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FOREIGN DIRECT INVESTMENT ATTRACTION POLICY IN VIETNAM - ACHIEVEMENTS IN THE FIRST 6 MONTHS OF 2024

PhD. Pham Van Nghia* - PhD. Dong Thi Ha**

Abstract: ***Foreign direct investment (FDI) is an important source of capital to supplement economic development, helping countries acquire new technologies, improve management levels, expand export markets, and adjust economic structures. In fact, after nearly 40 years of reform and opening up, Vietnam has achieved significant success in attracting foreign direct investment. This is the result of Vietnam's efforts in recent years to improve its policies for attracting foreign direct investment. This article introduces the process of improving investment policies, the situation of attracting foreign direct investment in the first half of 2024, and the prospects of Vietnam. Therefore, the author also proposed some policy implications aimed at attracting foreign direct investment.***

• Keywords: *FDI, attracting, policy.*

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1. Introduction

After nearly 40 years of reform and opening up, Vietnam has achieved many successes in attracting FDI, but there are still problems that need to be addressed. In recent years, the significant development in attracting foreign direct investment has helped Vietnam become one of the top 20 countries in the world for attracting foreign direct investment and a reliable and effective investment destination for foreign investors (UNCTAD, 2021). So far, Vietnam has attracted nearly $438.7 billion in foreign investment. Among them, 274 billion US dollars have been paid, accounting for 62.5% of the total registered capital. So far, 129 countries and regions have invested in Vietnam. 63 out of 63 places have already had foreign direct investment projects and 19 out of 21 manufacturing and commercial sectors in Vietnam have invested in foreign direct investment.

Vietnam has made impressive strides in attracting foreign direct investment, yet its ability to attract high-quality foreign direct investment remains limited. For instance, only a small portion of foreign direct investment projects are high-tech and value-added, lacking access to source technology, and the labor intensity remains high. The connection between the foreign direct investment sector and the domestic sector is weak. The influence of FDI firms on domestic enterprises remains minimal.

Vietnam has adapted its policy strategy in response to changes in the domestic and international socio-economic development landscape in recent years. The implementation of documents from the 12th and 13th National Congresses of the Communist Party of China, specifically the Government Resolution No. 103/NQ-CP of August 29, 2013, has achieved this. The Ministry of Planning and Investment, with the support of the World Bank Group, released the "Strategy and Strategic Directions for Attracting a New Generation of Foreign Direct Investment from 2018 to 2030" in March 2018. On August 20, 2019, the Politburo issued Resolution No. 50-NQ/TW, which aimed to improve the system and policies, enhance the quality and efficiency of foreign direct investment cooperation by 2030, and improve the efficiency of attracting foreign direct investment to Vietnam. However, in reality, the system and policies for FDI still overlap and have not kept up with development requirements; the institutions and capabilities that attract and manage FDI are scattered and do not meet the requirements; investment incentive policies are still scattered, unstable, and inconsistent... Therefore, there is an urgent need in Vietnam today to analyze and evaluate the successes and limitations in the process of perfecting FDI attraction policies and to propose solutions to overcome shortcomings in FDI.

2. The process of improving preferential policies to attract investment capital

Mainly, incentives for corporate income tax, import and export tax, and land access reflect preferential policies to attract FDI capital.

Firstly, regarding corporate income tax policy. In each stage of socio-economic development, the Law on Corporate Income Tax has contributed to

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creating an equal environment among subjects, in line with international practices, encouraging entities to conduct investment activities in production and business, and creating conditions for enterprises to increase accumulation. As a result, various stages of socio-economic development have led to adjustments in this tax rate, which has ranged from 32% in 1997 to 28% in 2001, 25% in 2009, 22% in 2014, and 20% from January 1, 2016 to the present. During the period 1987-2010, the state implemented tax reform phases 1, 2, and 3 to encourage investment and ensure revenue. To reduce the tax burden, the state reduced tax rates, simplified the tax system, and expanded the taxable subjects. Tax policy has clearly demonstrated its conformity with the state's economic development orientation. That is: encouraging the development of production and business, promoting exports, encouraging enterprises to invest capital in areas with difficult natural conditions to create even development among regions in the country, moving towards forming a reasonable economic structure, creating sustainable and stable income for the economy.

Since 2011, the government has implemented the fourth phase of tax reform. During this period, the economic landscape of the country underwent many changes. After the global economic crisis, Vietnam's economic growth slowed down due to the development of natural resources, capital, and low-quality, low-cost labor, necessitating a change in its growth model to improve quality and ensure sustainability. In addition, international economic integration continues to progress toward improving quality and deepening development. The aforementioned changes also informed the formulation of newly promulgated tax laws and those revising and supplementing them during this period.

The current average corporate income tax rate in Vietnam is 20%, as stipulated in Article 11 of Notice No. 78/2014/TT-BTC. Article 19 of Notice No. 78/2014/TTBTC, revised by Notice No. 96/2015/TT-BTC, stipulates a case-by-case preferential tax rate for enterprises with a tax rate of 10% within 15 years; the tax rate for enterprises during their operation is 10%; the corporate tax rate is 15%; and enterprises with a tax rate of 17% within 10 years; the tax rate for enterprises during their operation is 17%. Article 20 of the revised Notice No. 96/2015/TT-BTC of the Ministry of Finance, No. 78/2014/TT-BTC, outlines a tax exemption period of four years, followed by a 50% reduction in the taxable amount for the next five years, and a two-year tax-free period followed by a 50% tax reduction for the next four years. Compared to other countries in the world, Vietnam's corporate income tax is lower than the current world average of 23.54%. Africa has the highest corporate income tax rate, at 27.97%.

At present, ASEAN countries have reached an agreement on the minimum corporate income tax. The implementation of the 15% global minimum tax rule in 2023 will result in the loss of its ability to attract foreign investors through tax incentives. Therefore, in order to maintain Vietnam's competitive advantage in attracting FDI while avoiding tax losses, the government needs to consider changing domestic tax regulations and designing new investment incentive policies while taking into account the world's lowest tax rates.

Secondly, import and export tariffs. In January 2007, Vietnam became a member of the World Trade Organization (WTO) and officially joined the global trading system. According to the commitments made by the World Trade Organization, ASEAN, and other countries regarding domestically produced raw materials and supplies, the annual reduction of tariffs has created conditions for foreign direct investment enterprises and businesses to lower production input costs and improve the competitiveness of domestic products relative to imported products. Therefore, the Import and Export Tax Law underwent continuous updates and revisions in 2001, 2005, and 2016 to fulfill integration commitments while also enhancing export-friendly policies to draw in foreign investment. Article 16 of the Import and Export Tax Law of 2016 encompasses imported raw materials, materials, and components utilized in the processing or production of exported goods. The law prohibits the domestic production of these raw materials, materials, and components for manufacturing projects within the list of industries and professions eligible for special investment incentives.

To support the production, processing, and assembly of priority products in the automotive manufacturing and assembly industry from 2020 to 2024, the government issued Decree No. 57/2020/ND-CP (amending Decree No. 122/2016/ND-CP) in 2020, adding provisions for a 0% preferential import and export tax. However, there is no empirical evidence to suggest that tax incentives will increase FDI in the ASEAN region, especially in Vietnam. Tax incentives have even created an unfair investment environment for small and medium-sized enterprises.

Thirdly, preferential treatment related to land. Prior to June 30, 2014, there were two types of land

discounts: land allocation and land leasing, which were subject to exemptions of 20%, 30%, 50%, or 7 years, 11 years, or 15 years. The 2013 Land Law and regulations on the collection of land use fees, land rent, and water surface rent have guided the implementation of land discounts since July 2014. In 2017, in order to attract investment and improve the effective management and utilization efficiency of land financial resources in economic zones and high-tech zones, the government issued Decree No. 35/2017/ND-CP on April 3, 2017, which stipulated the land use fees, land rents, and water surface rents for economic zones and high-tech zones, with discounts higher than those for normal investment projects. Both the Land Law and the Implementation Guidelines agree to eliminate the distinction between enterprises when it comes to acquiring and using land, as well as fulfilling financial obligations. Therefore, the current land incentive policy aligns with the provisions of the law on tax, land, and investment management. Regulations on land incentives play a crucial role in implementing the state's policies, specifically targeting subjects that require incentives and support, as well as areas that require encouragement to attract FDI. Simultaneously, land incentive policies serve as a tool to draw FDI to areas that face challenging socio-economic conditions and are considered priority investment areas.

3. The situation of attracting FDI in the first six months of 2024

In the context of the restructuring of the global supply chain, FDI attraction to Vietnam is still increasing in terms of new investment capital and adjusted capital. Foreign investors continue to consider Vietnam an important investment destination in the medium and long term. FDI attraction in the first 6 months of 2024 still grew positively, reaching 15.19 billion USD. This represents the highest realized FDI capital in the first half of the year during the 5-year period from 2020 to 2024. In 2024, Vietnam is still considered by international investors as an attractive and safe destination, so the wave of investment in Vietnam is increasing, especially in the fields of technology, electronics, and semiconductor manufacturing. Accumulated to June 2024, Vietnam has 40,544 valid projects with a total registered capital of nearly 484.77 billion USD. We estimate the cumulative realized capital of FDI projects to be 308 billion USD, which is equivalent to 63.5% of the total registered investment capital currently in effect. The quality of investment projects has improved significantly. In the first six months of 2024, new investment and capital expansion were received by many large projects in the fields of semiconductors, energy (production of batteries, photovoltaic cells, and silicon bars), manufacturing of components, electronic products, and products with high added value.

Figure 1: Attracting FDI into Vietnam in the first six months of 2024 (USD)

Capital / Time	New Capital	Adjusted Capital	Contribute Capital to buy shares	Total
Half year 2024	9,54	3,95	1,70	15,19
All year 2023	6,49	2,93	4,01	13,43

Source: General Statistics Office

The total amount of foreign direct investment entering Vietnam in the first six months of 2024 includes new registered capital, adjusted registered capital, and contributions, as well as nearly 15.19 billion US dollars in shares purchased by foreign investors an increase of 13.1% compared to the same period in 2023. The registered capital saw the addition of 1,538 new licensed projects, totaling 9.54 billion US dollars. The number of projects increased by 18.9% year over year, and the registered capital increased by 46.9%. The increase in newly registered capital means that new projects will enhance the production and operational capabilities of the economy. The year-on-year decrease in adjusted capital for 592 investment projects stands at 6.3%, while the total newly added registered capital surpasses 3.95 billion US dollars, indicating a 35% increase. There were 1,420 foreign investor transactions in terms of investment and stock purchases (a year-on-year decrease of 10.9%), with a total investment of nearly 1.7 billion US dollars (a year-on-year decrease of 57.7%). Although the adjusted foreign direct investment and investment, as well as stock purchases, exhibit signs of decline, this is merely a temporary pause. Although the growth of new foreign direct investment is the most important indicator for measuring the efficiency of capital flows,

In terms of investment partners, 84 countries and regions invested in Vietnam in the first six months of 2024. The largest investment partners are traditional Vietnamese partners from Asia. Especially, Singapore leads with a total investment of nearly 5.58 billion US dollars, accounting for almost 36.7% of the total investment, an increase of 86% from 2023; Japan ranks second with a total investment of over 1.73 billion US dollars, accounting for 11.4% of the total investment; Next is the Hong Kong Special Administrative Region (China), with a total investment of 1.18 billion US dollars, accounting for 12.4%; China's total investment is 1.01 billion US dollars, accounting for 10.6%; Türkiye's total investment is 730.1 million US dollars, accounting for 7.7%; Taiwan's total investment is

529.8 million US dollars, accounting for 5.6%. *In terms of investment field*, foreign investors have invested in 18 out of 21 sectors of the national economy in Vietnam. Among them, the processing and manufacturing industry leads with a total investment of nearly 10.69 billion US dollars, accounting for 70.4% of the total registered investment, a year-on-year increase of 26.3%. The real estate business ranks second with a total investment of over 2.47 billion US dollars, accounting for nearly 16.3% of the total registered investment capital up 61.5% over the same period. Next in line are the wholesale and retail, professional activities, and science and technology industries, each boasting a total registered capital exceeding 614 million USD and 452 million USD, respectively; the remaining sectors comprise other industries. Vietnam is attractive to foreign investors focusing on the processing and manufacturing industry. This is a positive indication that Vietnam is actively promoting economic restructuring and industrial development, with the goal of becoming a modern, industrialized country with a high average income by 2030 and aiming to become one of the leading industrialized countries in Asia by 2045.

In terms of the number of projects, the processing and manufacturing industry is the leading industry in terms of the number of new projects (accounting for 35.2%) and capital adjustments (accounting for 67.9%). The wholesale and retail industry leads in the number of transactions of capital contribution to purchase shares (accounting for nearly 43.5%).

Figure 2: Newly established and dissolved enterprises in the investment field in the first half of 2024

Business Data / Investment Field	Business		Increase/ Decrease (%)	
	New	Dissolution	New	Dissolution
Wholesale, retail, motorcycle repair	32.773	4.231	13,8	35,4
Processing and Manufacturing Industry	9.741	1.057	8,2	6,8
Real estate business	2.210	605	1,4	-7,5
Warehouse transportation	4.276	366	20,8	4,9
Construction	8.374	732	2,5	7,2
Accommodation and catering service	2.993	448	-12,3	-6,5
Production and distribution of electric, water and gas	590	113	15,7	-31,5

Source: General Statistics Office

In terms of investment forms, the real estate business's investment capital reached 480.3 million US dollars, representing 28.3% of the total value of contributions and share purchases. Professional and technological activities reached 324.7 million US dollars, accounting for 19.1%. The remaining 893.1 million US dollars, accounting for 52.6%, include the Deli stationery project with an investment of 270 million US dollars, the BoViet photovoltaic panel project with a scale of over 120 million US dollars, and the Korninghill Group Ltd. (Hong Kong) toy, stationery, household appliances, and other projects with an investment of 3 million US dollars. Jia Rixing Ltd. invests approximately 4 million US dollars in the project, which aims to produce radio and plastic products.

In terms of investment location, investment capital is concentrated in provinces and cities with advantages in attracting foreign investment (good infrastructure, stable human resources, efforts to reform administrative procedures, and vitality in investment promotion). In the first six months of 2024, foreign investors invested in 48 provinces and cities across the country. Bac Ninh leads with a total registered investment capital of nearly 2.58 billion USD, accounting for almost 17% of the total investment capital 3.1 times higher than the same period. Next is Ba Ria-Vung Tau with nearly 1.54 billion USD, accounting for 10.1% of the total registered investment capital and 12 times higher than the same period. Quang Ninh ranks third with a total registered investment capital of more than 1.36 billion USD, accounting for nearly 9% of the total investment capital. Next are Hanoi, Hai Phong, and Ho Chi Minh City. In terms of the number of projects, Ho Chi Minh City leads the country in the number of new projects (accounting for 38.8%) and capital contribution to buy shares (accounting for nearly 71.5%). Bac Ninh leads in the number of capital adjustments (accounting for 13.5%).

4. Vietnam's FDI attraction prospects in 2024

In 2024, Vietnam's prospects for attracting FDI show many positive signals due to three core factors.

***Firstly*,** multinational producers are increasingly strengthening the role of foreign direct investment in their supply chain diversification strategies. Vietnam hopes to invest in many cutting-edge industries, as the technology sector is undergoing significant innovation and digitization. By 2024, the industrial production sector (supporting projects such as factories, power plants, logistics infrastructure, etc.) is likely to concentrate 80% of FDI in Vietnam. Furthermore, the renewable energy sector has garnered significant attention, with a growing emphasis on clean energy sources like solar and wind power, aiming to sustainably boost Vietnam's electricity supply.

Vietnam is becoming increasingly attractive to high-tech manufacturing enterprises. Many large companies and enterprises in the electronics and semiconductor

industries already exist and plan to expand their investments in Vietnam, such as Intel, Samsung, Synopsys, Qualcomm, Infineon, Amkor, etc. Many of the world's leading economic corporations plan to move their production activities and increase their investment capital to Vietnam in high-tech fields, such as semiconductors, solar energy, wind power, artificial intelligence (AI), and financial technology (Fintech). This is a testament to Vietnam's key and increasingly important role in the global semiconductor supply chain.

Secondly, Vietnam has broad prospects for economic growth. Investors have high expectations for the ongoing economic recovery. This is an important factor affecting investment. Investors' confidence in Vietnam continues to strengthen, and existing investors are confident in government policies and the future development of the Vietnamese economy. Many investors believe that Vietnam is an attractive destination with many potential and advantages in the medium to long term. Vietnam ranks 25th among the 60 most attractive countries in the world for attracting foreign direct investment. Vietnam ranks 25th and has surpassed Southeast Asian countries such as Indonesia, the Philippines, and Thailand in attracting FDI, thanks to its domestic market size and attractive spending to reduce the total cost of foreign direct investment. Vietnam ranks first, with 42.3% of 122 Japanese companies choosing it. Next are Thailand (20.6%), the Philippines (18.6%), and Indonesia (16.5%). Japanese businesses are moving out of China not only because of the trade war but also to "avoid" the increasingly high input costs in the Chinese market.

Thirdly, Vietnam's macroeconomy is stable, despite facing many difficulties, especially external challenges related to the pricing of some strategic commodities in the world market. However, Vietnam's average CPI remains within the National Assembly's target range, hovering around 4%. A basic inflation rate exceeding 2% indicates macroeconomic stability. This is crucial for investors to ensure the safety of their investments. Investment from Japan, South Korea, Singapore, and Asia is still increasing, as are investments from the United States, Germany, France, the United Kingdom, and other European countries in modern technology, future technology, education and training, research and development, and many large-scale projects. International organizations' comments confirm that foreign investment in Vietnam will continue to accelerate, and FDI will continue to be a driving force for Vietnam's economic growth. Vietnam has outstanding competitive advantages in attracting FDI in Southeast Asia and has received high attention from foreign investors, namely:

Firstly, Vietnam has a stable socio-economic and political situation and is known as one of the most dynamic economies. FDI enterprises consistently appreciate these aspects of Vietnam at a rate exceeding 90%. Social and political stability has established a strong trust with domestic and foreign investors, making them willing to raise funds to increase investment and expand production. We continue to improve and upgrade the infrastructure of industrial zones, export processing zones, and economic zones. In addition, Vietnam's advantages in attracting foreign investment include a potential market of 103.3 million people (2023), per capita income (nearly $4400), directions for attracting foreign investment, sustainable development of infrastructure, favorable geographical location, land and labor resources, and other factors. The early successful control of COVID-19 has given Vietnam an advantage over other countries.

Secondly, the geographical location is conducive to investment. Due to its strategic location, Vietnam is situated in the heart of East Asia, which is home to numerous large and dynamic economies. Vietnam enjoys a superior geographical position and trades with the world. It is not only the connecting center of the region but also the gateway to the western economy of the Southeast Peninsula. Compared with India and Indonesia, which directly compete with Vietnam to attract FDI in Southeast Asia, Vietnam has more advantages. Viet Nam is closest to China, and the transportation distance is easy. In addition, Vietnam has become a production base for Samsung smartphones and tablets. Furthermore, Vietnam boasts a population of 650 million within the ASEAN community, and its market size surpasses that of the EU. It has established free trade agreements with ASEAN, South Korea, Japan, and Australia. As a member of the Trans-Pacific Partnership Agreement (CPTPP) and the Regional Comprehensive Economic Partnership Agreement (RCEP), Vietnam has great opportunities to compete with the regional market. At the same time, Vietnam also has the advantage of becoming the center of ASEAN, the fastest-growing region in the world.

Fourthly, the investment office rent is reasonable. Although labor costs in Vietnam are rising, they are still competitive compared to the world, and energy and fuel costs remain the lowest in the region. The average rent in industrial parks is also relatively low. The occupancy rate and rent of industrial parks in

Vietnam are attractive, with an average rent 45-50% lower than in Thailand, Malaysia, and Indonesia. Troy Griffths, Deputy Director of First Pacific Davis Vietnam, stated that office rents in Vietnam are quite moderate compared to the region. Vietnam's labor costs are lower than those of Thailand, Malaysia, and Indonesia. High-yield agriculture and fishing, along with the presence of oil, natural gas, and numerous other mineral resources, contribute to the competitive cost of many basic materials in Vietnam. High tax incentives are another factor in enhancing Vietnam's attractiveness as an investment destination. Explosion on the floor.

Fifthly, factor is the stability of the currency and the appropriateness of electricity prices. The Vietnamese currency is considered the most stable in the region. The exchange rate between the Vietnamese dong and the US dollar has only risen by 0.26%, while the currencies of various countries in the region have depreciated by about 1-5% against the US dollar. High levels of foreign exchange reserves, projected to reach approximately $100 billion in 2023 and surpass $110 billion in 2024, are favorable macro factors. Inflation is under control (it is expected that the Vietnamese economy will grow by 6.3-7% in 2024, and the annual inflation rate will be between 3.5-3.8%); the reasonable management of the National Bank of Vietnam helps to maintain the value of the Vietnamese currency, which is more stable than other currencies in Southeast Asia. Vietnam's electricity prices are significantly lower than those of other countries in the region, accounting for only 80% of Indonesia's prices. This is 42.1% of the electricity price in the Philippines and 66.7% of the price in Cambodia. These favorable factors contribute to a bright prospect for Vietnam to attract foreign direct investment.

5. Policy implications

To enhance the efficiency of attracting investment, we must follow specific guidelines when formulating and implementing investment-related policies, as outlined below:

- Appropriately and reasonably use tax preferential policies, by clearly and specifically identifying tax preferential targets, to avoid excessive and wasteful use. Clearly and specifically identify the targets and departments that require tax incentives. For each province and urban group with different characteristics, there are specific investment preference policies.

- We should not overly focus on tax preferential policies but seek a good, transparent, fair, and effective tax system that conforms to international practices and standards. Tax incentives should shift from profit-based incentives to incentives through investment efficiency and value-added.

- Ending land preferential competition is crucial, as long-term cheap leasing of land can lead to income inequality and negative impacts on local residents, thereby causing land conflicts and inciting anger in society.

- Implementing preferential policies gradually over the medium to long term will limit their frequent changes and have an impact on foreign investors' business performance and investment strategies.

- Develop rules for managing investment incentives effectively, including choosing clear deadlines and standards for each incentive measure rather than providing rewards to businesses arbitrarily. Conduct a cost-benefit analysis before approving any tax or non-tax incentives and regularly evaluate the effectiveness of granting investment incentives. Additionally, we can develop a specific set of preferential levels and standards to ensure transparent and stable implementation of post-preferential policies. Standards based on scale, department, industry, occupation, product, scope, and preferential social responsibility will diversify and solidify. Report evidence and procedures for implementing incentive measures to regulatory agencies.

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IMPACT OF GLOBAL MINIMUM TAX ON FDI ATTRACTION IN VIETNAM

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Abstract: ***Vietnam has always been considered a dynamic economy, attractive to many foreign investors. One of the factors that has brought success and FDI attraction to Vietnam for many years is tax incentives. From 2024, Vietnam will officially participate in the implementation of the global minimum tax, which will bring multi-dimensional impacts to Vietnam's FDI attraction activities. The article focuses on clarifying the impacts of the global minimum tax on FDI attraction in Vietnam, and proposing some solutions for Vietnam to continue to be an attractive destination for foreign investors.***

• Keywords: *global minimum tax, tax incentives, investment environment, foreign direct investment, fdi.*

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Overview of the global minimum tax

The global minimum tax is a kind of tax that has been studied for a long time. However, when the world economic situation has many fluctuations, this tax has been promoted to enter the global economic market. The full name of this tax is the Global Minimum Corporate Income Tax. This is one of the two main pillars of the Base Erosion and Profit Shifting (BEPS) Action Plan initiated by the Organization for Economic Cooperation and Development (OECD) in June 2013

In implement the "Anti-tax base erosion" Initiative, countries have agreed in principle on the 2-Pillar Solution to address tax challenges arising from the digitalization of the economy (referred to as the Global Minimum Tax Agreement). In particular, the second pillar sets a global minimum effective corporate income tax rate (ETR) of 15% for multinational companies, to prevent these companies from transferring profits to low-tax countries to avoid income tax. In terms of the goal of global economic development and creating a healthy and fair competitive environment among countries, the Global Minimum Tax Rule is a progressive tax reform, aiming to limit the situation where many large companies plan to minimize taxes by transferring profits to lower tax coutries.

Accordingly, the tax is applicable to multinational corporations (MNEs) that meet the minimum consolidated revenue threshold of EUR 750 million based on the financial statements of the group by country for at least 2 years in the 4 consecutive years preceding the year of review (Except for certain cases as prescribed by the OECD). The main provisions of the global minimum tax include:

- Income Inclusion Rule (IIR): The provision allows the country where the ultimate parent company is headquartered to tax the ultimate parent company on the income of its subsidiaries in other countries if the ETR of these companies is lower than the minimum tax rate of 15%.

- Undertaxed Payment Rule (UTPR): In case the country of all parent companies has not applied the IIR Regulation, the countries with intermediary companies belonging to the group have the right to tax the intermediary parent company in that country on the income of subsidiaries in other countries that are subject to ETR of less than 15%.

- Standardized Domestic Minimum Additional Tax (QDMTT): According to the OECD Model Rules, countries with an ETR ratio of less than 15% of corporate income tax are entitled to issue legal regulations to collect additional taxes according to the QDMTT Regulation. The countries receiving investment have the right to prioritize collecting QDMTT tax before the investing country applies the minimum tax of 15%. Since the right to tax is sovereign, the general rules (Model Rules) are not mandatory. Countries that agree to participate in the OECD/G20 Inclusive Framework on BEPS (overall framework on global minimum tax) such as Vietnam can choose to apply or not apply these rules. However, if they choose to apply these regulations, countries will have to implement

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them consistently according to the instructions. In case a country does not apply, it must still accept the Global Minimum Tax regulations applied by other members (138 participating countries as of December 16, 2022).

Thus, the global minimum tax is a tax levied on large enterprises and multinational companies with large revenues, but investing in countries with low tax rates to evade taxes, potentially causing unfair competition. Therefore, to create a healthy and fair competitive environment among countries and avoid tax evasion, countries have agreed to introduce the Global Minimum Tax on large investment enterprises by setting limits on tax payments in the host country or home country. And certainly, the Global Minimum Tax is an externally-derived policy that will have profound and multi-faceted influences and impacts on countries that attract and receive investment, including Vietnam.

In 2017, Vietnam began participating in the Action Plan to Combat Base Erosion and Profit Shifting (BEPS). BEPS includes 15 major action plans, in which, Vietnam only participates in a number of minimum commitments, in line with developing countries such as: Transparency in tax dispute settlement; exchange and share information and in the future may expand to value added tax, sales tax, not just corporate income tax

Impact of Global minimum tax on FDI attraction in Vietnam

The effective global minimum tax will bring multi-dimensional impacts to Vietnam in attracting FDI.

On the positive side, participating in the implementation of the global minimum tax will help Vietnam continue to improve his legal framework and investment environment, towards enhancing international economic integration.

When applying the standard domestic minimum tax regulation, investment-receiving countries in general, and Vietnam in particular, with the previous preferential tax rate, will have the right to impose additional taxes on foreign direct investment (FDI) enterprises that are enjoying preferential tax rates, which are actually lower than the minimum rate of 15%, thereby increasing state budget revenue. The OECD has stated that a minimum tax rate of 15% would help "generate an additional $150 billion in global tax revenue each year, including $125 billion from about 100 of the world's largest and most profitable multinational corporations operating in countries with tax rates lower than 15%".

Participating in the implementation of the global minimum tax will also promote Vietnam to increasingly improve its legal framework and financial policies related to attracting FDI in a direction consistent with international practices and standards; thereby, contributing to helping Vietnam strengthen international integration, increase competitiveness through improving both the investment environment and the quality of human resources, and perfecting and synchronizing the infrastructure system. Vietnam's position and competitiveness in the eyes of partners and foreign investors will be increasingly enhanced.

In addition, the Global Minimum Tax also brings positive impacts to the overall investment environment in the world as well as in Vietnam, such as creating a more transparent environment, limiting tax evasion, tax avoidance, and transfer of expertise by corporations. And for Vietnam, applying a minimum tax rate of 15% to all enterprises that were previously and are eligible for incentives will help Vietnam to have a certain amount of budget revenue, from which, there will be resources to implement support in other forms (infrastructure, human resource training...) to compensate investors who have to pay this minimum tax rate.

However, in the short term, the global minimum tax will reduce Vietnam's attractiveness and competitive advantage in attracting FDI. The global minimum tax policy is considered a concern for countries with large economic openness and dependent on attracting FDI capital flows for economic development like Vietnam. Since the economic reform, Vietnam has attracted FDI flows through preferential policies, of which the most used is tax policy. When applying the global minimum tax, some incentives such as tax exemption and reduction for new investment, expansion investment, and corporate income tax incentives will have some changes. That is, when the global minimum tax rate is applied, some large corporations may have to pay additional taxes in other countries where they are headquartered. Thus, the previous benefit of the tax incentives they enjoyed will no longer exist or will be significantly reduced. This also means reducing the attractiveness of attracting FDI flows to Vietnam,

or in other words, when applying global minimum tax, tax incentives may no longer be an attractive factor to attract FDI flows to Vietnam as before.

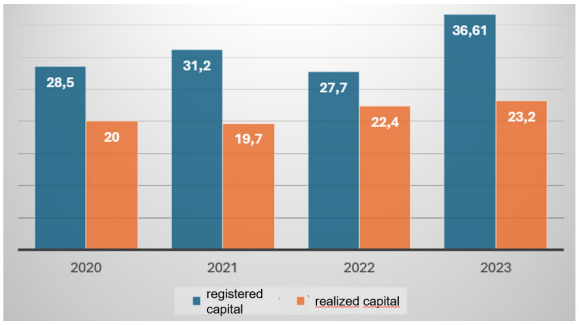
In fact, over the past many years, Vietnam has always been considered a dynamic country, attractive to many foreign investors. After the Covid 19 pandemic, Vietnam has truly become a bright spot in attracting FDI capital flows. Nowadays, Vietnam has entered the top 20 countries in the world in attracting FDI. With many advantages, foreign investors are placing great trust in Vietnam as a link in the global supply chain.

Vietnam's success and global spotlight in attracting FDI is due to the flexible application of attractive policies with many incentives for foreign investors, the most prominent of which is corporate income tax incentives.

Since economic reform, Vietnam has undergone 4 tax reforms. To attract foreign investment capital FDI, tax policies are adjusted to suit the development and requirements at each stage. In which, the Corporate Income Tax Policy always offers many incentives to foreign investment sectors, such as tax rate incentives, tax exemption and reduction periods. These corporate income tax incentives, along with other incentives such as import and export tax incentives, and land policy incentives, have brought about outstanding results in attracting FDI.

By the end of December 2023, FDI capital in Vietnam reached 36.61 billion USD, disbursed capital reached 23.18 billion USD - this is a record high in the period 2018 - 2023, up 32.1% over the same period, including total newly registered capital, adjusted capital and capital contribution to buy shares, capital contribution purchase of foreign investors. Newly registered capital increased by 20.19 billion USD and the number of newly registered projects increased by 3,188 projects - a very remarkable point. The number of new projects increased by 66.3%, much higher than the growth rate of total new investment capital (up 43.6%), showing that small and medium-sized foreign investors continue to be interested in and trust in Vietnam's investment environment, so they have made new investment decisions. Although adjusted investment capital decreased, the downward trend has improved. Newly registered capital and capital contributed to buy shares increased, the number of projects adjusting capital also maintained an increase, affirming investors' confidence in Vietnam's investment environment and continuing to make decisions to expand existing projects.

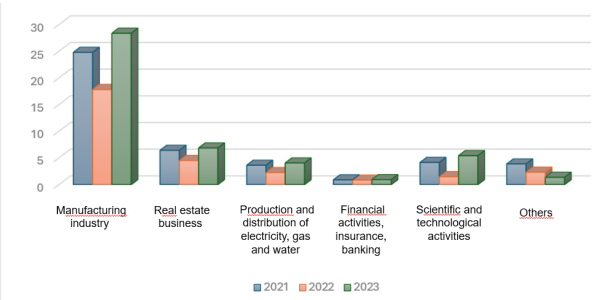
Figure 1: Total FDI capital in Vietnam (Billion USD)



Source: Foreign Investment Agency - Ministry of Planning and Investment

In 2023, the highlight is the sharp increase in new FDI inflows into the manufacturing sector, despite many global economic difficulties and restrictions following the Covid-19 pandemic.

