0.744**		
IC0	-0.001	0.126*	0.08	0.252***	0.247***	**0.756**	
ST0	0.691***	0.616***	0.691***	0.521***	0.546***	-0.026	**0.803**

According to Hair et al. (2010), discriminant validity ensures that a concept measure is statistically distinctive and accurately depicts phenomena that other measures in a structural equation model miss. This was tested by comparing if the square root of AVE, in a latent construct, was higher than all the construct correlations. The results showed that the square of AVE values, for all the variables, Innovation capability, Personal contact quality, Order fulfillment, Information quality, Social responsibility, Satisfaction, Perceived performance were higher than the inter-construct correlations (see Table 5). Thus, the outcomes were considered appropriate.

Table 6. Results of hypothesis test

Hypotheses	Path	Standardized path coefficient	T-value	Result
H1	Innovation capability -> Personal contact quality	0.284***	5.111	Support
H2	Innovation capability -> Order fulfillment	0.138*	2.517	Support
H3	Innovation capability -> Information quality	0.240***	3.488	Support
H4	Innovation capability -> Social responsibility	0.313***	5.227	Support

H5	Personal contact quality -> Satisfaction	0.199***	4.793	Support
H6	Order fulfillment -> Satisfaction	0.450***	10.276	Support
H7	Information quality -> Satisfaction	0.202***	6.745	Support
H8	Social responsibility -> Satisfaction	0.082*	2.17	Support
H9	Satisfaction -> Perceived performance	0.652***	11.174	Support

Table 6 represents the results briefing. The data analysis indicates that innovation capability is significantly positively related to personal contact quality (β = 0.284, p < 0.001), order fulfillment (β = 0.138, p < 0.001), information quality (β = 0.240, p < 0.001) and social responsibility (β = 0.313, p < 0.001). Thus, H1, H2, H3, H4 is supported. In addition, personal contact quality, order fulfillment, information quality and social responsibility has significantly positive impact on satisfaction (The beta values respectively are 0.199, 0.450, 0.202, 0.082, p < 0.001). Thus, H5, H6, H7, H8 is supported. Finally, satisfaction is significantly positively effect on perceived performances (β = 0.652, p < 0.001). Thus, H9 is also supported.

6. Management implications

The outcomes of this research offer practical implications for logistics service providers seeking to improve customer satisfaction and increase perceived performances. First, logistics service providers should make innovations in processes and improve the quality of the service provided by developing new applications and strategies. Providing innovative solutions is aimed at responding to changing conditions and customer expectations quickly, accurately and improving service quality in logistics, thereby satisfying customers. Additionally, rewarding employees for providing exceptional customer service with incentives and praise might inspire them to provide higher-quality service. This investigation suggests that improving personal contact quality might raise consumer satisfaction with logistical services. In order to meet customer expectations and improve their overall experiences, logistics service providers should pay attention to factors like companies that can offer flexible and customizable delivery options, such as same-day or time-specific deliveries, timely and accurate delivery, effective problem-solving, clear and comprehensive information, and courteous and friendly communication.

Logistics service providers should make investments to raise the information quality they provide to customers. This can entail creating user-friendly platforms and interfaces, offering current, reliable information, and enhancing communication routes. By doing so, logistics service companies may improve their market competitiveness and clientele. In order to build a reputation in the logistics service sector, logistics service providers should also get involved in community activities, environmental safety activities, and community responsibility activities to create reputation in the industry.

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MODELS OF MEDICINAL HERB CULTIVATION UNDER THE FOREST CANOPY: A CASE STUDY OF HOA BINH PROVINCE

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Abstract: *This study aims to assess the implementation of medicinal cultivation production models under the forest canopy in the context of agricultural economic restructuring, which is the prevailing trend in the country. The objective is to analyze the results and limitations and propose recommendations to improve the implementation of these models in Hoa Binh province. Currently, medicinal cultivation production models under the forest canopy in this area are highly specialized, with approximately 50% of households exclusively growing medicinal herbs under the forest canopy, without cultivating other plants. Sometimes, up to four workers are involved in medicinal herb production. On average, each household engaged in medicinal herbs employs about 1.3 people. The gross income from this model is quite promising. On average, the gross income from Gynostemma pentaphyllum can reach 9.36 million VND/ha/crop, while Fallopia multiflora can yield up to 1,556.17 million VND/ha/crop. In addition to its advantages, such as favorable natural conditions, ease of care, and few diseases, households also face difficulties in terms of reduced productivity, an uncertain market for consumption, and high input prices. Therefore, the recommendations focus on stabilizing selling prices, providing technical support, managing input prices, and offering equipment and machinery support for production.*

Tóm tắt: *Nghiên cứu này nhằm đánh giá thực trạng mô hình sản xuất dược liệu dưới tán rừng trong bối cảnh chuyển đổi cơ cấu kinh tế nông, lâm nghiệp đang là xu hướng chung của cả nước và đề xuất kiến nghị để cải thiện các kết quả thực hiện mô hình tại tỉnh Hòa Bình. Hiện nay, mô hình trồng dược liệu dưới tán rừng của các hộ gia đình trên địa bàn có tính chất chuyên môn hóa cũng khá cao (khoảng 50% số hộ chỉ trồng dược liệu dưới tán rừng mà không trồng loại cây khác). Một số thời điểm có thể huy động tới 4 lao động, lao động phổ biến của một hộ tham gia vào trồng dược liệu trung bình khoảng 1,3 người/hộ. Lợi nhuận từ mô hình này cũng khá tốt, trung bình lợi nhuận từ trồng giảo cổ lam có thể đạt 9,36 triệu đồng/ha/vụ và hà thủ ô 1.556,17 triệu đồng/ha/vụ. Ngoài các thuận lợi về điều kiện tự nhiên, dễ chăm sóc, ít sâu bệnh các hộ còn gặp khó khăn về sản lượng suy giảm, đầu ra bấp bênh, đầu vào giá cao. Vì vậy, các kiến nghị tập trung vào ổn định giá bán, hỗ trợ kỹ thuật, hỗ trợ đầu vào và hỗ trợ trang thiết bị, máy móc sản xuất.*

• Từ khóa: *dược liệu, tán rừng, chuyển đổi cơ cấu, lâm nghiệp.*

1. Introduction

Forests play a crucial role in the development of every country. They provide numerous benefits to human life and society, including medicinal herb cultivation from plants, climate regulation, natural disaster prevention, and increased soil fertility. Economically, forests offer construction materials, fuel for the wood processing and food industries, valuable medicinal herbs, and opportunities for ecological tourism. Nevertheless, deforestation is currently a serious issue in Vietnam, leading to significant

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consequences for the environment and human life. Recent studies have also indicated that deforestation poses a severe threat to biodiversity in Vietnam, putting many medicinal plant species at risk of extinction. This, in turn, creates shortages of raw materials for the pharmaceutical industry. One sustainable approach to counter these challenges is the cultivation of medicinal herbs under the forest canopy. This model involves growing medicinal herbs on natural forest land without the use of pesticides, chemicals, or fertilizers. This method ensures a clean source of medicinal herbs and maximizes their medicinal properties. To establish specific regulations and policies for the development of the economy under the forest canopy, the Prime Minister's Office issued Official Letter No. 8373/VPCP-NN on December 13, 2022, approving the "Multi-Functional Value Development Project of the Forest Ecosystem by 2030, with a Vision to 2050." This initiative aims to harness the untapped potential beneath the forest canopy, including the cultivation of medicinal herbs, to increase income for local communities and contribute to forest protection.

Hoa Binh is a mountainous province with a total forest area of 460,869.09 hectares and forest land covering 332,813.1 hectares, which accounts for 72.21% of the province's natural land area. It is one of the most important regions in the national plan for medicinal plant cultivation. Hoa Binh province boasts natural conditions and terrain suitable for numerous species of medicinal herbs, including Gynostemma pentaphyllum, Fallopia multiflora, and Celastrus hindsii. Some precious medicinal herbs are already being cultivated under the forest canopy. However, in the process of implementing the model of medicinal herb cultivation under the forest canopy, there are still many obstacles that need to be addressed to ensure the maintenance of positive economic, social, and environmental impacts. This study aims to comprehend the implementation of the medicinal herb cultivation model under the forest canopy within this context, analyze the results, evaluate the shortcomings and limitations, and propose recommendations to enhance the model's implementation in Hoa Binh province.

2. Research Methods

2.1. Research framework

The research is conducted using systematic approaches, which involve understanding policies related to the development of medicinal herb cultivation models under the forest canopy, as well as assessing the advantages and difficulties related to natural, economic, and social conditions in Hoa Binh province. The evaluation of model efficiency encompasses several aspects, including the specialization and mobilization of the local workforce, environmental and social impact assessments, and an assessment of the economic efficiency of cultivating medicinal herbs under the forest canopy. The study's objective is to formulate recommendations for appropriate support policies for the development of medicinal herb cultivation models under the forest canopy in Hoa Binh province, as well as general policies that can be applied nationwide (see Figure 1).

Figure 1. Research framework
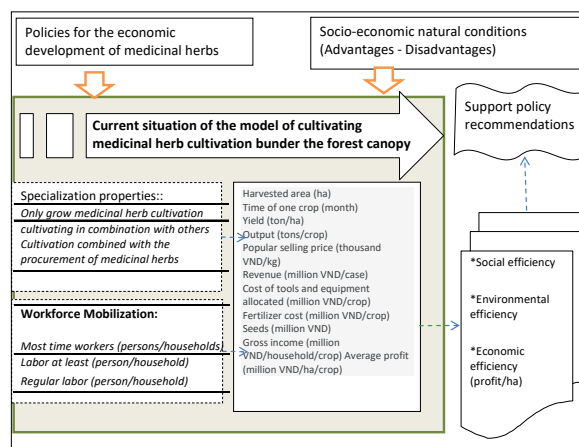
2.2. Methods of information collection

Secondary information was collected from a system of documents, policies, and documents related to the development of pharmaceutical production along the value chain at international, national, and local levels, including Hoa Binh province. Primary information was gathered through surveys and questionnaires conducted among 30 agents involved in the production (cultivation) of medicinal herbs under the forest canopy, including households, cooperatives, and enterprises in five selected communes: Phu Cuong, Phu Vinh (Tan Lac district), and Tu Ly,

Yen Hoa, Cao Son (Da Bac district). Medicinal herbs under the forest canopy in Hoa Binh province are primarily harvested naturally, with these two districts having the highest output and acreage under the forest canopy in the province. Additionally, due to the impact of a significant drop in the selling prices of medicinal herbs and the recent Covid-19 epidemic disrupting the herbal consumption chain, the number of actors involved in the production of medicinal herbs under the forest canopy in these two surveyed districts has decreased to only 30 agents as of 2021. Among these, 23 agents cultivate Gynostemma pentaphyllum, while 7 agents cultivate Fallopia multiflora. Furthermore, we conducted seminars and in-depth interviews with 10 district and commune officials responsible for agricultural oversight, 5 collection agents, 5 processing agents, and 5 wholesale and retail agents of medicinal herbs in the two surveyed districts.

2.3. Information analysis methods

Methods such as descriptive statistics, comparison, and financial analysis have been employed to analyze the activities, results, and economic efficiency of various models of cultivating medicinal herbs under the forest canopy in Hoa Binh. The correlation coefficient analysis method was also used to examine the linear relationships between factors, including the area, specialization, place of consumption, selling price, and the economic efficiency of these medicinal herb cultivation models under the forest canopy.

Code	Variable name	Explain
DT	Revenue	Total revenue (million VND)
NS	Productivity	Output per hectare (ton/ha)
SL	Quantity	Total production (tons)
GB	Price	Popular consumption price (thousand VND/kg)
DT	Acreage	Total harvested area (ha)
CPPB	Allocation cost	Cost of tools and tools allocated for 1 year (calculating the 5-year amortization period, unit: million VND)
NTT	Place of consumption	Consumption locations (1. Right at the plantation; 2. Bring to the gathering point; 3. Bring to the processing point)

Code	Variable name	Explain
CMH	Specialization	Specialization in cultivating medicinal herbs (1. cultivating only medicinal herbs; 2. cultivating in combination with other plants; 3. cultivating in combination with purchasing medicinal herbs)
LHa	Gross income/ha	Gross income calculated for 1 hectare of medicinal plant area (million VND/ha) = Revenue - Cost of tools and equipment allocated + Fertilizer cost + Seeds

3. Research results

3.1. Overview of the development of medicinal herb cultivation under the forest canopy in Hoa Binh province

3.1.1. Economic development policies associated with medicinal herb cultivation under the forest canopy of Hoa Binh province

At present, Hoa Binh province's support policies primarily focus on general agricultural development, as evidenced by Decision No. 1340/QD-UBND dated June 5, 2018, and Decision 3119/QD-UBND dated December 28, 2018, both issued by the People's Committee of Hoa Binh province. In July 2020, the Provincial Party Committee issued Resolution No. 27-NQ/TU, outlining plans for sustainable development of production forests up to 2025, with an orientation toward 2030. This resolution encompasses a significant expansion of production forest areas, creating ample opportunities for economic development under the forest canopy. By extending the business cycle of large timber forests beyond 10 years, individuals and communities will have the opportunity to develop eco-tourism ventures, including the cultivation of non-timber forest products, medicinal herbs, agricultural crops, and animal husbandry. This approach offers multiple advantages, reducing the effort and cost required for forest maintenance while generating substantial economic benefits. However, while there is a policy framework for developing models of cultivating medicinal herbs under the forest canopy, specific policies and priority solutions for establishing concentrated medicinal areas and supporting agents in the sustainable development of the medicinal value chain are currently lacking.

3.1.2. Situation of development of medicinal herb cultivation under the forest canopy in Hoa Binh province

Recently, Hoa Binh province has initiated a plan to bolster its agroforestry economy, specifically in the areas of vacant protection forests and production forests, with the aim of increasing income and improving livelihoods for residents in the mountainous regions. The planned forestry land area in the province spans approximately 298,013 hectares, constituting 64.66% of the province's natural area in 2021. This presents a valuable resource for harnessing and developing production under the forest canopy, alongside traditional forestry products, which are experiencing a decline in output. Various economic models have been studied and implemented in Hoa Binh province, including cattle and poultry raising under the forest canopy, as well as beekeeping for honey production. The entire province boasts approximately 225,468.4 hectares of forest, encompassing both natural and planted forests, suitable for the cultivation of non-timber forest products and medicinal herbs under the forest canopy [6]. Several cooperatives and enterprises within the province, such as Tan Lac Son Cooperative, 0789 Cooperative (Tan Lac district), Bigfarm Pharmaceutical Cooperative, Hoa Binh Agricultural Service Cooperative, and RTC Pharmaceutical Production Joint Stock Company (Da Bac District), have collaborated with local households to establish production and consumption models for medicinal herbs. These initiatives involve investments in machinery, standardization of production processes, and joint promotional efforts to build and develop brands, encompassing the entire herbal product supply chain from cultivation to local product output. In 2019, the National Agricultural Extension Center provided support to the Agricultural Extension Center of Hoa Binh province in organizing a training course on techniques for cultivating medicinal herbs under the forest canopy. This initiative aimed to assist local communities in effectively developing the aforementioned models.

As of the end of 2022, the entire province has cultivated and harvested over 2,145 hectares of annual medicinal and aromatic herbs. Among the primary crops with substantial acreage and production are citronella, covering 1,576 hectares and yielding over 10.79 thousand tons, 294 hectares yielding 2.21 thousand tons, and 218 hectares producing 1.62 thousand tons. Additionally, there are other plants such as turmeric (both red and yellow varieties), wormwood, Jiaogulan, Dang ginseng, Dingling, and Cat ginseng, with smaller areas of less than 50 hectares. Aside from the concentrated planting areas in fields and mixed gardens, there is currently approximately 64.5 hectares dedicated to cultivating medicinal herbs under the forest canopy. This area is used to cultivate main medicinal herbs like Gynostemma pentaphyllum, Fallopia multiflora, Morinda officinalis, and Sachi. Some cooperatives in Da Bac and Tan Lac districts are also conducting experiments with precious medicinal herbs like Ngoc Linh Ginseng, Cat Ginseng, Honeysuckle, and Dai Hanh Ginseng. Notably, many of these medicinal herbs have been used as inputs for the production of OCOP products (One Commune, One Product program). These products come in diverse designs and forms of use, including items like Shachi Omega seeds from Hoa Binh Agricultural Service Cooperative achieving a 3-star rating in Da Bac district, Giao Co Lam filter tea bags from Tan Lac Son Cooperative achieving a 3-star rating in Tan Lac district, and Ca gai powder from Bao Hieu cooperative receiving a 3-star rating in Yen Thuy district.