Figure 2: Summary of licensed FDI by economic sector (Billion USD)



Source: Statistical Yearbook 2021, 2022, 2023

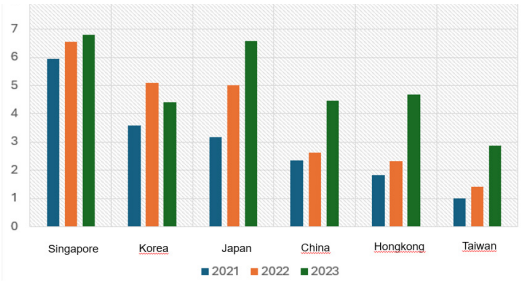
Foreign investors have invested in 18 out of 21 sectors of the national economy. Of which, the processing and manufacturing industry leads with a total investment capital of more than 28.3 billion USD in 2023; The real estate business industry ranks second with a total licensed investment capital of more than 6.89 billion USD in 2023.

Nowadays, there are currently 111 countries and territories investing in Vietnam, of which Singapore is always at the top of the list of countries with the highest total investment capital in Vietnam. Table 3 below summarizes the 6 countries with the largest investment capital in Vietnam in the period 2021 to 2023 (the order of the countries may change slightly each year).

It can be seen that, investors from Asia, traditional investment partners still account for a large proportion

of total investment capital (Singapore, Japan, Hong Kong, Korea, China, Korea, Taiwan). These 6 partners alone accounted for more than 81.4% of the country's total investment capital in 2023.

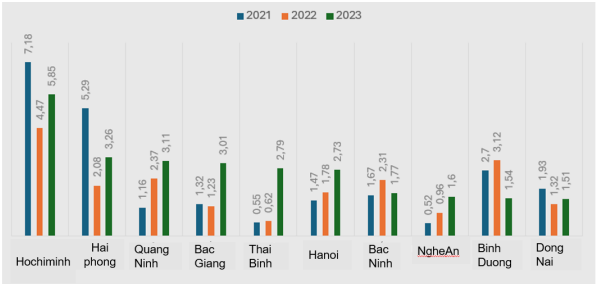
Figure 3: Countries with the largest registered investment capital in Vietnam (Billion USD)



Source: Foreign Investment Agency - Ministry of Planning and Investment and Statistical Yearbook

Along with economic growth, the investment environment and improvement of the investment environment in localities are increasingly improving, accordingly, almost all localities in Vietnam also have FDI flows. Some provinces in Vietnam are always at the forefront of attracting foreign direct investment, namely Ho Chi Minh City, Hai Phong, Quang Ninh, Bac Giang, BacNinh, Hanoi, ThaiBinh, NgheAn, BinhDuong, DongNai… These are the localities considered the most dynamic in the country, with many advantages in attracting FDI (good infrastructure, stable human resources, efforts to reform administrative procedures and dynamism in investment promotion, etc.) with high provincial competitiveness index. Statistics for 2023 alone show that these localities accounted for 78.6% of new projects and 74.4% of the country's capital.

Figure 4: Localities attracting the most FDI in the period 2021 - 2023 (Billion USD)



Source: Statistical Yearbook 2021, 2022, 2023

Figure 4 shows that Ho Chi Minh City leads the country in attracting investment capital, other localities have made great efforts in attracting FDI, with investment capital increasing rapidly and strongly over the years, such as Quang Ninh, Thai Binh, Hanoi. Besides, there are also some localities where total investment capital tends to decrease gradually, such as Binh Duong, Dong Nai.

That is the result of attracting FDI up to 2023. There will be a difference in 2024 when Vietnam participates in the implementation of the global minimum tax. Vietnam is a developing country with a large economic openness, mainly receiving foreign investment capital. The biggest adverse impact is that Vietnam's competitiveness in attracting FDI may be reduced due to changes in tax policy. Currently, Vietnam is applying many tax incentives for foreign-invested enterprises in Vietnam. These are the policy of tax exemption for the first 4 years, tax reduction for the next 9 years, incentives for 23 special sectors, and 7 sectors with lower incentives. These incentives are applied in industrial parks, economic zones, high-tech zones, etc. Tax incentives include: (i) tax rate incentives (10% for up to 15 years and 20% for up to 10 years); (ii) tax exemption and reduction for a limited period (up to 9 years); (iii) allowing loss transfer when calculating taxable revenue (within 5 years); (iv) tax exemption for transferring profits abroad; (vi) tax refund for reinvested profits; (vii) allowing accelerated depreciation or other tax incentives, land rent reductions... These tax incentives help reduce the actual corporate income tax of FDI enterprises to only 12.3%, even some large corporations only pay a tax rate of 2.75 - 5.95%

When the global minimum tax is applied, large multinational companies investing in Vietnam will have to pay the difference from the 15% tax rate to the country where their headquarters are located, so the benefits from the previous tax incentives that they enjoyed and could enjoy in Vietnam will no longer exist or will be significantly reduced. Obviously, this makes the tax attractiveness of investing in Vietnam no longer available to FDI, and therefore may significantly affect their investment decisions in Vietnam in the near future. Although the global minimum tax is only imposed on multinational companies with large revenues, to some extent, it is very likely that small FDI enterprises that are part of the production and business chain of a large multinational corporation will also be indirectly affected. According to preliminary statistics, the application of global minimum tax from January 1, 2024 will affect more than 120 corporations (with about 1,000 enterprises) FDI in Vietnam.

Therefore, Vietnam needs to face the fact that tax incentives are no longer an advantage to

attract FDI to Vietnam, but needs to base on other factors (besides taxes) that can create attractiveness and attract foreign investors to Vietnam, such as investment environment, favorable geographical location, stable and safe economy - politics - society, dynamic economy, still quite cheap labor costs... to attract FDI and retain investors.

Solution

First, *perfecting tax policies in line with international practices and standards.*

The more the economy develops and integrates deeply with the world economy, the more it is necessary to perfect the legal system and build appropriate standards. For the policy system in general, and tax policies in particular, the criteria to aim for are to be consistent with the general rules of global minimum tax but still attractive to foreign investors to continue attracting FDI flows. Thus, in the current context when the Global Minimum Tax is in effect, and Vietnam have to certainly comply, the immediate and urgent solution is that Vietnam needs to speed up the process of researching policies and solutions for implementing the global minimum tax rate rule.

In the current situation, Vietnam needs to internalize the law by issuing a Standard Domestic Minimum Tax (QDMTT) mechanism as a quick response mechanism to protect taxing rights instead of ceding taxing rights to other countries. This Standard Domestic Minimum Additional Tax will be applied to multinational enterprises investing in Vietnam with an effective minimum tax rate of less than 15% and maintain the current general tax rate of 20%. This will ensure that Vietnam does not lose its tax collection rights, while ensuring the harmony of interests between the State and investors. This solution has been applied by many economies, such as Singapore, Malaysia, HongKong, Thailand, etc. Along with that, Vietnam needs to carefully study the rules and guidelines of the OECD, thereby adjusting them to suit Vietnam's circumstances

Second, *transforming the FDI attraction strategy*

Previously, Vietnam used tax as an important and quite decisive tool to attract FDI, but when applying global minimum tax, the strategy of competing through tax tools no longer exists. Therefore, Vietnam needs to transform its FDI attraction strategy by exploiting, affirming and promoting other advantages as well as through other incentives. The investment strategy to attract FDI should focus on factors such as: geographical location advantages; openness of Vietnam's economy; Vietnam's reputation and position in the international arena; the level of global supply chain connectivity; infrastructure; human resources; labor productivity; administrative procedure reform; Significantly reduce informal costs... In addition, there are preferential and supportive policies associated with investment goals and activities, such as support for infrastructure investment, support for administrative procedures, support in research and development... These are the basic factors when making business decisions of investors.

Third, *improve the investment environment.*

In reality, the quality of the investment environment has been proven to be more important than incentives. Effective environment, transparent, and favorable investment environment will be the space for all other factors of the economy to operate smoothly and effectively. Therefore, when the Global Minimum Tax comes into effect, tax incentives are no longer an advantage for Vietnam, then Vietnam certainly needs to pay great attention to improving the domestic investment environment. Specifically:

- Continue to make efforts to achieve the goal of upgrading the indexes of the business environment and national competitiveness. To improve and enhance global competitiveness indexes, it is necessary to strongly promote state administrative reform, considering this as one of the comprehensive solutions, which plays a relatively decisive role in many indexes of global competitiveness.

- Improve the effectiveness of the Provincial Governance and Public Administration Performance Index - PAPI and the Provincial Competitiveness Index - PCI, especially the indexes similar to the Global Competitiveness Index - GCI. Local authorities in Vietnam need to increase publicity, transparency, and proactiveness in providing information to people and businesses, and resolve legitimate requests from businesses. A business environment with high transparency and increasingly improved indexes will help attract investors and retain investors in continuing to maintain and expand their investment and business activities.

In addition, Vietnam need to promote the development of e-government, creating a

transparent, equal, and open business environment; proactively improve the effectiveness of international economic integration, creating leverage for enhancing resilience and sustainable economic development

- Invest in synchronous development of infrastructure systems for the economy. Planning infrastructure development in a synchronous and modern direction, with strategic thinking, long-term vision, and regional linkages to create a driving force for development diffusion.

- Developing an ecosystem of science, technology, and innovation. Science and technology capacity along with innovation are factors to assess national competitiveness. Therefore, it is necessary to build and develop an ecosystem of science, technology, and innovation with a flexible management mechanism, suitable for the digital business environment to create a favorable space for innovation and creative startups, creating a foundation to attract and develop high-tech industries.

- Improving the effectiveness of international economic integration and Vietnam's position in the international arena. The more consolidated Vietnam's position and prestige in the international arena will be, the more foreign investors will trust, thereby attracting FDI flows.

Fourth, *developing high-quality human resources*

In the context of the strong development of the 4th industrial revolution, the requirements for human resources will increase, instead of the large number by the quality, skills and expertise of the human resources, which plays a very decisive role. Therefore, to attract FDI, Vietnam must prove that the country always has a human resource that is sufficient in quantity, strong in quality, and meets all the requirements of corporations and multinational companies. In the coming time, Vietnam needs to promote professional training, skills, discipline, culture and raise awareness for the workforce, especially in priority industries attracting foreign investment, in accordance with international standards and requirements for attracting and using foreign investment.

Fifth, *implementing support to improve the capacity of domestic enterprises*

Developing a strong domestic enterprise sector with sufficient capacity to integrate internationally; providing maximum support for start-ups, innovative enterprises, small and medium enterprises to enter into joint ventures and partnerships with the foreign investment sector, focusing on high technology, new technology, advanced technology, key technologies of the 4th Industrial Revolution, modern services, manufacturing industry, information technology and financial services. In the current conditions, Vietnam needs to promote and support domestic enterprises in joint ventures and partnerships through capital contributions, purchase of shares, and capital contributions of foreign investment enterprises in industries and fields using high technology, new technology, and advanced technology, towards owning and mastering the technology. At the same time, there should be policies to develop supporting industries, both to increase domestic industrial production capacity and to attract and retain foreign investors

Conclusion

The article has outlined the issues related to the global minimum tax, thereby identifying the impacts of the global minimum tax on attracting FDI in Vietnam. When tax instruments are no longer a competitive factor to attract FDI flows, other factors that Vietnam needs to affirm and highlight are the investment environment, FDI attraction strategy, synchronization in the legal system, deep integration and enhancing the national position. These are also the solutions proposed in the article, with the aim of maintaining and increasing the attractiveness in attracting FDI flows and retaining FDI enterprises in Vietnam.

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SUSTAINABLE GROWTH THROUGH EXPORT: CURRENT SITUATION AND SOLUTIONS FOR VIETNAM

Assoc.Prof.PhD. Do Thi Thuy Phuong - Nguyen Thu Ha***

Abstract: ***In the context of deepening globalization and international economic integration, exports play a crucial role as one of the main drivers of Vietnam's economic growth. Based on the analysis of secondary data from existing reports and studies, this paper highlights Vietnam's significant progress in increasing export turnover, especially in key sectors such as textiles, electronics, and agricultural products. However, the research also points out that intensifying international competition, rising product quality requirements, and dependence on imported raw materials have created major challenges for export enterprises. Additionally, global market fluctuations and non-tariff trade barriers are also factors hindering Vietnam's ability to maintain and expand its export market share. Based on these analyses, the paper proposes practical and effective solutions to promote sustainable growth through exports, including improving product quality, investing in modern production technology, expanding export markets, and strengthening trade partnerships...***

• Keywords: *growth, sustainable, export, goods, Vietnam.*

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1. Introduction

Vietnam's economic development over the past few decades has been characterized by rapid growth, largely driven by its export-oriented strategy. As one of the most dynamic emerging economies in Southeast Asia, Vietnam has harnessed its comparative advantages, such as a young workforce, strategic geographic location, and favorable trade agreements, to become a significant player in global trade. The country's exports have surged, contributing not only to GDP growth but also to poverty reduction and improved living standards. However, as the global economic landscape becomes increasingly complex and competitive, Vietnam faces new challenges that threaten the sustainability of its export-driven growth model. The ongoing transformation of global supply chains, coupled with the rising demand for high-quality and sustainably produced goods, requires Vietnam to adapt swiftly. Traditional reliance on low-cost labor and export of raw materials or low-value-added products may no longer suffice in maintaining competitiveness. The increasing pressure from global competitors and the evolving nature of international trade agreements call for a shift towards higher value-added production and the adoption of sustainable practices. Moreover, the country's heavy dependence on imported raw materials, particularly for its manufacturing and processing industries, poses a vulnerability. This dependency not only impacts the cost structure but also exposes the economy to external shocks, such as fluctuations in global commodity prices or disruptions in supply chains. Additionally, Vietnam's exporters must navigate an increasingly stringent set of non-tariff barriers, including standards related to environmental sustainability, labor rights, and product safety, which are becoming more prevalent in key export markets. To achieve sustainable growth through exports, Vietnam must implement comprehensive reforms that address these challenges. This involves not only improving the quality and competitiveness of its exports but also enhancing the resilience of its economic structure. By diversifying export markets, upgrading technological capabilities, and fostering innovation, Vietnam can reduce its reliance on traditional markets and products, thereby mitigating risks associated with global market volatility. Strengthening trade relationships and actively participating in international trade forums will also be essential in securing favorable terms and access in a rapidly changing global trade environment.

2. Current status of Vietnam's exports

2.1. Achievements in Vietnam's exports

Exports have played an extremely important role

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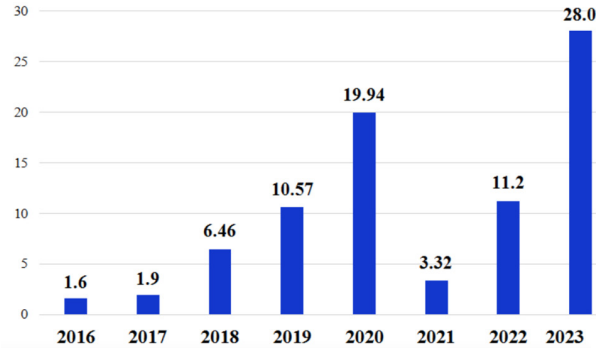
in driving Vietnam's economic growth. In recent years, Vietnam has made significant achievements in the field of exports, contributing to enhancing the country's position on the international stage. Despite the global economy continuing to grow slowly and global demand declining, Vietnam's export activities have managed to overcome challenges and recorded some positive outcomes. The year 2023 was challenging for Vietnam's economy due to both internal and external impacts. However, the economy still maintained a trade surplus, with the surplus reaching 28 billion USD, far exceeding 2022's 11.2 billion USD. This marks the eighth consecutive year that Vietnam has sustained a trade surplus, with a record surplus growth of 2.5 times that of 2022.

Chart 1. Vietnam's trade surplus from 2016 to 2023 (Billion USD)

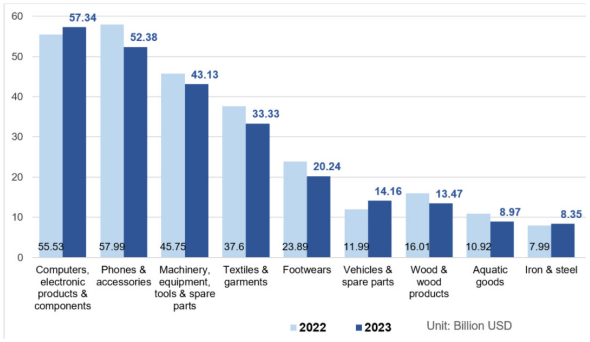


Source: Compiled from the Annual Import-Export Reports of the Ministry of Industry and Trade

Vietnam has successfully diversified its export products, shifting from reliance on traditional agricultural products to exporting higher-value industrial products. The country's key export sectors currently include electronics and components, textiles and footwear, as well as agricultural and aquatic products. Vietnam has become one of the world's leading exporters of electronic products, particularly mobile phones and electronic components. The strong investment from multinational corporations such as Samsung, LG, and Intel has helped Vietnam emerge as a major electronics manufacturing hub in the region and globally.

In the textiles and footwear industry, Vietnam has risen to become the third-largest exporter worldwide. Domestic companies have continually improved product quality, innovated designs, and enhanced their competitiveness in the international market. Despite the diversification of its products, Vietnam has maintained its position as one of the world's leading agricultural exporters. Key export items such as rice, coffee, cashew nuts, and seafood hold significant market shares in demanding markets like the United States, the European Union, and Japan. Exports of agricultural and aquatic products have increased compared to the previous year, with some categories recording substantial growth. For instance, fruit and vegetable exports reached 5.6 billion USD, up 66.7%; rice exports reached 4.7 billion USD, up 35.3%; and cashew nut exports reached 3.6 billion USD, up 18.1%. The structure of rice export markets continues to shift positively towards diversification and expansion into new, potential markets such as Australia and European countries. The export of high-value rice varieties that align with market demand and Vietnam's advantages, such as fragrant rice (DT8, OM 18, 5451), ST, glutinous rice, and premium 5% broken white rice, has been growing significantly.

Chart 2. Vietnam's largest export commodity group 2023



Source: Import-Export Reports 2023 of the Ministry of Industry and Trade

Vietnam has signed and implemented numerous free trade agreements (FTAs) with major economic partners worldwide, including the EU-Vietnam Free Trade Agreement (EVFTA), the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), and the Regional Comprehensive Economic Partnership (RCEP). Participation in these FTAs has allowed Vietnam to expand its export markets, reduce trade barriers and tariffs, and enhance the competitiveness of Vietnamese businesses in the global market. The effective utilization of these FTAs has yielded positive results for Vietnam's exports. Specifically, agricultural products, seafood, and textiles have significantly benefited from tariff reductions when accessing major

markets such as the EU, Japan, South Korea, and Australia.

One of the key factors contributing to the success of Vietnam's exports is the improvement in product quality and the adoption of new technologies in production. Vietnamese enterprises have recognized the importance of enhancing product quality to meet the increasingly stringent requirements of international markets. Many companies have invested in modern production lines, implemented quality management processes according to international standards, and developed high-value-added products. Additionally, participation in global supply chains has driven Vietnamese businesses to enhance their production and management capabilities. The connection with multinational corporations has enabled Vietnam to learn and adopt advanced technologies, thereby boosting its competitiveness in the global market. Thanks to its export achievements, Vietnam's position on the international stage has been significantly elevated. Vietnam has not only become an important trading partner for many countries but also an attractive destination for foreign investors. This is reflected in Vietnam's high rankings in international reports and rankings on competitiveness and business environment. Moreover, Vietnam has demonstrated its active role in international trade organizations and forums, such as the World Trade Organization (WTO), ASEAN, and the Asia-Pacific Economic Cooperation (APEC). Vietnam's active and responsible participation in these organizations has contributed to enhancing the country's credibility and influence on the global stage.

2.2. Challenges and limitations in Vietnam's exports

Despite achieving significant milestones in export activities, Vietnam continues to face numerous challenges and limitations. These difficulties stem from various factors, including inherent issues within the domestic economy and fluctuations in the international environment. Below are some of the major challenges and limitations that Vietnam is currently encountering in its export activities.

Dependence on traditional markets and key export products

One of the significant limitations of Vietnam's export sector is its heavy dependence on a few traditional markets and key export products. Countries like China, the United States, the EU, and Japan are the primary export destinations for Vietnam, accounting for a large proportion of the total export turnover. However, this over-reliance on a few markets poses a high risk, especially when these markets experience economic fluctuations or implement changes in trade policies. Additionally, Vietnam's key export products, such as electronics, textiles, agricultural products, and seafood, face intense competition from other countries, particularly those with lower production costs or more advanced technologies. This situation could lead to imbalances in the export structure, reducing the sustainability of Vietnam's economy.

Trade barriers and trade defense measures

In the context of globalization, traditional trade barriers like tariffs have been gradually reduced through free trade agreements. However, non-tariff trade defense measures, such as technical standards, food safety regulations, and origin requirements, have become significant challenges for Vietnamese exporters. Developed markets such as the EU, the United States, and Japan have implemented stringent technical standards for imported goods, making it difficult for Vietnamese businesses to meet these requirements. This necessitates investments in technology, improvements in production processes, and quality management, which in turn increase production costs. Moreover, trade defense measures like anti-dumping and countervailing duties are increasingly applied to Vietnamese export goods, negatively impacting the competitiveness of domestic enterprises.

Low product quality and added value

A major limitation of Vietnam's exports is the low quality and added value of its goods. Many of Vietnam's export products still rely on cheap labor and traditional production processes, with little breakthrough in technology and innovation. As a result, Vietnamese goods are often undervalued in the international market, making it difficult to increase added value and profitability for businesses. Industries such as agriculture, seafood, and textiles frequently encounter this issue, where products are mainly exported as raw materials or in a semi-processed state, without deep processing. This not only reduces export value but also limits Vietnam's competitiveness in the global market.

Technological and innovation limitations

Despite significant improvements, the technological level and innovation capacity of Vietnamese enterprises remain limited compared to developed countries. Most Vietnamese businesses, particularly small and medium-sized enterprises (SMEs), still rely heavily on outdated technology, lack investment in research and development (R&D), and have low levels of automation in production. This hinders their ability to quickly adapt to changing market demands and reduces their competitiveness against international competitors. Vietnam's high-tech products are still primarily dependent on foreign direct investment (FDI) enterprises, while domestic firms lack the resources and skills to deeply integrate into global supply chains.

Labor quality and skill issues

Labor is a crucial factor in export activities, but Vietnam is currently facing challenges related to labor quality and skills. Although Vietnam has a large workforce, the majority of workers are not well-trained, lack specialized skills, and are unable to adapt to new technological requirements. This poses difficulties for businesses in improving product quality, increasing labor productivity, and participating in high-tech sectors. The shortage of skilled labor also raises training costs and reduces the operational efficiency of export enterprises.

Infrastructure and logistics constraints

Vietnam's infrastructure and logistics systems are still not adequately developed to meet the demands of an export-oriented economy. Despite improvements in recent years, there are still significant shortcomings in the transportation system, seaports, and export support infrastructure. Export businesses continue to face high logistics costs, long shipping times, and inconsistencies in the transportation network. These factors reduce the competitiveness of Vietnamese goods in the international market and limit the potential for expanding export markets.

Global economic fluctuations and market risks

Global economic instability, particularly financial crises, exchange rate fluctuations, and trade wars, has had a negative impact on Vietnam's export activities. When major markets like the United States, the EU, and China experience economic difficulties, consumer demand declines, leading to reduced orders and lower prices for export goods. Additionally, trade wars between major powers, especially the U.S.-China trade war, have created significant risks for Vietnamese businesses as global supply chains are disrupted and markets become more unpredictable.

Lack of linkages and cooperation among enterprises

Another limitation of Vietnam's export sector is the lack of strong linkages and cooperation among domestic enterprises. This deficiency results in the inability to fully leverage the collective strength of businesses within the value chain, from raw material production to processing and export. The lack of coordination and information sharing among businesses also makes it difficult for SMEs to access markets, manage risks, and take advantage of opportunities from FTAs. Despite these achievements, Vietnam's export sector still faces numerous challenges and limitations that need to be addressed to ensure sustainable development. Vietnamese businesses must continue to strive to improve product quality, enhance technological capacity, upgrade labor skills, and expand export markets. The government also needs to provide timely and effective support policies to create favorable conditions for businesses to overcome these challenges.

3. Solutions to boost Vietnam's exports

In order to promote Vietnam's export growth in a sustainable direction, it is essential to implement a comprehensive and strategic set of solutions, each contributing to strengthening the economic foundation and enhancing the position of Vietnamese goods in the global market. Below are detailed solutions:

First, improving product quality is a crucial requirement. We must ensure that Vietnam's export products meet the highest quality standards, comparable to or surpassing those of competing nations. To achieve this, businesses need to invest in upgrading production processes, from selecting raw materials, controlling the production process, to the final quality inspection. Additionally, advanced quality management systems such as ISO 9001, HACCP, or other international certifications should be applied to ensure that products not only meet but exceed the stringent standards of demanding markets like the EU, the US, and Japan.

Second, investing in modern production technology is indispensable. In the context of the rapidly advancing Fourth Industrial Revolution, upgrading production technology becomes

urgent. Businesses need to invest in automating and digitizing production processes to improve efficiency and minimize errors. This not only helps increase productivity but also reduces production costs, thereby enhancing the competitiveness of products in the global market. Moreover, adopting environmentally friendly technologies will also enable businesses to meet the growing demand for green standards, thereby expanding opportunities to access markets with strict environmental requirements such as the EU and North America.

Third, expanding and diversifying export markets is a long-term strategy to mitigate risks from relying on traditional markets. Vietnam needs to intensify trade promotion activities, not only focusing on traditional markets like the US, the EU, and China but also seeking opportunities in emerging markets in Africa, South America, and the Middle East. Deeper participation in free trade agreements (FTAs) is also a way to reduce tariffs, creating favorable conditions for Vietnamese goods to access large markets. For example, leveraging trade agreements like CPTPP and EVFTA can open up significant opportunities for exporters to access potential markets.

Fourth, strengthening international trade partnerships is a critical factor in helping Vietnam consolidate its position on the international stage. The government and businesses must proactively negotiate and sign new bilateral and multilateral trade agreements, expanding cooperation with international organizations to create a favorable trade environment. These agreements not only help reduce tariff barriers but also create a stable legal framework, protecting the interests of Vietnamese businesses when operating abroad.

Fifth, reducing dependence on imported raw materials is a necessary step to enhance the self-sufficiency of export sectors. This requires a shift from importing raw materials to using domestic sources or finding suppliers from other countries with more reasonable costs. Additionally, investment in research and development of alternative materials or the development of domestic raw material production technologies is essential to reduce dependence on international markets. This not only helps businesses mitigate risks related to price and supply but also contributes to domestic economic development.

Sixth, developing high-quality human resources is a key factor in enhancing the competitiveness of businesses. To meet the increasingly high demands of the international market, we need to make substantial investments in education and training to create a skilled workforce ready to adapt to market changes. Vocational training programs and skill enhancement for workers should be widely implemented, especially in key industries such as textiles, electronics, and agricultural processing. Additionally, encouraging cooperation between businesses and universities, research institutes to develop training programs closely linked to production practices will ensure that the workforce not only has professional skills but also a deep understanding of the market and technological trends.

Seventh, promoting green production and environmental protection is a requirement that cannot be overlooked if sustainable development is the goal. In the context of increasingly stringent environmental protection requirements, adopting green production measures not only helps businesses comply with legal regulations but also opens opportunities to access demanding markets. Businesses need to focus on minimizing environmental impacts by saving energy, reducing emissions, using environmentally friendly materials, and recycling waste. Moreover, adopting green production and environmental protection standards will not only enhance the brand image but also create long-term competitive advantages in the international market.

If these solutions are implemented synchronously and with a clear strategy, they will help Vietnam not only increase export turnover but also ensure long-term sustainable development. By improving product quality, investing in modern technology, expanding markets, and developing human resources, we will build a strong export economy that is confident in facing global market challenges.

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THE ROLE OF FINTECH IN ENHANCING ENTREPRENEURSHIP

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Abstract: ***Financial technology, also known as "Fintech", is one of the prominent fields introduced by the Fourth Industrial Revolution at the beginning of the second millennium. The rise and development of the Fintech sector globally today is playing a crucial role in enhancing financial accessibility among individuals as well as businesses, particularly small and medium-sized enterprises (SMEs). The main objective of this research is to explore how Fintech can play a significant role in boosting the entrepreneurial spirit of SMEs, based on lessons learned from India and Egypt. This study is based on the theoretical and conceptual framework of Fintech, the Fintech ecosystem, and the importance of Fintech in promoting the entrepreneurial spirit of SMEs. It examines various archives, and reports from both domestic and international organizations. The results show that Fintech presents significant opportunities to enhance entrepreneurship and economic growth in Egypt and India, although the Fintech sector in Egypt is still nascent, it is expanding rapidly, while the Fintech ecosystem in Egypt is facing major shortages.***

• Keywords: *financial technology; micro, small and medium enterprises; fintech ecosystem..*

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1. Introduction

Emerging financial technology (Fintech) and innovations in traditional financial services play a key role in entrepreneurial growth in developing countries by expanding the access of micro, small and medium enterprises (MSMEs) to financial services (i.e. credit, insurance, payments and savings). Consulting firm BCG has suggested that India's GDP grew by 5% in 2020 through the addition of mobile financial services in society. Increased access to credit, greater investment opportunities, and the establishment of new businesses can bring an additional 4 million jobs to India's total workforce (Prasad MVNK, 2019).

MSMEs play an important role in boosting economic activity worldwide because they are seen as a source of job creation, productivity boost, and a hub of innovation. Despite their important role, MSMEs still receive a small portion of credit from the traditional financial

system in developing countries. Fintech and innovation in traditional financial services are playing an increasingly important role in the growth of entrepreneurship in developing countries by expanding MSMEs' access to financial services (i.e. credit, insurance, payments, and savings).

The main objective of this study is to identify the role of the Fintech sector in increasing access to finance and promoting inclusive growth and entrepreneurship in developing countries. First, the author introduces the concept of Fintech and the Fintech ecosystem. The author then explains the importance of the Fintech sector to the development of entrepreneurship in developing countries. And finally, the author presents the Digital Financial Services Ecosystem in India and Egypt to finally come to conclusions and some solutions that developing countries need to pay attention to to increase the effectiveness of the Fintech ecosystem for the entrepreneurial spirit of MSMEs.

2. Rationale and research overview of Fintech

2.1. Rationale of Fintech

Concept of Fintech

Fintech (Financial Technology) or "Digital Financial Services" is "a range of financial services accessed and delivered through digital channels, including payments, credit, savings, remittances, and insurance" (Alliance for Financial Inclusion, 2016).

In the simplest way, Fintech is the application of modern technologies and technical innovations into financial activities.

This concept is common to all companies that use the internet, mobile phones, cloud computing technology and open source software for the purpose of improving the efficiency of banking and investment activities.

The Fintech sector is introducing a relatively new, low-cost digital medium that impacts

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traditional financial services (Perlman L, 2018). To study how Fintech has an impact, it is necessary to learn about the Fintech Ecosystem.

Ecosystem of Fintech

The McKinsey Global Institute (2016) argues that the Fintech ecosystem includes:

- All types of digital financial services such as payments, savings accounts, credit, insurance, and other digital financial solutions.

- All types of users, including individuals of all income levels, businesses of all sizes, and government organizations of all levels.

- All types of financial service providers include banks, payment service providers, other financial institutions, telecommunications companies, fintech startups, retailers, and other businesses.

Members participating in the Fintech ecosystem

The Fintech ecosystem consists of 4 parties that interact with each other to achieve financial goals. Perlman L (2017) explains that the four main objects of the digital financial services ecosystem are Customers, market service providers, ITC infrastructure, and governments:

- Customers: users of financial services products generally include end consumers, businesses, government agencies, and non-profit organizations.

- Marketplace service providers: Includes all types of Fintech service providers such as banks, other licensed financial institutions, and independent companies operating in the field of information technology that provide new products and services in the financial sector

- ITC Infrastructure: All the necessary ITC infrastructure (financial, technical, and other infrastructure) helps provide digital financial services faster, easier, cheaper, and safer against any fraud or cybercrime.

- Government: Includes government policies, laws, and regulations that establish rules of operation in the market to ensure that digital financial services are provided in a comprehensive, accessible, affordable, and secure manner, and that they are serving the sustainable development of the strategic country.

Factors affecting the efficiency of the Fintech ecosystem

The effectiveness of the Fintech ecosystem depends on two basic factors.

The first factor is environmental conditions and infrastructure readiness (Perlman L (2017)). The environment includes all the laws that govern and the organization that sets out the rules of conduct in the ecosystem, such as (i) the law and industry organization regulations that determine the authority of financial regulators, licensing non-bank financial service providers and IT; (ii) Consumer protection laws and regulations. Environmental conditions will be set according to standards at different levels such as national, regional and international.

The effectiveness of the Fintech ecosystem is also determined by the country's efforts to build a solid level of infrastructure readiness, incorporating the technical systems necessary to enable Fintech such as (i) Secure Payment Systems available for transactions between and between industry participants (individuals, enterprises, Fintech companies, government); (ii) Identification systems capable of identifying end users and their vendors and authentication systems capable of identifying and authenticating these identities. The identification system can be a country ID, an industry ID (e.g., a financial industry identifier, a bank account number, a mobile phone number), or a private sector ID (e.g., a PayPal identifier); (iii) Voice and data transmission networks. The quality and security of these networks is an essential component of infrastructure.

2.2. The importance of Fintech for the development of entrepreneurship

Fintech is paving the way for MSMEs to access better financial services through several channels.

Channel 1. Reduce costs and support payments: Fintech applied in the banking sector will provide faster, simpler and more convenient support for payment and money transfer services. Digitizing payments has dramatically expanded access and reduced costs for all users. Fintech has reduced the cost of financial services by turning it into a self-service or automated service. Banking service applications installed on smartphones (also known as mobile banking) are the most typical and easy-to-understand examples of banks' Fintech technology. These applications will all be directly managed by the bank and linked to a Fintech company to implement.

When using the bank's online application, customers can easily manage their account balances, quickly make transactions on bill payment, internal

and interbank money transfers quickly without having to go directly to transaction offices to carry out procedures as before.

It can be seen that Fintech technology is now considered an extension of banks, helping banks easily and quickly connect with customers in all regions of the country.

Channel 2. Facilitate access to credit: Digital financial services have made it much easier to provide loans, especially for MSMEs. The time and cost associated with applying for a loan has been reduced because Fintech is a platform that allows lenders and customers to quickly connect with each other without having to meet face-to-face. The use of digital data analytics and machine learning to better evaluate data sources such as financial history, mobile phone usage data, and e-commerce transaction data has helped expand access to credit for the poor and small businesses that were previously not eligible for financial loans. Thanks to the application of Fintech technology, today's customers can easily borrow money through applications such as Cash 24, Money Cat, One Click Money... without having to go to the unit's headquarters, without meeting with the lender's staff.

The process from making documents to receiving disbursement by customers is carried out 100% online. Money borrowers only need to submit online documents through websites/ applications, lending units and organizations will rely on the information provided to check and approve loans without meeting face-to-face to carry out appraisal.

The loan amount will then be disbursed by transferring directly to the bank account of the customer provided. The customer repayment process will also be carried out online to help borrowers save maximum time and travel costs.

Channel 3. Allowing access to savings: Fintech has also made it easier to access deposit and investment products by eliminating the high requirements for borrowing money (i.e., minimum balance requirements and associated fees for opening an account).

Channel 4. Allow access to insurance: Fintech allows MSMEs to access insurance products that are suitable for their specific conditions and needs, such as buying insurance online with mobile phones quickly and easily while ensuring full ownership.

3. Research overview

In the Global Fintech Adoption Index (GFAI, 2019) report, it has been pointed out that Fintech services play an important role in enhancing MSMEs' access to finance in developing countries by providing innovative solutions to traditional businesses. The financial constraints of MSMEs include a lack of credit information, less competition, and generally the relatively high cost of meeting the financial needs of MSMEs. In this regard (Blancher, Mr Nicolas R, et al., 2019) highlight the various innovative solutions that Fintech companies have implemented to overcome the common financial problems of MSMEs, including:

Credit information: New technologies such as big data analytics and computational clouds facilitate the collection and processing of large amounts of consumer credit performance information and behavioral data (e.g., from social media, psychological information, and retail receipts).

Real-time Credit Scores: For small and medium-sized businesses, credit analysis can rely on artificial intelligence and machine learning combined with registration and accounting of small and medium-sized enterprises geographic and socioeconomic information that is helping in generating real-time credit scores and profiles as well as stronger credit risk management.

Increased competition: By using a Fintech platform, borrowers can compare credit cards, insurance, leasing, and banking services for SMEs from other customer groups. The Fintech sector has created new channels for financing MSMEs, in both developed and developing markets. New e-platforms have emerged to provide various financing solutions for MSMEs including crowdfunding, peer-to-peer lending, and other channels

4. Research methodology

This study focuses on harnessing the lessons learned about the challenges and opportunities of the Fintech ecosystem in India and Egypt.

The method of data collection is desk research, the sources are mainly secondary data in the form of published reports that have been commented on from the analysis of the archives of national and international organizations such as the Alliance for Financial Inclusion, Alexandria Bank, the Central Bank of Egypt, the Financial Regulatory Authority

in Egypt, the Government of India (GOI), the McKinsey Global Institute, UNCDF, the World Bank and Bank Negara Malaysia.

5. Fintech ecosystem in India and Egypt

5.1. India's Fintech ecosystem impacts MSMEs' entrepreneurial spirit

The Government of India through India Stack and Jan Dhan-Aadhaar-Mobile Trinity has been supporting the digitization of payments, modification of KYC requirements, and enabling automated access to data from various data systems in the country.

D'Silva D, Filková Z, Packer F, Tiwari S (2019) argue that since2009, the Government has created innovative digital platforms in the form of public goods. Each platform, designed in a management system, addresses a unique need such as identification, payment, or data sharing. These platforms work together to strengthen the Fintech ecosystem by supporting open, free, and competitive markets in Fintech.

One of these platforms is the India Stack. It is the largest Application Programming Interface in the world that enables governments, businesses, MSMEs, and developers to use a unique Digital Infrastructure to solve India's tough problems towards needless presence, without paperwork and providing cashless services" (India Stack, 2020). This interface has been implemented in phases, starting in 2009 with the introduction of a Unique Identification Number (UID) known as "Aadhaar". It is also the first digital public good in India designed for the specific purpose of personal identity authentication.

In 2012, the Government of India launched eKYC (electronic Know Your Customer) which allows businesses to carry out the customer verification process using Biometric or Mobile OTP. The introduction of eKYC has significantly reduced transaction costs for businesses and allowed for more access to bank accounts. Governments can now also transfer subsidies directly to bank accounts instead of making these transactions in cash, reducing fraud and leaks.

In 2015, the Government of India implemented digital signatures (eSign) and digital repositories (DigiLocker) for the India Stack. In 2016, Unified Payment Interface was launched as the most advanced public payment system in the world aimed at revolutionizing digital payments in India. In the three years since 2016, this payment interface has processed a total of more than 12 billion transactions compared to 5 billion credit card transactions in the same period (D'Silva D, Filková Z, Packer F, Tiwari S, 2019).

The Indian government has established a regulatory environment in the country and encouraged new businesses to take the lead and make their mark in the financial industry. The government has launched initiatives such as the National Payment Council of India (NPCI), the Indian Digital Program, and Jan Dan Yojana.

Another initiative to digitize financial services and accelerate the transition to a cashless economy is the JAM (Jan Dhan-Aadhaar-Mobile) trio. It is a financial inclusion initiative launched by the Government of India in 2014 to link Jan Dhan accounts, mobile phone numbers and Aadhar cards of Indians to directly transfer benefits to intended beneficiaries and eliminate intermediaries and leaks.

Key Fintech products in India include:

(1) Money transfer services (both outbound and inbound money transfers are being carried out by Fintech startups such as FX, Instarem, Remitly, and others);

(2) Finance and personal loans (Like the Loanbaba website, which helps people access loans quickly within 24 to 72 hours);

(3) Payment services (web and mobile applications for accepting and transferring payments from businesses and individuals have increased after the monetization cessation in 2016. Examples of top Fintech payment service companies are Paytm, Mobikwik, and Oxigen Wallet.

(4) Peer-to-peer (P2P) lending: a P2P lending platform that allows borrowers and lenders to communicate with each other for loans and cash loans, which are regulated by the Reserve Bank of India (RBI) regulations (e.g., Lendbox).

(5) Equity fundraising: crowdfunding platforms such as Start51 and Wishberry.

With the creation of such a favorable regulatory environment, India has become one of the fastest-growing Fintech markets in the world. India ranks highest globally in terms of Fintech adoption rate along with China. India has overtaken China to become Asia's leading Fintech financing target market with an investment of around 286 million

USD for 29 transactions, compared to China in 2019 (Invest in India, 2020).

The launch of India (Unique Identifiers UID, Aadhar), eKYC, eSign, DigiLocker, and UPI) along with high bank penetration through Jan Dhan Yojana (over a billion bank accounts) has played a significant role in accelerating the growth of Fintech and Boosting entrepreneurship in developing countries.

5.2. The Fintech ecosystem in Egypt impacts the entrepreneurial spirit of MSMEs

Banks are the leading service providers in the Egyptian financial market. They hold the majority of financial assets and flows in the market. The Central Bank of Egypt's annual report on the financial year (2017-2018) shows that more than 60% of banks offer full e-banking and mobile finance, 80% offer online banking. Other non-bank organizations that are providing financial services in Egypt include: (i) the National Postal Organization of Egypt (ENPO) with 3,900 branches across Egypt; (ii) Microfinance institutions and NGOs, 873 licensed with 848 branches; (iii) Brokerage companies (140), insurance companies (37), leasing companies (226) and mortgage companies (13).

The data also shows that the number of fintech startups in Egypt is growing rapidly, driven by initiatives by the Egyptian government and the Central Bank of Egypt to digitize payment systems and achieve financial inclusion goals. The best-performing sector in Egypt's Fintech ecosystem is the provision of payment services, mobile cash, and smart wallets (Chance C, 2017). Other products that are also focused by Egyptian Fintech include Savings and Investment, Insurance, Financial Management, Crowdfunding, and Blockchain. Details of Fintech services are as follows:

(1) Mobile wallets: According to the new regulations on cashless payments by smartphones issued by the Central Bank of Egypt since 2016, only licensed banks can apply to offer mobile wallets and act as issuing banks to receive deposits in exchange for the issuance of cryptocurrencies. Mobile wallet services, according to the new regulations, include cash withdrawals/withdrawals, person-to-person (P2P), person-to-merchant (P2M), merchant-to-merchant (M2M), cash withdrawals/ATM-out withdrawals, international money transfers (IMT), virtual card numbers (VCNs), and account top-ups (AVL) from bank accounts to wallets.

(2) Payment service providers: With cooperative cooperation with banks, Fintech startups provide payment services to banked and unbanked customers for money transfers, phone payments, and other utility bills, as well as various payment purposes.

(3) Micro-savings: Egyptian Fintech startups specialize in micro-savings, i.e. provide unbanked customers with a tool to save small sums of money. Feloosy assists people in saving money for a specific investment.

(4) Crowdfunding: Several Fintech startups in Egypt specialize in crowdfunding, such as AqarFunder, Shekra, and Yomken. They are coming up with different ways to support local innovation with a crowdfunding platform where they collect money over the internet for a specific project or business from a large group of supporters.

(5) Financial Management: Enotta is an example of an Egyptian Fintech startup that provides cash management tools to companies.

The Fintech ecosystem in Egypt includes banks, non-bank organizations, and Fintech companies, local Fintech agencies that provide technical assistance to MSME companies. Nile University (NU) in collaboration with the Academy of Scientific and Technological Research (ASRT) has launched Egypt's first blockchain-focused incubator at NU Tech Space (Odhiambo R, 2018).

The Egyptian government and the Central Bank of Egypt have taken many important steps to accelerate the transition to a cashless economy and strengthen key indicators of financial inclusion. The Bank of Alexandria (2017) pointed out four important steps.

Firstly, the establishment of the National Payment Council in 2017, in order to reduce the use of paper money outside the banking system, encourage the use of electronic payments and develop the national payment system.

Second, the issuance of a new version of the regulation for Mobile Payment Services by the Central Bank of Egypt in November 2016. The new regulation allows bank customers to transfer or receive money and transfer money through their mobile accounts.

Third, the signing of a Memorandum of Understanding (MoU) between the Egyptian government and Visa, to enable the digital payment

of government subsidies to 22 million Egyptian families. Previously, Visa signed a Memorandum of Understanding with the Federation of Chambers of Commerce in Egypt to encourage the acceptance of debit cards and other electronic payments between the traders and small and medium-sized enterprises. Similarly, the Ministry of Communications and Information Technology and MasterCard signed a Memorandum of Understanding to expand financial services to 54 million Egyptians.

Finally, the establishment of the Financial Access Unit by the Central Bank of Egypt (CBE) to support and enhance Financial Inclusion; announcing plans to establish an independent central regulatory unit to protect consumers' interests against financial market risks.

Conclusion

The implementation of the Fintech ecosystem is crucial to promote the economic well-being of MSMEs in developing countries. A comprehensive Fintech ecosystem includes a wide range of digital financial services that provide opportunities to access and move capital, growth capital, and reduce costs and risks in financial transactions.

An analysis of India's experience in digital financial transformation reveals that the Government of India has implemented a comprehensive digital finance ecosystem that has key features including extensive coverage of mobile services, fast identity authentication, and real-time payment services for revenue earners low entry. transaction value for hundreds of millions of customers at the same time. Four key pillars in the Fintech ecosystem are making the digitization of financial services in India a unique experience globally: (a) providing digital financial infrastructure as a public good; (b) encourage private innovation by providing open access to this infrastructure; (c) create a level playing field through the legal framework; and (d) empowering MSMEs through a data sharing framework that requires the consent of the MSMEs themselves.

India has been successful in Fintech in recent years, so besides applying solutions like what India has done, we can suggest to Egypt as well as developing countries some of the following solutions to increase the efficiency of the Fintech ecosystem: (i) Fully apply KYC/CDD market requirements and start implementing eKYC; (ii) Enforce market regulations on consumer protection and cybersecurity; (ii) Increase daily and monthly transfer limits to meet the needs of individuals and businesses; (iv) Increased investment in mobile and internet infrastructure; (v) Reduce the costs and risks associated with formal financial transactions; (vi) Providing financial and technical support (national/international) to market vendors.

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EXPERIENCE IN MOBILIZING AND USING FINANCIAL RESOURCES FOR ADVANCED NEW RURAL CONSTRUCTION IN SOME LOCALITIES AND POLICY IMPLICATIONS FOR VINH PHUC PROVINCE

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Abstract: ***Farmers, agriculture and rural areas in Vietnam are always the concerns of the Party and the State. In order to improve the quality of life of farmers, invest in infrastructure systems and change the face of rural areas, Vietnam has developed and implemented the National Program on New Rural Development for the period 2021 - 2025. To successfully implement the program as well as complete the set goals, mobilizing and using financial resources play an important role, especially mobilizing and using financial resources for advanced new rural construction. The following article focuses on analyzing the experience of some localities in Vietnam in mobilizing and using financial resources for advanced new rural construction, thereby providing policy implications for Vinh Phuc province to promote the mobilization and effective use of financial resources in the process of building advanced new rural areas.***

• Keywords: *experience, new rural construction, advanced new rural areas.*

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Introduction to mobilizing and using financial resources to build advanced new rural areas

Advanced new rural area construction can be understood as the process of building the economy, politics, culture, society, and rural environment to improve the quality of life of residents in all aspects, both material and spiritual. In advanced new rural areas, infrastructure is invested synchronously, the quality of the living environment is improved, creating a comprehensive change in the socio-economic face of rural areas.

According to Decision 318/QD-TTg dated March 8, 2022 of the Prime Minister promulgating the national criteria for advanced new rural communes for the period 2021 - 2025, an advanced new rural commune is a commune that completes 19 criteria set out in economic, social, environmental, and national defense and security aspects. Based on that set of criteria, localities develop plans to mobilize and use financial resources to complete the set goals.

Mobilizing financial resources for advanced new rural construction is the process of using policies, measures and forms to gather financial resources from different subjects in the economy to implement the contents of the advanced new rural construction program. Financial resources can include state budget capital, and capital mobilized from enterprises, capital mobilized from local people.

Using financial resources for advanced new rural construction is the allocation of mobilized financial resources to implement the contents of the advanced new rural construction program.

Contents of mobilizing and using financial resources for advanced new rural construction

Content of mobilizing financial resources for advanced new rural construction

To mobilize enough capital for the advanced new rural construction program, it is necessary to diversify capital sources as well as capital mobilization methods. For capital sources directly allocated by the central budget, localities work with agencies and branches to mobilize capital annually. For sources with self-balanced local budgets, localities proactively arrange capital based on the local socio-economic development plan. For capital contributions from residents and enterprises, capital mobilization is based on the voluntary spirit of the subjects.

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Content of using financial resources for advanced new rural construction

The use of financial resources for advanced new rural construction is based on the provisions of current laws such as the Law on Public Investment, the Law on State Budget, the Law on Public Debt Management, and related legal documents. The mobilized capital is ensured to be used for the right purpose, economically and effectively. Investors and project management boards implement construction investment projects in compliance with state regulations. Financial agencies at all levels and management agencies for investment in the construction of advanced new rural construction projects shall manage according to their assigned functions and tasks. People and socio-economic organizations participate in monitoring the use of local capital in the construction of advanced new rural areas.

Experience in mobilizing and using financial resources to build advanced new rural areas

Experience in mobilizing and using financial resources to build advanced new rural areas in Nghe An

Nghe An province is located in the center of the North Central region, a locality with a long history of formation and development, rich in revolutionary traditions and a spirit of learning. After more than 12 years of implementing the advanced new rural construction program, the province has achieved many positive results in all aspects. By the end of June 2024, the whole province had 319/411 communes meeting new rural standards, 83 communes meeting advanced new rural standards, 12 communes meeting model new rural standards, 9 district-level units completing the task of meeting new rural standards, 212 villages/hamlets meeting new rural standards, the average new rural criteria of the whole province are 17 criteria/commune.

To achieve the above results, it is the relentless efforts of the people and the leadership of the advanced new rural construction program with active activities in the following aspects:

First, promote propaganda and mobilization to raise awareness of cadres, party members and people of all walks of life about the advanced new rural construction program.

The steering committee of the advanced new rural program and management boards at all levels promote propaganda about the program in many different forms such as: organizing regular meetings of political and social organizations, people's conferences in villages to propagate the content of the program... In addition, political and social organizations also carry out campaigns and emulation movements to the entire population so that people see that they are the main subjects in the advanced new rural construction program.

Second, diversify production and business types to increase people's income.

In recent times, the Party Committee and local authorities have implemented measures to shift the economic structure, transform the structure of crops and livestock, and develop agricultural production according to the linked value chain. The products produced by the people are also linked with businesses for consumption in the domestic market and exported to the world market. Agricultural products are produced with organic agricultural production processes, clean agriculture, meeting Viet Gap standards. In addition to closely linking production, harvesting and consumption of products with agricultural processing factories, wholesale markets in and outside the province, forming a value chain, communes and cooperatives have also used smartphones to introduce and promote local products on the media, e-commerce trading floors, etc. to increase the value of agricultural products and increase people's income.

Third, enhance the role of the political system in mobilizing financial resources to build advanced new rural areas.

In recent years, implementing the program of building advanced new rural areas has been considered by Party committees and authorities at all levels as one of the important political tasks of Nghe An and grassroots Party organizations in districts and communes. The local Party Executive Committee has issued a specialized Resolution on building advanced new rural areas. In the process of implementing the Resolution, the Party Committee has promoted the leadership and direction role of the Party organization. The Party Committee and People's Committee of communes also assigned tasks to cadres, party

members, and mass organizations with the motto "Commune cadres, commune administrative centers do first, village cadres, village cultural houses take the lead; cadres and party members set an example in implementation". Many communes, thanks to promoting the leadership role of the Party, especially grassroots Party cells, and promoting propaganda work, have created a clear change in the awareness of the people and the entire political system. Many households have promoted their sense of responsibility in developing their homeland, voluntarily donated hundreds of square meters of land, dismantled fences and civil works, contributed money and labor days to build new, advanced rural areas.

Experience in mobilizing and using financial resources to build advanced new rural areas in Thai Binh

Thai Binh province is located in the Northern Delta, has a relatively developed infrastructure, convenient transportation, close to large urban and industrial centers of the Hanoi - Hai Phong - Quang Ninh key economic region. Thai Binh is also an agricultural province with a long tradition, so the implementation of advanced new rural areas in the province has been carried out very actively. Responding to the emulation movement of the whole country joining hands to build advanced new rural areas, the province has deployed many activities with different contents to speed up the completion of the criteria for building advanced new rural areas set by the state.

First, focus on propaganda work to raise awareness of Party committees and all people about building advanced new rural areas

The Fatherland Front at all levels of the province has mobilized cadres, members and people to join in the emulation of creative labor, contributing resources to build advanced new rural areas. The Provincial Fatherland Front has seriously grasped and implemented the campaign "All people unite to build new rural areas and civilized urban areas" with creative and effective methods that have spread throughout the province. Thanks to that, the awareness of all levels, sectors, and people about the role of new rural construction has been raised more fully and deeply. The Provincial Farmers' Association has coordinated to organize conferences to propagate the guidelines and policies of the Party, the State, and Thai Binh province on new rural construction. Youth Unions at all levels have developed action programs to respond to the movement to build advanced new rural areas, attracting union members to participate, and actively implementing the movements: "Pioneering, volunteering to develop the economy - society and protect the Fatherland", "Accompanying young people to establish their careers" ...

Second, mobilize and diversify financial resources to build advanced new rural areas

The Provincial People's Committee has issued mechanisms and policies to support investment in 17 categories of advanced new rural infrastructure; followed by mechanisms and policies to encourage investment and manage the exploitation of clean water supply works in rural areas. It can be said that this is the highlight in building advanced new rural areas, worth learning from for many localities in the country. Thai Binh has had policies and incentives to attract investors to invest in rural construction works. In the period of 2010 - 2020, the total capital mobilized for the construction of advanced new rural areas of the province is estimated at about 22,236 billion VND; of which the central budget supports about 1,456 billion VND, the provincial budget is 5,201 billion VND, the district budget is 1,911 billion VND, the commune budget is 4,303 billion VND, the capital combined from other projects is about 2,807 billion VND, the capital mobilized from enterprises is 1,259 billion VND, the credit capital is about 1,177 billion VND, the rest is mobilized from people's contributions. Diversifying financial resources from different subjects in the economy has helped the province have an increasingly modern rural infrastructure system, the goals in the construction of advanced new rural areas have also been gradually completed and ensured the implementation progress.

Experience in mobilizing and using financial resources to build advanced new rural areas in Hanoi

Hanoi city is the capital, the economic - political - cultural center of Vietnam, and is also one of the leading localities in the country in the

movement to build advanced new rural areas. Up to now, the city has 382 communes meeting new rural standards, of which 186 communes have met advanced new rural standards. To achieve the above results, Hanoi has actively implemented activities to ensure the acceleration of the implementation of the contents of the advanced new rural area construction program.

Firstly, the Party Committee, the government, the Fatherland Front, and socio-political organizations from the city to the grassroots level have done a good job of propaganda, mobilization, and raising awareness of the meaning, role, and importance of agriculture, farmers, and rural areas.

In order to raise awareness of all people about building advanced new rural areas, on March 17, 2021, the Hanoi Party Committee issued Program No. 04 - Ctr/Tu on Promoting the effective implementation of the National Target Program on building new rural areas associated with restructuring the agricultural sector and developing the rural economy, improving the material and spiritual life of farmers in the period 2021 - 2025. Since then, members of the grassroots political system have proactively developed propaganda content for cadres, party members, and people to create high unity in the grassroots political system and all people from awareness to action, joining hands to build advanced new rural areas. Second, diversify financial resources for advanced new rural construction

The Hanoi People's Committee has paid great attention to and implemented specific solutions to proactively attract, promote and effectively exploit financial resources for advanced new rural construction. From 2016 to present, the total capital mobilized by the city is over VND 25,093 billion; of which, non-budgetary capital contributed by organizations, enterprises and people is up to VND 2,250 billion. Based on the city's proposal, from 2016 to present, the State Bank of Vietnam, Hanoi branch, has lent over VND 101,385 billion to the agricultural and rural development sector, of which VND 42,455 billion is for new rural construction. The Hanoi branch of the Vietnam Bank for Social Policies also lent over VND 5,193 billion to households in 18 districts and towns to develop production and gradually improve their living standards. Mobilizing diverse financial resources ensures the implementation of projects and programs in the new rural construction plan.

Third, deploy the application of science and technology in the construction of advanced new rural areas

Hanoi has deployed the application of science and technology in the agricultural sector, focusing on researching mechanisms, policies, and solutions for agricultural development and building advanced new rural areas, thereby contributing to improving the quality of life of residents. Scientific research and technology applications develop high-quality, economically valuable plant, animal, and biological varieties. The results show that in 2021, the city had 595 products from 26 districts, towns and cities recognized as OCOP products, including 367 4-star products and 228 3-star products. The achievements further demonstrate that the city's policies on applying science and technology in new rural construction are correct and need to continue to be promoted in the coming time.

Policy implications in mobilizing and using financial resources for advanced new rural construction in Vinh Phuc province

To promote the mobilization and use of financial resources for advanced new rural construction in Vinh Phuc province in the coming time, it is necessary to implement the following policies:

First, need mechanism to promote the role of the Fatherland Front and socio-political organizations in advanced new rural construction

In the advanced new rural construction program, the Fatherland Front and socio-political organizations play an important role, participating in propaganda work to raise people's awareness of advanced new rural areas, representing the will and aspirations of the people in activities to monitor the implementation of the program, giving comments on draft documents, procedures, and procedures for recognizing and evaluating the results of implementing new rural construction criteria before promulgation, organizing to collect opinions on people's satisfaction with the results of advanced new rural

construction... Therefore, Vinh Phuc province needs to strengthen the role of the Fatherland Front and socio-political organizations in the construction of advanced new rural areas to ensure the progress and effectiveness of the program.

Second, perfect the legal system, mechanisms and policies to promote the role of the people as the subject in the construction of advanced new rural areas

The role of the people as a subject is emphasized when implementing the construction of advanced new rural areas. The role of the people is not only in contributing financial resources to the construction of advanced new rural areas, but also includes the participation of the people in the decision-making and implementation process. The people participate in all activities in the process of building advanced new rural areas, as they propose the need, participate in the implementation, enjoy, check, and monitor the criteria for building advanced new rural areas. Therefore, for the national target program on building advanced new rural areas to be successful and ensure sustainability, Vinh Phuc province needs to promote the role of the people as the subject in building advanced new rural areas of the province with the motto "People know, people discuss, people do, people check, people supervise, people enjoy".

Third, continue to improve the mechanism for mobilizing diverse financial resources

To implement the program on building advanced new rural areas, many financial resources are needed, including state budget capital and non-state budget capital. Due to the limited budget for the program, it may not be enough to invest in the construction of project works in the advanced new rural construction program, so Vinh Phuc province needs to mobilize and diversify non-state budget capital sources such as credit capital, capital from organizations and enterprises, capital contributed by the people to achieve high results in the implementation of the program.

Fourth, perfect policies on science and technology, apply digital transformation in advanced new rural construction

The province needs to carry out training and raise awareness of information technology such as organizing training courses and information technology awareness programs for managers and people; promote the construction of digital government in advanced new rural construction; improve people's capacity to use and apply information technology; promote the digitization process, build a synchronous database, implement management of raw material area codes and traceability of agricultural products; support farmers and cooperatives to consume agricultural products on e-commerce trading floors.

Conclusion

The program for building new advanced rural areas has significantly changed the appearance of rural areas in localities as well as improved the quality of life of farmers. From the experience of mobilizing and using financial resources in building new advanced rural areas in Nghe An, Thai Binh provinces and Hanoi city, Vinh Phuc province needs to promote propaganda work, raise people's awareness of new advanced rural areas, mobilize maximum resources from different subjects and deploy the application of science and technology to successfully implement this program in the coming time.

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THE CLARIFICATION OF SOME METHODS IN MODERN MANAGEMENT ACCOUNTING

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Abstract: ***According to Kaplan, Management Accounting was originally called cost accounting and was formed and applied in some of large enterprises operating in the textile, transportation and railway industries…in the US from the late 19th century such as Andrew Carnegie Steel Company, DuPont Company, General Motors Company. The cost accounting system of the Lyman Mills textile factory established in 1855 in New England allowed management to monitor the efficiency of different types of finished products. The development of Management Accounting techniques during this period reached its peak in 1920. He management accounting techniques developed during this period were later referred to as traditional management accounting techniques. Nowadays, modern managerial accounting has used many methods to apply, so this article will partly clarify some of these contents.***

• Keywords: *managerial accounting, methods of managerial accounting, mordern managerial accounting, managerial accounting of construction business.*

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Activity-Based Costing (ABC) Theory: First officially and systematically published by Robert S. Kaplan and W. Bruns in 1987. The ABC method was developed to overcome the shortcomings of traditional cost accounting methods, which allocate overhead costs based on a subjective criterion to cost objects. Traditional cost allocation assumes that the costs of common activities are proportional to a single allocation base. In reality, the activities that generate overhead costs are diverse and not proportional to any specific allocation base. This leads to inaccuracies in product and service costing. To address these shortcomings, Robert Kaplan and Robin Cooper proposed allocating costs to products and services based on the causal relationship of cost-generating activities. Accordingly, indirect costs (overhead) are allocated in two stages.

Conditions for Application: ABC costing is suitable for enterprises with high overhead costs, diverse products, and complex production processes. Enterprises applying the ABC costing method will determine product costs more accurately and identify non-value-adding activities that can be eliminated to reduce costs and enhance competitiveness. However, applying the ABC method also faces challenges as it requires investment in time, equipment, and personnel to measure activity cost drivers.

Target Costing (TC): According to Kato, the target costing method has been applied by major companies in the Japanese assembly industry since the 1960s. The goal of this method is to focus on planning production costs during the research, design, and implementation phases to reduce costs during production. According to Tanaka, the target costing method is implemented during the planning and production phases to achieve cost and profit targets throughout the product life cycle. The product life cycle is divided into three stages: (1) research, design, and implementation; (2) production; (3) post-sales support and product disposal. All three stages incur costs that need to be controlled and reduced to maximize profits. However, the degree of cost reduction varies across the stages due to differences in cost proportions during the product life cycle. The research, design, and implementation phase is considered the core of this method because decisions on product design, production processes, and manufacturing methods largely determine the costs incurred in subsequent stages. Therefore, cost reduction opportunities lie in this phase as costs can be easily reduced by adjusting product designs and production processes. Once the product enters production, opportunities for cost adjustments and reductions are limited as it is not easy to change the entire invested infrastructure. Therefore, many theoretical studies and applications of the target costing method in manufacturing and service industries suggest that target costing is a cost management method during the research, design, and implementation phases.

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Conditions for Application: The target costing method is suitable for enterprises in the manufacturing sector, especially large-scale manufacturers with complex product structures and those producing to order. This method focuses on the research and design phases. To apply this method, all stages from design to production and consumption must implement cost reductions so that the costs incurred at each stage do not exceed the allowable limits.

Kaizen Costing Method: The Kaizen method is a waste-reduction philosophy in work management that began to emerge in the early 1950s in Japan. However, it was not until after 1986 that this method was fully researched and widely applied, especially in mass production enterprises. In Japanese, the word Kaizen is composed of two words: "Kai" meaning "change" and "Zen" meaning "better." Thus, the Kaizen philosophy can be understood as "change for the better." The origin of the word Kaizen is "Gemba Kaizen," meaning "continuous improvement." Continuous improvement is one of the key strategies to optimize production efficiency in a globally competitive environment. Kaizen calls for continuous improvement efforts from all individuals within the organization. Therefore, Kaizen means continuous improvement in operations, costs, and quality. Kaizen strives to empower workers, encourage their contributions, and foster pride in their work. The Kaizen costing method not only ensures leaner production processes but also helps save costs, eliminate waste, and add value to the enterprise. Therefore, this method is always considered a production management philosophy. The Kaizen costing method focuses all efforts of the enterprise on minimizing the production costs of products and services. This method has a similar task to the target costing method, which is to reduce costs, but this reduction focuses on the production phase of the product life cycle. To achieve this, the enterprise must continuously improve the production process and set cost reduction targets by all means, such as enhancing the operational capacity of machinery and equipment, increasing employee training, and implementing measures to encourage employees to carry out initiatives and eliminate activities that do not add value to the product. Thus, the Kaizen costing method focuses on the entire production process, not just the product.

Conditions for Application: The Kaizen costing method focuses on the production phase. This method can be applied to manufacturing and service enterprises. To apply this method, all individuals involved in the production process must maximize their capabilities and initiatives to reduce non-value-adding activities and maximize equipment capacity.