3.2. Situation of some models of cultivating medicinal herbs under the typical forest canopy

3.2.1. The specialization of models

Surveys conducted in two districts, Tan Lac and Da Bac, regarding the cultivation and harvesting of medicinal herbs under the forest canopy revealed that households predominantly grew Fallopia multiflora and Gynostemma pentaphyllum. Many households began cultivating medicinal herbs quite early, with some initiating the practice as early as 2012. Consequently, a significant number of households have gained valuable experience in cultivating medicinal herbs under the forest canopy. However, the number of households formally trained in this method remains quite limited. Presently, training efforts primarily target local

administrators, commune leaders, and village managers. The entities engaged in the cultivation of medicinal herbs under the forest canopy are mostly specialized households. Some households specialize exclusively in medicinal herbs, while others practice intercropping with different plant varieties. The involvement of organizations such as cooperatives and enterprises in these models is relatively scarce, with Tan Lac district hosting two cooperatives and Da Bac district hosting two cooperatives and one enterprise. This limited participation can be attributed primarily to the absence of support policies tailored specifically to this target group.

Table 1. Degree of specialization of households cultivating medicinal herbs under the forest canopy

Degree of specialization	Households cultivating Gynostemma pentaphyllum		Households grow Fallopia multiflora		Total	
	Quantity (opinion)	Ratio (%)	Quantity (opinion)	Ratio (%)	Quantity (opinion)	Ratio (%)
Only grow medicinal herbs	12	52.2	3	42.9	15	50
Planting in combination with other plants	3	13.0	4	57.1	7	23.3
Planting in combination with purchasing medicinal herbs	8	34.8	-	-	8	26.7
Total	23	100.0	7	100.0	30	100.0

Source: Survey data (2021)

3.2.2. Mobilizing the workforce to participate in models of cultivating medicinal herbs under the forest canopy

The number of household laborers involved in cultivating medicinal herbs under the forest canopy is significant. During peak seasons, up to four workers can be employed, and on average, each household employs about 2.57 people. The average number of laborers per household engaged in cultivating medicinal herbs is approximately 1.3 people. The peak demand for labor is during the harvesting of medicinal herbs. It can be said that the model of cultivating medicinal herbs under the forest canopy has significantly contributed to the local economy by creating job opportunities, especially for elderly individuals aged over 50.

Table 2. Employed labor by households cultivating medicinal herbs under forest canopy

	Gynostemma pentaphyllum			Fallopia multiflora			Total		
	Biggest	Medium	Standard error	Biggest	Medium	Standard error	Biggest	Medium	Standard error
Working at the most time (person/household)	4	2.30	1.11	4	3.43	0.79	4	2.57	1.14
Working at least (person/household)	2	1.39	0.50	2	1.43	0.53	2	1.40	0.50
Regular labor (person/household)	2	1.22	0.42	2	1.57	0.53	2	1.30	0.47

Source: Survey data (2021)

3.2.3. Economic efficiency of some models of cultivating medicinal herbs under the forest canopy

In general, the model of cultivating medicinal herbs under the forest canopy brings significant benefits to growers. The study of two models involving Gynostemma pentaphyllum and Fallopia multiflora revealed notable differences in economic efficiency between them. Gynostemma pentaphyllum, being a short-day plant with a harvesting time of approximately 4 months, results in growers incurring expenses only for fertilizers. Family labor is actively involved in production, resulting in an average profit of around 4.53 million VND per household and 9.36 million VND per hectare. On the other hand, for Ha Thu O (Fallopia multiflora), the harvesting time is longer, spanning about 27 months before a new crop can be harvested. Households incur expenses for seeds, fertilizers, and allocation tools. Nonetheless, the average gross income amounts to about 382.19 million VND per household per crop and 1,556.17 million VND per hectare per crop.

Table 3. Economic efficiency of households from models of cultivating medicinal herbs under the forest canopy

Evaluation criteria	Gynostemma pentaphyllum		Fallopia multiflora	
	Medium	Standard error	Medium	Standard error
Harvested area (ha)	0.35	0.25	0.25	0.03
Time of one crop (month)	4.39	0.84	27.71	1.48
Yield (ton/ha)	1.95	0.86	12.57	0.65

Evaluation criteria	Gynostemma pentaphyllum		Fallopia multiflora	
	Medium	Standard error	Medium	Standard error
Output (tons/crop)	1.09	1.98	3.03	0.40
Popular selling price (thousand VND/kg)	5.74	0.45	150.00	3.78
Revenue (million VND/case)	5.42	10.00	460.80	68.72
Cost of tools and equipment allocated (million VND/crop)	0.37	0.41	1.10	0.42
Fertilizer cost (million VND/crop)	0.52	0.21	15.79	2.14
Seeds (million VND)	0.00	0.00	61.71	8.66
Profit (million VND/household/crop)	4.53	10.04	382.19	59.52
Average gross income (million VND/ha/crop)	9.36	12.63	1,566.17	113.83

Source: Survey data (2021)

3.2.4. Social and environmental effects of models of cultivating medicinal herbs under the forest canopy

Social effects

In addition to the economic benefits derived from the model of cultivating medicinal herbs under the forest canopy, there are also significant social advantages. Accurate statistics and assessments of the social impact of implementing this model in the area are currently lacking. However, based on surveys and in-depth interviews with respondents, it is evident that the adoption of the medicinal herb cultivation model under the forest canopy has made several noteworthy contributions to social well-being. This model has created job opportunities for workers, promoted gender equality, improved living standards, and supported efforts to combat hunger and poverty. Furthermore, it has enhanced people's knowledge and awareness of forest management and conservation practices. Specifically, 87.5% of respondents stated that the model has generated additional employment, with 50% noting its positive impact on gender equality by creating jobs for female workers. Additionally, 72.5% of respondents acknowledged that it has contributed to improving living standards. While the model has made strides in supporting hunger eradication and poverty alleviation, its full potential remains unrealized due to limited coverage. Engaging in the cultivation of medicinal herbs under the forest canopy has also heightened community awareness and encouraged proactive thinking to promote non-timber forestry production, ensure sustainable development, and achieve high economic efficiency.

Criteria (n=40)	Evaluation of medicinal herbs compared to cash crops (%)		
	Less than	Equal	More
1. Create jobs for workers	2.5	ten	87.5
2. Increasing gender equality	20	30	50
3. Improve people's lives	7.5	20	72.5
4. Help support hunger eradication and poverty alleviation	30	25	45
6. Improving people's knowledge about forest management and protection	7.5	40	52.5

Source: Survey data (2021)

Environmental efficiency

In addition to the economic and social impacts, cultivating medicinal herbs under the forest canopy also has a positive environmental impact. Survey results indicate that compared to leaving forest land empty or planting some cash crops like cassava, potatoes, and galangal, cultivating medicinal herbs under the forest canopy provides better ground cover and helps prevent erosion. Furthermore, cultivating medicinal herbs is environmentally friendly: Over 77% of respondents stated that the soil quality remains stable, retains its natural color, and can support consecutive crops after the cultivation of medicinal herbs. This is attributed to the reduced use of pesticides and chemical fertilizers compared to other crops. Additionally, most medicinal herbs grown under the forest canopy are drought-tolerant and thrive in arid conditions. As a result, they rely primarily on natural rainfall and do not require irrigation, leading to a significant reduction in labor and resource consumption associated with irrigation and maintenance.

Table 4. Assessment of the impact of medicinal cultivation under the forest canopy on the environment

Criteria (n=40)	Evaluation of medicinal herbs compared to cash crops (%)		
	Less than	Equal	More
1. Create coverage, anti-erosion	5.0	12.5	82.5
2. The level of stability of the soil after cultivation	7.5	15.0	77.5
3. Water usage	87.5	7.5	5.0
4. Use chemical fertilizers	90.0	7.5	2.5
6. Use of pesticides	82.5	10.0	7.5

Source: Summary of survey data (2021)

3.3. Factors affecting the economic efficiency of models of cultivating medicinal cultivation in under the forest canopy

To assess the factors influencing the economic efficiency of the medicinal herb cultivation model, the study conducted an evaluation using the case of Gynostemma pentaphyllum cultivation. The evaluation results indicate that the harvested area and specialization significantly impact the economic efficiency of the model. The area of cultivation has a positive influence on productivity, output, and specialization. Consequently, an increased cultivation area leads to a higher average gross income per hectare. Specialization has a positive impact on both yield and harvested area, thereby also positively affecting gross income. Households that combine medicinal herb cultivation with other plants ensure a stable income source, promote soil circulation, minimize land wastage, and improve soil quality. Households that engage in both planting and collecting medicinal herbs tend to be more proactive in managing output and selling prices of medicinal herbs after harvest. Households that actively deliver their products to planned gathering places for processing and selling tend to achieve better economic efficiency due to improved handling of medicinal herb output after harvest.

Table 5. Factors affecting the economic efficiency of households from models of medicinal herb cultivation under the forest canopy

		DT	NS	SL	GB	DTich	CPPB	NTT	CMH	LHa
DT	Hstq	1	0.517*	0.741**	-0.034	0.752**	0.276	-0.059	0.473*	0.422*
	Sig.		0.012	<0.00	0.878	<0.00	0.202	0.791	0.022	0.045
NS	Hstq	0.517*	1	0.461*	0.203	0.476*	0.086	-0.172	0.492*	0.675**
	Sig.	0.012		0.027	0.353	0.022	0.697	0.431	0.017	0
SL	Hstq	0.741**	0.461*	1	-0.289	0.999**	0.138	-0.267	0.395	0.732**
	Sig.	<0.00	0.027		0.181	<0.00	0.53	0.217	0.062	0
GBPB	Hstq	-0.034	0.203	-0.289	1	-0.279	-0.095	.515*	-0.005	-0.246
	Sig.	0.878	0.353	0.181		0.198	0.668	0.012	0.983	0.258
DTich	Hstq	0.752**	0.476*	0.999**	-0.279	1	0.13	-0.262	0.41	0.737**
	Sig.	<0.00	0.022	<0.00	0.198		0.555	0.228	0.052	0
CPPB	Hstq	0.276	0.086	0.138	-0.095	0.13	1	-0.118	0.083	0.129
	Sig.	0.202	0.697	0.53	0.668	0.555		0.591	0.707	0.556
NTT	Hstq	-0.059	-0.172	-0.267	.515*	-0.262	-0.118	1	-0.287	-0.397
	Sig.	0.791	0.431	0.217	0.012	0.228	0.591		0.184	0.06
CMH	Hstq	0.473*	0.492*	0.395	-0.005	0.41	0.083	-0.287	1	0.488*
	Sig.	0.022	0.017	0.062	0.983	0.052	0.707	0.184		0.018
LHa	Hstq	0.422*	0.675**	0.732**	-0.246	0.737**	0.129	-0.397	0.488*	1
	Sig.	0.045	<0.00	<0.00	0.258	<0.00	0.556	0.06	0.018	

* The correlation coefficient is significant at 0.05 level (two-tailed test).
** The correlation coefficient is significant at 0.01 level (two-tailed test).
Sig.: Level of significance; Hstq: Correlation coefficient

Source: Analysis of survey data (2021)

3.4. General assessment of advantages, difficulties and necessary recommendations

The results of household interviews reveal that the model of cultivating medicinal herbs under the forest canopy offers numerous advantages, including minimal care requirements, a wide variety of species, favorable natural conditions, a low incidence of pests and diseases, and proximity to selling locations. However, the implementation of this model also presents several challenges. These include declining yields, uncertain output, unfavorable technology and production conditions due to difficult terrain and transportation challenges in the mountainous production areas. Additionally, input costs, such as fertilizers and seeds (for Fallopia multiflora), tend to increase, and medicinal herbs have a short shelf life after harvest. The synthesis of recommendations based on these findings highlights the key issues raised by households, including stabilizing output prices, providing fertilizer support, offering technical assistance, supporting product packaging, and providing equipment to make farming more favorable.

Table 6. Advantages, disadvantages and recommendations for households to cultivate medicinal herbs under the forest canopy

Favorable	SL (opinion)	TL (%)	Hard	SL (opinion)	TL (%)	Request	SL (opinion)	TL (%)
Takes little care	16	53.33	Output declines	16	53.33	Stable selling price and output	twelfth	40.00
Seed source available	16	53.33	Precarious output	14	46.67	Fertilizer support	ten	33.33
Favorable natural conditions	26	86.67	Unfavorable engineering and production	twelfth	40.00	Technical support for planting and care	18	60.00
Less pests	6	20.00	High input price	ten	33.33	Support machinery and equipment	16	53.33

Favorable	SL (opinion)	TL (%)	Hard	SL (opinion)	TL (%)	Request	SL (opinion)	TL (%)
Selling locations near	6	20.00	Difficult to maintain	2	6.67	Connecting purchasing and processing units to form a chain	25	83.33

Source: Survey data (2021)

From the above survey results, some policy recommendations to develop and improve the effectiveness of the model of cultivating medicinal herbs under the forest canopy are as follows:

- Support farmers to stabilize output for products by building a sustainable connection channel with trading and processing establishments of medicinal herbs in and out of Hoa Binh province. To do this, it is necessary to have policies to connect and attract investment from businesses, cooperatives and the private economy involved in building chain links in the production of medicinal herbs.

- Support good quality inputs (fertilizers, pesticides, seeds) to improve productivity, output and create safety and stability in production for people. Stable input supply in both quantity and quality is a decisive factor in maintaining production, ensuring output product quality and creating peace of mind for farmers when participating in the farming model of medicinal herbs under the forest canopy.

- Support to improve production techniques, apply machinery and equipment in cultivating medicinal herbs under the forest canopy to improve farming efficiency, ensure product quality and productivity in a sustainable way. The application of machinery and equipment in farming can improve labor productivity, create uniformity in post-harvest product quality and preserve post-harvest products. This is an important factor to maintain large-scale production of goods for farmers participating in this model.

4. Conclusion

The cultivation of medicinal herbs under the forest canopy is emerging as a positive trend in agricultural and forestry restructuring due to its significant impact on job creation, labor attraction to production, and increased household income in mountainous areas. It contributes to the establishment of stable and sustainable livelihoods, particularly for ethnic minority households. The economic efficiency of households engaged in cultivating medicinal herbs under the forest canopy is influenced by factors such as specialization, production area, and consumption. Therefore, to enhance this model, it is essential to implement policy solutions that focus on capacity-building for households in integrated agricultural production. These solutions should also address proactive approaches to purchasing and selling medicinal herbs after harvest and concentrate the production area of medicinal herbs for households.

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INTELLECTUAL PROPERTY MANAGEMENT - RECOMMENDATIONS FOR BANKING SECTOR IN VIETNAM

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Abstract: *The banking sector in Vietnam is undergoing rapid transformation driven by technological advancements and increasing market competitiveness. As banks strive to innovate and differentiate themselves, effective intellectual property (IP) management emerges as a critical strategic component. This paper presents a comprehensive set of recommendations tailored to the specific context of the Vietnamese banking sector. Drawing from World Intellectual Property Organization's approach, previous studies related to this topic, and considering unique characteristics of the local landscape, these recommendations encompass key areas such as developing a robust IP strategy, cultivating an IP-aware culture, ensuring data protection and cybersecurity, and navigating the regulatory environment. By adopting these recommendations, banks in Vietnam can enhance their IP management practices, drive innovation, safeguard valuable IP assets, and contribute to their long-term growth and success in a dynamic and evolving industry.*

Tóm tắt: *Ngành ngân hàng tại Việt Nam đang trải qua sự biến đổi nhanh chóng trước những tiến bộ về công nghệ và mức độ cạnh tranh ngày càng gay gắt trên thị trường. Trong bối cảnh đó, quản trị tài sản trí tuệ (IP) hiệu quả trở thành một yếu tố chiến lược quan trọng giúp các ngân hàng đổi mới và tạo sự khác biệt. Dựa trên phân tích các tiếp cận về quản trị tài sản trí tuệ và xem xét các đặc điểm riêng của ngành ngân hàng tại Việt Nam, bài viết này đưa ra một số đề xuất cho ngành ngân hàng tại Việt Nam bao gồm các lĩnh vực chính như phát triển chiến lược IP mạnh mẽ, xây dựng văn hóa nhận thức IP, bảo vệ dữ liệu và an ninh mạng, theo sát các chính sách pháp lý. Bằng cách áp dụng những đề xuất này, các ngân hàng tại Việt Nam có thể nâng cao thực hành quản trị tài sản trí tuệ, thúc đẩy đổi mới, bảo vệ tài sản trí tuệ quan trọng, góp phần vào sự thành công và phát triển bền vững.*

• Từ khóa: *quản trị tài sản trí tuệ, ngành ngân hàng, chiến lược.*

1. Introduction

Intellectual property refers to creations of the mind, such as inventions, literary and artistic works, designs, symbols, names, and images used in commerce (World Intellectual Property Organization, 2020). Intellectual property (IP) management has emerged as a critical strategic consideration for organizations across various industries, including the banking sector. By effectively managing intellectual property, organizations can enhance their competitive edge, foster innovation, and ensure legal compliance.

Intellectual property (IP) represents a valuable resource within the banking industry. It serves as a safeguard for the sector's advancements, such as novel financial offerings, and offers the potential for income generation through licensing or sales. Nevertheless, inadequate IP management can also pose challenges. The significance of effective IP management in the banking sector is underscored by several key factors. Primarily, it serves to shield innovations, preventing rivals from replicating them. This imparts a competitive edge to the bank, permitting the imposition of premium pricing on

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its offerings. Additionally, IP management plays a pivotal role in revenue generation, as it enables the bank to license or sell its IP assets to other enterprises, thereby cultivating additional income streams.

In Vietnam, the banking industry is experiencing swift expansion. The State Bank of Vietnam (SBV) oversees the banking sector, encompassing tasks such as bank licensing, establishment of prudent regulations, and sector supervision. A significant portion of Vietnam's banking assets, exceeding 50%, is held by the five largest state-owned banks. However, the private sector is burgeoning and is projected to wield greater influence in the banking arena going forward. As of March 2022, the Bank for Investment and Development of Vietnam (BIDV), a state-owned financial institution, was the leading bank in Vietnam, with approximately 1.8 thousand trillion Vietnamese doing worth of assets. Fellow state-owned Vietnam Joint Stock Commercial Bank For Industry and Trade (Vietinbank) ranked second in terms of assets, followed by the Joint Stock Commercial Bank For Foreign Trade Of Vietnam (Vietcombank), at 1.5 and 1.4 thousand trillion Vietnamese dong, respectively (Statista, 2022b). In accordance with financial reports from the banks, five banks in Vietnam had a pre-tax profit of more than 10 trillion VND (422 million USD) in the first half of this year, and with the order being Vietcombank (866 million USD), BIDV (583 million USD), MB (536 million USD), Vietinbank (528 million USD), and Techcombank (73 million USD) (VNA, 2023).

Multiple reasons substantiate the importance of IP management within Vietnam's banking sector, including: Frist, Escalating Innovation: The Vietnamese banking landscape is undergoing heightened innovation, evident through novel products and services tailored to customer needs. IP serves as a protective buffer against competitors seeking to emulate these innovations. Second, Escalating Competitiveness: The sector's escalating competitiveness mandates the need for a competitive edge. IP can provide this edge, enabling banks to secure a unique position in the market. Third, Facilitating Foreign Investment: Vietnam is witnessing an influx of foreign

investments in its banking domain. IP assurance can bolster confidence among foreign investors by ensuring the safeguarding of their financial stakes.

The research on intellectual property (IP) management in the banking sector highlights the significance of protecting and leveraging intangible assets within the context of financial institutions. This area of study recognizes various types of IP, such as patents, trademarks, copyrights, and data-related rights, which are employed by banks to safeguard innovations, establish brand identity, and navigate the digital age.

2. Literature review

The origins of research on *intellectual property management* (IPM) can be traced back to the early 1980s. During this era, a few pioneering investigations commenced delving into the economic and managerial dimensions of intellectual property. Primarily theoretical in nature, these studies explored how IPM could stimulate innovation and economic advancement. However, preceding this breakthrough, the inception of intellectual property concepts dates back to ancient civilizations, with early prototypes of copyright and patent protection manifesting in historical legal codes. Throughout the early to mid-1900s, research concerning IP management predominantly centered on legal frameworks, underscoring the necessity for safeguarding and enforcement.

A significant milestone emerged with the establishment of the World Intellectual Property Organization (WIPO) in 1967, signifying a substantial global endeavor to harmonize IP laws. The late 1900s ushered in discussions on adapting IP regulations to the digital age, as digital technologies proliferated. Notably, the expansion of copyright laws to encompass software and digital content garnered considerable attention. During the transition from the late 20th to the early 21st century, the advent of the internet spurred dialogues on digital rights management (DRM) and copyright in the digital milieu. Striking a balance between safeguarding and enabling access to digital content emerged as a pivotal theme.

Approaching the early 2000s, concurrent with the ascendance of the knowledge economy,

scholarly and industry interest in IP management burgeoned. Research now probed the role of IP in catalyzing innovation, facilitating collaboration, and effecting technology transfer. Subsequently, the mid to late 2000s witnessed the inception of targeted investigations into IP management within specific industries. Notable sectors such as technology, pharmaceuticals, and entertainment commenced formulating bespoke strategies for IP preservation, licensing, and monetization. The surge of open innovation concepts facilitated collaborations and the mutual exchange of IP assets among organizations, transcending conventional confines.

Advancing into the late 2000s and the early 2010s, the proliferation of digital platforms and social media introduced novel challenges and prospects for IP management. Debates surrounding user-generated content, fair usage, and digital piracy garnered heightened attention. Simultaneously, research ventured into exploring the nexus between IP management and organizational performance, underscoring the role of adept IP management in bolstering competitiveness.

During the late 2010s and the early 2020s, the proliferation of emerging technologies such as fintech, artificial intelligence, and blockchain kindled augmented research on IP management in nascent sectors. This period witnessed a surge in studies focusing on intellectual property management within finance and banking domains. As discussions around intellectual property rights in the digital realm intensified, research delved into the implications of open-source software, open data, and the sharing economy. This trajectory continues to evolve in recent years, reflecting the dynamic interplay between intellectual property management and the ever-evolving landscape of technology and commerce.

Recently, debates related to IP management have broadened to encompass ethical deliberations, sustainability, and societal accountability. Scholars have commenced exploring the juncture where IP intersects with principles encompassing the environment, social equity, and corporate governance. The continual progression of technology, shifts in regulatory environments, and

dynamic changes in the global economy persist in molding the research domain centered on IP management. The involvement of IP in addressing pressing issues like climate change, public health emergencies, and economic inequalities is poised to attract amplified scrutiny.

Noteworthy findings highlight that the implementation of proficient strategies for managing intellectual property is propelled by a confluence of factors including technological progress, alterations in regulations, and the necessity for distinctiveness within an increasingly competitive milieu. Scholars emphasize the assortment of intellectual property forms that hold relevance in the banking sector, encompassing patents, trademarks, copyrights, trade secrets, and rights linked to data. Patents are identified as pivotal for safeguarding inventive financial products and technological innovations, like algorithms employed in trading platforms or exclusive payment systems. Trademarks emerge as indispensable tools for establishing brand recognition and nurturing customer confidence, while copyrights contribute to shielding software, digital content, and instructional materials. The heightened recognition of data's significance as an invaluable asset has spurred amplified attention on data-linked intellectual property rights, encapsulating strategies for data protection and data sovereignty.

This study accentuates a series of driving forces compelling the adoption of effective intellectual property management strategies in the banking realm. Technological advancements, marked by the ascension of fintech breakthroughs and the infusion of artificial intelligence and blockchain, have engendered heightened IP generation and the imperative for safeguards. Concurrently, shifts in regulatory frameworks have impelled banks to accord precedence to IP management, ensuring alignment with compliance requisites without relinquishing competitiveness. The synergy of collaborative partnerships, alliances, and industry mergers further accentuates the pivotal nature of IP due diligence within the sector.

Challenges in this context involve balancing proprietary knowledge sharing, addressing regulatory complexities, and managing IP

assets within data privacy and cybersecurity frameworks. Researchers have identified unique challenges associated with IP management in the banking sector. One key challenge is striking the right balance between protecting proprietary technologies and collaborating with industry peers for innovation. The complex regulatory landscape, spanning financial and IP regulations, requires careful navigation. Additionally, concerns about patent quality, IP litigation risks, and managing IP assets within the confines of data privacy and cybersecurity regulations present ongoing challenges.

Effective strategies for proficient IP management underscore the importance of instilling an organizational culture centered around intellectual property, establishing unambiguous policies and procedures, and fostering collaboration with external experts. In tandem, the pivotal role of IP in propelling innovation, engendering value through licensing agreements and collaborations, and mitigating risks emerges as a core focus. Research posits that a triumphant approach to IP management necessitates a multifaceted methodology.

The establishment of an IP-centric culture, reverberating from upper management to all tiers of employees, emerges as a fundamental imperative. Equally essential is the formulation of well-defined IP policies and procedures, serving as the conduit through which innovation is harnessed and shielded. Regular IP assessments assume significance in the identification of prized IP assets, while enlisting the expertise of external professionals, such as legal practitioners, augments strategic decision-making. Embracing open innovation paradigms and active participation in patent consortiums further facilitate the shared utilization of non-core IP assets, concurrently advancing industry-wide innovation trajectories.

Protection of intellectual property rights has essential legal, informational and policy functions that serve as tools to promote innovation, stimulate the development of new markets, and disseminate technology as well as other knowledge to the public in beneficial ways. However, it is believed that its potential as a "powerful tool" for economic development and wealth creation remains underutilized in all countries, especially in developing countries. According to Statista's report, research and development (R&D) expenditure was forecast to reach over 2.47 trillion U.S. dollars globally in 2022 (once local currencies are converted for purchasing power parity). To some extent, spending decreased in 2020 following the outbreak of COVID-19, but in the opposite trend from 2021 when increasing agagin (Statista, 2022a). In developed countries, intangible assets – such as knowledge, information, creativity and inventiveness - are rapidly replacing traditional and tangible assets – such as land, labour and capital. Intellectual property has indeed become the driving force of economic health and social well- being (OECD Data, 2023).

Integral to the discourse is the assertion that adroitly managed IP can galvanize innovation within the banking sector. IP holdings can be strategically monetized through collaborations, joint ventures, and alliances, paving the way for supplementary revenue streams. The safeguarding of inventive solutions furnishes banks with a competitive edge, augments customer experiences, and widens market outreach. Moreover, skillful IP management serves as a linchpin for bolstering risk management mechanisms, preemptively thwarting potential IP-related disputes that could compromise a bank's operational continuity and reputation.

As the banking sector evolves, the impact of emerging technologies, such as quantum computing and decentralized finance (DeFi), on IP strategies is an important avenue for research. Moreover, understanding the relationship between IP management and sustainable banking practices, including environmental, social, and governance (ESG) considerations, offers an intriguing area for future investigation.

Furthermore, it can be observed that research on intellectual property management in the banking/ financial services sector has started to be conducted and published from around 2006 onwards. The number of studies in China and India appears to be greater than in other countries. Issues related to security and protection of intellectual assets, risk mitigation, and external infringements are also highlighted. Among the aforementioned surveyed

studies, one was conducted in Vietnam concerning small and medium enterprises in general. Therefore, this study can contribute a part of knowledge related to the management of intellectual property of enterprises in general and the notes for banks in particular in creating, protecting, and developing. develop their "invisible" competitive advantages.

Table 1: Previous studies related to intllectual property management

| No	Paper title	General	In service/ banking sector	Nations/ Companies	Sources
1	The Management of Intellectual Assets: A New Corporate Perspective	x		UK	R. Hall (1989)
2	The Economics and Management of Intellectual Property	x			O. Granstrand (1999)
3	The Insurance and Management of Intellectual Property Risks	x			Melvin Simensky, E. Osterberg (1999)
4	From ideas to assets: investing wisely in intellectual property	x			B. Berman (2022)
5	Intellectual property management practices	x			N. Bhaduri, M. Mathew (2003)
6	Intellectual Property Management: The Role of Technology-Brands in the Appropriation of Technological Innovation	x			K. Jennewein (2004)
7	A handbook of intellectual property management: protecting, developing, and exploiting your IP assets	x			A. Jolly, J. Philpott (2004)
8	Intellectual Property Management in R&D Collaborations: The Case of the Service Industry Sector		x	IBM, SAP, Swisscom and SwissRe	Martin A. Bader (2006)
9	Intellectual property rights business management practices: A survey of the literature			US, Canada, EU, Japan, and Australia	Petr Hanel (2006)
10	Managing intellectual property in the financial services industry sector: Learning from Swiss Re		x	SwissRe	Martin A. Bader (2008)
11	Research advancement on intellectual property strategy	X		China	Lau, A. K. W., Kong, S. L. S., & Baark, E. (2012).
12	Strengthen the Intellectual Property Protection in Chinese Banking		x	China	Wenyi Dong, Ling Zhang, Fangping Zhu (2012)
13	Analysis on Patent Information of Banking Industry in China Based on Patent Management Map		x	China	Qiu Hong-hua (2012)
14	Risk Management on Intellectual Property Pledge Financing by Small and Medium S&T Enterprises - from the Aspect of Bank		x	China	Zhang Jie-qian (2013)
15	Research on Innovation of Science and Technology Investment and Financing of SMEs in Intellectual Property		x		Y. Xing, Zhangzhi Ge, Weiwei Song (2016)
16	A Summary of Research on Blockchain in the Field of Intellectual Property		x		Junyao Wang et al., (2018)
17	Effective Intellectual Property Management for Small to Medium Businesses and Social Enterprises IP Branding, Licenses, Trademarks, Copyrights, Patents and Contractual Arrangements	X			Francina Cantatore, & Elizabeth Crawford-Spencer. (2018).
18	Study on the various intellectual property management strategies used and implemented by ICT firms for business intelligence	x			Shabib-Ahmed Shaikha, Tarun Kumar Singhalb (2019)
19	Managing intellectual assest and security in the context of technological progress on the example of banking sector company		x	Polish	P. Dziwiński, A. Barcik (2020)
20	Intellectual property as fiduciary object in banking institution	x		Indonesia	Setyawati Setyawati (2020)
21	Specific aspects of intellectual property management in the knowledge-based economy	x			Aurel Mihail, A. Pop, C. Oprean, S. Stan (2020)
22	Intellectual Property Management: Case Studies of Vietnamese SMEs	x		Vietnam	H. Le, Trang Luong (2022)

Source: Compiled by the authors

3. A strategic intellectual property management

A strategy for intellectual property management was introduced first by WIPO training course about Intellectual property management, and then it has been publiced in self-study course from 2023 (World Intellectual Property Organization, 2023). In this material, IP strategy is an essential component of the broader business strategy. Therefore, strategic planning should align with the organization's mission, and policies should serve to strengthen the chosen strategy, rather than the other way around. An intellectual property strategy needs to encompass both internal and external IP management aspects. Managing IP internally is crucial, as without identifying and safeguarding IP, there won't be any assets to oversee. Additionally, the effectiveness of the IP management strategy relies on its external direction, influencing the company's competitive edge and economic prosperity.