Balanced Scorecard (BSC) System: The Balanced Scorecard (BSC) is a management system that helps managers and all employees in an organization clearly define the organization's vision and strategy and translate them into action. BSC provides feedback on internal processes and achieved results, helping all employees in the organization continuously improve to achieve desired outcomes. BSC was introduced in 1992 by Robert Kaplan, a professor of management accounting at Harvard Business School, and David Norton, an information technology expert, to develop strategies. This model was rated by the Harvard Business Review as one of the 75 most influential ideas of the 20th century. BSC uses four scorecards to evaluate an organization's performance in terms of finance, customers, internal processes, and learning and growth. Each scorecard must reflect four requirements: objectives, performance measures, targets, and initiatives. The balanced nature of the model is reflected in the alignment of short-term objectives with long-term goals, financial measures with non-financial measures, outcome indicators with performance drivers, and market-oriented activities with internal activities.

Conditions for Application: The Balanced Scorecard system can be applied to any enterprise operating in various business sectors. To apply this method, the enterprise needs a specific strategy. Based on the enterprise's strategy, the Balanced Scorecard builds a system of financial and non-financial performance indicators for all departments within the system. Each department and individual within the system must be evaluated through their own Balanced Scorecard. This individual Balanced Scorecard includes several items that directly relate to the performance measures on the enterprise's overall Balanced Scorecard. The performance measures on the individual Balanced Scorecard are not affected by the goals of others in the enterprise or by events beyond the enterprise's control. Thus, to apply the Balanced Scorecard system, all departments and individuals in the enterprise must achieve their own goals evaluated through an integrated system of performance measures built from the Balanced Scorecard.

Just-In-Time (JIT) Production: The purpose of applying JIT is to reduce costs with the lowest inventory levels and timely delivery to customers. JIT is "a system in which goods in one stage of the production cycle are completed just before they are needed in the next stage; it focuses on minimizing activities or resource use that do not add value to the product." In other words, the JIT production system focuses on eliminating waste throughout the production cycle. JIT has significantly contributed to reducing production operating costs. The application of the Just-In-Time (JIT) production method is considered one of the key factors contributing to the success of Japanese companies in the international market during the 1980s and 1990s.

Conditions for Application: Just-In-Time (JIT) production can be applied to both manufacturing and service enterprises, such as banks, insurance companies, hotels, and auditing firms. Additionally, Canel, Rosen, and Anderson suggest that JIT can be applied in service companies in the same way it is applied in manufacturing companies. Enterprises applying JIT need to focus on the process rather than the product. Therefore, JIT can be applied to both manufacturing and service industries.

Total Quality Management (TQM): TQM is a comprehensive/synchronized management method aimed at continuous improvement of the quality of products, goods, and services, with the participation of all levels, all stages, and all people in the enterprise to best meet the needs and expectations of customers. Total Quality Management is considered an effective management tool that has contributed to making Japan a powerhouse in quality and economy. TQM is a way of managing an organization/enterprise focused on quality, based on the participation of all members of that organization, to achieve long-term success by satisfying customers and bringing benefits to the members of that organization and society (According to ISO 8402:1994). There are many different perspectives on TQM (the perspective of the US and Western countries in general; of Japan; of the International Organization for Standardization ISO), but these perspectives are both comprehensive and harmonize different existing approaches.

Conditions for Application: To implement TQM in an enterprise, the leader must first have the responsibility to set quality goals and policies. The leader must have absolute faith in the philosophy of TQM and must commit to implementing TQM. To successfully implement TQM, managers need to apply appropriate methods to mobilize the talents of people in all departments and divisions to solve problems and improve quality.

Life Cycle Costing (LCC): When conducting life cycle costing, the general goal of the manager is to reduce costs by choosing the appropriate management accounting method for each stage in the product life cycle. Therefore, the characteristics of the product life cycle are extremely important information that must be thoroughly analyzed and serve as the basis for developing subsequent management plans such as business production plans and profit plans of the enterprise. Some product characteristics that affect the life cycle that managers need to consider include:

Products with high technology content require more research and development costs and time than products with low technology content. The time to introduce and promote new products will be shortened if the enterprise has a good product distribution system. New products will be quickly accepted by consumers if the price, design, and quality are superior. If the production technology of the product does not have breakthroughs and consumer tastes are stable, the saturation phase will be prolonged. This is the phase where enterprises often focus on recovering investment capital and making profits.

If the production technology of the product changes slowly and consumer tastes are stable, the decline phase will be prolonged. Analyzing product characteristics is particularly meaningful for products with short life cycles, requiring quick investment recovery plans. However, due to the different characteristics of cost generation and cost reduction effectiveness at different stages in the product life cycle, to achieve short-term and long-term cost management goals, managers must carefully choose the appropriate management accounting method. There are many different perspectives on how to combine cost management accounting methods into the product life cycle. In the first stage of the product life cycle, global studies agree that applying the target costing method in this stage will have the greatest cost reduction opportunities. When the product life cycle moves to the mass production stage, enterprises continue to pursue the goal of reducing production costs by cutting unnecessary worker operations on the production line, minimizing material waste, and enhancing the operational capacity of machinery and

equipment. The continuous improvement process in the production stage to reduce costs in the mass production stage is the application of the Kaizen costing method. When the product life cycle moves to the decline stage, production activities gradually decrease, and the management goal is to determine the end of production to have a plan for handling inventory and liquidating machinery and equipment.

In summary, to effectively account for costs according to the product life cycle, managers need to apply a combination of modern cost management accounting methods, including the target costing method in the research and product design stage and the Kaizen costing method in the mass production stage. With the very different cost generation characteristics in the product life cycle, combining and applying appropriate cost management accounting methods from the very beginning will bring higher efficiency compared to traditional methods.

Conditions for Application: Life cycle costing is applied under the condition that the enterprise determines the product life cycle from the idea formation to the product withdrawal from the market. Therefore, life cycle costing estimates all costs related to the procurement, operation, maintenance, and eventual disposal of a product throughout its life cycle. This method can also be applied to service-providing enterprises. However, the life cycle of a service differs from that of a product in that the research and implementation phase does not exist due to the intangible nature of services. The process of completing a service must also be carried out sequentially in specific steps and stages. Therefore, to apply life cycle costing for services, enterprises need to consider arranging each stage reasonably to minimize costs.

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IMPACTS OF AUDIT QUALITY AND AUDITOR'S EXPERIENCES ON THE FRAUD ASSESSMENT CAPACITY OF THE AUDITOR: STUDIES OF COMPANIES IN VIETNAM

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Abstract: ***The audit quality and the auditor's experience play important roles in enhancing the assessment capacity and fraud detection. A high-quality audit system, coordinated with an experienced auditor, creates the best conditions to protect the enterprise's assets and ensure the transparency and truthfulness of the financial reports. This study aims to examine the impacts of audit quality and auditor experience on the fraud assessment capacity of auditors. The study employs quantitative methods, supported by SPSS IBM 22. Data were surveyed from 298 auditors, internal auditors, directors, and vice directors who have worked or are currently working at enterprises in Vietnam. The study results show that the variable of audit quality has a significant impact on fraud detection capacity. This is because higher auditor ability leads to quicker and more accurate fraud detection. Additionally, the variable of auditor experience also has a positive and significant impact on fraud detection capacity, indicating that the more an auditor works with complex cases and varying workloads, the better their fraud detection capacity in financial reports.***

• Keywords: *audit quality, auditor's experience, fraud.*

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1. Introduction

The audit quality is the key factor ensuring that the enterprise's financial reports truthfully and suitably reflect the financial status and the working results of the enterprise. The high audit quality not only strengthen the creditability of the financial reports but also distribute an important part in fraud finding and preventing.

The technology revolution 4.0 develops, the experts in any sectors have to harmonize with the changes and have to put the customers' satisfaction to be the first purpose. Next to that, the technology revolution also increases the competition between the companies and make it be harder and more competitive.

However, the downside of the competition is the impacts of the illegal competition such as fraud in financial reports due to the irresponsible parties implemented in order to have immediately interest, one of them is by manipulation. Some companies use many different ways to carry out the fraud in financial reports in order to have the good assessment of the working effectiveness.

On the other hand, in order to avoid the fraud and find out right at the beginning time, it depends much on the internal manpower source of the company, especially the auditor's role. Basically, the main task of auditor is to analyze to assess the financial report of the company is good or bad in order to be able to know and understand the model and structure of many cases of fraud in the financial reports which happened many years ago. Hence, their quality and ability are very important to prepare an audit which is worth to consider in the development context and avoid fraud to prevent the company development. When perform their tasks, with the characteristics of the auditor, you need to make a good audit quality because the audit quality is very important to the auditor.

This study is done to review the relationship between the audit quality and the auditor experience to the fraud assessment capacity of the auditors which have been studied in the companies in Vietnam. Following to that, the study includes the following structure: Introduction of the topic (item 1); Theoretical basis (item 2); Study method (item 3); Results and discussions (item 4); Conclusion and recommendation (item 5).

2. Theoretical basis

The study of Wawo (2022) showed that the audit quality has positive and significant impact to the

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fraud finding. Pratiwi & Rohman (2021) recognized that the auditor's quality has positive and significant impact to the auditor's responsibility in the fraud finding in the financial reports. Febrianto Febrianto (2022) based on the above phenomenon, explained that in order to avoid fraud and find it out right at the beginning time, depend much on the company's internal manpower source, especially the auditor's role. Basically, the main task of auditor is to analyze to assess the financial report of the company is good or bad in order to be able to know and understand the model and structure of many cases of fraud in the financial reports which happened many years ago. Hence, their quality and ability are very important to prepare an audit which is worth to consider in the development context and avoid fraud to prevent the company development. The higher audit quality, the more capacity of auditor to find out the manipulation activities of the customer income.

Besides, the capacity of finding fraud cases of the auditor not only has been considered based on the audit quality but the audit experience of the financial reports of the auditors is also very necessary in assessment and consideration of the current fraud Natalia & Latrini (2021). Naturally, the auditors have long time participating to the audit process of the fraud cases will be sensitive to the un-healthy financial reports.

The auditor's experience will be established when the auditors solve the different issues when doing their tasks, so this experience will raise the knowledge and the knowledge of the auditors in solving the cases of fraud financial report preparation. Moreover, the auditors have less experience will face to difficulty in making decision compared to the auditors who have much experience in solving the issues. This has been public by Koroy (2008) that the auditors who don't have capacity to find out the fraud in the financial reports relating to the specification knowledge which has been established from the experience relating to the fraud cases solved by them. The auditors who have enough experience can make good audit quality.

Yusrianti (2015) the audit experience has position impact to the capacity of fraud finding. Rafnes & Primasari (2020) the experienced auditors will have more knowledge about mistakes and fraud in order to with this knowledge the auditors can assess the relevant information or proof and help the auditors to complete their tasks.

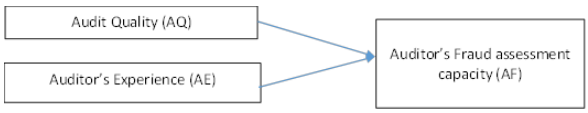
One way to analyze human resources in financial statement analysis capability is the quality of audit results performed by auditors. Based on the understanding of audit quality as how well auditors comply with auditing standards Qintharah, Fajarwati, & Ovitasari (2020), Umar, Erlina, Fauziah, & Br Purba (2019), Emalia, Midiastuty, Suranta, & Indriani (2020). Therefore, good audit quality will have the ability to evaluate fraud cases well. This is because auditors with audit quality have a good understanding of auditing standards. If auditors find that financial statements do not comply with auditing standards, auditors will feel that there is fraud in the financial statements. The results of this study are also supported by the findings from Wawo (2022) which showed that audit quality has a positive and significant impact on fraud detection. This means that the higher the audit quality, the higher the auditor's ability to detect fraud. Qintharah et al. (2020) The audit quality is the opportunity or the ability for the auditors to define and report the serious mistakes or losses.

The companies which have competitive advantage compared to the other ones are affected by the way that the company analyze and develop the manpower source in the company. A good and professional manpower source will have experience to well solve the problems of the company. As knowing, the auditor's experience is the experience which a person obtained when implement audit of the financial reports, based on the working time or working volume which a particular auditor has been done Ahmad Hajering, Muslim, Ahmad, & Lannai (2022) A auditor who has high working experience will have advantage in finding out the mistakes, understanding mistakes and finding out the causes of mistakes Sarra & Alamsyah (2020), Fadillah (2020), Pagalung & Habbe (2017); Sembiring & Widuri (2023)

Mahsitah & Mahmudi (2021) The more experienced auditor has the more experiences, this has been shown in the long working time and participating to the frauds as well as complex audit reports, so made them to be more careful in fraud finding. Based on this, it can be seen that the auditor who has higher audit knowledge and experience, the capacity of fraud finding will help the auditors to easier to find out the frauds in the customer's financial reports. This is because the auditor's experience relates to the audit experience, so the auditors has done many audits of the different financial reports. From the different financial reports audited by the auditors, the auditors can know and feel the differences in each financial report based on experience, the auditor can know that the financial report is good or not.

From that, giving the following study model:

Model 1: Model of the factors affect to the fraud assessment capacity of the auditor



In which: the variables are measured by scale Liker from 1-5 (very disagreed - very agreed)

The proposed hypothesis (Table 1):

Table 1: Proposed study hypothesis

Hypothesis	Explanation	Source
H1	Audit quality has impact to the fraud assessment capacity	Qintharah, Fajarwati, & Ovitasari (2020), Umar, Erlina, Fauziah, & Br Purba (2019), Wawo (2022); Qintharah et al. (2020)
H2	Auditor's experience has positive impact to the assessment capacity of the fraud cases.	Hajering, Muslim, Ahmad, & Lannai (2022); Sarra & Alamsyah (2020), Fadillah (2020), Sembiring & Widuri (2023); Mahsitah & Mahmudi (2021)

3. Study method

3.1. Data collection

From the impact factors which have been discovered in the study phase, the quantitative questionnaire has been developed to the survey objects such as auditors, internal auditors, directors, vice directors who have worked and are working at the enterprises in Vietnam. The way to distribute the surveys are: (i) directly, (ii) sending letter, (iii) sending via email, (iv) via Google docs, (v) others. The result is that 345 sheets have been collected in the total of 370 distributed sheets. After selected the invalid sheets because of many blank boxes or not enough information, the author uses 298 valid sheets with the rate of 80.05%.

3.2. Data process

The author uses the software SPSS 22, the criteria to analysis are: Mean value (Mean), Median value (Median), Max value (Max), Min value (Min) of the variables which have been studied and measured.

In order to verify the scale quality, the author uses coefficient Cronbach's. Based on the results EFA, Multiple Linear Regression model to calculate the parameters of the factors used in the model.

4. Study result

4.1. Descriptive Statistics

The variable of audit quality has value from 1 to 5. In which, AQ2 has the maximum average value of 3.85, lowest is AQ5: 3.23 (table 2).

The variables of auditor's experience (AE) have values from 1 to 5. In which variable AE6 has the maximum average value of 3.91, lowest is AE4: 3.11 (table 3).

Table 2: Descriptive Statistics of variable of audit quality

Descriptive Statistics					
	N	Min	Max	Mean	Std. Deviation
AQ1	298	1	5	3,65	,841
AQ 2	298	1	5	3,85	,782
AQ 3	298	1	5	3,51	,834
AQ 4	298	1	5	3,62	,777
AQ 5	298	1	5	3,23	,799
Valid N (listwise)	298				

Source: Result from SPSS 22.0

Table 3: Descriptive Statistics of variable of auditor's experience Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
AE1	298	1	5	3,23	,961
AE2	298	1	5	3,41	,940
AE3	298	1	5	3,67	,954
AE4	298	1	5	3,34	,931
AE5	298	1	9	3,83	,932
AE6	298	1	5	3,91	,967
Valid N (listwise)	298				

Source: Result from SPSS 22.0

The variables of auditor's fraud assessment capacity have values from 1 to 5. In which variable AF2 has the maximum average value of 3.53, lowest is AF5: 3.01(table 4)

Table 4: Descriptive Statistics of variable of auditor's fraud assessment capacity Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
AF1	298	1	5	3,23	,931
AF 2	298	1	5	3,53	,730
AF 3	298	1	5	2,57	,906
AF 4	298	1	5	3,41	,967
AF 5	298	1	5	3,01	,945
AF 6	298	1	5	3,36	,957
Valid N (listwise)	198				

Source: Result from SPSS 22.0

4.2. Scale verification

Table 5: Result of coefficient Cronbach's Alpha of the scales

	Observed variables		Cronbach's Alpha	Min total correlation coefficient
	Before	After		
Audit quality	5	5	,733	,681
Auditor's experience	6	5	,796	,614
Auditor's fraud assessment capacity	6	4	,847	,707

Source: Result from SPSS 22.0

The verification of impact scale of the information technology to the internal audit has been done by creditable coefficient Cronbach's Alpha and analysis EFA. Table 5 shows that, most of factors have coefficient Cronbach's Alpha more than 0,6; the total

correlation coefficient of the scales is more than 0,3. After deducting the observed variables including: AE4, AF2, AF5.

4.3. Analysis of discovering factor and correlation between variables

4.3.1. Verification KMO and Bartlett

The results of factor analysis (table 6) show that indexes KMO of 0,812 are >0,5, this means that the data for analysis is completely reasonable.

Results of verification Bartlett's is 1646,675 with the meaning level of (p_value) sig =0,000 <0,05, (rejected hypothesis Ho: observed variables are not correlative to each other in the total). So, the hypothesis about correlative matrix of the variables is the uniform matrix has been rejected, it means that the variables are correlative with each other and meet condition of the factor analysis

Table 6: Coefficient KMO and Bartlett

Criteria	Model
Coefficient KMO	0,812
Bartlett's	1646,675
Verification Bartlett having value sig	0.000
Total Variance Explained value	58,365
Min Eigenvalues value	1,275

Source: Result from SPSS 22.0

The results show that with the remaining observed variables after rejected the unsatisfactory scales, the Total Variance Explained values of 58.365 % are met requirement >50%; so it can be said that this factor can explain 58.365% the variance of the data. The values of coefficient Eigenvalues of the factors are high (>1), the factor has Eigenvalues (lowest) is 1.275 which are met >1.

Table 7: Analysis factor EFA of the variables

Rotated Component Matrix[a]			
	Component		
	1	2	3
AQ1		0,622	
AQ 2		0,496	
AQ 3		0,489	
AQ4		0,543	
AE1	0,681		
AE2	0,752		
AE3	0,464		
AE5	0,495		
AE6	0,658		
AF1			0,722
AF3			0,743
AF4			0,708
AF6			0,642

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Source: Collected for the survey data

So, the analysis EFA is suitable to all data and the observed variables are correlative to each other in the total, so are used for the next analysis.

The analysis EFA has been done with the method of Component Analysis and turning method Varimax, the analysis result has 14 observed variables of the scale in Table 7.

4.3.2 Analysis the correlation between the variables in the model

Table 8 gives the result of the correlative coefficient between the variables. The aim of checking the close correlation between the dependent and independent variables is to eliminate the factors which may lead to the multi-collinearity before running the regressive model. The results show that 02 independent variables have coefficient Sig < 5% so these 02 factors are correlative with the dependent variables. The correlative coefficient of the 2 factors is: AQ: 0.344, AE 0.302. The correlative coefficient between these 02 independent variables in the model, not any couple is more than 0.8 so when using the regressive model, there is less risk for multi-collinearity happens. This shows that the dependent variables are correlative with 3 factors, these variables has the standard distribution.

Table 8: Correlative matrix between the components

Correlations				
		AF	AQ	AE
AF	Pearson Correlation	1	0,344	0,302
	Sig. (2-tailed)		0,000	0,000
	N	298	298	298
AQ	Pearson Correlation	0,344	1	0
	Sig. (2-tailed)	0,000		1
	N	298	298	298
AE	Pearson Correlation	0,3.02	0	1
	Sig. (2-tailed)	0,000	1	
	N	298	298	298

Source: Collected for the survey data

4.3.3. Multiple linear regression analysis

Table 9: Result of Multiple linear regression

	Un-standardized coefficient		Standardized coefficient	Value t	Sig	Multicollinearity	
	B	Deviation level	Beta			Acceptance level	VIF
Constant	3,1320	0,025		7.623	0,000		
Audit quality	0,401	0,048	0,379	4,535	0,000	0,767	1,124
Auditors's experience	0,227	0,033	0,301	4,354	0,000	0,854	1,457
R^2							0,542
Revised R^2							0,498
Sig. F Change							0
Durbin-watson							2,108

Source: Collected for the survey data

In order to define, measure and evaluate the impact level of the factors to the internal audit, the authors use multiple linear regression method between 02 impact

factors which have been collected from the analysis of the discovered factor and the above correlative analysis.

According to the regression results in table 9, this result gives the value of revised $R^2 = 0.498$; the revised value R^2 shows that the independent variables in the model can explain 49.8% of the changes of the dependent variables. At the same times, the analysis results show the VIF very small, all are smaller than 2, show that these independent factors don't have close relation with each other so the multicollinearity does not happen. Regarding the independence verification of the surplus part which is the statistical quantity Durbin -Watson of the regression having value 2,108 < 3 shows that there's no serial self-correlation 1, or in the other works, the estimated surplus parts of the independent model don't have the linear relationship to each other. Value t equivalent to Sig. of the independent variables are smaller than 0.05 so it has statistical meaning. From table 9, it can be seen that 2 factors have negative impact to the auditor's fraud assessment capacity. The regression equation has following form:

AF = 3,1320 + 0.401*AQ+ 0.227*AE

The hypothesis H1, H2 are accepted. It means that the audit quality and auditor's experience have positive impact to the auditor's fraud assessment capacity

This has the same meaning with the previous studies such as Qintharah, Fajarwati, & Ovitasari (2020), Umar, Erlina, Fauziah, & Br Purba (2019), Emalia, Midiastuty, Suranta & Indriani (2020); Wawo (2022); Qintharah et al. (2020); Sarra & Alamsyah (2020), Fadillah (2020), Pagalung & Habbe (2017).

Conclusion

The data checking results show the positive and remarkable correlation between the audit quality and the auditor's capacity in fraud finding and evaluating in the companies in Vietnam.

In order to maintain the audit quality in one organization, the enterprises should organize the internal audit team. In which, the fraud finding play a role as an effective method regarding the cost in order to prevent fraud. The fraud solving after happen requires the specific loses and require more cost compared to the prevention methods. Hence, enhancement of the effort in fraud finding via enhancement of the quality of the audit procedures is considered as the recover method.

Besides, the study results also show the positive and significant correlation between the auditor's experience and the auditor's fraud assessment capacity at the enterprises in Vietnam. Therefore, the more that the auditor's experience and the results of their audit efforts, the higher that their capacity in finding and evaluating fraud in the financial reports. This experience may archive by training, consulting, sharing the knowledge and other tools. One experienced auditor is considered that not only has capacity to find out the abnormal points or the fraud in the financial reports but also has capacity to accurately present their findings compared to the less experienced auditors.

Apart from that, the auditors who have higher profession has wider vision regarding many different issues and help them to develop their knowledge about their working sector and effectively solve the complex challenges. The skillful auditors are necessary to perform the complex audit analysis because they have professional knowledge in finding the mistakes, accurate understand and define their natural causes. The study results show that the higher experienced auditors present the higher awareness about the mistakes which allow them to more effective understand and solve the problems relating to the abnormal points which they have discovered.

Therefore, for the public accounting companies and auditors, the important thing is tat the auditors have to improve both ability and experience in performing the audit in the professional and accurate ways in order to ensure no fraud or if fraud happen, it can be found out and reported as soon as possible.

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INFLUENCE OF PSYCHOLOGICAL FACTORS ON INDIVIDUAL INVESTMENT DECISIONS ON STOCK INVESTMENT

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Abstract: ***Financial investment studies must consider the influence of psychological elements on investing decisions. Economic psychology is becoming increasingly popular among academics and seasoned investors. Gaining insight into the psychology and emotions of investors can help analysts forecast their intentions and behavior in the market more accurately. This study evaluates how psychological variables affect individual investors' stock investing choices in the Vietnamese stock market. Additionally, it investigates investors' personality factors, including herding, risk aversion, overconfidence, and self-efficacy, excessive optimism, pessimism, and financial literacy, with these factors serving as independent variables and investment intention as the dependent variable. The research population includes individual investors in the Vietnamese stock market, with a total distribution of 513 questionnaires. A linear regression model is applied to analyse the data and test the hypotheses. The study results indicate that all six variables significantly influence the investment intentions of individual investors in stocks.***

• Keywords: *financial investment, psychological factors, financial psychology, investment decisions, individual investors, herding, risk aversion, excessive confidence, excessive optimism, pessimism, financial literacy, investment intentions.*

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1. Introduction

The Vietnamese stock market has experienced significant development, marked by increased scale, listed stocks, and trading value. Individual investors, who constitute the majority of trading accounts, exert considerable influence over the market, impacting its direction.

This market is dynamic and unpredictable, heavily influenced by investor sentiment, volatile shifts in domestic and global macroeconomic conditions, and the financial performance of listed companies. Rumours often shape the mindset of individual investors, adding to the market's unpredictability.

Therefore, understanding investor psychology and market orientation is crucial for making informed investment decisions. In addition to fundamental and technical analysis methods, researching and analysing investors' financial behaviour is vital, especially as traditional analysis methods lose their significance.

While some studies have explored the psychological factors influencing the investment intentions of individual investors, many are outdated or lack sufficient scope. As a result, our research group aims to delve into the topic "Psychological factors influencing the investment intentions of individual investors in the Vietnamese stock market." This study seeks to pinpoint essential psychological factors and propose suitable solutions to foster a healthy and developed securities market in Vietnam, enabling investors to make informed decisions and gain deep insights into the Vietnamese stock market.

2. Literature review

In 2019, Ton Hoang Thanh Hue conducted a study on the influence of psychological factors on investment decisions in the Vietnamese stock market. The research adopted a behavioral finance theory perspective to analyze the presence and effects of psychological factors on investment decisions. The findings indicated a strong relationship between overconfidence, excessive optimism, representativeness, decision anchoring, pessimism, and the herd effect, and their impact on investment decisions. conducted research on the influence of psychological factors on investment decisions in the Vietnamese stock market. The author approached the topic from the perspective of behavioural finance theory to examine the existence and impact of psychological factors on investment decisions. The results revealed that variables such as overconfidence, excessive optimism, representativeness, decision anchoring,

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pessimism, and the herd effect are closely related to and impact investment decisions.

In their 2016 study, Đoan Anh Tuan and Hoang Mai Phuong examined herd behavior on the HOSE and HNX exchanges by analysing yield volatility. They utilised daily stock price data to assess price volatility profits and explored different psychological indicators of herd behaviour. The findings suggested that herd behaviour significantly impacts stock investment decisions. Regression analysis indicated that herd behavior is more pronounced during market downturns than during market upturns.

In a study conducted by Tran Trung Kien in 2019, the effects of prospect theory, herd behavior, and decision-making behavior on individual investors in the Vietnamese stock market were examined using a sample size of 107 investors. The research findings suggested that herd mentality and overconfidence could significantly influence the investment decisions of individual investors. The study highlighted herd behavior as the primary psychological factor impacting the investment choices of individual investors.

In 2020, Phan Tran Trung Dung conducted a study on the factors influencing individual investors' intention to invest in derivative securities in Vietnam. By utilizing the PLS-SEM and PLS-MGA research methods, the study revealed that attitude, social norm, perceived behavioral control, experience, risk perception, and financial literacy all positively influence the intention to invest in derivative securities among individual investors in Vietnam. Among these factors, behavioral control, attitude, and experience were found to be the strongest influencers of investment intention.

In 2012, Nguyen Duc Hien surveyed five hundred individual stock market investors in Vietnam and found that individual investors' decision-making is influenced by five categories of elements from listed securities and four groups of factors from the stock market and economic environment. The study, which utilized both quantitative and qualitative methods, identified five groups of psychological factors comprising a total of 19 attributes: namely, the group of overly optimistic psychological factors, the group affected by herd mentality, the overconfident group, the group influenced by risk-taking attitude, and the group affected by pessimistic psychological factors. All these groups of factors impact the investment intentions of individual investors in the Vietnamese stock market.

Mahnaz Azari Ghelichi, Maryam Gharehdaghi, and Bardia Nakhjavan studied 384 investors to analyze the impact of psychological factors on investment decisions in the Iranian stock market. They found that regret, loss aversion, beliefs, and self-confidence play significant roles.

Abdul Moueed, Muhammad Umar Asghar, Ahmed Imran Hunjra, and Basharat Raza explored the relationship between psychological and social aspects and their influence on investing decisions. Their findings showed that fear, anger, and mood affect investment choices, while stress, herding, and social interaction have negative impacts.

Amelia Ng Chui Yi and Suzaida Bakar investigated how psychological variables affect stock market judgments in Malaysia. They concluded that availability bias, conservatism, and overconfidence influence investors' decisions in the Malaysian stock market, with psychological variables varying by gender.

Dayaratne D.A.I and Wijethunga A.W.G.C.N researched how psychology affects investors' behavioral intentions in financial markets using the Theory of Planned Behavior model. They found that subjective norms have the most influence on investors' behavioural intentions.

Ni Made Dwi Ratnadi studied 336 individual investors to evaluate the impact of economic, social, and psychological variables on Millennials' stock investment choices. Their findings revealed that profit expectations, self-efficacy, and risk perception influence investment decisions, but risk perception does not directly influence millennials' stock investment decisions.

3. Research methodology

Research data

Survey questionnaires were used to gather the data for this investigation. Between January 2024 and October 2023, the study team delivered 1000 survey forms to individual investors on the Vietnam stock exchange through several securities firms, Zalo, and Facebook groups. Five hundred thirteen genuine questionnaires were obtained after the survey.

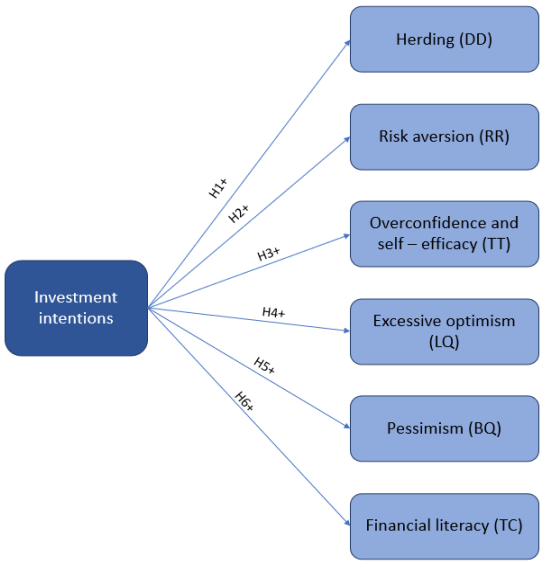
Questionnaire development and measurement

The questionnaire comprises six factors influencing the intention of individual stock investors to invest in the Vietnamese stock market: (1) Herding (5 questions); (2) Risk aversion (5 questions); (3) Overconfidence and self-efficacy (5 questions); (4)

Excessive optimism; (5) Pessimism; (6) Financial literacy. Additionally, the questionnaire includes three observational variables corresponding to three questions related to the variable "Intention of individual stock investors to invest in stocks". Most studies are measured using a 5-point Likert scale; therefore, this study also employs a 5-point Likert scale with 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree.

Research model and hypotheses

Figure 1: Research model



Based on previous studies and theoretical foundations, the research team has constructed a research model for the project. Drawing from the models of earlier authors, the research team proposes a model consisting of 6 independent variables and one corresponding dependent variable, aligned with six research hypotheses as follows:

H1: The factor "Herding" positively influences the intention of individual stock investors to invest in stocks on the Vietnamese stock market.

H2: The factor "Risk aversion" positively influences the intention of individual stock investors to invest in stocks on the Vietnamese stock market.

H3: The factor "Overconfidence and self-efficacy" positively influences the intention of individual stock investors to invest in stocks on the Vietnamese stock market.

H4: The factor "Excessive optimism" positively influences the intention of individual stock investors to invest in stocks on the Vietnamese stock market.

H5: The factor "Pessimism" positively influences the intention of individual stock investors to invest in stocks on the Vietnamese stock market.

H6: The factor "Financial literacy" positively influences the intention of individual stock investors to invest in stocks on the Vietnamese stock market.

Statistical descriptive analysis

The study applied criteria regarding gender, age, field of activity, educational level, and income to conduct a statistical descriptive analysis of the research sample. The characteristics of the research subjects, after being statistically analysed using the SPSS software, are presented in the table below:

Survey data reveals a gender disparity in participation, with a majority of over 72% being male. Individual stock investors aged 26-35 and 36-50 constitute the highest participation rates, accounting for 33.53% and 33.72%, respectively. This reflects the investment inclination of these individuals, who possess experience and accumulated capital. Most individual investors are engaged in business, finance, and technology, with proportions of 37.62%, 23.78%, and 22.42%, respectively. These individuals often leverage their advantages and experience from similar fields when entering the stock market. Educational attainment is also a significant factor, with the highest proportion holding a university degree at 44.25%. Regarding income, investors with an average income ranging from 15-30 million VND and above 30 million VND constitute the most significant proportions. These figures reflect individual investors' investment demand and capability in the Vietnamese stock market.