Figure 1: Intellectual property managment framework
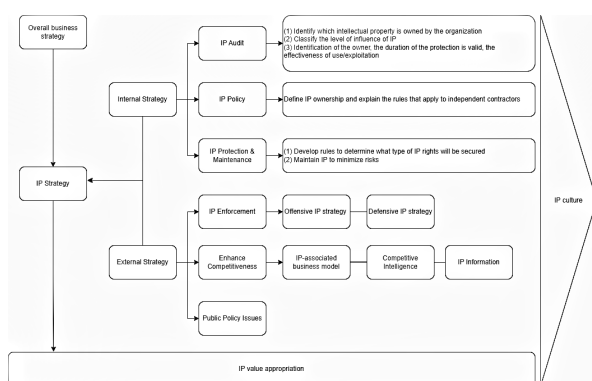
Source: Complied from WIPO (2023)

Intellectual property management from within the organization. Internal strategy includes: *(1) IP Audit; (2) IP Policy; (3) IP Protection & Mainenance.*

- (1) IP Audit: This is a systematic review of the IP assets that a company owns, uses, or acquires is referred. Its goals are to find underutilized intellectual property assets, spot potential dangers to a company's bottom line, and to make it possible for business strategists to develop well-informed plans that will sustain and enhance the firm's position in the market. To conduct IP

Audit, three steps including: Identify which IP is owned by the organization; Classify the level of influence of IP. The company brand, product brands, company and product get-up, goodwill, product certification, export certificates, regulatory approvals, distribution and raw material networks, client lists, marketing, and advertising campaigns, and so on are some examples of these; Identify the owner, the duration of the protection is valid, the effectiveness of use/ exploitation.

- (2) IP Policy: The IP Policy, which is the second internal component of an IP Strategy, outlines the fundamental guidelines that the organization must go by while handling IP. IP must be recorded, evaluated, and protected according to a standardized and efficient manner. In addition to defining IP ownership, an IP policy should outline the restrictions that apply to independent contractors. The policy must outline the policies and processes for filing intellectual property as well as the upkeep processes.

- (3) IP Protection & Maintenance: The third internal component of the Internal IP Strategy. The business must establish policies to specify the types of IP rights that will be protected; these policies include financial ramifications and patent application tactics. Finally, it covers the upkeep of IP to reduce dangers. Moreover, managing IP risks is a crucial component of strategic IP management. All IPs should have their expiration and renewal dates handled. Important patents with expiration dates that might negatively affect sales of key products should have backup strategies in place. Independent monitoring and reporting services may be very helpful in making sure that the right actions are made to protect the IP portfolio.

Outward-facing intellectual property management, external strategy includes: *(1) IP Enforcement; (2) Enhance Competitiveness; (3) Public Policy Issues.*

- (1) IP Enforcement: To enforce IP, both offensive and defensive IP strategy are combined. In which, offensive IP strategy refers to a proactive approach that focuses on leveraging and exploiting intellectual property assets to gain a competitive advantage, generate revenue, and enhance market positioning. This strategy involves actively using

intellectual property as a tool to create value, drive innovation, and establish a strong market presence. Unlike a defensive IP strategy, which primarily focuses on protecting assets from infringement, an offensive IP strategy is centered around maximizing the benefits of intellectual property assets.

- *(2) Enhance Competitiveness:* To obtain more advantages than competitors, organizations need to select one in four IP-associated business model (Fortress-Monopoly, Value Added Monopoly, Hub-Monopoly, Monopoly in-a-box). In addition, competitive intelligence such as knowledge and forecast of the surrounding world, information for making decisions, systematic programs also need to exploit to create more benefits for organizations. Moreover, mapping IP information could be used to gain competitive insight into competitor's field.

- *(3) Public Policy Issues:* Managers must be aware of public policy concerns that might create an obstacle or have a negative influence on their capacity to fully use intellectual property (IP), since it has become a strategic concern for businesses. Public policy problems that may have a substantial influence on a company's IP Strategy include access to important medications, the adoption of open-source software, and bioprospecting. The significance of two incidents that adequately showed the crucial role that public policy and intellectual property law play in advancing sustainable development.

IP value appropriation: The process of collecting the value of one's ideas and efforts in developing and commercializing them is referred to as "IP value appropriation," a term that is frequently used in discussions about innovation. It refers to the process by which individuals, organizations, or entities realize and extract value from their intellectual property (IP) assets. It involves converting the potential value inherent in intellectual property into tangible benefits, such as revenue, competitive advantage, increased market share, and other economic gains (Francina Cantatore & Elizabeth Crawford-Spencer, 2018).

IP Culture: Intellectual property (IP) culture in an organization refers to the collective attitudes, values, practices, and behaviors related to the identification, protection, utilization, and respect of

intellectual property assets within that organization. It encompasses how employees, stakeholders, and leadership view and interact with intellectual property in the course of their work and business activities. A strong IP culture promotes awareness, appreciation, and responsible management of IP assets, which can contribute to innovation, competitiveness, and long-term success.

4. Features of intellectual property management activities in the banking sector

The banking sector has unique characteristics that influence how intellectual property (IP) management is approached. It stems from the sector's regulatory environment, technological advancements, customer relationships, and competitive landscape. These are:

- *Regulatory Compliance:* The banking industry is heavily regulated to ensure financial stability, consumer protection, and fair practices. IP management must comply with both financial regulations and IP laws, which can create complex challenges in protecting and leveraging IP assets.

- *Data Privacy and Security:* Banks handle sensitive customer data and financial information, making data privacy and security a paramount concern. IP management must align with stringent data protection regulations, impacting how IP assets are shared, stored, and utilized.

- *Fintech Innovation:* The rise of fintech (financial technology) has led to rapid innovation in banking services, payment systems, and digital platforms. IP management in the banking sector includes protecting novel fintech solutions, algorithms, and software, as well as navigating collaboration with fintech startups.

- *Cross-Border Operations:* Many banks operate across international boundaries, necessitating the management of IP assets in various jurisdictions. This requires a nuanced understanding of global IP laws and the coordination of IP strategies across different legal frameworks.

- *Customer Trust and Reputation:* Banks rely on trust and reputation to attract and retain customers. IP management plays a role in protecting the bank's brand identity, trademarks, and customer-facing technologies to maintain customer confidence.

- *Mergers and Acquisitions:* The banking sector is characterized by frequent mergers and acquisitions. Effective IP management includes conducting IP due diligence during M&A activities to assess the value, risks, and integration of IP assets from different entities.

- *Complex Technology Ecosystem:* Banks employ a wide range of technology solutions, from core banking systems to mobile apps. IP management involves identifying, protecting, and managing IP rights in these technologies to ensure innovation and competitiveness.

- *Intellectual Capital:* Much of the banking sector's value is derived from intellectual capital, including proprietary trading algorithms, risk management models, and financial analytics. IP management safeguards these valuable assets and ensures they are properly utilized.

- *Partnerships and Alliances:* Banks often form partnerships and alliances with other financial institutions, technology companies, and service providers. IP management involves negotiating IP-related terms in collaborative agreements and addressing ownership of jointly developed solutions.

- *Customer - Centricity:* Banking services are designed to cater to customer needs. IP management should consider customer experience and data privacy concerns when implementing new technologies or services that involve IP assets.

- *Evolving Cybersecurity Landscape:* With the increasing frequency of cyber threats and data breaches, IP management should align with robust cybersecurity measures to protect sensitive IP assets from unauthorized access or theft.

- *Licensing and Commercialization:* Banks might license their proprietary technologies, such as risk assessment models, to other financial institutions. IP management includes determining licensing terms, negotiation, and ensuring compliance with licensing agreements.

5. Recommendations for banking sector in Vietnam

The banking sector in Vietnam experiences unique challenges and opportunities in intellectual property management due to its economic growth, regulatory landscape, fintech innovation, and cultural factors. Crafting an effective IP strategy requires addressing these unique characteristics while aligning with the bank's business goals and contributing to the overall development of the Vietnamese financial industry.

Frist, develop a comprehensive IP strategy: Craft a meticulously outlined and formally recorded intellectual property (IP) strategy that harmonizes with the overarching business goals of the bank. This strategy should encompass the identification, safeguarding, utilization, and enforcement of IP assets, serving as a catalyst for innovation and upholding a competitive advantage. A holistic IP strategy is a fluid blueprint that navigates an entity's endeavors to optimize the value of its intellectual property assets while mitigating potential risks and nurturing innovation. Its contours should be intricately molded to reflect the distinctive aspirations, strengths, and obstacles characteristic of the organization. Some main recommendations for banking sector in Vietnam are included:

- *Regular IP Audits:* Conduct periodic IP audits to identify and catalog existing IP assets. Regular assessments ensure that valuable intellectual property is not overlooked and that appropriate protection measures are in place. Begin by conducting an IP audit to identify and assess existing IP assets. This includes patents, trademarks, copyrights, trade secrets, and other intangible assets. Evaluate the value, relevance, and potential risks associated with each asset.

- *Strengthen IP protection measures:* Secure IP assets through patents, trademarks, copyrights, and trade secret protections. Determine which assets need legal protection based on their strategic value and potential impact on the bank's operations. Determine which IP assets need legal protection, such as patents, trademarks, and copyrights. Define the criteria for pursuing protection, the geographical scope, and the timing for filing applications. As data-driven operations become more prevalent, ensure robust data protection and cybersecurity measures. Safeguard customer data, proprietary algorithms, and other sensitive information to prevent IP breaches. This includes: (1) Data classifcation; (2) Data Encryption; (3)

Access Control; (4) Multi-Factor Authentication (MFA); (5) Incident response plan, and (6) Ruglar updates and patches.

- Continuously expand the scope of cooperation and IP development with external partners: Explore collaborations, partnerships, and joint ventures that involve sharing non-core IP assets. This can lead to mutually beneficial innovation while minimizing the risk of IP infringement. Establish strategic alliances with technology companies, research institutions, and fintech startups to access external expertise and innovative ideas. Such alliances can enhance the bank's IP portfolio and competitive position. Evaluate opportunities to monetize IP assets through licensing agreements, joint ventures, and technology transfer. Generate additional revenue streams by leveraging IP beyond the bank's core operations. Integrate environmental, social, and governance (ESG) principles into the IP strategy. Consider the ethical implications of IP decisions and how they align with the bank's broader sustainability goals.

- Regular Review and Adaptation: Continuously assess the effectiveness of the IP strategy and adapt it based on changing business conditions, technological advancements, and shifts in the competitive landscape. Collaborate with legal professionals well-versed in IP laws and regulations. Their expertise can ensure compliance with IP-related regulations, manage disputes effectively, and protect the bank's interests.

Second, cultivate an IP - aware culture: Foster an organizational culture that values and respects intellectual property. Raise awareness among employees about the importance of identifying and protecting IP assets and encourage them to contribute innovative ideas. Provide ongoing training to employees on IP management practices, legal considerations, and emerging trends. Keep them informed about changes in IP laws and regulations that could impact the bank's IP strategy. These means can be used, for example: (1) Education and Training; (2) Inter-communication; (3) Recognize and Rewards; (4) Building/creating IP symbols, such as ambassadors; (5) Intergrate with organizations's activities. An IP-aware culture goes beyond mere compliance and encourages employees to actively engage with IP assets, generating ideas, and contributing to the organization's innovation and competitiveness. It requires consistent efforts to raise awareness, educate, and integrate IP considerations into the organization's day-to-day operations.

By implementing these recommendations, banks can optimize their intellectual property management practices to drive innovation, protect valuable assets, and maintain a strong competitive position in the dynamic financial industry.

Conclusion

Given the pivotal role of intellectual property in driving innovation, fostering competitiveness, and safeguarding invaluable assets, this research introduces a strategic intellectual property management (IPM) framework. This article has suggested recommendations for the banking sector, delineating strategies that banks can adopt to navigate the multifaceted realm of IP management. By adopting these guidelines, banks can optimize their IP assets, fortify their market standing, and stimulate sustainable growth.

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ORIENTATION AND SOLUTIONS TO GUARANTEE THE RIGHTS AND BENEFITS OF EMPLOYEES IN FDI ENTERPRISES IN VIETNAM

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Abstract: *Stemming from the need and orientation to complete the legal provisions on ensuring the rights and interests of workers in FDI enterprises in our country today, the article proposes two groups of solutions: Ensure the employment rights and interests of employees in FDI enterprises and ensure the rights and interests of workers in FDI enterprises.*

Tóm tắt: *Xuất phát từ nhu cầu và định hướng hoàn thiện các quy định pháp luật về bảo đảm quyền và lợi ích của người lao động trong doanh nghiệp FDI ở nước ta hiện nay, bài viết đề xuất hai nhóm giải pháp: Bảo đảm quyền và lợi ích của người lao động trong doanh nghiệp FDI và bảo đảm quyền và quyền lợi của người lao động trong doanh nghiệp FDI.*

• Từ khóa: *người lao động, người sử dụng lao động, doanh nghiệp FDI, bộ luật lao động.*

Vietnam is integrating deeply into the world economy, thereby attracting a large number of foreign investors, contributing to economic development and creating jobs for millions of workers. However, the violation of the labor law in ensuring the rights and interests of employees in FDI enterprises over the past time has affected the strictness of the law and negatively impacted the investment environment of FDI enterprises in Vietnam. Therefore, ensuring the rights and interests of employees in FDI enterprises is concerned by the competent state agencies and it is necessary to have solutions to both ensure the interests of workers and encourage FDI enterprises to produce and trade effectively.

1. Orientation to ensure the legitimate rights and interests of employees in FDI enterprises

Firstly, concretize human rights in terms of employment, labor and social security in the 2013 Constitution

The 2013 Constitution - the original law of the Socialist Republic of Vietnam state recognizes human rights, basic rights and obligations of citizens, in which human rights in general, human rights in the field of economy, especially the rights of workers in particular. Workers' rights are their right to employment, labor and social security - one of the basic human rights. If the 1992 Constitution only recognizes this right, it is enumerated with the basic content of stipulating the responsibility of the State and society in creating more and more jobs for workers. Until the 2013 Constitution, employees' rights to employment, labor and social security were specified in Articles 34, 35 and 57. The Constitution also stipulates the responsibilities of the employer. Entrepreneurs must ensure fair and safe working conditions, receive wages and rest regimes. It can be said that the provisions of the 2013 Constitution have promoted the freedom to choose jobs, workplaces, and social security for employees. These regulations are of great value to the protection, guarantee and promotion of workers' rights in the context that our country is in the process of redistributing social labor and restructuring the economy, economic integrating economy in the region and the world today.

Second, ensure a harmonious combination of interests between workers, foreign investors and the common interests of society.

The investment environment affects the investment process through factors affecting costs, risks, competition barriers and thereby, affecting the benefits and efficiency of investment activities. Therefore, it will greatly affect the investment

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decision-making process, how much to invest, where to invest capital. Creating a favorable and attractive investment environment with few barriers for FDI enterprises will contribute to ensuring the rights and interests of employees in FDI enterprises.

In any business, the goals of the employer and the employee are both contradictory, unified, and interwoven. The contradiction is that business owners will find ways to cut employee benefits in order to maximize profits. As for the employees, they try to have the maximum rights and benefits to secure work and have a stable life. Therefore, in order to ensure the benefits for both of these subjects in the labor relationship, it is necessary to know how to coordinate the interests in a harmonious way.

Third, it should be based on the views, guidelines and policies on labor and employment of the State and in accordance with the requirements of integration to ensure the rights and interests of workers in FDI enterprises.

All relationships in society are regulated by law. Relations between state management agencies on labor as well as FDI enterprises and employees are also naturally subject to the regulation of labor law.

The process of building and perfecting the legal system in general, labor and employment in particular must thoroughly grasp the legal viewpoint, reflect properly and in accordance with the guidelines and policies of the Party. The lines and policies of the Party and State related to FDI enterprises in Vietnam must be institutionalized in a timely manner, making that institution effective and compulsory throughout the country. Documents on labor and employment must create a favorable legal basis for the expansion of international cooperation relations between Vietnam and other countries. The Resolution of the 12th National Congress of the Communist Party of Vietnam clearly stated the goal of "Comprehensively and synchronously promoting the renovation work; develop the economy quickly and sustainably, strive to turn our country basically into an industrialized country in the direction of modernity as soon as possible". The improvement of the law on ensuring the rights and interests of workers in FDI enterprises must be consistent with the international regulations and commitments that have been ratified and are in the process of being ratified by Vietnam.

2. Some solutions to ensure the rights and interests of employees in FDI enterprises in Vietnam

2.1. Ensuring employment rights and interests of employees in FDI enterprises

The current labor law has basically protected, guaranteed and promoted the rights of employees, including the right to have a job. However, stemming from the practice of implementing these regulations in practice, there are still a number of provisions of the Labor Code 2019 that need to be further studied, revised and supplemented in the coming time in order to better protect the legitimate rights and interests of employees, especially their employment and labor rights. Specifically:

Firstly, the State needs to amend, supplement and perfect legal documents related to human rights in general and labor law in particular to create legal unity in order to protect, ensure and promote human rights and workers' rights, especially their right to employment, labor and social security on the basis of institutionalizing the Party's guidelines and policies on labor and employment, specifically improve regulations on human rights, citizens' rights and obligations under the 2013 Constitution and international labor standards, especially when our country has signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership. Binh Duong and join the ASEAN Economic Community.

Secondly, it is necessary to amend, supplement and perfect the legal form of the employment relationship in order to protect, ensure and promote the employment rights of employees.

It is necessary to clarify the provisions of Clause 1, Point c, Article 37, Clause 1, Article 183 of the Labor Code on acts of abuse, sexual harassment and forced labor. In Vietnam, according to the Research Report on Sexual Harassment in the Workplace conducted by the Ministry of Labour, Invalids and Social Affairs with the help of the ILO, the majority of victims of sexual harassment in Vietnam are women (78.2%) and cultural factors and the fear of losing their jobs prevented many victims from reporting the incident. Sexual harassment in the workplace causes mental damage to employees, seriously affects labor productivity and worsens the workplace environment. Therefore, in the coming time, in order to protect, ensure and maintain the right to a stable and sustainable job for employees, the competent authorities should consider concretizing regulations on sexual harassment acts. education, the employer's responsibility to ensure that there is no sexual harassment in the workplace.

In addition, it is necessary to consider the provisions on the responsibility of the employer in the case of changes in structure, technology or for economic reasons in Clauses 1 and 2 of Article 44.

Clauses 1 and 2, Article 44 stipulate that in case of changes in structure or technology that affect the employment of many employees, many employees are at risk of losing their jobs or having to quit their jobs, the employer must develop and implement the labor use plan as prescribed in Article 46. In case the business owner cannot find a new job but has to dismiss the employee, he/she must pay a job loss allowance to the employee. According to the provisions of Article 49. However, Article 49 stipulates that the employer only pays the unemployment allowance to the employees who have worked for them regularly for 12 months or more but lose their jobs, every working year pays 01 month's salary but must be at least equal to 02 months' salary. As for employees who have worked regularly but for less than 12 months, they are not entitled to unemployment allowance. This regulation is unreasonable and needs to be reviewed to protect and ensure the right to receive unemployment benefits in case they have worked for the business owner for less than 12 months.

Third, it is necessary to review, amend, supplement and complete the regulations on assurance of specific labor

First of all, there needs to be a change in the theoretical perception of the law with specific labor. For a long time, when discussing the law with specific labor, especially with female employees, we always use the concept: Protection of female workers. With such an approach, we often prescribe measures to protect workers as preferential regulations for female employees and correspondingly the responsibility of business owners such as: Leave 6 months maternity; during the period of raising a child under 12 months old, the employee is entitled to 1 hour of child care leave counted in working hours and receiving salary; not be allowed to terminate the labor contract with the employee while raising a child under 12 months old...However, FDI enterprises with strict job position and strict human resource management requirements should the implementation of regulations leads to the risk of female workers losing their jobs. So from the privilege comes the risk of being discriminated against. Therefore, in terms of theoretical awareness, it is necessary to change the concept of protecting female workers to the perception of promoting gender equality at work, which will be appropriate and feasible.

The current Labor Code only prohibits employers from unilaterally terminating labor contracts with female employees for reasons of marriage, pregnancy, maternity leave or raising children under 12 months of age. The postponement of the termination of labor contracts for female employees who are pregnant or raising children under 12 months of age is not regulated, leading to the fact that the labor law does not protect the interests of female employees, especially their right to employment. The failure to provide for the unilateral suspension of labor contract termination for female employees who are pregnant or raising a child under 12 months old is a loophole that is easily exploited by enterprises to dismiss pregnant female employees pregnant or nursing a small child. Therefore, in the coming time, in order to protect the rights of female workers, and at the same time ensure and promote the right to have a job for this particular group of workers, The State needs to supplement regulations on temporary postponement of unilateral termination of labor contracts for female employees who are pregnant or raising children under 12 months old.

2.2. Ensuring the income rights and interests of employees in FDI enterprises and the mechanism to implement these solutions

In essence, wage is the price of labor power, so it is subject to the regulation of the laws of supply and demand in the market in general and the labor market in particular. However, due to the specific nature of salary and its role and meaning to employees and to the economy and society, its formation is not simply a single bargaining process between workers and employees. Workers and employers that need the influence of legal regulations in order to respect the decisions of the parties in the labor relations on the one hand, respect the rules of the market, and on the other hand protect interests of workers and the general order of society. Salary is an agreement between the two parties, so it is necessary to have a mechanism for the two parties to agree accordingly. In order to ensure the rights and interests of employees, salary cannot be a single agreement between the employee and the employer (this is the reality in Vietnam today) but it must be done on basis of collective commitments. Experiences of other countries show that the rights and interests of employees in terms of wages and income can only be guaranteed with the support of commitments through the Collective Labor Agreement.

On the basis of current regulations, the following solutions can be implemented synchronously:

* *Competent authorities, especially central state agencies such as the National Assembly, the Government, the Ministry of Justice, the Ministry of Labor, War Invalids and Social Affairs, etc., need to develop a roadmap* to complete the process, improve the draft and pass the Law on wages in enterprises in the fastest way, ensuring quality and objectivity, creating a legal basis for the parties in the current labor relationship to have a legal basis to strengthen effective participation in economic and social processes. The implementation of this solution in practice requires high political determination, in which, in many Resolutions, conclusions of the Party, in the Resolution of the National Assembly, this issue is mentioned many times. In the condition that the country is conducting a favorable process of industrialization, modernization and expansion of democracy and life.

* *The current representative organizations of employees and employers* need to focus on researching, recommending and proposing solutions to state agencies to ensure and enhance independence and autonomy, promote dialogue in the workplace, negotiate in a tripartite mechanism, minimize the interference and domination of state agencies in a number of business activities, including salary issues, in accordance with the spirit of Resolution No. 27-NQ/TW in 2018 of the 12th Central Committee clearly indicated.

* *To perfect the tripartite mechanism in labor relations*, in which to re-evaluate and properly assess the role and importance of the employer's representative organization. Currently, according to the Government's regulations, the organization representing employers in labor relations when participating in negotiations in the tripartite mechanism is the Vietnam Chamber of Commerce and Industry. However, in the view of many experts, this organization does not operate completely its role as an organization representing the employer, because in fact, there are also some organizations such as the Vietnam Cooperative Alliance, the Association of small and medium enterprises, and other industry associations nationwide. These organizations themselves also perform the function and role of representatives, but due to the Government's appointment to the Vietnam Chamber of Commerce and Industry, other organizations hardly have the opportunity to participate in the tripartite mechanism in the employment relationship. This is also an unreasonable point, which should be adjusted in the near future.

* *Strengthening state management of wages, salaries, and labor norms*

Improving the efficiency and effectiveness of the State's management of wages should focus on issues such as: The State stipulates a common minimum wage, on that basis, trade unions and user representatives labor agreement to form the industry minimum wage. Every year, the State conducts surveys, surveys and publishes the salaries of a number of actual occupations in the market for businesses and employees to refer to when negotiating contract wages. Strengthen the state management of labor and wages on the basis of regularly inspecting and inspecting the implementation of labor and salary regimes and policies, resolutely handling violations of the law. in the field of wages as well as in labor relations.

* *Adjusting the salary mechanism according to the market mechanism*

When perfecting the wage mechanism in FDI enterprises, it is necessary to enhance the role of the wage agreement mechanism, which is a factor to realize wage equity in a democratized society, and is the basis for building a harmonious labor relations on the basis of equality and mutual benefit, for common development. Reforms can be made towards perfecting regulations on collective labor agreements in order to promote healthy and harmonious labor relations and ensure wage determination on the basis of: (i) Depending on conditions the enterprise's payment case; (ii) No State intervention; (iii) In line with market prices according to the law of supply and demand: (iv) Ensuring the needs of workers according to living standards; (v) Not lower than the level prescribed by law; (vi) The contents of the collective labor agreement on salary and income should focus on the salary increase regime, labor norms, overtime wages, bonuses, collective welfare, and social insurance, health insurance, unemployment insurance and performance conditions.

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CLIMATE-RELATED STRESS TESTING: INTERNATIONAL EXPERIENCE AND POLICY IMPLICATIONS FOR VIETNAM

PhD. Nguyen Thi Thuy Dung*

Abstract: *Climate change poses unprecedented challenges to central banks, regulators and supervisors. This article reviews the implementation of climate stress testing from the Bank of England, European Central Bank, and Monetary Authority of Singapore to assess their countries' vulnerability to climate-related risks. The article, then, provide some implications for the State Bank of Vietnam to conduct a climate stress test in the future.*

Tóm tắt: *Biến đổi khí hậu đã và đang đặt ra những thách thức chưa từng có đối với các ngân hàng trung ương, cơ quan quản lý và giám sát trên thế giới. Bài viết này xem xét việc thực hiện các bài kiểm tra căng thẳng liên quan tới biến đổi khí hậu của Ngân hàng Trung ương Anh, Ngân hàng Trung ương Châu Âu và Cơ quan Tiền tệ Singapore để đánh giá mức độ dễ bị tổn thương của hệ thống tài chính của các quốc gia trước các rủi ro liên quan đến khí hậu. Bài báo cũng đưa ra một số gợi ý để Ngân hàng Nhà nước Việt Nam có thể chuẩn bị cho các bài kiểm tra mức độ căng thẳng liên quan tới biến đổi khí hậu trong tương lai.*

• Từ khóa: *kiểm tra sức chịu đựng khí hậu, ngân hàng trung ương, biến đổi khí hậu, phân tích kịch bản.*

1. Climate-related stress test

1.1. Climate financial risk

Climate change can create significant risk for banks, investors, and the economy. There are two main drivers of the climate-related and environmental risks (FSB 2022)

• Physical risk refers to the financial impact of a changing climate, including more frequent extreme weather events and gradual changes in climate, as well as of environmental degradation, such as air, water and land pollution, water stress, biodiversity loss and deforestation. This can directly result in, for example, damage to property or reduced productivity, or indirectly lead to subsequent events, such as the disruption of supply chains.

• Transition risk refers to an institution's financial loss that can result, directly or indirectly, from the process of adjustment towards a lower-carbon and more environmentally sustainable economy. This could be triggered, for example, by a relatively abrupt adoption of climate and environmental policies, technological progress or changes in market sentiment and preferences. These climate-related risk could be materialized into several categories of credit risk, market risk or operational risk as shown in Table 1.

Table 1: The financial impact of climate-related and environmental risks

	Physical risk	Transition risk
Credit risk	lower collateral valuations in real estate portfolios follow from increased flooding risk. This could in turn affect the probabilities of default (PD) and loss given default (LGD) of a bank loan or loan portfolio	Energy efficiency standards may trigger substantial adaptation costs and lower corporate profitability

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	Physical risk	Transition risk
Market risk	Severe physical events may lead to shifts in market expectations and could result in sudden repricing, higher volatility and losses in asset values on some markets	Transition risk drivers may generate an abrupt repricing of securities and derivatives, for example for products associated with industries affected by asset stranding (i.e oil/coal-related industries)
Operational risk	The bank's operations may be disrupted due to physical damage to its property, branches and data centres as a result of extreme weather events (i.e flooding)	Changing consumer sentiment regarding climate issues can lead to reputation and liability risks for the bank as a result of scandals caused by the financing of environmentally controversial activities.

Source: FSB (2022)

Given this arising concern about the financial climate risks, regulators and banks around the world have attempted to measure and prepare for the possible financial ramifications of physical risks and transition risks created by the uncertain path towards Net-Zero economy. The climate stress testing is among one of the most popular tools employed by these institutions to assess their vulnerability to these climate risks.

1.2. Climate stress testing

1.2.1. A brief introduction of stress test

Introduced globally following the 2008 financial crisis, Stress testing is commonly used to analyze the ramifications of risks such as recessions. Many central banks, including the Federal Reserve and the European Central Bank, regularly conduct stress tests to assess banks' ability to weather various market conditions. A proper definition of stress testing is provided by Bank for International Settlement: "_Stress testing is integral to banks' risk management and banking supervision, in that it alerts bank management and supervisory authorities to unexpected adverse outcomes arising from a wide range of risks, and provides an indication to banks and supervisory authorities of the financial resources that might be needed to absorb losses should large shocks occur_" (BIS 2018, page 1).

Stress testing relies on the identification of stressing factors, the mechanism of impact and models to analyze the impact under different scenarios. Hypothetical stressors can be generated either using a re-creation of a historical stressor (such as the 2008 financial crisis, past pandemic etc.) or a hypothetical event (such as a war). Modelers understand how macro-economic and financial factors affect the outcome variables of interest (i.e an institution's profitiablity or a system's financial stability, etc.), then use mathematical or statistical models to simulate the hypothetical impact under different scenarios (i.e difference combination of stressors). These exercises can help determine whether institutions should adjust their operations, as well as how much capital a bank is required to maintained.

Stress testing could be conducted following top-down or bottom-up approach depending on who performs the analysis. A top-down exercise is conducted by a regulator, whereas a bottom-up exercise is performed by individual banks and submitted to the regulator. A top-down approach ensures a consistent methodology and more comparable results across banks while a bottom-up approach allows for banks to individualize their risk assessment based on more detailed information.

1.2.2. Key differences between traditional stress test and climate stress test.

Given the rising concern over the financial impact of climate-related risks, several financial institutions and central banks have conducted climate stress testing. These tests are designed for regulators and banks to gauge the significance of climate risks on the financial health of both individual institutions and the overall financial system. "_A climate stress test is a forward-looking exercise designed to measure a financial institution's exposure to climate risks, using scenario analysis including severe climate risks, to assess the potential impact of climate change on the institution's business model_" (UNEP 2021).

There exists several differences between a conventional stress test and a climate stress test, as outlined in Table 2.

Table 2. Key differences between a conventional and climate stress test

	Conventional stress test	Climate stress test
Purpose	Assess whether banks are financially prepared to absorb losses during severe recessions	Assess banks' vulnerability to climate physical and transition risks and their capabilities to perform such analyses

	Conventional stress test	Climate stress test
Scenario components	Scenarios of recessions described by a set of macro-finance variables (such as GDP, inflation, and unemployment rates)	Scenarios of emission and climate policy pathways, and their economic impacts depicted by a set of climate, emission, and macro-finance variables
Sources for scenarios	Largely based on macro-finance data from historical recessions and economic downturns	Large-scale integrated assessment models projecting future physical and transition risks from hypothetical policy scenarios; projections from statistical models
Typical time horizon	12 quarters	30 years, but varies largely depending on the exercise and type of risk
Follow-up requirements	Determine whether capital requirements for large banks are met	Currently exploratory

Source: (RFF, 2023)

As seen in Table 2, the follow-up requirement after climate stress tests is under exploration. This is because there is a great uncertaily of early climate scenarios, it is premature to draw conclusions about banks' ability to withstand climate risks from existing findings. Thus far, regulators have treated the stress testing analyses mainly as informative exercises but have not imposed any real consequences on banks based on the findings, such as operational changes or increases in capital reserve requirements.