4. Research findings

Reliability analysis

Table 1: Reliability statistics

Variables	Type of variables	Questions	No. of Items	Cronbach's Alpha
Herding	Independent	5-1	5	0,921
Risk aversion	Independent	10-6	4	0,821
Overconfidence and self-efficacy	Independent	15-11	4	0,935
Excessive optimism	Independent	20-16	5	0,954
Pessimism	Independent	25-21	5	0,926
Financial literacy	Independent	30-26	5	0,768
Investment intention	Dependent	33-31	3	0,892
Total		33	31	**0,888**

Cronbach's Alpha has been employed to evaluate the questionnaire's reliability. The average Cronbach's Alpha value for the variables is 0.888. Table 2 shows the reliability metrics for every variable. According to Guilford (1965), a good

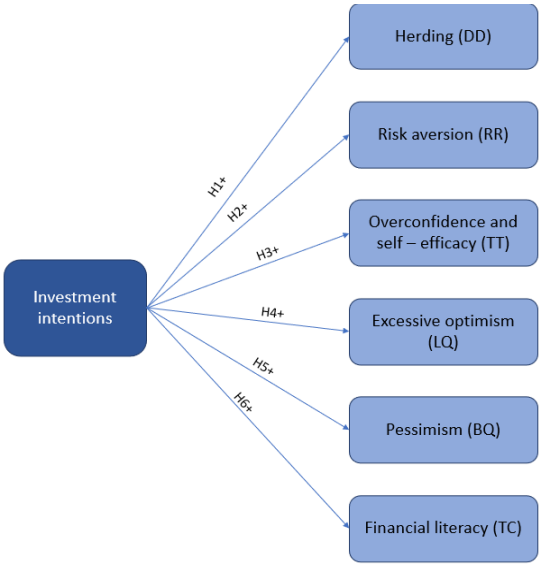
level of internal reliability for the questionnaire is indicated when Cronbach's Alpha is more than 0.7. Here, Cronbach's Alpha is more significant than 0.7, suggesting that the reliability of the questionnaire is satisfactory. Moreover, Table 2 demonstrates that Cronbach's Alpha values for every variable are more critical than 0.6. This shows that every variable used in the study has at least one item that satisfies the dependability standards needed to conduct research.

Kmo and bartlett's test

The Kaiser-Meyer-Olkin (KMO) and Bartlett's tests were used to evaluate the sample size's adequacy. Accepting values above 0.5 is advised by Kaiser (1974), who also states that values in the range of 0.5 to 0.7 are average, 0.7 to 0.8 are good, 0.8 to 0.9 are exceptional, and values beyond 0.9 are remarkable (Hutcheson & Sofroniou, 1999). The KMO measure of sample adequacy for our study sample is 0.831, within the excellent adequacy range. Additionally, the test produces a Sig. A sample size adequate for analysis is indicated by a coefficient of 0.000.

Exploratory factor analysis (EFA)

Figure 2: Linear regression analysis



The independent variables' eigenvalues are 1.011, indicating that seven meaningful factors best summarise the data and explain 79.44% of the variance. Similarly, the analysis for the dependent variables shows an Eigenvalue of 2.473, with a total variance explained as 82.441%, further confirming the suitability of the EFA model.

The rotated matrix of the independent variables shows that 30 observed variables have been grouped into seven factors. All observed variables have factor loadings greater than 0.5. Notably, observed variables TC4 and TC2 have been identified to belong to the same factor group. Therefore, the research team eliminated these two unnecessary observed variables without creating a new factor group.

The exploratory factor analysis (EFA) and model validation results have been synthesised. They indicate that the adjusted model comprises six factors influencing the investment intention of individual stock investors in the Vietnamese stock market, with 26 observed variables included in the correlational regression analysis.

Table 2: Pearson's correlation analysis

Correlations								
		YD	DD	RR	TT	LQ	BQ	TC
N		513	513	513	513	513	513	513
YD	Pearson Correlation	1	.565**	.470**	.352**	.372**	.321**	.365**
	Sig. (2-tailed)		0,000	0,000	0,000	0,000	0,000	0,000
DD	Pearson Correlation	.565**	1	.291**	.197**	.219**	.172**	.188**
	Sig. (2-tailed)	0,000		0,000	0,000	0,000	0,000	0,000
RR	Pearson Correlation	.470**	.291**	1	.236**	.139**	0,084	.128**
	Sig. (2-tailed)	0,000	0,000		0,000	0,002	0,059	0,004
TT	Pearson Correlation	.352**	.197**	.236**	1	-0,020	0,050	0,086
	Sig. (2-tailed)	0,000	0,000	0,000		0,649	0,256	0,050
LQ	Pearson Correlation	.372**	.219**	.139**	-0,020	1	.111*	.200**
	Sig. (2-tailed)	0,000	0,000	0,002	0,649		0,012	0,000
BQ	Pearson Correlation	.321**	.172**	0,084	0,050	.111*	1	.334**
	Sig. (2-tailed)	0,000	0,000	0,059	0,256	0,012		0,000
TC	Pearson Correlation	.365**	.188**	.128**	0,086	.200**	.334**	1
	Sig. (2-tailed)	0,000	0,000	0,004	0,050	0,000	0,000	0,000
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Table 2 represents the results of Pearson correlation analysis between all variables. The findings reveal that all variables have positive correlations with each other. Herding and investment intention exhibit a strong positive correlation, with a coefficient of r = .565 at a significance level of 0.000. This is followed by the positive correlation between risk aversion and investment intention, with a coefficient of r = .470 at a significance level of 0.000. According to the correlation matrix, intention and excessive optimism (r = .372) and intention and financial literacy (r = .365) demonstrate moderately positive relationships at a significance level of 0.00.

Overconfidence, self-efficacy, and excessive optimism also show a negative correlation (r = -0.02) at a significance level of 0.01. Finally, the correlation results indicate the existence of positive correlations, where an increase in one variable corresponds to a rise in the other variable and vice versa. The correlation analysis suggests that the variables do not exhibit multicollinearity. Thus, all variables meet the conditions for further study.

Table 3: Regression analysis

Coefficients						
Model		Standardised Coefficients	t	Sig.	Collinearity Statistics	
		Beta			Tolerance	VIF
1	Constant		-3,940	0,000		
	DD	0,346	10,974	0,000	0,841	1,189
	RR	0,257	8,300	0,000	0,871	1,148
	TT	0,207	6,834	0,000	0,918	1,090
	LQ	0,216	7,146	0,000	0,914	1,095
	BQ	0,154	4,969	0,000	0,875	1,142
	TC	0,154	4,906	0,000	0,846	1,182
R				0,759		
R-Square				0,576		
Durbin-Watson				1,159		
P(Anova)				<.001[b]		
F-value				114,422		
a. Dependent Variable: YD						

The computed correlation coefficient indicates a comparatively high linear connection between the dependent and independent variables (R = 0.759). The coefficient of There is a relatively high degree of linear connection between the dependent and independent variables, as indicated by the computed correlation coefficient (R = 0.759). The square of the sample correlation coefficient between the actual and projected values is known as the coefficient of determination or R Square. It describes the percentage of the dependent variable's variance that can be accounted for by all of the chosen independent variables or the degree to which changes in the independent variables can account for changes in the dependent variable. This model's coefficient of determination (R Square) is 0.576.

The computed correlation coefficient indicates a comparatively high linear connection between the dependent and independent variables (R = 0.759). The coefficient indicates that the dependent variable, investment decisions, can be explained by the independent factors, herding, risk aversion, overconfidence and self-efficacy, excessive optimism, pessimism, and financial literacy, by almost 57.6%. Stated otherwise, the six independent variables account for approximately 57.6% of the decision-making process for investors, whilst the remaining elements not covered in this study account for 42.4%. As a result, it is acknowledged that this model, which has all the required variables, is good. At the 1% significance level, the F-statistic is validated, suggesting that the null hypothesis that is, that there is no difference in any of the regression coefficients can be rejected. Regression estimations are, therefore, helpful in making predictions. The global test utilising F- and R-statistics suggests that the regression model's independent variables can account for the variance in the dependent variable, which is the decisions made by investors. For making predictions, the regression model is dependable and robust.

The regression analysis results show no phenomenon of autocorrelation among the residuals, with a Durbin-Watson coefficient of 1.159. The multiple linear regression model fits the data with a statistical significance above 95%. The most significant variance inflation factor (VIF) is 1.189, while the other values are all less than 5, indicating no multicollinearity among the independent variables in the regression model.

The unstandardised regression equation is represented as follows:

The investment intention is calculated as follows: Investment intention = -0.659 + 0.267*Herding + 0.293*Risk aversion + 0.145*Overconfidence and self-efficacy + 0.162*Excessive optimism + 0.127*Pessimism + 0.142*Financial literacy.

From the established regression equation, assuming all factors herding, risk aversion, overconfidence and self-efficacy, excessive optimism, pessimism, and financial literacy remain constant (their values are all zero), investors' investment intention will be -0.659.

The standardised regression equation is represented as follows:

Investment intention = 0.346*Herding + 0.257*Risk aversion + 0.216*Excessive optimism + 0.207*Overconfidence and self-efficacy + 0.154*Pessimism + 0.154*Financial literacy.

The six recognised theories represent the factors of herding, risk aversion, overconfidence and self-efficacy, excessive optimism, pessimism, and financial literacy. Based on the linear regression equation, the research team noticed the significance of independent variables on the variation in individual investors' investment intention in the Vietnamese stock market. The estimated coefficient for herding's favourable influence on individual investors' investing intention is 0.346. Stated otherwise, a one-unit rise in herding corresponds to a 0.346 unit increase in individual investors' investment intention in the Vietnamese stock market, and vice versa, assuming all other factors remain constant. In contrast, an increase of one unit in risk aversion causes the investment intention to rise by 0.257 units; an increase of one unit in excessive optimism causes the investment intention to rise by 0.216 units; and an increase of one unit in overconfidence and self-efficacy causes the investment intention to rise by 0.207 units.

Meanwhile, a one-unit increase in pessimism and financial literacy leads to an increase of 0.154 units in investment intention. These results imply that herding contributes the most to investors' decisions, followed by risk aversion, excessive optimism, overconfidence and self-efficacy. In contrast, pessimism and financial literacy contribute the least to investors' intentions.

5. Solutions and recommendations

Solutions

The results from the linear regression analysis in Chapter 4 indicate that the factor herding has the most substantial impact on the intention to invest in stocks among individual investors in the Vietnamese stock market. For investors, there are several simple solutions to improve investment decisions. Firstly, seek professional advice instead of relying on herd opinions. Secondly, use reliable sources of information and diversify information sources. Thirdly, establish specific investment plans and determine the acceptable level of risk. Finally, enhance financial literacy and understanding of particular companies.

Recommendations

Based on our research, we propose the following recommendations. Firstly, to combat market manipulation crimes, periodic monitoring mechanisms must be strengthened, and continuous checks on new account openings and trading activities of securities companies must be conducted. Serious enforcement and refinement of relevant legal provisions related to market manipulation behaviour are essential.

Secondly, state management agencies should refine legal provisions related to stocks in the stock market. At the same time, it is necessary to create favourable conditions for a stable economic and social environment, thereby building a solid foundation for economic development. Additionally, enhancing supervision, strict enforcement of laws, and improving and perfecting information technology infrastructure are crucial to creating favourable conditions for investors.

Thirdly, strict management measures should be implemented for the Stock Exchange and the Ministry of Finance, and tight regulations related to price manipulation behaviours in the stock market should be established. Utilising tax management laws to apply a uniform tax calculation method for all individuals and organisations participating in the stock market to prevent tax evasion and legal loopholes is recommended. This will also create a more favourable environment for individual investors.

Conclusion

The research methodology adopted a systematic approach, drawing upon established theories from prior studies to explore the determinants influencing the stock investment intentions of individual investors in the Vietnam Stock Exchange (VSE). Employing factor analysis, the study discerned six pivotal factors shaping these intentions: Herding, Risk aversion, Overconfidence and self-efficacy, Excessive optimism, Pessimism, and Financial literacy. Notably, Herding emerged as the most influential factor, while Pessimism and Financial literacy exhibited comparatively lesser impacts.

Quantitative techniques such as descriptive statistics and regression analysis were meticulously employed to substantiate these findings. The results, aligned with market realities and human behavioural patterns, underscored the significance of enhancing market surveillance mechanisms and augmenting investor education initiatives. This assumes heightened importance in light of recent sophisticated market manipulations, highlighting the need for robust regulatory frameworks and investor awareness programs to mitigate risks and foster a transparent and resilient market environment.

Furthermore, fostering collaboration among regulatory bodies, financial institutions, and the investing community becomes pivotal in fortifying market integrity and bolstering investor confidence. Establishing a conducive market ecosystem characterised by transparency, accountability, and investor empowerment is essential for sustainable market development and equitable benefits for all stakeholders.

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RESEARCH ON FACTORS AFFECTING GENERATION Z'S DECISION TO USE CREDIT CARDS IN HO CHI MINH CITY

PhD. Tran Thi Trang*

Abstract: ***In today's modern life, with the digital explosion and technological advances, many elaborate forms of payment have been invented to complement the traditional cash exchange process. One prominent example of this change is the drastic increase in the number of people using credit cards within the consumer community in recent years. Nowadays, the type of payment involving the use of credit cards is no longer a strange concept to most people, especially those from the younger generation such as Gen Z consumers. Given their early exposure to modern technology and positive adaptation to new inventions and ideas, Gen Z consumers prove to be a potential source for researchers and practitioners to conduct studies on their credit card usage behaviors and decisions. Therefore, this research was conducted to identify and analyze major factors that influence the decision to use credit cards by Gen Z buyers in Ho Chi Minh City. The study uses the quantitative method with a sample of surveys from 230 Gen Z consumers using credit cards in Ho Chi Minh City, thereby illuminating the decision and behavioral tendencies of this group. The research results present that Generation Z's decision to use credit cards in Ho Chi Minh City is positively influenced by five factors: Cost, Convenience, Lifestyle, Trust, and Technology.***

• Keywords: *generartion Z, decision to use, credit cards, technology, lifestyle.*

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1. Introduction

Major breakthroughs in technology and the digitalization process in recent decades have brought about significant transformations in the way people behave and in how core systems function across many arenas and industrial sectors, including finance. The financial landscape, particularly in Vietnam, has undergone prominent changes over the past few years, which profoundly impact consumers' behavioral habits and motivate them to make decisions relating to alternative financial investing methods. In addition, the increasing economic instability nowadays has emphasized the importance for consumers to have financial preparedness and asset management capabilities surrounding the utilization of new financial tools, especially credit card use (Chen et al., 2023). Credit card use is a trend emerging during the rapid pace of change in the financial sector among numerous financial products and services, which provides individual investors with greater opportunities. A credit card is a vehicle for making monetary transactions and paying for goods and services (Surekha et al., 2022). The mode of credit card uses functions depending on the cardholders' promise to pay for the goods and services in the future (Surekha et al., 2022). In other words, a credit card allows users to borrow money for regular payments through a line of credit score attached to a specific account. The increasing popularity of credit cards also involves the contribution of banks, both locally and internationally. Banks allocate a considerable portion of their budgets to invest in developing card products and services, with credit cards playing a significant role, serving two primary functions: electronic payments and consumer lending.

The journey of credit cards began in America around the 1940s and rapidly spread their popularity among the community of consumers worldwide due to the great convenience and ease of use (Surekha et al., 2022). According to U.S. Credit Card Statistics for 2021, 70.2% of American consumers own at least one credit card, and those who possess ten or more credit cards account for 14% of the population. Furthermore, a 2.5% increase in the number of credit card accounts compared to the previous year indicates the growing prominence and high potential of credit cards as a primary and essential means of payment in modern society, not only within

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America but also in other countries. Additionally, since the beginning of the 21st century, facing financial difficulties in pursuing higher education in the United States has become increasingly common due to continuously rising tuition fees, reduced government funding for higher education, and declining average household incomes. For college students, resorting to borrowing is not the sole strategy for tuition payment. In the context of the credit card boom from the 1980s to the 2000s, college students have gradually been using credit cards to balance their budgets for tuition fees (Andrews, 2021). Hence, conducting research on the factors that drive credit card usage decisions, especially within the community of Generation Z, which consists of a great number of college students, proves to be highly significant and promising.

As for Vietnam's financial market, in recent years, the use of credit cards has been greatly enhanced due to the advent of famous international card brands such as VISA, MasterCard, JCB, and CUP (Nam et al., 2021). The study also highlighted the importance of banks in promoting and driving consumers' decisions to use credit cards. Since their first introduction into the market in early 1996, credit cards in Vietnam have witnessed multiple significant developments as the technology infrastructure and digital tools continue to advance (Quan & Nam, 2017). According to the statistics provided by the State Bank of Vietnam, there is a circulation of 4.9 million credit cards among the community of Vietnamese consumers at the end of 2020. This number of credit card users has undergone a drastic increase of almost 25 percent compared to the year 2019, but the credit card ownership rate was still much lower than that of Southeast Asia and the world (0.08 cards/person in 2020) (Nam et al., 2020). However, the credit card business in Vietnam is reported to be on the rise and achieving major breakthroughs over the past few years, providing researchers and practitioners with valuable resources for more thorough studies in this realm in the future.

2. Literature review

2.1. Credit cards

Nowadays, the act of paying by credit cards is no longer an unusual concept to most people around the world. A credit card is a means of payment issued in the form of a small plastic card which grants its holder a line of credit which represents the amount of money the card lends to the user, who can then use the card to purchase goods and services (Surekha et al., 2022). The research also emphasized the duality of credit cards as they provide multiple benefits such as convenience, comfort, and protection but also involve an element of risk and unnecessary debt. Credit cards and credit use revolve around the concept of arranging between the borrowers and the lenders to receive cash and items now and pay for them at a later time. Cloutier & Roy (2020) also proposed that credit card use, besides its convenience and comforting characteristics, poses several problems related to indebtedness that need to be addressed, especially among students and the younger generation. This is also the reason why many people still hold a reluctant attitude towards using credit cards, and their credit decision is usually the result after considering a combination of affecting factors.

In Vietnam, a credit card is a card that allows the cardholder to make card transactions within the credit limit granted under the agreement with the card issuer. An individual is 18 years old or older and meets all requirements, he or she can own a credit card. The government's policies help facilitate the development of credit card use among people in Vietnam but also increase the chance of financial risk and debt, which significantly influence how individuals behave and make decisions around the concept of credit use.

With a view to finding which factors impact consumers' decision to use credit cards, multiple research and academic papers have been conducted to answer this question. The perception from consumers can be based on different aspects of using credit cards such as perceived risk, perceived ease of use, or perceived usefulness (Nam et al., 2020). On the other hand, the influence of factors like convenience and comfort on individuals' credit utilization decisions, the level of personal incomes significantly impacts people's choice to use credit cards and even the choice of which card brand to use. The study also highlighted the importance of demographic factors and behavioral habits in the decision-making process involving credit use (Surekha et al., 2022). Furthermore, Jung & Kang (2021), when conducting a survey on Korean consumers, found that not only young individuals but also elderly people can develop a

high tendency towards using credit cards if their income is high enough. The study proposed that the income factor is the major determinant of people's decision to use credit cards regardless of their age or retirement status.

2.2. Factors affecting generation Z's decision to use credit cards

Cost: The cost of a product or a course of action refers to everything an individual must sacrifice, usually monetary values, in order to achieve a purpose or gain a benefit for themselves (Srivastava, 2019). According to this definition, the cost of using credit cards involve everything an individual have to give up to possess the card and make regular transactions such as the card opening fee, transaction fee, maintenance fee or the interest penalty when the holder is unable to pay the full balance over a particular period of time. The theory by Srivastava also suggested that cost is extremely crucial to an individual or organization's decision-making process as it is the first thing they will take into consideration before decide to perform an action. In addition, cost is one of the main influencing factors on individuals' behavior and decision to use a particular service or product (Zolkepli et al., 2021). In other words, cost influences consumers' choices and attitudes towards a course of action and the evaluation of cost seem to be a natural behavior before making any decision.

In terms of credit cards use, the cost usually comes from the accumulating interest and fees when the overdraft or the missing of payment occurs (Gathergood et al., 2019). When the costs outweigh the benefits of using credit cards which include rewards points or the "buy now pay later" comfort, consumers tend to show certain reluctance and unwillingness to continue to use credit cards in the future. As for gen Z consumers, the impact of the function "buy now pay later" of credit cards on the overall cost for impulsive buying and overconsumption which usually happen among this group of buyers. The compelling features of a credit card evoke gen Z consumers' intention to use it but the cost that comes along with it when overconsumption happens helps drive their decision to continue with credit cards usage in the future. The level of credit card debt profoundly impacts consumers' payment choice as well as their attitude towards the act of using credit cards again at the later time (Stavins, 2020).

H1: Cost has a positive impact on generation Z's decision to use credit cards.

Convenience: The concept of convenience first appeared in the marketing literature in relation to the category of products. According to Brown (1990), in early marketing strategies, "convenience" was understood as the time and effort consumers spent to purchase the product, not the feature or attribute of the product. Based on this definition, the convenience factor of using credit cards refers to the easiness and quickness when utilizing this vehicle for regular payments. Credit cards bring benefits to merchants and consumers in a way that no other payment instruments can provide: flexibility and convenience because it is possible to borrow money and repay debt at the later time. The convenience of credit cards as the comfort of reduced pain of paying compared to the cash payment method and in turn, enhance consumers' willingness to pay and usage decision (Boden et al., 2020) defined. The study also posited the early adoption of modern technology of the young generation can make the method of credit cards appear easier to use and this helps enhance their convenience perceptions and evoke their decision to use credit cards.

Furthermore, convenience can act as a balancing factor for the financial and security risks surrounding the usage of modern payment methods like credit cards or mobile apps. If the perceived convenience is greater than the perceived risk, consumers will still decide to use credit cards to purchase goods and services (Pal et al., 2021). Credit cards offer users with great convenience and practicality and hence, they attract many consumers and facilitate the payment process. However, the convenience of credit cards also makes consumers more likely to perform impulse buying behaviors so they should be more prudent and wiser in using this mode of payment. Convenience also refers to the level of feeling comfortable when using a technology and because they feel comfortable, they tend to perceive that technology as useful and develop strong usage decision towards it (Wardana et al., 2022).

H2: Convenience has a positive impact on generation Z's decision to use credit cards.

Lifestyle: The concept of lifestyle is quite general but also unique to each entity at the same

time. It permeates across various fields and is intertwined with numerous issues. A person's lifestyle is closely connected to his/her social status as well as personal income. People with high social status are more likely to have more premium lifestyle and consume more products and services (De Silva et al., 2021). The study also emphasized the correlation between lifestyle and decision to use credit cards as people with high-end lifestyle will use credit cards more frequently. Using credit cards as a lifestyle tool is quite popular among the surveyed group of people, they use credit cards because they want to access the lifestyle they desire. According to the report. In addition, the arguments have reshaped perceptions of self when engaging with credit products specifically as the use of credit products goes beyond the mere consumption of goods; it involves crafting a lifestyle where these products serve as symbols of a desirable life (Deville, 2015).

As stated above, lifestyle is deeply associated with an individual's social status and their self-image in others' eyes, hence many people develop a desire to use credit cards as a mean to raise their lifestyle and value. The study also emphasized the importance of lifestyle among the young generation like gen Y and gen Z consumers, and this significantly influence their choices of credit use. In other words, credit cards are considered to help boost the social status and facilitate the high-end lifestyle of many people (Bernthal et al., 2005).

H3: Lifestyle has a positive impact on generation Z's decision to use credit cards.

Trust: There are numerous definitions and approaches to understanding the concept of trust. Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another (Rousseau et al., 1998). Applying the definition into the context of credit cards use, the trust factor can help minimize the effect of potential risk and cost perceived by consumers, and in turn, enhance their intention and willingness to make the decision. In addition, the acceptance of cashless transactions is primarily affected by the trust factor. Trust indicates how comfortable, secure, and willing users are to conduct transactions without fear, and it also shows how confident users are with using cashless payment methods, particularly the mode of credit cards (Sitompul et al., 2022)

The feeling of trust may vary among different people and different aspects of life. Szumski (2020) have posited that technological trust acts as a crucial factor in influencing individuals' decision to switch to cashless and digital payment. Technological trust is also a major determinant of technology adoption as well as positive attitudes towards new consumption changes. The trust of consumers when using credit cards also comes from the perceived level of security and information assurance (Nam et al. 2020). When individuals feel safe and secure, they develop a sense of trust and confidence and this in turn, promote their decision to use credit cards. Additionally, trust towards an organization or institution in the credit card business will enhance the chance of an individual holding the card for himself/herself. Trust also helps increase the frequency of using credit cards in daily payments (Zhou, 2016). The study also highlighted the origin of trust usually from the flexibility of credit cards and individuals' preferences towards this mode of payment. Lifestyle and status are the major motives why a person choose to use credit cards but trust is the main factor affecting their decision to keep holding the cards and make future transactions with them.

H4: Trust has a positive impact on generation Z's decision to use credit cards.

Technology*:* The development of science and technology has profoundly impacted the use of technology in everyday life, including the emergence and popularization of credit cards (Inman et al., 2017). As a quintessential product of financial technology, credit cards have not only changed the way we conduct transactions but also influenced our perceptions of money and personal finance. Advances in telecommunications and computer technology have made credit cards a global payment tool. For instance, chip and PIN technology has been developed to enhance security for credit card transactions, minimizing the risk of fraud. Improvements in network technology not only allow for safer but also faster transactions. The development of credit cards is also a typical

example of how science and technology can affect consumer decisions to use technology (Venkatesh et al., 2003). Users increasingly seek convenient, fast, and secure solutions, which drives financial institutions to continuously innovate technology to meet these demands.

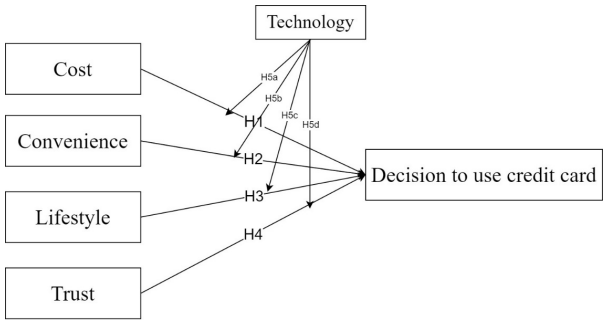
H5a: Technology enhances the relationship between Cost and generation Z's decision to use credit cards.

H5b: Technology enhances the relationship between Convenience and generation Z's decision to use credit cards.

H5c: Technology enhances the relationship between Lifestyle and generation Z's decision to use credit cards.

H5d: Technology enhances the relationship between Trust and generation Z's decision to use credit cards.

Figure 1: Theoretical research model of factors affecting generation Z's decision to use credit cards



3. Research method

3.1. Construct Measurements

The research model presented in Figure 1 was tested via an online cross-sectional field survey of Generation Z credit card users. A survey questionnaire based on the measures of constructs specified in the research model and customers' demographic characteristics was developed for data collection. The items measuring each construct were mainly adopted from previous literature.

The measures of Cost were adopted from Srivastava (2019). The measures of Convenience were adopted from Brown (1990). The Lifestyle items were adopted from De Silva et al., (2021). The measures of Trust were adopted from Rousseau, Sitkin, Burt, and Camerer (1998). The measures of Technology were adopted from Inman et al. (2017). The measures of Decision to use credit cards were adopted from Jinkook Lee and Kyoung-Nan Kwon (2005). All variables were measured using a five-point Likert scale anchored by "strongly disagree" and "strongly agree".

We followed a four-step process to improve the validity of the questionnaire. First, the study constructs were adopted from previous studies. Second, an expert panel consisting of five university professors was established to validate the measurements. Third, pre-testing was done with university lecturers and graduate students who had experience buying products using credit cards to further test the study measurements. Fourth, a pilot study was conducted with fifty credit card users from the target population. Although the pilot results showed that the constructs had good internal consistency (all alpha values were greater than 0.80), no further modifications were made to the survey questionnaire.

3.2. Data collection and demographic descriptive information

In this study, the Google Survey platform was used to conduct an online survey with credit card users from mid-March to the end of May 2024. A screening question was also included in the questionnaire to identify real credit card users. A total of 251 responses were received, of which 230 responses were usable, while the remaining 21 responses were deleted due to significant missing data. Respondents' demographic descriptions show that 51.7% are male, 70% are students, and 49.1% live in the South.

4. The research results

Cronbach's Alpha*:* Alpha coefficients range from 0.802 to 0.928. All observed variables have intercorrelation coefficients totaling 0.30 or higher. Thus, the scales measuring factors influencing the decision to use a Credit card meet the reliability requirements.

EFA of independent variables*:* The results show KMO = 0.779 > 0.5, Bartlett's test result shows $p = 0.000 < 0.05$, indicating that the variables are related to each other and meet the conditions for factor analysis using EFA. At Eigenvalue = 1.891, 4 factors are extracted (consistent with the number of factors in the initial proposed model), and all factors have Eigenvalues > 1. The variance extracted is 71.986% > 50%. The factor matrix results after rotation show that all observed

variables have factor loading coefficients greater than 0.5, and these variables load only on one factor each. Therefore, it can be concluded that the scales of the independent variables ensure convergence and discriminant validity.

EFA of dependent variables: The KMO coefficient is 0.826, and Bartlett's test has Sig. = 0.000 (< 0.05), indicating rejection of this hypothesis and suitability for EFA analysis. Eigenvalue is 3.311. Total variance explained is 82.768% > 50%.

EFA of moderating variables: The KMO coefficient is 0.706, and Bartlett's test has Sig. = 0.000 (< 0.05), indicating rejection of this hypothesis and suitability for EFA analysis. Eigenvalue is 2.199. Total variance explained is 73.297% > 50%.

Correlation Analysis: There is a statistically significant correlation at the 5% level (sig. < 5%) between the dependent variable (DUC) and the independent variables (CO), (CV), (LS), and (TR). The independent variables have a positive correlation with the dependent variable from 0.321 to 0.560. The variable (TR) shows the highest correlation with (DUC) (r = 0.560, sig. = 0.000). Therefore, these variables can be included in the model to explain the variable (DUC).

Testing the Research Model and Hypotheses: The linear regression equation representing the relationship between the four impacting factors and (DUC):

$$DUC = \beta_0 + \beta_1 * CO + + \beta_2 * CV + \beta_3 * LS + \beta_4 * TR$$

Where: β_i represents the regression coefficient of the model

The linear regression equation representing the relationship between the four impacting factors (independent variables), the moderating variable (TEC), and the interaction variables and The decision to use Credit Card (DUC):

$$DUC = \beta_0 + \beta_1 * CO + + \beta_2 * CV + \beta_3 * LS + \beta_4 * TR + \beta_5 * TEC + \beta_6 * CO.TEC + \beta_7 * CV.TEC + \beta_8 * LS.TEC + \beta_9 * TR.TEC \ (1)$$

Table 1. Results of hierarchical regression analysis

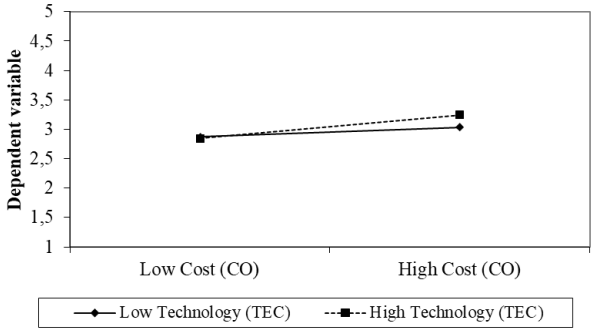
No	Item	Model 1	Model 2	Model 3
		Beta	Beta	Beta
1	Cost (CO)	0.205***	0.206***	0.194***
2	Convenience (CV)	0.177***	0.188***	0.156***
3	Lifestyle (LS)	0.375***	0.359***	0.322***
4	Trust (TR)	0.402***	0.411***	0.407***
5	Technology (TEC)		0.098**	0.045ns
6	CO.TEC			0.103**
7	CV.TEC			0.115**
8	LS.TEC			-0.053ns
9	TR.TEC			0.096**
	R2	0.522	0.531	0.571
	Δ R2		0.01	0.04
	R2 adjustment	0.514	0.521	0.554
	Δ R2 adj change		0.01	0.03
	F or F change	61.527	4.326	5.133
	Sig. F change	0.000	0.039	0.001

(***) p < 0.01; (**) p < 0.05; (ns) not sigfinicance

After the F-test was conducted, it met the requirements. The author proceeded with the regression coefficient analysis for each independent variable to measure the impact of each independent variable on the dependent variable. The study used hierarchical regression analysis to test the role of the moderating variable. The results of the hierarchical regression analysis are shown in Table 1.