2. Stress testing in the UK, US, and European Union

This section will review the climate stress tests conducted by the Bank of England, European Central Bank and Monetary Authority of Singapore, with regard to its objective, approach, scope, scenario, results and implications.

2.1. Bank of England (BOE)

BOE first published its climate stress test results in May 2022; the test is titled as *"2021 Climate Biennial Exploratory Scenario"* (CBES). The 2021 CBES exercise aims to test the resilience of the current business models of the largest banks and insurers, and the financial system to the physical and transition risks from climate change. The 2021 CBES adopt the top down approach of stress testing

The 2021 BES (BOE 2021) includes both banks and insurers using the same scenarios. The

specific institutions include large UK banking groups and building societies, large UK life insurers and general insurers.

+ For banks, the CBES focuses on the credit risk associated with the banking book, with an emphasis on detailed analysis of risks to large corporate counterparties.

+ For insurers, the CBES will focus on changes in Invested Assets (and Reinsurance Recoverables), and Insurance Liabilities (including accepted Reinsurance) assuming an instantaneous shocks

The CBES explores three different climate policy scenarios, which generate a range of possible future outcomes for global temperatures and the economy, each spanning 30 years. The Early action and Late Action scenarios primarily explore transition risks from climate change: scenario primarily explores physical risks from climate change. The No Additional Action scenario primarily explores physical risks from climate change.

Early Action: the transition to a net-zero emissions economy starts in 2021 so carbon taxes and other policies intensify relatively gradually over the scenario horizon. Global carbon dioxide emissions (and all greenhouse gas emissions in the UK) drop to net-zero around 2050.

Late Action: the transition is delayed until 2031, at which point there is a sudden increase in the intensity of climate policy. In the UK, greenhouse gas emissions are successfully reduced to net-zero around 2050, but the transition required to achieve that is more abrupt and therefore disorderly.

No Additional Action: no new climate policies introduced beyond those already implemented in 2021. The absence of transition policies lead to heighten physical risks, chronic changes in precipitation, ecosystems and sea-level as well as permanent lower economic growth and higher uncertaily to the society and the economy.

The stress test result (BOE, 2022) has shown the size of climate risk impact. For instance, regarding to banks, the projected bank credit losses were greatest in the Late Action scenario, with loss rates more than doubling compared to the counterfactual scenario. The credit loss is equivalent to an extra £110 billion of losses over

the examined period. The projected climate risk impacts were highest for banks' wholesale and mortgage exposures. With regard to insurance companies, losses on insurers' investment assets were largest in the No Additional Action scenario. Specifically, insurers' asset values fall by 15% in the NAA scenario, compared with 8% and 11% in the early and late action scenarios, respectively. The two key drivers of these investment losses are falls in the value of equity holdings, and increases in credit downgrades and defaults in life insurers' corporate bond portfolios.

As clearly stated by BOE, this stress test results will not be used to set capital requirements related to climate risk. BOE will use the results to assist the test's participants in enhancing their management of climaterelated financial risks.

2.2. European Central bank

In 2022 the ECB conducted a climate risk stress test (CST) of the Eurosystem balance sheet as part of its action plan to include climate change considerations in its monetary policy strategy. The aims of this exercise were to (i) analyse the sensitivity of the Eurosystem's financial risk profile to climate change; and (ii) enhance the Eurosystem's climate risk assessment capabilities (ECB 2022).

The 2022 CST was a constrained bottom-up exercise, meaning that participating banks provided their own data submissions and stress test projections subject to a common methodology and common scenarios.

The scope of the exercise covered a number of the Eurosystem's monetary policy portfolios, namely its holdings of corporate bonds, covered bonds, asset-backed securities (ABSs), as well as its collateralized credit operations.

This climate risk stress test used 3 scenarios with different time frame, namely Long term scenario (2020-2050), Short-term scenario (2022-24), and flood risk scenarios (2022).

+ The long-term scenarios project macro-financial and climate variables over a 30-year horizon. There are 3 sub-scenarios namely "Orderly Transition"; "Disorderly Transition" and "Hot house world". The scenarios differ in terms of the extent to which climate policies are assumed to have been implemented (primarily in the form of a carbon tax) and the different types

of climate risk that are expected to materialise as a result.

The hot house world scenario entails severe physical risk but does not lead to transition risk, as it is based on the assumption that climate policies are not enforced.

Under the disorderly transition scenario, the implementation of climate policies is delayed, leading to severe transition risk but only limited physical risk.

Under the orderly transition scenario, climate policies are implemented in a timely manner, which is used as basis to compare against the other two scenarios

+ A short-term disorderly transition scenario, which frontloads sharp increases in carbon prices over a short-term (three-year) horizon.

+ A flood risk scenario, which includes severe physical hazards materialising over a one-year horizon.

The stress test results reveal that the disorderly transition and hot house world long-term stress scenarios produce risk estimates that are between 20% and 30% higher than those under the orderly transition scenario.

Given the finding, ECB continues integrate climate change risk into the Eurosystem's regular risk assessment. ECB also support its financial institutions to modify the existing risk control frameworks and build up financial buffers over time to address the climate risks.

2.3. Monetary Authority of Singapore (MAS)

MAS conducted a climate scenario analysis exercise for selected banks and insurers as part of the 2020 Industry wide stress test (MAS 2021). The exercise aims to raise awareness of the potential economic and financial implications of climate risks, and facilitate learning for both MAS and its financial institutions.

MAS also focuses on credit risk for banks as well as market/insurance risks for insurers. Specifically, the considered banks/insurers are assessed over its exposure to six sectors (i.e. fossil fuels, utilities, energy inventsive manufacturing, building and construction, transport, and agriculture), sovereign credit exposures and insurers' insurance policy clams.

MAS also adopt the similar scenarios to the ECB's. Under the long-term scenarios (2021-2050) there are sub-three scenarios namely Orderly Transition, Disorderly Transition and Hot House world. MAS also adopt a short-term scenario for the period of 2021-2024, under the assumption of severe flooding shocks across the ASEAN-5.

The stress tests result shows that the participant banks projected that their probability of default for credit exposures to the six key industries increased across all the scenarios. For instance, the highest loss that recorded for the Hot House World scenario in 2040 doubled the size of the actual credit loss recorded in 2021. Similarly, the projected market values of insurers' debt holding portfolio also suffer 20% decline in its value under the three scenarios in 2025.

After the stress tests, MAS also ensure that the participants banks and insurers have made meaningful progress in addressing data and methodological gaps in conducting the stress tests.

3. Policy implications for Vietnam

The State Bank of Vietnam provided the requirement to conduct stress tests under the Circular 13/2018/TT-NHNN dated May 18 2018 on internal control systems of commercial banks and foreign bank branches. The stress test is one of the requirements Under Pillar 2 of the Basel II accord which requires a bank to develop an Internal Capital Adequacy Assessment Process (ICAAP). Stress testing is considered an important tool to measure the financial institution's capital, liquidity endurance in different scenarios. According to this Circular, commercial banks should comply with several requirements. Some of the key requirements include (i) Prepare at least 2 stress test scenarios including a business as usual scenario and a stress scenario during the next stress test; (ii) Putting stress testing into a content of the Internal Regulations on the internal control system of commercial banks; (iii) The stress test process must calculate the impact of assumptions on liquidity, capital adequacy ratio in each scenario. There has been a few commercial banks conducting the stress test for the assessment of capital adequacy and liquidity purpose given the complex nature of the stress tests (Le 2022).

The SBV have had some policies in place to mandate the commercial banks to integrate the assessment of climate-related and environmental risks into their risk management process notably including the "Handbook for environmental and social risk in granting credits" published in 2021 or Circular No. 17/2022/TT-NHNN guiding the implementation of environmental risk management in credit extension activities of credit institutions and foreign bank branches on December 23, 2022.

Given this background, the recommendations focus on two main aspects: (i) Further support the implementation of the conventional stress tests among commercial banks; and (ii) develop a road-map to conduct a climate stress testing in the future. The international experience provided in Section 2 could provide a relevant and useful guidance in the latter regard.

(i) Further support the implementation of the conventional stress tests among commercial banks by providing more specific guidance on the content and process of the stress tests, detailed specific scenarios, and testing methodology. This will lay the foundation (in terms of operation, technical methodology, resources etc.) for any climate stress tests to be conducted in the future.

(ii) develop a road-map to conduct a climate stress testing in the future

+ In the early stage, the climate stress testing should aim to raise awareness about the impact of climate-related and environmental risks on the financial system. The climate stress tests results could not only identify the major transition and physical risks that the nation's financial sector faces but also provide relative magnitudes of these risks and suggest mitigation measures in order to lessen their potential impacts and improve resiliency under a variety of climate futures.

In another words, the nature of the climate stress test, at least at the early stage of its development, should be explanatory as regulators and central banks from the UK, EU and Singapore acknowledge that the existing climate stress tests to date have limitations. This explains why the results from the climate stress tests has not been used to make any adjustment on the existing requirement on capital adequacy or liquidity supervision. The various regulators emphasized that these tests

provide useful starting points for understanding the risks of climate change for banks.

+ The SBV could learn from experience of MAS and BOE to use the top-down approach to conduct the climate stress test. This approach ensures a consistent methodology and more comparable results across banks as well as alleviate the burden of conducting such a complicated climate tests on individual commercial banks.

+ The SBV could build its climate stress test on the background of the existing conventional stress test for the purposes of capital adequacy assessment; by adding further climate-related elements of the tests such as climate scenarios or relevant climate-related financial metrics.

+ Following MAS approach, the SBV could start its climate assessment by conducting a scenario analysis for one year period given the impact of severe flooding or other natural hazards in Vietnam. This could provide some initial assessment about the physical risks on the financial system, more importantly, it is considered as a practice before the SBV conduct a proper climate stress test over a long period of time of 20-30 years.

+ The SBV could consider its financial institutions to disclose financial data related to climate and environmental risks. By developing specific disclosure expectations for Vietnam's financial sector, the State Bank of Vietnam will reap multiple benefits. For instance, the SBV could gain an understanding about the financial sector's preparedness for climate change. Furthermore, the quality and standardization of the disclosures made by financial institutions could provide useful and relevant data input for the climate stress testing in the future.

+ Provide training, capacity development program to prepare its human resources for the climate stress tests.

The SBV should ensure that a growing share of its staff are equipped with sufficient climate-related financial risk knowledge to effectively integrate these climate risks into their current work. Capacity-building programmes are one way that supervisors build knowledge on fast moving climate-related financial topics. These programmes can be internal seminars where those most involved with climate risk speak with their colleagues, but they can also include external training and support. The objective of these trainings should be to highlight the relevance of climate-related financial risks for different functions across the bank and provide a primer on major climate risks, global regulatory initiatives, and risk assessment methodologies

+ Promote international co-operation

"Network for Greening the Financial System-NGFS" is among several leading international organizations providing support to the central banks and regulators around the world to cope with arising climate issues. Over the past few years, financial supervisors around the world have worked to develop good practices regarding climate-related risk management and disclosure. The SBV can benefit from the experiences of peer institutions on these topics by joining international initiatives such as the NGFS. With over 100 members, the collection of supervisors and central banks within the NGFS have worked on scenario development, climate risk supervision, and overcoming climate-related data challenges among many other topics./.

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EXPERIENCE DEVELOPING CRAFT VILLAGE TOURISM IN SOME LOCALS IN ASIA AND LESSONS FOR HANOI

MSc. Tran Thi Hien*

Abstract: *The development of craft village tourism not only brings economic benefits, and creates jobs for local workers, but also maintains and preserves the national cultural values. In reality, many localities in Asia have successfully researched and implemented craft village tourism, it brings many economic values and promotes the image of national tourism, including Thailand, and Japan. On the basis of analyzing policies and development models of craft village tourism in some localities such as Chiang Mai province, Thailand, and Oita province, Japan, the article draws some lessons from experience in the management of craft village tourism development in Hanoi city in the current context, contributing to improving the efficiency of tourism activities and preserving the capital's traditional values.*

Tóm tắt: *Phát triển du lịch làng nghề không chỉ đem lại lợi ích về kinh tế, giải quyết việc làm cho lao động địa phương mà hơn thế nữa, còn là một cách thức gìn giữ và bảo tồn những giá trị văn hoá của dân tộc. Việc phát triển du lịch làng nghề đã được nhiều địa phương của Châu Á nghiên cứu và triển khai thành công trên thực tế mang lại nhiều giá trị kinh tế và quảng bá hình ảnh du lịch quốc gia trong đó phải kể đến Thái Lan, Nhật Bản… Trên cơ sở phân tích những chính sách và các mô hình phát triển du lịch làng nghề tại một số địa phương như tỉnh Chiangmai, Thái Lan và tỉnh Oita, Nhật Bản, bài viết rút ra một số bài học kinh nghiệm về quản lý phát triển du lịch làng nghề trên địa bàn thành phố Hà Nội trong bối cảnh hiện nay, góp phần nâng cao hiệu quả khai thác hoạt động du lịch và bảo tồn những giá trị truyền thống của thủ đô.*

• Từ khóa: *du lịch làng nghề, phát triển du lịch làng nghề, chính sách hỗ trợ.*

Introduction

Craft village tourism is a type of high-quality cultural tourism because this is known as a meaningful humanistic tourism resource, a "living museum", where the treasures of tangible and intangible cultural heritage are preserved, which are both rich, diverse, vivid and contributing to the value system of the national culture. Exploiting and developing craft villages in the direction of tourism bring dual effects, including preserving and promoting the cultural values of the craft villages and creating socio-economic benefits. Based on the benefits brought by the development of craft village tourism, some developed countries in Asia have adopted planning policies and successfully implemented several craft village tourism models, which must mention Thailand and Japan, etc. Therefore, Vietnam needs to acquire experience in developing craft village tourism in some countries with similar characteristics in Asia in general and Hanoi city in particular. It helps to limit the shortcomings and promote the strengths of sustainable tourism development in craft villages in the current context.

Experience in developing craft village tourism in Oita Prefecture, Japan

In the process of industrialization and modernization, a few famous craft villages in many countries are gradually dying or disappearing on the world map. However, that is

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not the case in Japan though it is one of the top seven industrialized countries in the world. In this country, many craft villages with traditional crafts still exist and operate very efficiently. Japan is a typical country in Asia for exploiting craft village tourism activities in rural areas in the context of unfavorable agricultural resources. Taking advantage of leisure after harvest time and the cultural value of traditional crafts, tourism in rural and mountainous Japanese craft villages has favorable conditions for development.

As a province located in the southern part of Japan, Oita has a humid subtropical climate, with four seasons: Spring, Summer, Autumn, and Winter, and the same similarities with the weather of Vietnam with many beautiful scenery. Today, Oita has become a popular tourist destination known to many tourists. Oita is named the "hot spring capital" of Japan. Coming to Oita Prefecture, visitors will be able to visit many attractive places such as the Funai Castle Ruins, and Umi-Tamago aquarium as well as drink Sapporo beer for free and enjoy shiitake mushrooms as unique dishes of the Oita people. In addition, visitors can also visit the traditional villages of Oita named Ontayaki Pottery Village, and Yufuin small ancient Village.

Oita Prefecture is the origin of the "Ipson Ipin" or OVOP (One Village One Product) movement in Japan. Accordingly, each village, commune, and district will select unique agricultural products with local characteristics to develop such as vegetables, fruits, and wooden furniture, at the same time, associate with cultural products, services, and tourism in the area. The small village of Yufuin has 100% of the population living on agriculture. When embarking on exploiting and developing tourism from agricultural activities, local people have established a culinary research and development association in order to restore traditional dishes, with the main ingredients being local agricultural products. Moreover, residents also create handmade products bearing the image and tourism brand Yufuin. Visitors to Yufuin can experience many cultural activities, attractive

cuisine and especially be immersed in natural hot springs, capable of therapy and relaxation. Up to now, Yufuin has been famous throughout Japan as a tourist destination with natural scenery and a safe environment, associated with a peaceful and beautiful village image.