Model 1: The regression analysis results indicate that the independent variables (CO), (CV), (LS), and (TR) have a positive impact on (DUC) at a significance level of 5%. Therefore, hypotheses H1, H2, H3, and H4 are accepted. To compare the impact levels of the independent variables, we must use standardized regression weights (β) for more accurate comparisons. A comparison of the values of the standardized coefficients in the Beta column shows: The strongest impact factor is (TR) (β = 0.402), (LS) (β = 0.375 and the lowest is (CV) (β = 0.177).

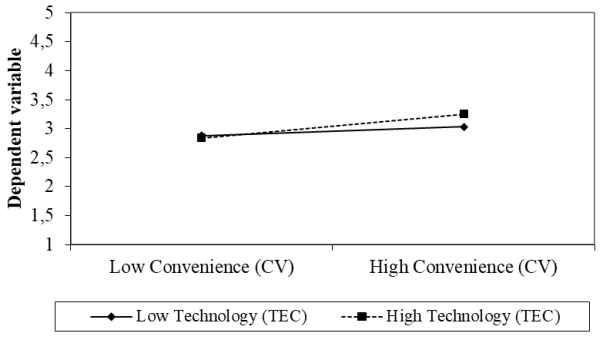
Figure 2: Effect of interaction between cost and technology on the decision to use credit card



Model 2: The regression analysis results show that (CO), (CV), (LS), (TR), and (TEC) positively impact on (DUC) at a significance level

of 5%. The standardized regression weights of the independent variables are as follows: βCO = 0.206, βCV = 0.188, βLS = 0.359, βTR = 0.411 and βTEC = 0.098. Among these, (TR) has the strongest impact on (DUC).

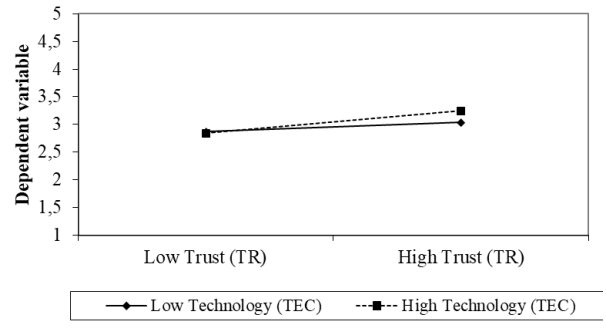
Figure 3: Effect of interaction between convenience and technology on the decision to use credit card



Model 3: The regression analysis results indicate that (CO), (CV), (LS), (TR), and (TEC) positively impact on (DUC) at a significance level of 5%. The standardized regression weights for the independent variables are as follows: βCO = 0.194, βCV = 0.156, βLS = 0.322, βTR = 0.407.

The interaction variables CO.TEC, CV.TEC, and TR.TEC all achieve statistical significance (sig. < 5%), confirming their impact on (DUC). The interaction variable CO.TEC (β = 0.103, sig. = 0.026); CV.TEC (β = 0.115, sig. = 0.016) and TR.TEC (β = 0.096, sig. = 0.036). Therefore, the variable TEC acts as a moderator in the relationships between CO and DUC, CV and DUC, and TR and DUC. The results show that the moderating variable Technology enhances the relationships between CO and DUC, CV and DUC, and TR and DUC.

Figure 4: Effect of interaction between trust and technology on the decision to use credit card



Conclusion: This study has provided deep insights into the factors influencing Generation Z's decision to use credit cards in Ho Chi Minh City, including elements such as cost, convenience, lifestyle, and trust. The results have demonstrated a positive relationship between these factors and the decision to use credit cards. Notably, technology has enhanced the relationship between these factors and the decision to use cards, thus affirming the significant role of technology in the consumption behavior of Generation Z. However, this study also encountered some limitations such as a lack of diversity in identifying influencing factors and the diversity of theoretical models used. Factors such as economic conditions, influence from friends and family, personal experiences, and financial education may play an important role and should be thoroughly investigated in future research.

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FINANCIAL STATEMENT FRAUD OVERVIEW REACHED BY DIRECTORY AND CONTENT BIBLIOMETRIC ANALYSIS

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Abstract: ***The research on financial statement fraud is paramount in connecting businesses with investors, as financial statements are a cornerstone of information. This study presents a comprehensive analysis of financial statement fraud, encompassing authors, journals, countries, and references. The study utilizes the Scopus data source from 1993 to March 24, 2024, and 418 financial statement fraud studies for bibliometric analysis, employing VOSviewer software blended with Python software. The first outcome of the study identifies the top journals, articles, countries, and keywords based on various bibliographic measurement metrics. Secondly, the study uses research topic modeling to reveal four contexts of critical financial statement fraud detection. However, it is crucial to note that this study relies solely on Scopus data; hence, the analysis results may not cover all published studies. Therefore, follow-up studies may incorporate data from other sources to increase the objectivity of the findings.***

• Keywords: *financial statements; fraudulent; bibliometric analysis; VOSviewer.*

JEL codes: G10, M42, M41

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1. Introduction

Financial statements connect businesses with investors, regulators, and other stakeholders in a market economy. They serve as an essential source of information, aiding in public confidence and sound economic decisions. Financial statement fraud, which errors and mistakes can cause, is a severe offense when businesses engage in misconduct to benefit themselves. Unfortunately, many cases of listed companies have been involved in financial scandals, leading to bankruptcy. Therefore, it is essential to focus on limiting fraud in the financial statements of listed companies to restore and enhance public confidence in the stock market. This will help to develop a healthy stock market. The law has regulations to prevent financial statement fraud.

The law mandates that enterprises conduct an external inspection of financial statements to prevent fraud. This inspection is called an audit and is performed by independent and fully qualified auditors who are legally and economically responsible for their comments on the reliability of the financial statements audit. However, the effectiveness of independent auditors' auditing financial statements in bringing higher quality to financial statements has been debated in academia. Several studies have been conducted to investigate this issue. One such study by (Kinney & Martin, 1994) examined numerous studies of discrepancies between audit data and self-made entity data to demonstrate the significance of auditors in detecting trends in underreporting entity data.

This article presents a unique approach to reviewing the research literature on financial statement fraud. We employ two methods, bibliographic analysis and thematic content analysis, to identify emerging trends in fraud detection. Our methodology, which adheres to the guidelines presented in our article (Donthu, Kumar, Mukherjee, Pandey, & Lim, 2021) , utilizes VOSviewer and Python software for analysis.

Although various research methods are available, not many authors have chosen to investigate financial statement fraud through bibliometrics. However, some studies have been conducted using bibliographic measurement tools to analyze financial statement fraud, such as those by (Soltani, Kythreotis, & Roshanpoor,

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2023). These studies are based on different data sources and approaches, indicating the importance of financial statement fraud research. To better understand the current research landscape, it is necessary to conduct more similar studies to describe the situation of financial statement fraud research, identify the main research directions, and determine the future research direction. Our research questions are as follows:

RQ1. What are the trends in published studies on financial statement fraud from 1993 to 2024?

RQ2. What are financial statement fraud's key keywords and themes from 1993 to 2024?

RQ3. Which articles and authors have the highest citation rates regarding financial statement fraud in each context?

RQ4. Which countries collaborate and have the most published studies on financial statement fraud?

RQ5. How do journals collaborate in publishing research related to financial statement fraud?

We aim to provide a comprehensive understanding of research on financial statement fraud using statistics in our literature review. This will benefit academics, researchers, students, and anyone interested in this field, as well as universities and countries worldwide. The review consists of five parts. In the introduction, we explain the purpose of the review. Part 2 defines the basic concepts and provides the theoretical background. Section 3 describes the research and data processing methods. Section 4 presents the research findings and their discussion. Finally, in Part 5, we conclude the findings, limitations, and the direction for further research.

2. Theoretical basis

Financial statement fraud is intentionally or recklessly falsifying financial statements by materially misrepresenting an organization's financial condition. Errors in financial statements can arise from fraud or mistake. It is essential to distinguish between fraud and error by considering whether the conduct that led to the misstatement in the financial statements was intentional or unintentional. Fraud is an intentional act committed by one or more individuals on the Board of Directors, employees, or third parties to gain unlawful or ill-gotten benefits.

In finance and accounting, fraud and errors are considered serious misconducts that can distort information and misrepresent reality. The difference between these two behaviors lies in consciousness and severity. Errors are typically unintentional, while fraud is a deliberate and intentional act of wrongdoing for profit. Detecting fraud is challenging since it is often subtly hidden. Financial statements require prompt and accurate recognition of information. Managers may manipulate financial statements to meet specific goals and use profit management measures like actual profit management. However, unsatisfactory measures may lead to fraudulent tactics like forging documents and asset declarations, resulting in financial statement fraud. It is crucial to address these issues, and businesses must take necessary measures to prevent and detect fraud and errors to maintain the integrity of financial statements.

Theories explaining fraudulent behavior

Fraudulent behavior can be explained by the proxy theory of (Jensen & Meckling, 1976) and the related objects theory (Freeman, 1984), argues that because of the separation of ownership and operating rights, especially for public companies, managers (trustees) may engage in self-interested practices, including fraud on financial statements, instead of serving the interests of shareholders (principals). Meanwhile, the theory of related objects, suggests that contributing to the existence and development of the company are other objects such as creditors, employees, suppliers, customers, and the State ... Fraudulent activities can be performed for financial gain in associations with affiliated parties.

Fraudulent behavior research theory

Fraudulent behavior is often studied based on the fraud triangle theory proposed by (Cressey, 1953) and the fraud scale theory initiated by (Romney, Albrecht, & Cherrington, 1980) explains how fraud often occurs in the presence of three factors (the fraud triangle): pressure, opportunity, and attitude/personality. Meanwhile, (Romney et al., 1980) formulated the fraud scale based on the Red Flags of the occurrence of fraud, which included three factors: circumstances that create pressure, opportunity, and personal honesty. These theories are the basis for many authors to study fraud.

3. Research methods and data

This study introduced a framework that combined bibliographic analysis techniques such as word frequency, synonym analysis, and co-authorship analysis with implicit methodology. The drive topic modeling method is used to explore topics from headlines, keywords, and abstracts from financial statement fraud studies over the past 27 years.

Data sources and search methods

Bibliometric analysis will be performed using the Scopus database from 1993 to 2024. "Financial Statement Fraud" or "Fraudulent Financial Statement" is the search term in the title and keyword of the article used to search for related articles published in any language related to the study of financial statement fraud. (Annesley, 2010), suggests that the article's title is the first element the reader will observe. However, to expand the scope of the search, the author selects the search scope by article title, summary, and related keywords in the document search field on the Scopus homepage. It represents a topic relevant to the study's field and objectives. The author customized a search of studies published between 1993 and March 24, 2024, to identify studies on financial statement fraud.

Information mining

Figure 1: The search diagram

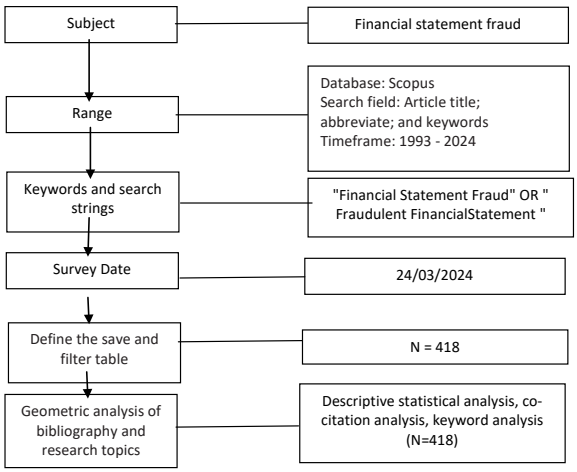


Figure 1 shows the author's search scheme. In this study, all materials were bibliographically analyzed. The author used (i) *Microsoft Excel* 2019 to calculate the frequency and percentage of published documents and to create relevant charts and graphs; (ii) *VOSviewer* (version 1.6.19) and Python to create and visualize networks of directories and phrases. The author has excluded types of documents to be edited and retracted to avoid duplicates or miscounting documents.

Research data

A total of 418 documents were found in the Scopus database based on their document type and source. These documents could be articles, review articles, books, or book chapters. Table 1 summarizes the different categories based on each document type. Out of all the papers published, 70.6% (295) were original writing, followed by conference papers accounting for 16% (67), book chapters (16, 3.8%), and the remaining commercial papers (2, 0.5%). Most retrieved documents were published in English (416, 99.5%), while the remaining two were in Spanish and Portuguese.

Table 1: Aggregate data retrieved (1993 - 24/03/2024)

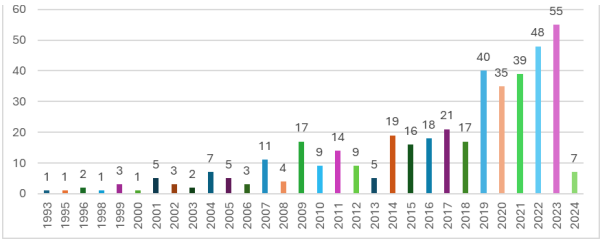
Document Type	Total Research	Percentages (%)
Articles	295	70.6%
Conferences	67	16.0%
Book chapters	38	9.1%
Book	16	3.8%
Trade Journal	2	0.5%
Total	**418**	**100.0%**

4. Results and discussion

4.1. Descriptive statistics

Statistics of studies based on the year of publication help researchers observe the pattern of development and popularity of subjects over time (Ahmi & Mohd Nasir, 2019). The number of studies has increased recently; in the period 1993-2026, the average number of annual publications was 2.83 articles; in the period from 2017-2013, it averaged 9.86 articles; from 2014-2018, it averaged 18.2 articles; and from 2019 to 2023, it averaged 43.4 articles (Fig. 2).

Figure 2: Chart of the number of studies by year

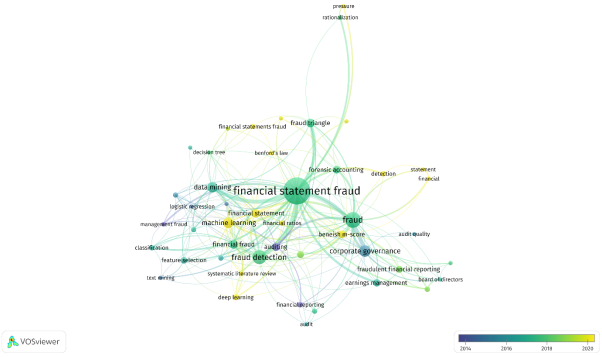


4.2. Research results

Mapping using *the VOSviewer* technique of author keywords with a minimum number of

occurrences of 10 shows that keywords such as fraud, fraud forecasting, corporate governance, machine learning, data mining, fraud triangle, financial fraud, financial reporting,… Auditing, accounting surveys, beneath m-score models, profit management, financial ratios, and attribute selection are the keywords the author encounters the most after excluding keywords primarily related to search queries (Figure 2). Circles in the same color cluster suggest a similar theme between studies. Each circle represents a subfield of the financial statement fraud research field.

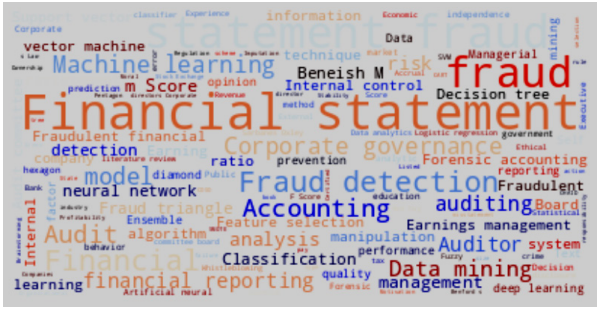
Figure 3: Visualizing the network of keywords



Topics related to financial statement fraud: content analysis of different topics based on keyword frequency. The most repeated keywords in financial statement fraud from 1993 to 2024 include financial reporting, fraud, fraud forecasting, data mining, deep learning testing, clustering testing, auditing, Benford's law, exception detection, and machine learning. These keywords are shown in the word cloud chart in Figure 4. Based on Figure 3 and Figure 4, it is possible to generalize some studies according to the following topics:

Firstly, information tools are used to detect fraud in financial statements. Financial fraud detection often combines techniques like data analysis and machine learning algorithms. The first group of keywords includes feature selection, critical component analysis, feature extraction, and size reduction. In general, issues related to the detection of financial statement fraud include the study of generalized financial data, which requires the identification of financial variables and ratios. Then, by applying data mining techniques, organizations are classified into two categories: fraudulent and non-cheating. The second group of keywords includes text mining, neural networks, classification, single-class classification, artificial intelligence, time series analysis, graph mining, visual analysis, random forests, regression, unsupervised learning, decision trees, means k, fuzzy logic, supervised learning, etc. time series prediction and correlation.

Figure 4: Visualizing Word Cloud based on keyword data studies



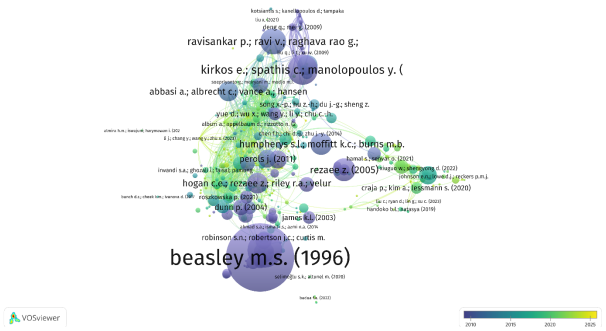
Second, causes and measures to prevent financial statement fraud, including keywords such as fraudulent financial statements, income management, corporate governance, fraud prevention, confinement triangle, and model diamonds; the bankruptcy of companies such as Enron and WorldCom has increased attention to the quality of financial statements, and researchers Research begins investigating causal factors related to the increased likelihood of fraud and the consequences of financial fraud (Rezaee, 2005). Other studies have attempted to investigate different representative variables to measure cheating factors in the lotus cheating triangle (Skousen, Smith, & Wright, 2009)

Third, audit roles and responsibilities for financial statement fraud, keywords that lead to context formation include keywords about audit risk plans, audit differences, audit analysis, audit procedures, audit software, audit planning, etc. audit risks, auditing standards, auditors' experience, audit responsibilities, audit adjustment, audit efforts, external audits, independence of auditors, audit sampling, audit evidence, and effectiveness of audit committees. In general, auditors' fraud-related liability studies can be divided into two groups: internal and external audits. Internal auditors can better detect financial fraud due to their proximity and understanding (ACFE, 2022).

The topics of the top 5 cited articles on financial statement fraud are presented in Table 2 and Figure 5. The highest-citation-receiving paper, "Financial Statement Fraud," was published in the journal Accounting Review in 1996, which received 2115

citations and was the most influential citation-based article per year (78.33 citations/year).

Figure 5: Visualization of the network of citations



Studies by (Beasley, 1996), (Beasley, Carcello, Hermanson, & Lapides, 2000) are the most cited and second-most prolific authors. This was followed by studies on financial statement fraud exploration and forecasting by Kirkos authors (Kirkos, Spathis, Nanopoulos, & Manolopoulos, 2007), (Ravisankar, Ravi, Rao, & Bose, 2011). The research (Rezaee, 2005) on the causes and consequences of financial statement fraud by authors is also interesting and of great interest to scientists.

Table 2: Summary of 5 studies with the most citations

	Authors	Year	Titles	Number of citations
1	Beasley M.S.	1996	An empirical Analysis of the relation between the Board of Director Composition and Financial Statement Fraud	2115
2	Beasley M.S.; Carcello J.V.; Hermanson D.R.; Lapides P.D.	2000	Fraudulent financial reporting: Consideration of industry traits and corporate governance mechanisms	557
3	Kirkos E.; Spathis C.; Manolopoulos Y.	2007	Data Mining techniques for the detection of Financial Statement Fraud	431
4	Ravisankar P.; Ravi V.; Raghava Rao G.; Bose I.	2011	Detection of financial statement fraud and feature selection using data mining techniques	314
5	Rezaee Z.	2005	Causes, consequences, and deterrence of financial statement fraud	250

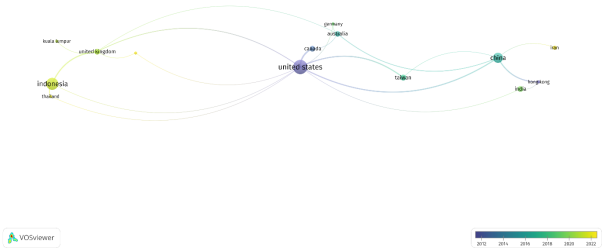
Researchers from 60 countries contributed to the publication of the materials retrieved between 1969 and 2024. The top 5 countries contributing to the studies are listed in Table 3. The United States came out on top with 96 (19.4%) studies, followed by Indonesia's 72 (14.5%) studies, and China's start publishing 51 (10.3%) studies.

Table 3: Summary of 5 countries with the highest number of research

	Country	Publications	Percentage
1	United States	96	19.4%
2	Indonesia	72	14.5%
3	China	51	10.3%
4	Malaysia	20	4.0%
5	Canada	18	3.6%

This map shows the international cooperation network between countries that have conducted at least ten studies. The thickness of the line connecting the two countries indicates the strength of their cooperation. Countries that have similar colors are clustered together. For instance, countries like the United States, Canada, and Australia are grouped and represented by green.

Figure 6: Visualization of the network of countries



Researchers need to know which journals publish much research on financial statement fraud. This will help them save time when looking for journals to read, especially if they are searching for an overview of the topic. Table 3 displays the journals with the highest number of publications on financial statement fraud, while Figure 5 shows the citation network between these journals.

Figure 7: Network visualization of journals

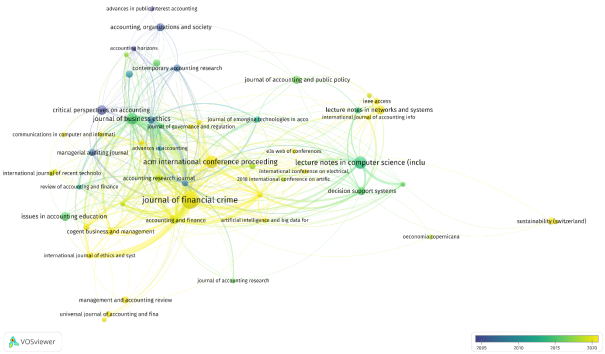


Table 4: Summary of 5 journals with the most research

	Journals/Proceedings	Amount	Citation
1	Journal of Financial Crime	23	137
2	Lecture notes in computer science	12	54
3	International conference proceeding series	12	26
4	Journal of Business Ethics	10	367
5	Critical perspectives on accounting	7	455

5. Conclusions and recommendations

The study aims to review research literature on detecting financial statement fraud from 1993 to 2024. The study was extracted from the Scopus database; we selected 418 studies for analysis after screening the studies. To analyze the literature on financial statement fraud, we first used a bibliography and found that articles published over nearly three decades tended upward. We also highlight the top 10 countries with the most published articles. The results showed that the United States, Indonesia, and China were the leading countries regarding financial statement fraud disclosures. In addition, the U.S. and Chinese co-authors collaborate more with other countries. We then looked at the journals and identified the top ones with more than ten articles over the past three decades. Our results also found that journals in the Journal of Financial Crime, Lecture Notes in Computer Science, and International Conference Proceeding Series increasingly tend to publish fraudulent financial statement content. We then analyzed the keywords and showed that keywords such as fraud, fraud forecasting, corporate governance, machine learning, and data mining recently caught the researchers' attention. We display the keywords of each context and identify four labels on fraud detection techniques, fraud prevention and prevention, computer, and online transaction fraud, and the auditor's accountability related to fraud based on analysis.

With the support of the *VOSviewer* app, this article has investigated an exciting topic in-depth and quantified it. This article can be considered a demonstration of studying a new field briefly and quickly. In this case, financial statement fraud was used to show that VOSviwer is a visual reflection of the results of co-authoring, co-appearance, and citation analysis. Compared to just looking at existing literature, this method visually shows the development of a topic, essential authors, and critiques and can also predict future trends. These findings provide a basic foundational knowledge of organizational culture for readers interested in financial statement fraud and a visual and quantitative research dimension for like-minded scholars interested in filling the gap between financial statement fraud and bibliographic analysis.

However, there are a few limitations to this bibliographic geometric study. First, the data presented is limited to the *Scopus* database, i.e., a sample section published globally on this topic, and scientific research on financial statement fraud is expected to be significantly larger. Second, the data in this study are from 1993 to March 2024, and new studies are published almost every day. Third, the author could have excluded some articles on financial statement fraud if the authors had not included descriptions that included the author's research in the article title. Fourth, the number of citations applied in a study's impact assessment may not directly reflect the quality of each study.

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THE IMPACT OF PHYSICAL STORES ON CLOTHING PRODUCTS PURCHASING INTENTION OF YOUNG CUSTOMERS IN HO CHI MINH CITY IN THE DIGITAL ERA

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Abstract: ***Through surveying 142 young individuals aged 19 to 25 in Ho Chi Minh City from February to April 2023, the article identifies key factors influencing the impact of physical stores on young customers' purchasing intention in the digital era in Ho Chi Minh City as follows: (1) Product trialability, (2) Customer satisfaction via physical touch, (3) Product evaluation, (4) Ease of exchange or return, (5) Emotional experience, (6) Perceived size.***

• Keywords: *physicial store, clothing products, digital era, young custumer.*

JEL codes: D11, D12

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Introduction

Young customers, for their significance in the clothing products market and retail sector, are specifically focused as the main audience of this research. Although there is extensive research on impact of physical stores on customer experience, most of them are outside the scope of Vietnam and do not pay enough attention to the audience of young customers. The resreach aims to examine empirically how specific factors of physical stores can impact young customers when buying clothing products and generate valuable managerial implications helpful for clothing products brands when designing customer-centric retail experience.

Review of literature and research methology

Review of literature

Theory of Reasoned Action (TRA) proposed by Ajzen and Fishbein (1980) demonstrates how behavior intentions result in actual behaviors, or stated differently, intentions will essentially influence customers' behaviors. Among identified factors, "attitude" (measured by "belief strength" and "belief evaluation") and "subjective norms" (measured by "normative beliefs" and "motivation to comply") have direct impact on customers' behaviors.

Theory of Planned Behavior (1991) was developed by Ajzen (1991) from Theory of Reasoned Action, by adding the factor of "perceived behavioral control" into the original TRA model. To prove the necessity of such addition, Ajzen conducted 16 different studies which all confirm the impact of perceived behavioral control on actual behavior. Fundamentally, Theory of Planned Behavior is an extension of Theory of Reasoned Action, with the addition of "perceived behavioral control". The purpose of is "perceived behavioral control" to reflect the level of ease or difficulty experienced by users when carrying out the actual behaviors. Such a level of ease or difficulty depends on availability of resources and opportunities to carry out actual behaviors.

Philip Kotler (2007) defined purchasing intention as the result of environmental causal factors affecting buyers' cognition, characteristics, and decision-making process, resulting in certain purchasing decisions. Shah et al. (2012) also proposed the definition of purchasing intention being the result of customers' process of studying different reasons why to buy a particular brand's product.

Motivated to determine how consumers decide the combination of "where" and "what" to buy, Zhang, Chang, and Neslin (2021) in their research introduced the notion of "product inspection depth". The concept classifies products by two categories of "deep" and "shallow", with difference in necessary amount of inspection needed to make a purchase. "Deep" products necessitate more deep inspection via physical touch and interaction (e.g., clothing) while "shallow" products require less inspection, in many cases, certain written descriptions or pictures are sufficient. The "product inspection concept" was also suggested with a measure continuum of four levels: (1) only pictures and written descriptions are required, (2) visual inspection is required, (3) physical touch of product is required, and (4) physical interaction with product (e.g., try-on, testing) is required.

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Sachdeva and Goel (2015) stressed the importance of physical stores as a place where the essential physical inspection for sensory products such as the fashion categories can be carried out before customers can make purchase. Their study claimed that effective modern retail formats require the balance between utilitarian, cognitive offering of attributes such as stocks, price, value, customer service, confidentiality, and emotional, hedonic, and intangible attributes such as recreations, entertainment. While utilitarian needs carry shoppers to the retail formats to satisfy the needs for basic, physiological needs, it is the hedonic needs retailers create at stores that stimulate customers' desires to stay at store longer and shop more out of the emotional needs. From this, the study proceeded to advise retailers on the crucial role of building customer-centric store environment to draw targeted customers into stores and trigger desired behavior to ensure customers' willingness to buy.

Amidst the growth of digital retail platforms, Peck and Childers' study (2003) studied and evaluated the role of touch as a source of "sensory" or haptic information. Online shopping provided inferior amount of product information and entertainment as compared to physical stores, and Peterson (1994) claimed that online store's information-presentation mechanisms affected customer's decision- making, Peck and Childers proposed several insights on the relationship between product touch, or haptic information, and consumers' behavior across various domains, such as brand judgements, choice preferences, leisure satisfaction, information search, product attributes perception, and acquisition and appreciation of treasured possessions. Actual examples drawn from the study were cases where customers' confidence was essentially affected by whether they could touch products and experience sensory feedback (e.g., rub a soft, leather clothing product), or where customers abandoned online shopping for the frustration due to lack of ways to acquire "sensory", or haptic information.

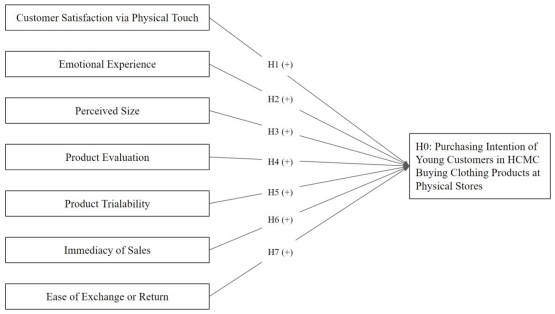
Citrin, Stemb, Spangenbergb, and Clark (2003) developed a model studying how factors of "need for tactile input", "Internet use", on "gender" impact "Internet purchase". The background of this research is the significant literature claiming there is an essential need for sensory experience before a decision on product purchasing can be made. Using a survey of 272 respondents (undergraduate students), the research proved that high tactility needs negatively impacted product purchases during Internet shopping. Need for tactile input moderated relationship between Internet usage for product information and its usage for actual purchasing. Women was showed to have a higher need for tactile input compared to men to evaluate products. Moreover, the research pointed out that people with high tactility need will be less likely to shop on the Internet. Products with a tendency to require high tactile input are also less likely to be purchased on the Internet.

In 2013, Kacen, Hess, and Chiang developed a multi-attribute using a web-based and paper-based survey of 224 shoppers (student and non-student adults in Midwestern United States), the research proved that traditional stores were much more preferred for purchasing all of the 6 product categories studied, with traditional stores being superior in attributes of "shipping and handling charges", "exchange/refund policy for returns", "providing an interesting social or family experience", "helpfulness of salespeople", "post-purchase service", and "uncertainty about getting the right item". "Brand-selection/variety" and "ease of browsing" are two attributes online stores dominate over traditional ones. While preference for brick-and-mortar stores prevails over six product categories studied in the research, significant different consumer's acceptance indices were recorded - with books and toothpaste online more likely to be purchased online, and shoes or food least likely.

Jarvenpaa et al. (2000) proposed the above in their research on how "perceived size" and "perceived reputation" impact "consumer trust" as an intermediary variable affecting consumer's "attitude" and their "risk perception", which directly influence the "willingness to buy" from online stores. Via an experiential study from a respondent group of 184 undergraduate and postgraduate students in Australia, Jarvenpaa et al. empirically proved that trust is a crucial antecedent of consumer attitudes when buying on Internet store and of intended shopping behavior generally; and, perceived size and perceived reputation, though in different ways, will substantially influence trust. As deduced from the model of Jarvenpaa et al, the author includes the variable of "Perceived Size" in this thesis. Indeed, the factor of perceived size is highly relevant and feasible to upgrade in context of physical stores; while in Internet store, perceived size can only be represented by pictures and information, or impressive proclaims (e.g., "welcome to the largest bookstore in city").

Proposed research model

Figure 1: Proposed research model and hypotheses



Source: Self-deprived by authors, 2023

Based on relevant concepts discussed above, the author suggests this model to examine how a physical store, via factors within it, can influence purchasing intention of clothing products. Those factors are: (1) Customer satisfaction via physical touch, (2) emotional experience, (3) perceived size, (4) product evaluation, (5) product trialability, (6) immediacy of sales, (7) ease of exchange or return.

Hypothesis

H1. Customer satisfaction via physical touch has a positive impact on customers' purchasing intention when buying clothing products at physical stores.

H2. Emotional experience has a positive impact on customers' purchasing intention when buying clothing products at physical stores.

H3. Perceived size has a positive impact on customers' purchasing intention when buying clothing products at physical stores

H4. Product evaluation has a positive impact on customers' purchasing intention when buying clothing products at physical stores.

H5. Product trialability has a positive impact on customers' purchasing intention when buying clothing products at physical stores.

H6. Immediacy of sales has a positive impact on customers' purchasing intention when buying clothing products at physical stores.

H7. Ease of exchange or return has a positive impact on customers' purchasing intention when buying clothing products at physical stores.

Research methodology

Data collection took place over a span of four weeks about young people between 15 and 29 ages, from February to April, 2023 in Ho Chi Minh city, utilizing both online and offline methods. In total, out of the 142 responses received, 137 responses are utilized for subsequent statistical analysis.

Result and discussion

Cronbach's alpha coefficient test

Regarding Corrected Item - Total Correlation, the results of Cronbach's Alpha coefficient analysis show that all measuring items have a length greater than 0.30, and almost all of them have an index higher than 0.60. The most subordinate Corrected Item - Total Correlation index is 0.40 (Table 1)

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

Variables	Abbreviations	Cronbach's Alpha	N of Items
Customer satisfaction via physical touch	CS	0.600	3
Emotional experience	EE	0.807	3
Perceived size	PS	0.822	4
Product evaluation	PE	0.717	4
Product trialability	PT	0.619	4
Immediacy of sales	IS	0.717	3
Ease of exchange or return	ER	0.695	3
Purchasing Intention	PI	0.681	3

Source: SPSS result (2023)

The reliability test's result for the factor "Perceived Size" has the coefficient of 0.822, satisfying the requirement and is the highest amongst proposed factors.

The adjustment of eliminating the observed variable PT4 results in the following updated reliability testing result of the factor "Product Trialability". The new-adjusted Cronbach's Alpha coefficient is 0.619, up to required standard. All corrected item-total correlations of three observed variables are all higher than 0.3. Besides, no elimination of any variable will now increase Cronbach's Alpha of the scale. Therefore, the adjusted measurement scale of "Product Trialability" with three variables (PT1, PT2, and PT3) is retained".

Explanatory factor analysis (EFA)

As summarized in the above table 2, all the requirements for the evaluation on the measurement scales of independent variables are met. Firstly, the KMO coefficient for EFA analysis is 0.739, higher than the standard of 0.5, indicating the consistence of the factor analysis with the survey data.

Bartlett's test with the sig value equals 0.000 < 0.05, indicating the sample's adequacy with correlated observed variables. Besides, the cumulative of variance is 64.841%, indicating the ability of selected seven factors to explain 64.841% of the data variation, exceeding the standard of 50%. Therefore, the selected factors in the research model can be confirmed to be statistically meaningful. Finally, the Eigen value stops at 1.143 with the right components, which still meets the requirement of exceeding 1. Therefore, all the measurement items of the independent variables are verified to be statistically significant.

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

	Result	Threshold	Implication
KMO Measure	0.739	0.5<0.739<1	Appropriate
Sig.	0.000	0.000<0.05	Appropriate
Cumulative of Variancce	64.841	50%<64.841%<100%	Appropriate
Eigenvalues	1.143	1<1.143	Appropriate

Source: SPSS result (2023)

Pearson correlation coefficient test

The Pearson correlation analysis was carried out on new representative variables. As shown in the below result table, Sig. values of independent variable and dependent variables are close to 0, and the captured correlation values fluctuating around and exceeding 0.5 indicates the strong correlation between the independent and dependent variables. Consequently, the independent factors can be effectively used to explain the dependent factor. However, the problem of multicollinearity may arise due to the high correlation.

Table 3. Summarized table of research variables

No.	Independent variables	Representative variable	Observed variables
1	Customer Satisfactionvia Physical Touch	CS	CS1, CS2, CS3
2	Emotional Experience	EE	EE1, EE2, EE3
3	Perceived Size	PS	PS1, PS2, PS3, PS4
4	Product Evaluation	PE	PE1, PE2, PE3, PE4
5	Product Trialability	PT	PT1, PT2, PT3, PT4
6	Immediacy of Sales	IS	IS1, IS2, IS3
7	Ease of Exchange/Return	ER	ER1, ER2, ER3

Source: SPSS result (2023)

Multiple regression analysis

The adjusted R-square value is 63%, indicating the research model's ability to explain 63% of the impact of factors within a physical store on purchasing intention of young customers in Ho Chi Minh City when buying clothing products. The other 37% depend on factors undefined or not included in the research model.

Table 4. Coefficients table in regression analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.039	.255		-.154	.878		
	CS	.217	.053	.246	4.088	.000	.723	1.382
	EE	.082	.034	.138	2.457	.015	.833	1.201
	PS	.073	.040	.109	1.847	.047	.758	1.319
	PE	.131	.046	.169	2.867	.005	.755	1.325
	PT	.329	.055	.355	5.975	.000	.744	1.343
	IS	.049	.031	.086	1.572	.118	.885	1.130
	ER	.126	.038	.186	3.292	.001	.824	1.213

Source: SPSS result (2023)

According to the ANOVA analysis, if the Sig. value equal 0.000 < 0.05 at F = 35.304 then H0 is rejected. Therefore, it can be deduced that there is at least one among the proposed variables influencing the purchasing intention of young customers in Ho Chi Minh City when buying clothing products.

As shown in the below table, all independent variables have the Sig. values below 0.05, except for IS (Immediacy of Sales). Therefore, it is apparent that, apart from IS, all other variables are statistically significant at 5% level. Besides, other testing indexes including Tolerance and VIF also meet the requirements of Tolerance > 0.0001 and VIF < 2. Consequently, the significant impact of the independent variables on dependent factors in the research model is confirmed. With IS being eliminated from the model for contributing insignificantly with Sig. value of 0.118, all other factors are proven to have a positive impact on the dependent variable with the coefficient of 0.217, 0.082, 0.073, 0.131, 0.329, 0.126 equivalent of CS, EE, PS, PE, PT, ER.

$PI = -0.039 + 0.355PT + 0.246CS + 0.169PE + 0.186ER + 0.138EE + 0.109PS + \varepsilon$

Conclusion and implications

Conclusion of the research

After completing 1 month of data collection, 142 responses were received, with 137valid responses, and data analysis was conducted. The study used SPSS and SmartPLS software to analyze data and test scales and hypotheses. The research has successfully accomplished its objective of physical stores on clothing products purchasing intention of young customers in Ho Chi Minh city in the digital era: (1) Product trialability, (2) Customer satisfaction via physical touch, (3) Product evaluation, (4) Ease of exchange or return, (5) Emotional experience, (6) Perceived size.

Regarding how physical stores impact the habits of clothing products shopping, especially in the digital era, there are some noteworthy points to be concluded: (1) Economic prosperity resulted inthis productg standards for Vietnamese people, including a higher consumption for clothing products; (2) With a thriving economy and large young-age population, the market of clothing products in Vietnam is highly potential; (3) For its demographics and high living standards, Ho Chi Minh city plays a crucial role in clothing market; (4) Despite the prevailing use of e-commerce platforms for various categories, physical stores are indispensable for clothing products categories as this products require deep inspection before purchasing; (5) Understanding how a physical store and factors within it impact clothing products purchasing intention is necessary for clothing brands and retailers to build strategic business practices to win customers' purchases.

Recommendations

Recommendations for the use of physical stores in clothing products category in the digital era

In the digital era, physical stores remain essentially as an interactive point in the customer journey of clothing products, which means brands should strive to win customer's purchasing intention at stores. Yet, in the digital era with the prevailing use of digital platforms such as websites and mobile apps also calls for brands to strategically build and fine-tune the omnichannel, online-and-offline-integrated retail journey. On such a basis and equally considering the importance of all factors as well as certain industry trends and insights, the author proposes the following recommendations from the management perspectives.

Recommendation on enhancing customer experience at physical stores

As for "Customer Satisfaction via Physical Touch" - an empirically proven factor in the literature and this thesis and especially relevant in the case of deep products such as clothing, brands and retailers of clothing products should pay attention to customers' physical touch with products to maximize customer experience. Secondly, brands and retailers should ensure physical stores are well-designed with sufficient space and display layout so that customers can reach for and physically touch products at ease for higher satisfaction. Moreover,

to facilitate customers touching and interacting with products, a good retail store layout is required as a foundational element; besides a well-designed store layout that is well-considered of customer flow.

As for "Perceived Size", clothing products brands and retailers should strive to increase their perceived store size as much as possible to win more customers' trust in terms of products and services quality. This recommendation is based on not only being empirically proven in this thesis and certain papers in the literature; but also on a psychological pattern that customers might pay attention to stores they come across as having many customers shopping in, because many people choosing a store may indicate it has good products and services.

As for "Emotional Experience", it is note-worthy that the retail experience should be fun, joyful besides delivering utilitarian values to customers because emotional needs may result in additional buying not initially planned by customers. Designing a standardized physical retail area in terms of smart, convenient display and stocking design, hygiene, neat, and tasteful shopping settings, and professional, well-trained staff - all of which meet the fundamental expectations of customers. Clothing products brands and retailers should consider store locations that can make the shopping process more emotionally appealing. The retail experience design should also be in accordance with brand guidelines of a clothing product brand/retailer, as this helps produce a consistent retail experience that in the long run can attract and retain targeted and suitable customers.

As for "Product Evaluation", an empirically proven factors in many research and becoming more relevant in digital era - with the role of physical stores as an mostly exclusive option where customers can physically see and touch products before deciding to purchase. Therefore, brands and retailers should make sure displayed products at stores are uniformly up to the highest standards to win customers' trust. Moreover, the communication of a simple message at store about product quality requires in-depth understanding on customers' insights and retail operation to ensure the message is noticeable and engaging, especially in the digital era where attention is so precious.

As for "Product Trialability", a widely empirically proven factor and is a unique selling point of physical stores for deep product categories such as clothing products; to enhance this fundamental factor, clothing products brands and retailers should ensure that the product trial process is easy and convenient with clean-cut, convenient fitting rooms in stores. A case in point to emphasize the creative approach to this action is a US-based men's apparel retailer to use digital technologies that allow consumers to scan product tags with their smartphones for real-time product details inspection and selection of size and stocks. In 30 seconds, the clothes will be sent automatically to fitting rooms which also feature self- checkout pay stations.

As for "Ease of Exchange or Return", though relatively new and yet an empirically proven factor in the literature, this is a significant factor within a physical to impact clothing products purchasing intention. Clothing brands and managers with operation of physical stores should enhance the current exchange/return scheme for even higher customers' friendliness - via ways of extending the exchange/return period, monitor and optimize time and expense to process each exchange/return case, and ensure maximum customer satisfaction when handling the cases. Standardized, transparent, and customer-centric exchange/return policies and engaged staffs are two essential success components.

Recommendation on leveraging physical stores in combination with other digital platforms

Firstly, regarding the prevalence of online searching for product information, clothing brands and retailers should invest in professional, customer-friendly, transparent, and engaging websites and apps. In the digital era, online channels serve the role of information searching while physical stores serve the role of products experiencing in the customer journey.

Secondly, it is worthwhile to notice that physical stores are still places where customers experience products and narrow down to the chosen option to purchase (from many options they have in mind when browsing online).

Thirdly, managers should look out for opportunities deriving from the integration of online and offline platforms. Innovations such as trying out products and paying at showrooms and product-trial hubs, then receiving products shipped to home from warehouses are economically viable for brands of online stores to leverage advantages of physical stores. Click-and-collect, an option allowing customers to "pre-order" products but still can inspect them at stores before purchasing, is also a good option that significantly improves purchasing intention.

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WHAT CAN MAKE CHANGES TO VIETNAMESE STATE-OWNED COMMERCIAL BANKS' PROFITABILITY?

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Abstract: ***This article explores the profitability of Vietnam's state-owned commercial banks and their influencing factors, and suggests appropriate measures to improve the profitability of these banks. The study focuses on four Vietnamese state-owned commercial banks, including: Agribank, BIDV, Vietcombank, Vietinbank, using panel data for the period from 2010-2021 and multivariate regression method Pooled OLS, REM and FEM to determine the dimension and the level of impact of factors on the profitability of above four banks. From the model results, the variables found to have a positive effect on the profitability of Vietnam State-owned Joint Stock Commercial Banks include enterprise size (SIZE), operating costs (OE), inflation (INF); variables that have a negative effect on bank profitability include credit quality (NPLTA), loan balance ratio (LTA), economic growth rate (GDP); while equity ratio (ETA) and liquidity (LQ) variables have no or no obvious impact on the profitability of SOCBs. The results give banks a basis to make appropriate policies and decisions and achieve expected profits. At the same time, it helps state agencies to promptly to adjust and make the right decisions in the management of the operation of SOCBs in particular as well as banks in general to achieve efficiency and improve performance.***

• Keywords: *state-owned commercial banks, factors influencing profitability, Vietnam banks.*

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1. Introduction

The primary goal of the Government and administrators is to ensure the efficient operation of SOCBs, as their value promotes the development of the macro-economy and increases sustainability. Profit is considered an important and highly reliable indicator to evaluate a bank's performance. Bank profits can be affected by both micro and macro factors in any period, especially when countries are increasingly expanding their international economic integration and strongly applying scientific achievements and technology. Financial institutions and foreign commercial banks, with their rich experience and strong financial resources, increase their competitiveness with domestic banks, requiring them to undergo many changes and outstanding development in operational scale. Therefore, managing and improving the quality and profit growth of SOCBs plays an extremely necessary role, helping policy makers and management agencies to have more scientific basis to keep up with the challenges, allocate resources and structure the most reasonable and effective management policies.

Many previous empirical studies have shown the factors affecting the profitability of commercial banks, however, no article has ever shown the relationship of these factors to the profitability of Vietnamese state-owned commercial banks. The majority have not yet delved into SOCBs. Also, the articles were studied in different time periods and in different regions with different socio-economic development conditions, so it is difficult to apply the research to Vietnam accurately. Therefore, conducting research on the factors affecting the profitability of Vietnam's SOCBs is very necessary to help banks make appropriate policies and decisions and achieve higher profits. At the same time, it helps state agencies to promptly adjust and make right decisions in the management of SOCBs' operation.

2. Literature review

This article will use all three indicators ROA, ROE, NIM as a proxy for the profitability of Vietnam's SOCBs and find out the factors that affect them.

A number of case studies in the world have been carried out, aiming to show the factors that affect the profitability of commercial banks. During the period 2000-2011, there was very little research on this issue (Bashir (2000), Staikouras and Wood (2004), Vong and Chan (2009), Sufian and Habibullah (2009). From 2012 up to now, the trend of studying the interaction of other factors on commercial bank profits has become more and more focused. Below is a summary of the research findings that are most relevant to this study.

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Table 1. Summary of previous studies in the period 2012-2021

Authors	Results	Signs of impact on bank's profitability
Sufian & Kamarudin (2012)	- Credit risk, capitalization rate, liquidity and non-interest income, GDP growth rate - Operating costs show the opposite effect. - Inflation	+ - Insignificant impact
Acaravci & Calim (2013)	- Liquidity, equity to total assets ratio, loan to total assets ratio and real exchange rate - While GDP growth, the ratio of deposits to total assets	- +
Francis (2013)	- Credit risk, liquidity risk - In contrast, the equity ratio, inflation, economic growth rate	- +
Saeed (2014)	- Bank size, deposit to total assets ratio, loan to total assets ratio, liquidity, interest rate and capital to total assets ratio - Speed GDP growth rate and inflation rate	+ -
Jumono & Mala (2019)	- GDP growth rate, indirect costs, foreign exchange market - Money supply, liquidity, market structure - Liabilities, revenue models, asset management, and inflation	- - No impact
Hasan et al (2020)	- FED interest rate, bad debt ratio - Net interest margin (NIM), capital adequacy ratio (CAR), operating expense ratio, borrowing on deposits	- +
Farkasdi et al (2021)	- Asset size, capital adequacy, and non-interest income - Deposits have a significant	+ -
Trần Việt Dũng (2014)	- Ownership structure (including state capital and foreign capital), credit risk, inflation rate - liquidity risk and bank size - GDP	- No clear impact +

From an overview of the research situation, this article selects ROA, ROE and NIM as the representative of profits of Vietnamese SOCBs. At the same time, on the basis of inheriting the results of many previous studies, the paper will focus on two groups of factors: (1) micro factors, which are dependent on subjective decisions such as bank size, operating costs, credit quality, equity ratio, liquidity, interest rate, loan balance. (2) macro factors, such as inflation rate, GDP growth rate.

3. Methodology

3.1. Hypothesis

H1: Bank size has a positive effect on profitability of Vietnamese State-owned Commercial Banks.

H2: Operating costs have a negative relationship with profitability of Vietnamese State-owned commercial banks.

H3: Credit quality has a negative relationship with profitability of State-owned commercial banks in Vietnam.

H4: Equity ratio and profit ratio of State-owned commercial banks in Vietnam have a positive correlation.

H5: Liquidity has a positive relationship with profitability of Vietnam's SOCBs.

H6: The ratio of outstanding loans and profits of Vietnam State-owned Commercial Banks have a negative relationship.

H7: Inflation and profitability of Vietnam State-owned Commercial Joint Stock Bank are inversely related to each other.

H8: The economic growth rate and the profit of the State Bank of Vietnam have a positive impact on each other.

3.2. Empirical research model

After studying previous studies on the quantitative model of factors affecting profitability of commercial banks and joint stock commercial banks in the world by Staikouras and Wood (2004); Sufian and Kamarudin (2012); Munyam Bonera (2013), Farkasdi et al (2021), this paper proposes a research model of 3 dependent variables representing profit analyze the impact of micro and macro variables on profit. The empirical models are presented as follows:

Model 1: Dependent variable ROA:

$$ROA = \beta_0 + \beta_1 *SIZE + \beta_2 *OE + \beta_3 *NPLTA + \beta_4 *ETA + \beta_5 *LQ + \beta_6 *LTA + \beta_7 *INF + \beta_8 *GDP + \epsilon_i$$

Model 2: Dependent variable ROE:

$$ROE = \beta_0 + \beta_1 *SIZE + \beta_2 *OE + \beta_3 *NPLTA + \beta_4 *ETA + \beta_5 *LQ + \beta_6 *LTA + \beta_7 *INF + \beta_8 *GDP + \epsilon_i$$

Model 3: Dependent variable NIM

$$NIM = \beta_0 + \beta_1 *SIZE + \beta_2 *OE + \beta_3 *NPLTA + \beta_4 *ETA + \beta_5 *LQ + \beta_6 *LTA + \beta_7 *INF + \beta_8 *GDP + \epsilon_i$$

In which:

Independent variables ROA, ROE, NIM represent profitability of Vietnamese SOCBs

Dependent variables:

ETA: equity ratio

GDP: economic growth rate

INF: inflation rate

LQ: liquidity

LTA: loan balance ratio

NPLTA: credit quality

OE: operating expenses

SIZE: bank size

$\epsilon_{i:}$ model error

Table 1. Measurement of variables and expected signs

No.	Variable	Measurements	Expected impact
	Dependent variables		
1	ROA	After tax return / Total assets	
2	ROE	After tax return / Total owner's equity	
3	NIM	Interest income/ total average interest producing assets	
	Independent variables		
1	SIZE	Natural log of total assets	+
2	OE	Operating expense/total assets	-
3	NPLTA	Bad debt/total assets	-
4	ETA	Equity/ total assets	+
5	LQ	Cash and cash equivalents/ Total assets	+
6	LTA	Total outstanding loans/total assets	-
7	INF	Inflation rate	-
8	GDP	Gross Domestic Product	+

3.3. Data

Secondary data, which is obtained from the annual published and audited financial statements of SOCBs in Vietnam, including Vietcombank, Agribank, BIDV and Vietinbank, is used in this research. Macro-economic data such as economic growth rate, inflation are

collected by from the websites of Worldbank, the State Bank and the World Bank. Dependent and independent variables are collected with transparent and accurate data each year in the period 2010-2021.

3.4. Methodology

To come up with a suitable regression model, the following steps are done:

- First, the Pooled OLS regression (classical linear regression model) and the FEM model on Stata software are used, the results will help making a decision to choose which model is suitable in model (2) above. Next, the F test is used to test the hypothesis H0: choose Pooled OLS model, H1: choose FEM model. If Stata software analysis gives results that hypothesis H0 is rejected, then choose FEM; while if H0 is accepted, Pooled OLS is chosen.

- Second, the selection test with the Pooled OLS model and the REM model will be done, which is verified by the Lagrange multiplier method and the Breusch-Pagan test. If, after performing the above quantitative runs, the results of the Pooled OLS model are selected, the Pooled OLS method will be used for all dependent variable models, otherwise, other tests will be performed.

- Finally, Hausman test is used to select the most optimal model. If the results reject H0, FEM model is used. Conversely, if H0 is accepted, REM model is selected.

Besides selecting regression estimation model, two other regression analysis of panel data, such as FGLS (Feasible Generalized Least Squares), Driscoll- Kraay standard errors (SCC) are also performed to make comparison between models.

4. Model results

Table 4 below is a descriptive statistics table of the variables in the research model of factors affecting the profitability of Vietnam's SOCBs.

Table 2. Statistic description

Variables	No. of observations	Mean	Std Dev	Min	Max
ROA	48	0.0078476	0.0034241	0.0023403	0.0155082
ROE	48	0.130523	0.0472338	0.0443965	0.2351593
NIM	48	0.0290932	0.0059848	0.0201151	0.0502394
SIZE	48	20.53018	0.4903838	19.54397	21.28954
OE	48	0.0155548	0.005545	0.0094351	0.0428177
NPLTA	48	0.0144031	0.0094304	0.0039259	0.0489856
ETA	48	0.0596436	0.0139463	0.0406252	0.1002365
LQ	48	0.0099945	0.0032441	0.004987	0.0170173
LTA	48	0.6878762	0.0744754	0.5249087	0.8030424
INF	48	5.460833	4.761955	0.63	18.68
GDP	48	5.746667	1.470535	2.58	7.08

Through the quantitative results on Stata, a linear relationship between the dependent and independent variables in the research model is shown as in table 5 that follows:

Table 3. Results of the correlation matrix between variables

	ROA	ROE	NIM	SIZE	OE	NPLTA	ETA	LQ	LTA	INF	GDP
ROA	1.0000										
ROE	0.8636	1.0000									
NIM	0.1108	0.0893	1.0000								
SIZE	-0.1913	0.0353	-0.2908	1.0000							
OE	-0.2890	-0.3132	0.7679	-0.3053	1.0000						
NPLTA	0.2479	0.2299	-0.2813	-0.1134	-0.2551	1.0000					
ETA	0.5678	0.0973	0.0173	-0.4570	-0.1023	0.1533	1.0000				
LQ	-0.0239	-0.1327	0.2225	-0.2375	0.3617	0.0489	0.0761	1.0000			
LTA	-0.6385	-0.4641	0.2578	0.4921	0.3456	-0.3806	-0.5528	-0.1513	1.0000		
INF	0.1966	0.0938	0.6624	-0.6982	0.4422	-0.0284	0.2291	0.2076	-0.1221	1.0000	
GDP	-0.1621	-0.1082	-0.0007	-0.3460	0.1101	0.0317	-0.1197	0.0540	-0.2066	0.1400	1.0000

Regression model with dependent variable ROA:

Table 4. Model regression results with dependent variable ROA

	(1)	(2)	(3)	(4)
	FEM	REM	FGLS	SCC
	ROA	ROA	ROA	ROA
SIZE	0.0026	0.0031**	0.0026***	0.0031*
	(1.48)	(2.48)	(3.28)	(2.06)
OE	0.1940*	0.1242	0.0790	0.1242**
	(1.91)	(1.45)	(1.25)	(2.58)
NPLTA	-0.1524**	-0.1566***	-0.1477***	-0.1566***
	(-2.55)	(-2.8)	(-4.49)	(-3.92)
ETA	0.0305	0.0644**	0.0663***	0.0644
	(0.81)	(2.25)	(3.56)	(1.61)
LQ	0.1934	0.0051	-0.0075	0.0051
	(0.66)	(0.04)	(-0.10)	(0.04)
LTA	-0.0177	-0.0274***	-0.0264***	-0.0274***
	(-1.31)	(-3.88)	(-4.84)	(-6.99)
GDP	-0.0004*	-0.0004*	-0.0003***	-0.0004**
	(-1.79)	(-1.69)	(-3.21)	(-3.01)
INF	0.0003***	0.0003***	0.0004***	0.0003***
	(2.90)	(3.55)	(8.04)	(4.83)
_cons	-0.0373	-0.0393	-0.0299**	-0.0393
	(-1.12)	(-1.57)	(-2.02)	(-1.17)
N	48	48	48	48

** 10% significance level, ** 5% significance level and *** 1% significance level*

With the dependent variable ROA representing the profitability of Vietnam's SOCBs in the research model. The research results show that the variables ROA, OE, and INF have a positive effect on the profitability of Vietnam's SOCBs while the variables NPLTA, LTA, and GDP have a negative effect on the profitability of these banks. Meanwhile, with the dependent variable ROA, the study has not found the impact of ETA and LQ variables on bank profitability. Theoretically, ROA and ROE are different in debt. In the absence of debt, equity and total assets are equal resulting in ROE equal to ROA.

For Vietnamese state-owned commercial banks, their capital sources are large, most of which come from the state capital and their debt is not high, so the ROA and ROE ratios are not too different and can be measured. To clearly see the impact of equity on bank profitability, the article will mainly use the results from the regression model with the dependent variable ROE as a basis to evaluate the impact of the measurement variables on profitability of Vietnamese state-owned commercial banks. In the empirical study with ROE model, the results show that the variables SIZE, OE, INF have a positive impact on the profitability of Vietnamese SOCBs while NPLTA, ETA, LTA and GDP

have the opposite effect. Particularly, the variable LQ has no relationship with the profitability of banks.

The regression model of the dependent variable ROE:

Table 5. Model regression results with dependent variable ROE

	(1)	(2)	(3)	(4)
	FEM	REM	FGLS	SCC
	ROE	ROE	ROE	ROE
SIZE	0.0492*	0.0525***	0.0409***	0.0525*
	(1.69)	(2.61)	(2.90)	(2.15)
OE	3.1058*	1.9739	1.3550	1.9739**
	(1.85)	(1.41)	(1.16)	(2.78)
NPLTA	-2.2587**	-2.3053**	-2.5848***	-2.3053***
	(-2.28)	(-2.51)	(-4.49)	(-3.95)
ETA	-1.4230**	-0.4958**	-0.8929***	-0.4958*
	(-2.3)	(-2.01)	(-2.99)	(-1.97)
LQ	2.3885	-1.1786	-0.5074	-1.1786
	(0.49)	(-0.63)	(-0.40)	(-0.63)
LTA	-0.3764	-0.4948***	-0.4433***	-0.4948***
	(-1.69)	(-4.28)	(-4.97)	(-9.34)
GDP	-0.0064	-0.0062	-0.0054***	-0.0062**
	(-1.68)	(-1.60)	(-2.92)	(-2.98)
INF	0.0048***	00.0056***	0.0060***	0.0056***
	(2.97)	(3.59)	(7.21)	(4.37)
_cons	-0.5674	-0.5343	-0.3333	-0.5343
	(-1.03)	(-1.30)	(-1.24)	(-0.99)
N	48	48	48	48

** 10% significance level, ** 5% significance level and *** 1% significance level*

Regression model of dependent variable NIM:

Table 6. Model regression results with dependent variable NIM

	(1)	(2)	(3)	(4)
	FEM	REM	FGLS	SCC
	NIM	NIM	NIM	NIM
SIZE	0.0058**	0.0034**	0.0027**	0.0034**
	(2.44)	(2.11)	(2.30)	(2.56)
OE	0.8622***	0.8828***	0.9324***	0.8828***
	(6.3)	(7.86)	(9.20)	(19.31)
NPLTA	-0.2309***	-0.2539***	-0.2772***	-0.2539***
	(-2.87)	(-3.46)	(-4.02)	(-4.52)
ETA	0.0363	0.0277	0.0273	0.0277*
	(0.72)	(0.74)	(0.88)	(1.91)
LQ	0.6050	0.0994	0.0958	0.0994
	(1.53)	(0.66)	(0.83)	(0.67)
LTA	-0.0152	0.0080	0.0087	0.0080
	(-0.84)	(0.87)	(1.16)	(1.22)
GDP	-0.0002	-0.0002	-0.0003	-0.0002
	(-0.65)	(-0.53)	(-1.23)	(-1.52)
INF	0.0008***	0.0008***	0.0007***	0.0008***
	(6.52)	(6.48)	(8.08)	(9.34)
_cons	-0.1012**	-0.0626*	-0.0484**	-0.0626**
	(-2.25)	(-1.91)	(-2.05)	(-2.64)
N	48	48	48	48

** 10% significance level, ** 5% significance level and *** 1% significance level*

With the dependent variable NIM, the regression results show that SIZE, OE, ETA and INF have a positive effect on profitability. On the contrary, having the NPLTA variable alone results in a negative effect. As for the variables LQ, LTA and GDP, they have not shown a relationship with the profitability of Vietnamese SOCBs.

Table 7. Evidence of empirical research

Dependent variables	Independent variables and influencing direction		
	ROA	ROE	NIM
SIZE	positive (*)	Positive (*)	Positive (**)
OE	Positive (**)	Positive (**)	Positive (***)
NPLTA	Negative (***)	Negative (***)	Negative (***)
ETA	No effect	Negative (*)	Positive (*)
LQ	No effect	No effect	No effect
LTA	Negative (***)	Negative (***)	No effect
GDP	Negative (**)	Negative (**)	No effect
INF	Positive (***)	Positive (***)	Positive (***)

** 10% significance level, ** 5% significance level and *** 1% significance level*

5. Discussion

Hypothesis 1: The results from all three models show that the hypothesis H1 is accepted: profitability of SOCBs and bank size have a positive correlation with each other. This empirical study supports the findings of Bikker (1999), Kosimodo et al. (2006), Staikouras and Wood (2004) that when the size of the bank is enlarged, the banks can use the resources to perform lending services and bring in profits from loan interests.

Hypothesis H2: Operating expenses have a positive relationship with profitability of Vietnam State-Owned Commercial Banks.

Empirical research shows a positive impact of operating costs on profitability of Vietnamese SOCBs. This result supports the views of researchers Molyneux and Thornton (1992), Neceur (2007), Entrop et al (2015). This result means that the higher the bank's operating expenses, the greater its profit. With competitive human resources attracting many good employees, high cost of salary, bonus, allowance and brand promotion will boost the bank's profit. Increasing operating costs to expand and improve service quality and attract customers helps banks bring in large profits.

Hypothesis H3: Credit quality has a negative relationship with profitability of SOCBs of Vietnam.

All results are at 1% significance level, accepting the hypothesis H3 that the higher the credit quality, the lower the profitability of banks and vice versa. This hypothetical result has contributed to support the research views of Kalapo (2012), Gremi (2013). Credit operations have played a key role in bringing profits to banks in Vietnam for many years. The ratio of bad debt to total assets represents credit quality, the stronger the credit, the higher the credit risk creation, the more banks deduct money to prevent risks and reduce profits.

Hypothesis H4: The ratio of equity has a positive impact on profit of Vietnam State-owned Commercial Banks.

Empirical research result shows that equity ratio has a positive impact on profitability of Vietnamese SOCBs. This statement agrees with the research results of Bashir (2000), Sufian (2012), Shamki et al (2016). The higher the equity, the more opportunities banks have to invest in lending activities, so the higher the profit will be. In imperfect capital markets, especially in developing countries like Vietnam, this factor is even more pronounced, banks with higher capital ratios will often have a lower need for external financing to support their capital markets.

Hypothesis H5: Liquidity has a positive relationship with profitability of Vietnam's SOCBs.

According to the model result, liquidity has not had an impact on bank profitability. Hypothesis H5 is rejected, which supports the view of Bai (2010), Zhong (2016), Du (2015) and Chen (2016) finding that the ratio of money and cash equivalents to total assets have a negligible effect on the profitability of Vietnam's SOCBs. In fact, assets are much more liquid than the amount of cash and cash equivalents owned by Vietnam's SOCBs. Given the large scale of operations, these banks show a negligible impact of this ratio on their profitability, banks have many opportunities to use these highly liquid assets to make real money.