The ancient Ontayaki pottery village is located between the majestic mountains separating Fukuoka and Oita prefectures, which is more than 300 years old. Not as large as other pottery villages, Ontayaki was built by visiting potters and is famous for its Ontayaki pottery characterized by geometric patterns. There are only ten kilns in the village. In order to preserve this traditional handmade pottery method, the local government has not increased the number of pottery kilns any further, the pottery techniques will be passed down from generation to generation. Today's Ontayaki potters do not use machines at all, only using human and natural power as in the past to make pottery. Unlike other localities, which encourage tourism promotion programs and expand craft villages, in Ontayaki village, the local government asserts that it is impossible to produce large quantities of products as in other places or receive massive tourists as a tourist attraction. However, hopefully, tourists can feel the peaceful, pleasant atmosphere in this locality, and see the good of traditionally made pottery, unchanged over time.

Tourism activities in traditional Japanese craft villages are increasingly developing with many customer experience activities. In addition to visiting to learn about the history of the birth and development of the traditional craft, visitors can also participate in the production process of some products, etc. Moreover, at craft village tourist sites, there are also lots of complementary services invested and developed to meet the increasing needs of tourists. Handmade goods are sold everywhere and considered valuable souvenirs for tourists to shop. Tourism activities have contributed to improving the added value of handmade products and promoting the image and traditional values of Japan to international friends.

Experience in developing craft village tourism in Chiang Mai Province, Thailand

Thailand is rich culture and history country, known as one of the "tourist paradises" in Asia with beautiful landscapes and especially attractive street food. Currently, Thailand has about 70,000 traditional craft villages. Every year, traditional craft villages in Thailand create many high-value handicraft products for domestic consumption and export. In addition, it also serves tourism and brings high income. Chiang Mai is the second largest province of Thailand, located in the northern region, this land has mainly mountainous terrain with a cool, pleasant climate all year round, similar to Da Lat of Vietnam. In addition to visiting beautiful landscapes in Chiangmai, visitors can also learn about historical and cultural values, traditional craft villages such as Borsang umbrella craft village, and silk and ceramic craft village, San Kham Paeng wood carving.

Bo Sang was formerly part of the ancient kingdom of Lanna, located about 9 kilometers east of Chiang Mai, Thailand. It has many beautiful temples and fertile rice fields, however, the most prominent is umbrella crafting. This place has formed unique and distinctive products that have been handed down through generations. Up to now, the craft of making umbrellas in Bo Sang has gone through more than five centuries. Initially, the village size was small, bringing together umbrella-making families for generations. Gradually, the village expanded with a far-reaching reputation for beautiful, sophisticated handicrafts. Today, all the local people make a living by making handmade umbrellas.

Only about 10 kilometers from the city center is the traditional craft village of San Kham Paeng - a cultural heritage containing the quintessence of Thailand. This craft village is famous for its traditional crafts such as ceramics, art embroidery, knitting, and wood carving. The artisans at the craft village have passed on the techniques and secrets as well as maintained and developed the cultural heritage through many generations. The handicraft products here

are boldly sophisticated and creative, clearly showing the uniqueness of the Thai people. Currently, San Kham Paeng attracts many international and domestic tourists to visit and shop for unique handmade products. This is an ideal place to explore and learn about Thai culture, art, and cultural heritage in a traditional and authentic space.

In the process of modern social development, and the context of the current global 4.0 industrial revolution, Thailand and the northern provinces of this country are also significantly affected, some craft villages are in danger of being lost. There are lots of goods that can replace the products of craft villages. As a result, the problem is how to balance the elements of local traditions with modern techniques so that the craft village can survive without losing its characteristics. Moreover, it is important to ensure that the production process of handmade products does not affect the health of consumers, and does not negatively affect the surrounding environment as well as make sure a stable economic life for local people. In order to preserve the unique traditional cultural values of the nation against the risk of being lost, the Thai Government and the local authorities of Chiang Mai province attach great importance to linking tourism with preserving and promoting the values of craft villages. Specifically, the Government has also had a lot of policies and programs linking craft village development with tourism development to maximize dual values such as:

- The Thai Government has applied the strategic program with the idea of "One Tambon One Product" (OTOP) since 2001. This is a strategic program from the initiative of the Department of Export Promotion (DEP) under the Ministry of Commerce of Thailand. One tambon one product does not mean that each village has only one product, but each one has its skills, culture, traditions, etc., which crystallize in the product, becoming the unique feature of the craft village. The government supports the connection of local to global, through support for the standardization of products, complete packaging, marketing, and organization of

distribution channels overseas. The development of OTOP policy has contributed to limiting the collision of interests and promoting the exploitation of product value. In addition, the construction of "One Tambon One Product" also contributes to creating a distinct, unique attraction for each traditional craft village and developing tourism exploitation value. The duplication of products and ways of exploiting products will lead to boredom and reduce the effectiveness of the tourist's experience.

- The local government in Borsang also organizes many attractive programs and festivals, attracting a huge of tourists. Specifically, in the third week of January every year, Chiang Mai province holds the Borsang umbrella festival. The festival takes place on the main streets to celebrate the traditional day of the craft village. When the festival is held, the whole village seems to be wearing a splendid outfit with a mixture of many vibrant colors of countless decorative umbrellas everywhere from the village gate to the procession. During the Borsang Umbrella Fair, there are many activities and contests organized to attract visitors such as talent contests, exhibitions, sale of umbrellas and handicrafts. Besides, another fair held in Borsang is the famous Paper Umbrella and Handicrafts Fair (Borsang Umbrella & San Kamphaeng Handicrafts Fair) showcasing traditional crafts of Borsang and San Kham Paeng villages. These are famous festivals in the North of Thailand that have attracted many tourists to visit here.

- In addition, with the support of the Government of Thailand, the products of Borsang umbrella village have also been recognized by UNESCO (The Seal of Excellence in Southeast Asia Award 2007 and 2008) as an environmentally friendly product by publicizing through the organization's website, increased confidence in the international market

Tourism activities have contributed to improving the value of local goods (added value) and creating favorable conditions for tourism development in craft villages. At the same time, it enhances the tourist experience through learning about the production process of products, interacting with artisans, and trying their hand at creating products, etc. In addition, due to tourism activities, additional services have also developed, including transportation, and food.

Lessons learned from developing craft village tourism for Hanoi city

Developing craft villages in association with tourism activities not only brings economic benefits to the local community but also contributes to the preservation and promotion of traditional cultural values. Hanoi has long been known as the convergence of Vietnamese craft villages. Especially after merging Ha Tay in 2008, Hanoi's craft villages became even more diverse. The fact shows that, with the potential and strengths of craft villages, if it is well exploited to serve tourism, surely craft villages of the capital will make a significant contribution to improving income and living standards for people. Currently, many famous craft village tourist destinations in Hanoi attract domestic and foreign tourists, named as Van Phuc Silk Village; Bat Trang Pottery and Porcelain Village; Phu Vinh bamboo and rattan craft Village, Ngu Xa bronze casting Village; Tay Tuu Flower Village. Each craft village of Hanoi has its cultural characteristics, expressed from the village gate, the temple of the craft ancestor, or in each sophisticated product created. However, in recent years, the development of craft village tourism in Hanoi still has many limitations and is not commensurate with its potential. From studying the experience of developing craft village tourism of some localities with similarities with Vietnam, some lessons can be drawn for the development of craft village tourism in Hanoi in the coming time as follows:

Firstly, in the development of craft village tourism, the State and competent agencies (specifically for Hanoi, the City People's Committee, and departments) play a key role in orienting and proposing development strategies and policies to support craft villages to develop tourism. For instance, it supports production premises, investment, credit, and trade

promotion; promotes the development of rural industries; continues to improve the mechanism for businesses and production households in craft villages to access credit sources, loans from banks with preferential interest rates; concentrates on building and developing brands, collective label, image promotion.

Secondly, Hanoi must pay special attention to the training of human resources, especially subjects with professional qualifications in tourism. Local authorities need to have policies to attract and develop this source, and to open training courses on tourism skills for local people. These are valuable human resources and if properly trained, there will be highly effective in satisfying the needs of tourists.

Thirdly, each district and town with craft villages associated with tourism should actively plan the development of local craft villages associated with tourism following the current situation and existing resources of the locality. In addition, it plays an important role in seeking and attracting investment, proceeding to build at least one model of a specific agricultural and rural tourism linkage chain model with the participation of farmers-cooperatives-business households-enterprises. Each district and town will actively make chain stores to introduce local products to create highlights of craft villages, serving people and tourists to visit and shop for village products. Gradually, it builds product brands for each craft village serving tourism according to the motto "one village, one product".

In addition, in the development strategy of craft village tourism of the City People's Committee, it is also necessary to emphasize that the development of craft village tourism must be associated with the trend of modern tourism development without losing cultural values and the local identity. From the lessons learned in the ancient pottery villages of Ontayaki, Oita, Japan, local authorities and craft villages also need to clearly define the goal of "preserving cultural values" through the combination of tourism development management or simply promoting tourism for economic development.

In the current context of globalization and extensive international economic integration, craft village tourism in Vietnam in general, and in Hanoi in particular is increasingly attracting tourists, especially foreign tourists, because of the long-standing cultural values and the way of creating handmade products typical in each region. However, craft village tourism also faces fierce competition in the global tourism market, mentioned as China, Japan, and Thailand. Besides, it is a fierce struggle to preserve diversity and traditional values, and national cultural identity. From studying the experience of developing craft village tourism in some localities around the world such as Bo Sang Umbrella Village, Thailand, or Ontayaki Pottery Village, Japan, in the coming time, Hanoi People's Committee needs to have long-term orientations and strategies to promote the strengths and limit the weaknesses in the development of craft villages associated with tourism activities to ensure the harmonious development of the economy - society - culture, environment and benefits to the local community.

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DETERMINANT OF "SINGLE WINDOW INSPECTION/SINGLE STOP INSPECTION" SUCCESS: EVIDENCE OF LAO BAO (VIETNAM) AND DENSAVANH (LAO PDR) INTERNATIONAL BORDER GATES

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Abstract: *This paper discusses and provides evidence on the Single Window Inspection/Single Stop Inspection (SWI/SSI) at the international border gates of Lao Bao (Vietnam) and Densavanh (Lao PDR). The study aims to measure the level of services provided by SWI/SSI at these border gates, analyze the necessary and sufficient conditions for the successful operation of SWI/SSI, and evaluate enterprise satisfaction with the use of SWI/SSI. A structured questionnaire was developed based on the SERVQUAL model, incorporating public service characteristics and the peculiarities of the SWI/SSI model. The survey was conducted among 231 enterprises engaged in trade through the Lao Bao (Vietnam) and Densavanh (Lao PDR) international border gates. Statistical tools in SPSS were used to calculate the means and perform linear regression analysis. The findings shed light on the factors contributing to the success or failure of the SWI/SSI model.*

• Keywords: *SWI/SSI, service quality in the customs sector.*

JEL codes: *F55, F63, F68, F69*

Tóm tắt: *Bài nghiên cứu này thảo luận và cung cấp thông tin về mô hình "Một cửa, một điểm dừng" (SWI/SSI) tại cửa khẩu quốc tế Lao Bảo (Việt Nam) và Đen-sa-vẳn (Lào). Nghiên cứu này nhằm đo lường mức độ dịch vụ do SWI/SSI cung cấp tại cửa khẩu quốc tế Lao Bảo (Việt Nam) và Densavanh (Lào), phân tích các điều kiện cần và đủ để SWI/SSI vận hành thành công và đánh giá mức độ hài lòng của doanh nghiệp sử dụng SWI/SSI. Bảng câu hỏi cấu trúc được xây dựng dựa trên mô hình SERVQUAL, kết hợp với đặc điểm dịch vụ công và đặc thù của mô hình SWI/ SSI. Khảo sát được thực hiện đối với 231 doanh nghiệp hoạt động qua cửa khẩu quốc tế Lao Bảo (Việt Nam) và Đen-sa-vẳn (Lào). Các công cụ thống kê của SPSS được sử dụng để tính toán giá trị trung bình và phân tích hồi quy tuyến tính. Tìm ra các yếu tố dẫn đến sự thành công và các khó khăn trong thực hiện mô hình SWI/SSI.*

• Từ khóa: *SWI/SSI, chất lượng dịch vụ hải quan.*

1. Introduction

The SWI/SSI inspection procedure is the first initiative approved by member countries in the Greater Mekong Subregion (GMS), which includes Vietnam, Cambodia, Lao PDR, Thailand, Myanmar, and two Chinese provinces, Yunnan and Guangxi. This initiative was established in the GMS agreement signed on November 26, 1999, in Vientiane, Lao PDR. This agreement aims to facilitate the transportation of people and goods among GMS countries. Based on the Vientiane agreement (Lao PDR) signed on August 13, 2002, and the Memorandum of Understanding (MOU) signed on March 25, 2005, in Vientiane between the Government of the Lao People's Democratic Republic and the Socialist Republic of Vietnam, the SWI/SSI model was piloted at selected border gates between Lao Bao (Vietnam) and Densavanh (Lao PDR).

The strategy of replicating the SWI/SSI pilot model at Lao Bao (Vietnam) and Densavanh

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(Lao PDR) international border gates with other international borders is currently under consideration. According to the MOUs signed by Vietnam with three countries, including Lao PDR (in 2005), Cambodia (in 2006), and China (in 2007), the SWI/SSI model was expected to be implemented at several border crossings: Lao Bao (Vietnam) - Densavanh (Lao PDR), Moc Bai (Vietnam) - Bavet (Cambodia), and Lao Cai (Vietnam) - Haikou (China). However, the implementation of these plans has not yet taken place. Regarding the pair of Lao Bao (Vietnam) and Densavanh (Lao PDR) border gates, based on the MOU signed on March 25, 2005, between the Governments of Vietnam and Lao PDR, both countries agreed to pilot the SWI/SSI procedure at the Lao Bao and Densavanh border crossings. The steps taken so far include the pilot of Step 1 on May 30, 2005 (the first of four steps under the GMS agreement), full implementation of all four steps on May 1, 2015, skipping steps 2 and 3, and the official opening ceremony of Step 4 on February 6, 2015. The adoption of the SWI/SSI model is a matter of national and international significance, requiring unified direction from the two countries involved in international border pairs. This synchronization should occur from the central government level to the local border gate level.

After more than 17 years of implementing the SWI/SSI model, it remains the world's first and only official pilot at international border gates between Lao Bao (Vietnam) and Densavanh (Lao PDR). The SWI/SSI model was established between 2005 and 2006 when customs procedures in GMS countries were still cumbersome, relying on manual processes involving numerous papers and having limited application of information technology. The customs management model has since undergone significant reforms, incorporating electronic customs, risk management techniques, and modern facilities and equipment. However, in April 2021, due to the urgent measures to prevent and combat the Covid-19 pandemic along the Vietnam - Lao PDR border, the Vietnamese government decided to suspend the implementation of the SWI/SSI model after discussions and agreements with the

Lao PDR government. Therefore, before deciding whether to continue implementing or replicating the model, it is imperative to conduct a thorough evaluation of the effectiveness of the SWI/SSI model within the context of modern customs management. Research is needed to determine the model's effectiveness and identify the factors contributing to its success. This research should draw from practical experiences gained during its pilot implementation at the Lao Bao international border crossing (Vietnam) and Densavanh (Lao PDR), as well as incorporate insights from enterprises operating at these border crossings.

2. Single window inspection/single stop inspection framework of Vietnam of Lao Bao (Vietnam) and Densavanh (Lao PDR) international border gates

The SWI/SSI Model Management is a modern application in customs management designed to enhance the facilitation of international trade activities while promoting customs reform and modernization. The implementation of the SWI/SSI procedure plays a crucial role within the framework of the Greater Mekong Subregion Cross-Border Transport Facilitation Agreement (GMS-CBTA) cooperation, which seeks to streamline the movement of people and goods across borders.

According to Article 4 of the Agreement on facilitating the transport of goods and people crossing the border signed on November 26, 1999 in Vientiane, Lao PDR, between the governments of the Lao People's Democratic Republic, the Kingdom of Thailand, and the Socialist Republic of Vietnam, the concept of "Single Window Inspection" is defined as follows: "*Single Window Inspection involves procedures for the inspection and control of persons (passport, visa, driver's license, foreign currency, customs, health, translation department), transport vehicles (vehicle registration certificate, certificate of insurance) and goods (customs, quality, quarantine of flora and fauna). The competent authorities of the contracting parties, such as customs, police, immigration, trade, agriculture, health, conduct joint and simultaneous inspections.*" The concept

of "Single Stop Inspection" is defined as follows: *"Single Stop Inspection, who assist each other in carrying out their duties. The competent national authorities of the two adjacent countries conduct joint and simultaneous inspections. If the ground conditions do not permit the installation of adjacent border checkpoints, the checkpoints of one Contracting Party are permitted to perform their duties on the territory of the other contracting Party".*

Based on the concepts of "Single Window Inspection" and "Single Stop Inspection" outlined the GMS agreement, the concept of "Single Window Inspection, Single Stop Inspection" can be defined as follows: *the procedure of "Single Window Inspection, Single Stop Inspection" is that the authorities at the border (gate) of the two adjacent countries jointly coordinate joint and simultaneous (or almost simultaneous) inspection of goods, vehicles and people at the joint inspection site located on the territory of the importing country.*

According to the GMS agreement, the authorities at the border gates of the two adjacent countries include customs authorities, immigration check-in agencies (border guard/gate police), and quarantine agencies (medical quarantine, phytosanitary and animal quarantine).

The "Single Window Inspection, Single Stop Inspection", according to the GMS agreement, is fully implemented through four steps:

Step 1: Actual inspection of goods at the joint inspection site in the importing country's Common Control Area (CCA) by customs authorities from the two border crossings.

Step 2: Customs clearance and actual goods inspection at the CCA in the importing country by customs authorities from the two border crossings.

Step 3: Customs clearance and actual goods inspection at the CCA in the importing country, as well as handling relevant documents, by customs authorities from the two border crossings.

Step 4: Full implementation of the SWI/SSI procedure, which involves joint inspections, document processing, and goods clearance by the

authorities from the two opposite country border crossings (customs, quarantine, immigration) at the joint inspection site located on the territory of the importing country.

As of February 6, 2015, all four steps of the SWI/SSI model have been officially implemented at the Lao Bao border crossing (Vietnam) and Densavanh (Lao PDR). Within this border crossing area between Vietnam and Lao PDR, dedicated workrooms have been established for the authorities on both sides, including customs, quarantine, and border guards. These authorities work collaboratively to carry out inspections and document processing at the border checkpoint of the importing country. Specifically, for exported goods, vehicles, and passengers leaving Vietnam for Lao PDR, there is no stop at the Vietnamese border crossing. Instead, they proceed directly to the control area at the Lao border crossing to complete exit procedures with Vietnamese authorities and import procedures with Lao authorities. Similarly, for imported goods, vehicles, and passengers entering Vietnam from Lao PDR, there is no stop at the Lao border crossing. They proceed directly to the control area at the Vietnamese border crossing to complete exit procedures with Lao authorities and entry procedures with Vietnamese authorities.

The SWI/SSI procedure is primarily designed to facilitate the transportation of people and goods across borders among GMS countries. Its primary goals are to promote trade and investment while contributing to improving economic efficiency and competitiveness in the region. One of the fundamental objectives in developing the SWI/SSI procedure is to harmonize and simplify the exchange of information between governments and the business community. By achieving this objective, the SWI/SSI procedure can deliver tangible benefits to the governments of GMS countries and the business community. Specifically, it simplifies and streamlines the process of providing and sharing information, making it easier for businesses and competent agencies to comply with trade laws. The adoption of this mechanism enhances efficiency in the control process and reduces costs for both governments and businesses by optimizing

resource utilization. Governments can realize various benefits, including more efficient resource allocation, adjustments in budgets (typically increases), improved business compliance, enhanced security, and increased integrity and transparency.

Moreover, the SWI/SSI procedure serves as a prerequisite for customs authorities in advanced countries to adopt the ASEAN Single Window customs mechanism. This mechanism is a crucial component of efforts to advance modern economic initiatives, including the ASEAN Free Trade Area (AFTA) initiative.

3. Current context of single window inspection/single stop inspection framework of Lao Bao (Vietnam) and Densavanh (Lao PDR) international border gates

Comparing the results of import and export procedures, specifically the value of imported goods and the number of joint inspection declarations, over the years of SWI/SSI model adoption provides the basis for evaluating its effectiveness and scale. The comparison period spans from 2006 to 2020, as the SWI/SSI model was initiated on June 30, 2005, and its implementation was halted in April 2021.

Table 1. The data on customs import and export procedures through the Lao Bao (Vietnam) and Densavanh (Lao PDR) international border gates from 2006 to 2020

Year	Number of check-in declarations	Weight of imported and exported goods (Tons)	Value of imported and exported goods (USD)
2006	3,036	505,519	171,676,606
2007	3,014	367,554	144,802,564
2008	3,558	409,409	194,113,025
2009	4,303	469,449	215,891,183
2010	4,221	567,045	254,120,650
2011	5,321	416,771	391,391,712
2012	5,039	472,726	340,773,681
2013	4,770	650,377	435,522,612
2014	4,464	513,047	366,799,846
2015	4,515	343,154	181,366,101
2016	4,858	222,555	136,976,860
2017	5,892	269,279	191,616,758

Year	Number of check-in declarations	Weight of imported and exported goods (Tons)	Value of imported and exported goods (USD)
2018	6,681	1,257,004	297,785,420
2019	9,444	978,822	416,683,000
2020	9,304	1,183,961	329,853,710
Total	78,420	8,626,672	4,069,373,728
Compare 2020 with 2006 (times)	3.06	2.34	1.92

Table 2. The general inspection customs clearance figures at the Lao Bao (Vietnam) and Densavanh (Lao PDR) international border gates from 2006 - 2020

Year	Number of check-in declarations	Weight of imported and exported goods (tons)	Value of imported and exported goods (USD)
2006	408	-	22,104,097
2007	1,501	85,951	20,052,179
2008	1,889	63,211	16,637,784
2009	1,497	56,380	14,165,383
2010	405	27,400	10,338,922
2011	463	53,852	17,080,921
2012	515	46,781	35,694,975
2013	608	42,179	29,429,157
2014	594	35,679	25,992,810
2015	2,098	26,537	31,000,000
2016	2,684	24,293	52,490,694
2017	781	11,024	12,588,276
2018	777	30,430	13,710,000
2019	566	18,111	14,000,000
2020	279	4,599	7,039,018
Total	15,065	526,427	322,324,216
Compare 2020 with 2006 (times)	0.68	-	0.32
Compare total of Table 2 with total of Table 1 (%)	4.5	-	6

Source: Customs department of Lao bao international border gate

Analyzing the statistics above reveals that, in comparison to the period from 2006 to 2020, the number of declarations for general customs inspection procedures increased by 0.68 times, while the turnover of goods for general import and export inspection increased by 0.32 times.

Although the total turnover and total weight of general inspection and export goods accounted for a relatively small proportion of the total number of procedures (with an increase of 4.5% in the number of procedures and 6% in value), they have fundamentally transformed the management approach of state customs administration. When customs authorities at Lao Bao (Vietnam) and Densavanh (Lao PDR) border crossings conduct joint inspections, enterprises save both time and costs. For example, the general inspection area streamlines the process by conducting a single inspection instead of separate inspections at the export and import gates. As a result, transparency is enhanced in import and export relations between customs and enterprises, as well as in the policies governing import and export activities between Vietnam and Lao PDR.

However, the data also indicate a decline in the success of the SWI/SSI model in recent years. While a significant contributing factor was the Covid-19 pandemic, leading both governments to advocate for the suspension of the SWI/SSI model in April 2021, this development has triggered a lively debate regarding the model's effectiveness. Therefore, further research is necessary to find answers and address these concerns.

4. Research methodology

The scale was developed based on a qualitative study conducted through technical group discussions with experienced public sector officials and international road crossing experts. It incorporates theories from the Quality Model of Customs Management at International Road Gates and the content of Public Service Quality Management. Additionally, the scale was further adjusted and supplemented with specific factors related to the practice of import and export activities through the Lao Bao (Vietnam) and Densavanh (Lao PDR) international border gates, which serve as representative examples of the SWI/SSI model.

In this section, the research findings are further refined through preliminary quantitative research involving a sample of 231 business representatives. The survey was conducted at the international gate of Lao Bao in Vietnam in 2017. The scales are evaluated and adjusted using a scale conformity test employing the Cronbach alpha reliability factor. In this test, observed variables with a correlation coefficient (item-total correlation) lower than 0.3 are removed. This process is repeated until an appropriate set of observation variables forms a scale for each factor, meeting the Cronbach alpha standard higher than the reference level of 0.6. This procedure is applied to all groups of factors until a set of scales aligns with quantitative technical standards and practical considerations. The results are subsequently presented in the following section.

Table 3. SWI/SSI factor scale

Coefficient Cronbach's Alpha	Coefficient Cronbach's Alpha Normalized	Number of observations
0.794	0.809	7

Construct	Item	Factor loading	Cronbach alpha
c62	SWI/SSI helps to shorten the time for customs clearance of exported goods compared to the traditional method	0.577	0.759
c63	SWI/SSI helps to shorten the time for customs clearance of imported goods compared to the traditional method	0.527	0.768
c66	SWI/SSI helps businesses save customs clearance costs compared to the traditional method (thanks to reducing the cost of loading and unloading goods).	0.604	0.751
c67	SWI/SSI has facilitated the exchange of people and goods across borders	0.562	0.76
c70	Language on profile synchronized between three parties in SWI/SSI model	0.404	0.788
c71	The language in the three-party synchronized communication in the SWI/SSI model	0.586	0.764
c72	Samples of certificates and papers have been synchronized between the two countries	0.504	0.777

Source: Author's survey, survey (2017)

After testing, the SWI/SSI factor scale consists of seven observed variables, listed in Table 3, with a corresponding Cronbach alpha factor of 0.794. This scale captures the unique characteristics of

Lao Bao international border gates (Vietnam), one of the initial pairs of international border gates to implement the SWI/SSI procedure. The procedure involves coordinated steps to streamline and consolidate duplicate procedures on both sides of the border gates into a unified process, reducing the time, procedures, and costs associated with customs clearance for goods, vehicles, and people crossing the border. This set of scales covers specific aspects, including time, cost, documents, and language factors utilized throughout the customs clearance process.

5. Results and discussion

5.1. Enterprises' satisfaction level for swi/ssi model

With the aim of facilitating import and export activities, the SWI/SSI inspection procedure initially garnered consensus from the business community and travelers (immigration passengers). It also received attention and support from the leaders of Quang Tri (Vietnam) and Savannakhet (Lao PDR), as well as the General Directorates of Customs in both Vietnam and Lao PDR. Over the course of 17 years, the implementation of the SWI/SSI procedure in customs management has achieved significant results in streamlining the transportation of goods and people across the border, aligning with the GMS-CBTA Agreement and the Memorandum of Understanding (MOU) between Lao PDR and Vietnam. However, based on enterprise satisfaction ratings, SWI/SSI has not been as effective as expected. In contrast, the lack of synchronization in terms of documentation, language, and work processes has often led to efficiency issues, which run counter to the theory of facilitating goods and vehicles through this model compared to the traditional one. According to the survey, 94% of enterprises believe that customs declarations have not been harmonized between Vietnam and Lao PDR; 95% of enterprises believe that quarantine certificates have not been harmonized between Vietnam and Lao PDR; and 96% of businesses believe that the only accepted document is the goods invoice recognized by both parties.

Table 4. Statistical description on enterprises' feedback to SWI/SSI

	Medium	Standard error	Conclude
SWI/SSI helps to shorten the time of customs clearance for export goods compared to the traditional one	3.52	0.065	Normal/ Neutral
SWI/SSI helps to shorten the time for customs clearance of imported goods compared to the traditional method	3.45	0.996	Disagree
Is the total time of customs clearance for export goods faster or slower than you expect thanks to SWI/SSI	4.33	0.537	Very slow
Compared with other border gates, customs clearance time at Lao Bao border gates is faster thanks to SWI/SSI	3.73	0.748	Disagree
SWI/SSI helps businesses save customs clearance costs compared to traditional methods (thanks to reducing the cost of loading and unloading goods).	3.44	0.911	Normal/ Neutral
SWI/SSI has facilitated the exchange of people and goods across borders	3.37	0.847	Normal/ Neutral
Legal processes and procedures between the two countries have been synchronized and harmonized in the SWI/SSI model	3.67	0.930	Asynchronous
Common language between the two border gates	4.00	0.000	100% do not use common language
Language on profile synchronized between three parties in SWI/SSI model	4.54	0.820	Completely out of sync
The language in the three-party synchronized communication in the SWI/ SSI model	3.94	0.598	Asynchronous
Samples of certificates and documents have been synchronized between the two countries	3.98	0.549	Asynchronous

Source: Author's survey, survey (2017)

Opinions from enterprises and passengers at the border crossings have highlighted several concerns. The presence of numerous people and multiple authorities involved in checks for transportation and import/export goods has caused psychological discomfort and fear for businesses and passengers. The requirement for goods exported from Lao PDR to undergo

checks both in Lao PDR and the CCA for Vietnam has been viewed as troublesome and expensive. Additionally, some individuals from the functional sectors at the two border crossings have displayed uncivilized attitudes, leading to further difficulties and disturbances.

5.2. Discussion

The results of assessing enterprise satisfaction with the SWI/SSI model, despite its many outstanding advantages, reveal several difficulties in its pilot implementation:

(1) Application of laws and compliance with agreements: Differences in laws and management policy policies have led to cases of non-compliance with the agreement, with each party prioritizing the application of their own country's laws. This has resulted in disputes regarding jurisdiction in handling violations and the application of respective laws during the implementation process. Resolving this problem is challenging due to the CCA being located within the territory of the importing country.

(2) Lack of joint coordination among authorities at the Lao Bao - Densavanh border crossing: The process of implementing Step 4 full SWI/SSI model has faced challenges in coordinating procedures and handling violations among the sectors of both parties and enterprises during the implementation process.

(3) Bilateral infrastructure: The check-in location and CCA of customs are divided into two zones located within the territory of each party, which is not convenient for the implementation of the SWI/SSI model. The distance between Lao Bao National Park and the CCA Black Gate is relatively far, requiring people, vehicles, and goods to pass through a new gate to enter this area. This has resulted in difficulties in controlling, coordinating paperwork, and applying the laws of each party in case of violation of the law at the CCA Black Gate, potentially leading to legal disputes (over jurisdiction) between the two countries.

(4) Procedures for crossing the border gates: Vehicles must have "one-stop but multiple pauses". Individuals, vehicles, and goods from both countries do not stop and park only once at the CCA.

(5) Other difficulties: Language barriers exist, and the percentage of customs declarations requiring actual goods inspection by the customs of both countries (especially Vietnam Customs) has gradually reduced to less than 10% of the total number of import and export procedures conducted annually during the period of SWI/SSI model application. Therefore, the allocation of manpower and investment in the equipment territory of the opposing country results in costly funding and a shortage of human resources.

5. Conclusion

The study's results provide a foundation for developing effective improvement strategies for the SWI/SSI model and offer valuable lessons and suggestions for replicating the model at other border crossings. This paper contributes to a multi-dimensional analysis and evaluation of SWI/SSI models. It synthesizes and clarifies the theory behind the SWI/SSI model. This study represents the first comprehensive examination of the model's effectiveness, based on the analysis of actual import-export activities of enterprises at Lao Bao (Vietnam) and Densavanh (Lao PDR) international border gates, along with a sociological survey measuring enterprises' satisfaction before and after implementing this model.

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