Hypothesis H6: The loan balance ratio and profit of the State-owned commercial bank of Vietnam have a negative relationship.

Hypothesis H6 has been rejected, which is consistent with the views of Olajide (2006), Staikouras and Wood (2003). The increase in the loan balance ratio increases the possibility of bad debts, forcing banks to use money for the cost of ensuring risk provisions, leading to lower profits. Especially with unsatisfactory loans, it will cause great damage, even loss, causing a deep decline in profits of Vietnam's SOCBs.

Hypothesis H7: Inflation has a negative impact on profitability of Vietnam SOCBs.

The experimental results reject the hypothesis H7, basing on which it is concluded that inflation has a positive impact on profitability of Vietnam SOCBs. In fact, in the period 2010-2013, the inflation rate in Vietnam was high, the interest rate and the profits of the Vietnamese SOCBs in this period were also quite high. After that, the inflation rate dropped, together with the going down of the bank profits. In the research period, Vietnam's inflation fluctuates relatively in line with expected inflation, so the Bank can forecast inflation to balance resources. In addition, inflation has a positive impact on profitability of commercial banks, which is also consistent with Fisher's theory and the reality of Vietnam's interest rates, increasing inflation will increase nominal interest rates, while credit is the main business of SOCBs in the period from 2010-2015.

Hypothesis H8: There is a positive relationship between the economic growth rate and the profit of the State Bank of Vietnam.

The results from the SCC regression model show a rejection against hypothesis H8, with the empirical conclusion is that the economic growth rate has a negative effect on the profitability of the Vietnamese SOCBs. This statement supports the research point of view of Ayadi and Boujelbene (2011); Francis (2013); Staikouras and Wood (2004) or Boitan (2015). It is assumed that reasonable GDP growth ensures the stability of the economy, and in that stable economic environment, the bank's business risk will be significantly reduced. Accordingly, the risk of the bank's profit trade-off can be reduced.

Conclusion: The study shows that bank size, operating expenses, credit quality, equity ratio, loan balance rate, inflation and GDP growth rate have impact on bank profitability. In which, the variables of bank size, operating expensess, equity ratio, and inflation have a positive relationship with the profitability of SOCBs while the variables of credit quality, loan balance ratio and GDP growth rate have a negative effect. Only the liquidity variable results in no impact on profit. The results show a correlation with the situation of profit in Vietnam in the period 2010-2021.

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FIRM-SPECIFIC DETERMINANTS OF MARKET VALUE OF FOOD AND BEVERAGE COMPANIES LISTED IN VIETNAMESE STOCK EXCHANGE

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Abstract: ***This article studies the impact of firm-specific determinants of food and beverage companies in Vietnamese stock exchange. We carried out an investigation into 31 listed food and beverage companies from 2018 to 2023. The data is analyzed by using STATA software. In this study, the regression analytical technique is used to study more deeply the effect of variables on market price of share. The regression results show that three variables, including dividend per share (DS), dividend yield (DY) and firm size (SIZE), have a significant negative influence on market price of share, while explanatory variable "return on equity" significantly positively impact indicator market price of share (MPS). Based on that empirical study, we offer some recommendation to improve market price of share of food and beverage companies. Our research is meaningful to directors of companies, researchers and policy makers.***

• Keywords: *market value, food and beverage companies, Vietnam.*

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1. Introduction

Market value is is an important element of the growth strategy of a corporation because it rather accurately reflects the level of achieving its most important objective of "maximizing the wealth of owners". Firstly, when this figure is improved, the company becomes more interesting to investors and creditors, so it helps it easily approach new capital source to finance its operations. Secondly, a high market value is a compelling evidence about the good firm performance which persuades owners about the capacity and integrity of direction board, especially in joint stock companies where the agency problem is always stressed between those two groups. With those effects, that value can enhance the efficiency and effectiveness of its operations.

Because this number plays an important role in businesses, it is necessary to carefully calculate it. Many ways have been suggested to evaluate this value, but it is the price of stock in the capital market that has been chosen by many researchers. The reason is that this figure partly expresses the evaluation of investors on the listed company, thereby its market value could be determined. According to the theory of efficient capital market (EMH), a market where financial assets are exchanged at the prices that fully reflect all available information is said to be efficient (Ross, Westerfied, & Jordan, 2010). A lot of people believe that the EMH makes stocks sold and bought at their suitable value. It means that traders neither purchase undervalued stocks nor sell stocks at inflated prices, which limits benefits gained based on take advantage of some special phenomena like market timing. With the above argument, supporters of this theory think that trading riskier financial assets is the main way to win a greater profit for investors. Although an efficient capital market is a crucial element of the economic growth, it is not easy to achieve it because the asymmetric issue is still existing. The lack of information leads to the fact that the stock prices of listed companies are significantly affected by numerous external and internal factors, making capital market less efficient. Many people mistrust the potentials of businesses, worry about the adverse selection problem, and in order to guarantee their money, some of them decide to give up this investment. Meanwhile, some others try to approach the true current status of companies to find out good stocks. For these investors, accounting information is really precious and plausible, because data given in financial statements is bound by a rigorous set of regulations imposed by the government. Indeed, the ability of financial statements to capture or summarize company situation is appreciated, as a result, they can

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offer information referred to as value relevance which affects share values. In this case, prices of equity are used as the proxy for the value of a company. Thus, value relevance studies measure the usefulness of accounting information from the perspective of equity investors (Beisland, 2009). Overall, the figure calculated based on accounting information is capable of impacting strongly the market price of stocks. In other words, firm-specific factors can create significant influence on market value of companies. However, until now, empirically studies on that issue are still not entirely consistent with each other. Therefore, carrying out empirical research on this issue has scientific and practical meaning in order have accurate research result.

In Vietnam, the matter of improve value of listed companies manufacturing food and beverage products needs more attention, because their ability to increase the wealth of owners is still evaluated as incommensurate with the potential of the industry. In fact, in Vietnam, there are numerous advantages for the development of this sector. First, Vietnam is an agricultural country, helping companies to easily access the input of cheap raw materials. Second, the total income per capital went up by 1.24 times from 2019 to 2023, leading to the increase in the demand for food and beverage. Third, free trade activities are promoted, creating opportunities to expand domestic and foreign market share. In spite of above benefits, the value of listed companies producing food and beverage experienced the unstableness between 2019 and 2023. Some reasons could be listed, for example, the outbreak of COVID-19 changed the consumption habits of human, making demand for some products reduce drastically. Additionally, weather related crop failure is also a trigger decrease the productivity of food and beverage manufacturing companies. When both demand and supply of products beam negative signs, the growing conditions of a sector is often predicted to be worse in the future. On the other hand, the worldwide economy is facing a range of stumbling blocks, decreasing import and export activities in the food and beverage sector. This situation indicates the necessity researching the determinants of market value of listed food and beverage manufacturers in Vietnam.

2. Literature review

Theoretically, the goal of creating market value could be implemented based on improving internal factor. To specific, when internal factors are properly oriented, firm performance could be improved, thereby the intrinsic strength of the company becomes better, the company will have more competitive ability with other rivals, and finally enhance the value of company. Therefore, the importance of this matter draws attention of many researchers, and there have been a lot of studies on determinants of market value of companies. However, there are some differences among research on this issue.

Malighetti*, et all.* (2011) analyzed the value drivers for companies in both airlines and airports by studying the determinants of the Tobin's Q. The research shows that ownership concentration has a positive impact, while size and state ownership are, on average, detrimental for the market valuation. Further, other industry-specific variables are statistically significant. Airport valuation is positively influenced by size, return on assets and the growth in terms of number of passengers. Airlines valuation is statistically higher for low-cost companies, while age and route number have a negative impact on market valuation.

Aveh (2017) examined the influence of firm-specific determinants of stock prices in an emerging market with particular reference to firms listed on the Ghana Stock Exchange. The study indicates that accounting information, specifically earning per share, return on equity, book value and market capitalization of the firms, is relevant in explaining stock prices after the adoption of International Financial Reporting Standards (IFRS) in Ghana.

Surjandari (2019) investigated the nonfinancial determinants of Firm Value of manufacturing firms listed in the Indonesia Stock Exchange year 2013 up to 2017 period. The study result shows that only one variable significantly affects Firm Value which is Institutional Ownership.

Endri (2020) tried to estimate the effect of dividend policy, profitability, firm size, leverage, and growth on firm value in financial sector listed on Indonesia Stock Exchange from 2013 to 2017. The results reveal that firm size, leverage, and growth did not have any significant effect on firm value in financial sector companies in the period 2013-2017. However, dividend policy and profitability proved to have significant positive effects on firm value in financial sector companies for the period 2013-2017. Simultaneous results also show that dividend policy, profitability, firm size, leverage and growth had some effects on firm value.

Renaldo (2021) made effort to determine the factors that affect firm value. The results showed that the Price Earnings Ratio (PER) and Earning per Share (EPS) had a significant effect on Stock Returns, while (Debt to Equity Ratio) DER, Size, and Growth had no significant effect on Stock Returns.

Salim (2020) aimed to examine and analyze the effect of profitability proxied by Return on Assets (ROA), capital structure proxied by Debt to Asset Ratio (DAR), and Purchasing Manager Index Manufacture (PMI) on the value of a company that is proxied by Price to Booked Value (PBV) and its impact on Stock Price. The results of this study indicate individually ROA and DAR significantly influence PBV while PMI has no effect. ROA, DAR and PMI have no significant effect on stock prices. Then through PBV as an intervening variable, ROA and DAR significantly influence stock prices, while PMI has no effect. Simultaneously ROA, DAR and PMI have a significant effect on stock prices through PBV as an intervening variable.

Anggraini (2021) carried out a research to identify internal factors that influence the value of the company with the leverage as a moderating variable. The results showed that return on equity (ROE) has a positive and significant effect on Tobin's Q. Debt to equity ratio (DER), can be expressed as a variable that moderates ROE, has a negative and significant impact on Tobin's Q. As practical implications, companies need to analyse and evaluate the DER ratio along with the high value of DER, because DER can affect ROE on Tobin's Q.

Nguyen (2021) investigated the importance of firm value and the factors that affect the firm value of trading companies listed on the Vietnamese stock exchange. Authors found that firm size is of the greatest importance to firm value. It refers that the value of a large company is of a higher rank than a small company. On the other hand, capital structure is proved to have a negative impact on firm value. Furthermore, the other independent variables (profitability, sales, and liquidity) are statistically insignificant in the regression model. This means that those mentioned factors do not affect firm value. More importantly, the research also suggests that both firm size and capital structure are crucial for firm value in the trading industry in Vietnam.

The research of Lisa (2021) showed that firm size variables have no effect on firm value, leverage has no effect on firm value, profitability has positive influence to firm value.

Abbas (2023) indicated that growth opportunity and International Standardization for Organizations do not influence firm value, and leverage influences company value.

Apparently, a range of studies have been carried with an aim of determine factors that can change the firm value in both short term and long term, but their results are rather different from each other, because of their difference in the studied sample and the choice of variables in models, which creates the research gap to dig deeper in order to reach more accurate and comprehensive conclusions on this problem.

3. Methodology

3.1. Data

The study is analytical in nature and involved testing of hypotheses quantitatively. The main content of this research approach is to find out a concise answer to the research objectives through the collection and analysis of information of firms. In order to evaluate the influence of independent variables on the market value of food and beverage processing companies, 31 Vietnam food and beverage companies listed on two Vietnamese stock exchanges, including HOSE and HNX, are selected. Because the characteristics of Vietnamese food and beverage companies are small scale, and the number of food and beverage companies listed on the stock market is rather low. Dataset has to meet some requirements including: 31 selected companies must have been in business before 2018; There is no disruption in their business operation. The study is mainly based on secondary financial data including income statements, balance sheets, and cash flow statements for period of 2018 to 2023. This offered an improved understanding of the links existing among the variables.

3.2. Research method

3.2.1. Empirical model of estimation

We modelled our study as follows:

$$MPS_{i,t} = \beta_0 + \beta_1 EPS_{i,t} + \beta_2 DS_{i,t} + \beta_3 DY_{i,t} + \beta_4 BVS_{i,t} + \beta_5 ROE_{i,t} + \beta_6 LEV_{i,t+} + \beta_7 SIZE_{i,t} + \alpha_i + \varepsilon_{i,t}$$

Where: MPS is Market price of share as at 31st December each year , EPS is Earnings per share, DS is Dividend per share, DY is Dividend yield, BVS is Book value of a share, ROE is return on equity, LEV is leverage, Size is firm size, and ε is error.

3.2.2. Research method

Two descriptive and inference techniques are used for this study to analyze mean values, standard deviation, variances, minimum and maximum values, range, deviation,… with the aim of finding the most accurate answer about the existence of a cause-and-effect relationship between profitability and capital structure ofmanufacturing companies in Vietnam between 2014 and 2021. Analyzing data is done based on using STATA software version 14. Before conducting a regression analysis, a panel unit root test (PURT) is done in order to ensure the stationarity of data. Then, to find a suitable estimate for the research, pooled OLS estimation is used, followed by the fixed effects model

(FEM) and random effect model (REM). The Fisher test and Chow test are used to determining the appropriate estimate between pooled OLS and FEM, and between OLS and REM. If FEM and REM are more suitable than OLS, Hausman test will be conducted to select the suitable model. Next, some tests are done to check the existence of multicollinearity, heteroskedasticity, and autocorrelation problems. When these problems exist, the regression results are not accurate. The solution to cope with the multicollinearity issue is to remove variables having VIF higher than 5 from the model. For heteroskedasticity and autocorrelation matters, Cluster regression is used to achieve the right research results. Cluster regression method is implemented based on the idea of making adjustments in the estimate to overcome the shortcomings of the data by distinguishing objects in each group.

3.3. Measurement

Variable	Measurement
MSP	Average market price of share each year
ROE	$\frac{\text{Net income}}{\text{Average Shareholder's Equity}}$
Dividend per share (DS)	The sum of declared dividends issued by a company for every ordinary share outstanding
Dividend yield (DY)	$\frac{\text{Annual Dividend per Share}}{\text{Market value of share}} \times 100$
Book value of a share (BVS)	$\frac{\text{Current assets - Inventory}}{\text{Current liabilities}}$
Earnings per share (EPS)	$\frac{\text{Sales}}{\text{Total assets}}$
Leverage (LEV)	$\frac{\text{Total liabilities}}{\text{Total assets}}$
Firm size (SIZE)	Log of Total Assets

4. Empirical results

4.1. Panel unit root test

In order to test the stationariness of the data, firstly, panel unit root test was carried out. When time series do not have unit roots or they are stationary, results generated from such series normally tend to be better and hence do not lead to inconsistent outcomes. There are a number of unit root panel tests (Harris & Tzavalis, 1999; Im, Pesaran & Shin, 2003 and Levin, Lin & Chu, 2002), and the Levin-Chin-Chu test was chosen to examine whether our series contain unit root. The null hypothesis is that the series contain a unit root and the alternative is that the series is stationary.

From our results as presented in Table 1, it is indicated that seven variables including MPS (Market price of share), EPS (Earnings per share), DS (Dividend per share), DY (Dividend yield), BVS (Book value of a share), ROE (Return on equity), LEV (Leverage), SIZE (Firm size) are stationary at level hence have no unit roots. Thus, we obtain all our series to be stationary as we reject the null hypotheses that the series are non-stationary.

4.2. Descriptive statistics

With the data from the financial statements of listed food and beverage companies in Vietnam from 2019 to 2023, some ratios are calculated.

Table 1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
MPS	186	45381.06	51172.45	1	254800
LEV	186	0.4286314	0.2599412	0.0336223	2.735071
ROE	186	0.145949	0.2382715	-0.7753969	2.485486
EPS	186	4020.278	6254.972	-2069.946	53407.77
DS	186	6.911486	15.26772	0	165
DY	186	0.0973864	0.1040817	-0.194402	0.7885108
BVS	186	23884.82	17251.47	8763.188	124355
SIZE	186	28.06872	1.531756	25.78614	31.60757

Result from STATA 14

The Table 1 shows that the mean value of MPS is 45381.06 with the rather high standard deviation of 51172.45. This number reflects the strongly fluctuation of market price share of food and beverage companies from 2018 to 2023 and the large gap of development level among them. In fact, the capital market of Vietnam experienced strongly fluctuated in studied period. Before 2020, it witnessed a steady increase in investment in stock market thank to the good national economic growth. Then, the COVID-19 pandemic outbroke, but it did not hinder capital flows poured into that market. By contrast, policies to respond to epidemics made a lot of other investments less effective, leading to the fact that money was concentrated into buying and selling stocks. As a result, the index of VN100 rose dramatically from 591.14 to 1500.2 in that 2-year period. However, since the year of 2022, the situation was inverted, ineffectiveness of producing companies led to difficulties in capital for both individuals and enterprises. Consequently, indexes of stock market went up and down very strongly. There were some points of time, the VN100 index plunged to 959.07. It is that continuous changes of market made the market price of shares of studied corporations drastically fluctuate. On the other hand, there was a large distance in development level among food and beverage firms. Large companies were often favored by investors, so they had higher market capitalization, leading to the difference in market price of share. That distinction in business scale was also the reason of difference in firm size and book value of a share. In addition, an economic growth that was not stable resulted in significant changes in firm performance, and then the return on equity.

The 6-year period also witnesses the change in capital structure of companies in that sector. The difficulties of national economy in the two last years boosted many of them to limit their use of debt in order to avoid the risk of bankruptcy. It also means that there had to be the modification in dividend policies that helped companies take advantage of equity from retained profit.

4.3. Correlation analysis

Table 2: Correlation matrix

	MPS	LEV	ROE	EPS	DS	DY	BVS	SIZE
MPS	1.0000							
LEV	-0.2990	1.0000						
	(0.0000)							
ROE	0.4865	0.3721	1.0000					
	(0.0000)	(0.0000)						
EPS	0.6518	-0.1765	0.6909	1.0000				
	(0.0000)	(0.0184)	(0.0000)					
DS	0.5056	-0.1129	0.4506	0.5805	1.0000			
	(0.0000)	(0.1314)	(0.0000)	(0.0000)				
DY	-0.0847	0.1972	0.6502	0.3641	0.0688	1.0000		
	(0.2612)	0.0083	(0.0000)	(0.0000)	(0.0000)			
BVS	0.5564	-0.2444	0.3366	0.7864	0.3467	0.1820	1.0000	
	(0.0000)	0.0010	(0.0000)	(0.0000)	(0.0000)	(0.0150)		
SIZE	0.4131	0.0494	0.1095	0.1715	0.0929	-0.0467	0.1259	1.0000
	(0.0000)	0.5046	(0.1380)	(0.0225)	(0.2162)	(0.5369)	(0.0949)	

Result from STATA 14

The Table 2 shows that there are significant correlations between variable "MPS" and all six independent variables including LEV, ROE, EPS, DS, DY, BVS and SIZE, in which the relations between MPS and variables of LEV, DY are negative, and the links between MPS and other variables are positive.

4.4. Regression result

4.4.1. Checking for Multicollinearity

According to the VIF results, it can be concluded that there is no multicollinearity problem in this model.

Table 3: VIF result

Variable	VIF	1/VIF
EPS	4.85	0.145994
ROE	4.78	0.209342
BVS	3.68	0.271586
DY	2.59	0.386767
DS	1.76	0.567167
SIZE	1.38	0.72436
LEV	1.26	0.791602
Mean VIF	**2.9**	

Result from STATA 14

4.4.2. Regression result analysis

Table 4: Regression result

MPS	OLS		FEM				REM	
	Coef.	Std. Err.	Coef.	Std. Err.	Robust		Coef.	Std. Err.
					Coef.	Std. Err.		
LEV	-23635.83	17169.3	-4781.094	21884.11	-4781.094	26805.23	-23635.83	17169.3
ROE	200862.5***	30604.6	116261.1***	33616.28	116261.1*	60179.76	200862.5***	30604.6
EPS	0.5657526	0.7614165	1.755428**	0.8123256	1.755428	1.051386	0.5657526	0.7614165
DS	-362.2304***	124.5698	-519.1014***	116.5281	-519.1014***	145.347	-362.2304***	124.5698
DY	-198690.3***	26389.31	-139107.8***	26400.83	-139107.8***	51242.61	-198690.3***	26389.31
BVS	0.773212***	0.2919734	0.2615725	0.378227	0.2615725	0.4342905	0.773212***	0.2919734
SIZE	3979.81*	2408.773	-8947.37*	4695.051	-8947.37**	3619.169	3979.81*	2408.773
_cons	-84559.53	66294.68	286265.9	130466.6	286265.9**	105285.6	-84559.53	66294.68

*Standard errors in parentheses *** p < 0.01, ** p < 0.05, * p < 0.1*

Result from STATA 14

The result of Chow test, Breusch and Pagan Lagrangian multiplier test and Hausman test show that fixed effect panel data regression is suitable for our model. Besides, the Wald test indicates the existence of heteroskedasticity problem and Wooldridge test shows that there is the autocorrelation issue, so robust standard error estimation is used.

The regression results indicate that three variables, including dividend per share (DS) , dividend yield (DY) and firm size (SIZE), have a significant negative influence on market price of share, while explanatory variable "return on equity" significantly positively impact indicator "MPS" at the 0.1 level.

5. Conclusion

In conclusion, the period from 2018 to 2023 saw strong fluctuations in national economy at large, and in stock market in particular, leading to significant changes in market price of share of food and beverage companies. That unstable MPS is always an obstacle for firm development, so studying determinants of MPS is necessary. The empirical results of our research indicate that MPS of studied companies were impacted by ROE, DS, DY and SIZE. To specify, an increasing ROE could make corporation more interesting to investors. By contrast, the rise in dividend was not appreciated in a such fluctuating period, because it made numerous people mistrust the business strategy and development potentials of the company in the future. In other words, that dividend policies created a sense of unsafety for investors. On the other hand, the firm size negative affected its market price of share. The reason could come from the thought that larger a company, higher its challenges when difficulties arise in the economy.

It is clear that controlling the market price of share is a headache of all companies, because that price is bound by a range of internal and external factors. However, our research shows that, corporations can achieve that goal based on modification of firm-specific determinants of MPS, such as building effective business plan to increase ROE, studying the sentiment of investors in order to have policies suitable for their preference.

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THE MODERATING ROLE OF ETHICAL LEADERSHIP IN THE RELATIONSHIP BETWEEN THE INTERNAL CONTROL SYSTEM AND ORGANIZATIONAL ETHICAL BEHAVIOR TO ENHANCE REPUTATION

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Abstract: ***Drawing upon the internal control framework and ethical leadership theory, this study examines the impact of the internal control system on organizational reputation, focusing on the mediating role of organizational ethical behavior. Furthermore, the research investigates the moderating effect of ethical leadership on the relationship between the internal control system and organizational ethical behavior. Utilizing data from 226 organizations in Vietnam, the study demonstrates that the internal control system fosters organizational ethical behavior, which subsequently enhances organizational reputation. The findings indicate that ethical leadership moderates the relationship between the internal control system and ethical behavior. These results contribute to the existing body of literature on internal control and provide valuable insights into how ethical leadership can augment the positive effect of the internal control system on ethical behavior, thereby improving organizational reputation.***

• Keywords: *ethical leadership, internal control system, organizational ethical behavior, organizational reputation, Vietnam.*

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1. Introduction

The accounting literature has increasingly emphasized the pivotal role of internal control systems in promoting sustainable development (Tu & Nguyen, 2022). Beyond ensuring operational efficiency, accurate reporting, and regulatory compliance (COSO, 2013), internal control systems contribute value that exceeds conventional expectations. In emerging markets, these systems reinforce organizational ethical behavior through their structural design and operational effectiveness (Nguyen & Tu, 2023). In the current era of heightened ethical awareness, leadership is instrumental in driving innovations within internal control mechanisms (Tu et al., 2022), and ethical leadership emerging as a critical factor in establishing and maintaining effective internal controls (Tu et al., 2022). As societal expectations rise, ethical leadership amplifies the positive impact of internal controls on organizational ethical practices, thereby enhancing corporate reputation.

This study addresses existing gaps by developing and empirically testing a moderated mediation model. Specifically, it introduces ethical leadership as a moderating variable in the relationship between internal control systems and organizational ethical behavior. The study further tests whether improvements in ethical behavior, facilitated by effective internal control systems, contribute to enhancing organizational reputation, particularly in emerging markets.

2. Model and hypotheses development

2.1. The mediating role of organizational ethical behavior

In practice, the effectiveness of an internal control system plays a crucial role in minimizing fraudulent activities and ensuring compliance with ethical standards (Le et al., 2020). A well-functioning internal control system identifies and rectifies deviations from ethical norms (Tetteh et al., 2020). Businesses that fail to adhere to ethical operational principles, such as falsifying financial statements or violating labor laws, often face reputational damage and legal scrutiny (Nguyen & Tran, 2018).

An effective internal control system ensures that employees' decisions align with organizational rules and ethical standards (Rodgers et al., 2015). When these controls are fair and effective, they foster ethical conduct among employees. However, when internal control weakens, corporate governance and audit functions become compromised, increasing the likelyhood of unethical behavior and fraud (Baldock, 2016; Nguyen & Tran, 2018). As a result, this study proposes the following hypothesis:

H1. The internal control system has a positive effect on organizational ethical behavior.

Organizational ethical behavior refers to the application of moral standards to guide decision-making, conduct, and operations within a corporate framework (Velasquez, 2012). Establishing a clear code of conduct is essential for defining acceptable practices and ensuring alignment with these ethical standards (Nguyen & Tu, 2023). Providing explicit guidelines for ethical behavior helps employees understand the organization's expectations (Kuenzi et al., 2020).

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Top managers who prioritize ethics can serve as role models by incorporating ethical considerations into their decisions, thereby encouraging employees to accept and internalize organizational rules. Ethical guidelines not only maintain public image but also mitigate risks of misconduct and enhance internal governance. Rewarding employees for ethical conduct reinforces these behaviors, promoting a culture of integrity (Kuenzi et al., 2020).

When ethical standards prevail, employees are more likely to conform, positively influencing the organization's reputation. However, balancing enforcing ethical guidelines with other organizational objectives can present challenges, particularly when ethical standards conflict with short-term financial goals. Nevertheless, organizations that consistently reinforce ethical behavior are likely to enhance their public image and build trust with stakeholders. Thus, the study proposes the following hypothesis:

H2. Organizational ethical behavior has a positive effect on organizational reputation.

Effective internal control systems mitigate fraudulent activities and uphold ethical standards within organizations (Tu et al., 2022). These systems employ mechanisms such as audits, segregation of duties, and automated monitoring to detect and correct deviations from ethical norms. By fostering a culture of ethical compliance, internal controls help ensure that decisions align with organizational rules and objectives. However, maintaining a robust internal control system can be resource-intensive, and organizations may face resistance from employees who perceive these controls as overly restrictive. Addressing such challenges requires strong leadership and a commitment to fostering ethical behavior over the long term. When internal controls are weakened, opportunities for fraud and unethical behavior increase, which can damage an organization's reputation. Conversely, organizations that consistently reinforce ethical behavior through their internal controls build trust with stakeholders, enhancing their public image. Overall, internal control systems positively impact organizational reputation by promoting adherence to ethical norms. As such, this study proposes the following hypothesis:

H3. Internal control system positively affects organizational reputation via the mediating role of organizational ethical behavior.

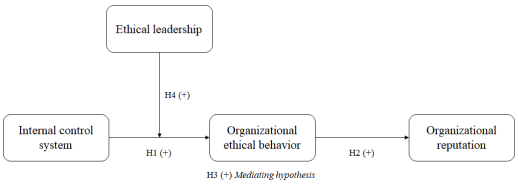
2.2. The moderating roles of ethical leadership

Leaders with strong moral values not only implement formal policies and structures to guide the organization's strategic direction but also influence employees by modeling ethical behavior (Cortes-Mejia et al., 2021). Ethical leaders engage employees in discussions about business ethics, creating a culture where ethical decision-making is a priority. These leaders also design internal control systems that promote transparency and accountability, ensuring that organizational practices align with ethical standards (Tu & Nguyen, 2022).

According to ethical leadership theory (Brown & Treviño, 2006), the ethical behavior exhibited by leaders significantly influences employees' ethical choices and conduct. Under the guidance of ethical leadership, internal control systems provide clear guidelines and fair procedures that positively impact employee attitudes, shaping their ethical behaviors. Ethical leaders motivate employees to participate in internal control activities actively, reinforcing their commitment to ethical conduct (Tu & Nguyen, 2022). Furthermore, an effective internal control system, under the oversight of ethical leadership, enables organizations to evaluate whistleblowing reports and respond to unethical behavior promptly. Ethical leadership thus plays a critical role in ensuring the success of internal control systems by promoting a culture of transparency and accountability (Rodgers et al., 2015). Based on these arguments, this study hypothesizes:

H4. Ethical leadership positively moderates the relationship between the internal control system and organizational ethical behavior.

Figure 1. Proposed model and hypotheses



3. Methods

3.1. Sampling and data collection

The participants were required to meet the following criteria: (1) they have to be employed by an organization with a dedicated internal control department, (2) they have to occupy mid-level managerial positions within their respective organizations, and (3) they have to possess a minimum of two years of professional experience within their organizations.

To mitigate potential common method bias, according to the recommendations of Podsakoff et al. (2003), the data collection will be conducted in two phases, separated by a short interval of two months. This approach follows the guidance of Einarsen et al. (2009) to reduce the risk of participant dropout and memory bias. The first phase, scheduled for July 2024, will distribute a survey to potential respondents on a pre-established email list. This survey will aim to collect valid responses that include email addresses, demographic details, and assessments of ethical leadership and the internal control system.

The second phase, to be conducted two months later, will consist of a follow-up questionnaire sent to respondents from the first phase. This second survey will focus on gathering data on organizational ethical behavior and reputation. Each participant will be assigned a unique identification number to ensure continuity and accurate linkage between the two phases. Table 1 provides a detailed overview of the demographic characteristics of the sampled organizations and respondents.

Table 1: Demographics of informants (n = 226)

Demographics	n	(%)	Demographics	n	(%)
Organizational size (employees)			*Position*		
51-200	56	24.8	Middle-level manager	226	100
201-500	113	50			
501-1.000	57	25.2			
Organizational age			*Work experience*		
5 -> 15 years	179	79.2	5 -> 10 years	178	78.8
16 -> 30 years	25	11	11 -> 20 years	29	12.8
31 -> 50 years	22	9.8	> 20 years	19	8.4

Source: Data analysis result

3.2. Measurement scales

The internal control system was evaluated using the formative scale developed by Chiu and Wang (2019), which is grounded in the COSO framework. Organizational ethical behavior was measured using a scale adapted from Wu et al. (2015). Organizational reputation was assessed through the scale from Fombrun et al. (2000) and Rettab et al. (2009). Ethical leadership was measured using the ten-item scale proposed by Brown et al. (2005).

4. Results

The results of the hypothesis testing for H1 confirm that organizations that prioritize internal control experience significant improvements in ethical behavior. This is attributed to their enhanced ability to strengthen compliance, mitigate risks, and promote responsible actions (Nguyen & Tu, 2023). Thus, organizations operating within such frameworks are incentivized to exercise sound judgment and discretion through their internal control systems, particularly when navigating turbulent conditions and potential risks.

The validation of H2 underscores the critical role of ethical behaviors in enhancing organizational reputation. It demonstrates that ethical behavior reduces misconduct and fosters a transparent business culture (Nguyen et al., 2020). Moreover, the confirmation of H3 suggests that ethical behavior is pivotal in mediating the relationship between internal control and organizational reputation. This finding offers further insights into the connection between internal control systems and organizational reputation, particularly in emerging Asian markets.

Although there is limited research on the mediating role of organizational ethical behavior in the influence of internal control on organizational reputation, it is noteworthy that H4, which examines the moderating effect of ethical leadership on the internal control–ethical behavior relationship, is supported. The results indicate that internal control substantially influences ethical behavior when ethical leadership is more actively practiced.

5. Conclusion

Grounded in the internal control framework (COSO, 2013) and ethical leadership theory (Brown & Treviño, 2006), this study hypothesized that organizational ethical behavior mediates the relationship between the internal control system and organizational reputation and that the influence of the internal control system on organizational ethical behavior is moderated by ethical leadership. By developing and testing a moderated mediation model using data from 226 organizations in Vietnam, this research significantly contributes to the internal control literature. It is among the first to empirically demonstrate that the internal control system enhances organizational reputation through the mediating role of ethical behavior, further influenced by the presence of ethical leadership. These findings are not only significant but also have the potential to reshape our understanding of organizational behavior and management.

In the future, organizations with robust internal control systems will likely foster and promote ethical behaviors, providing them with a competitive advantage through an optimized internal control system (Tu & Nguyen, 2022). This research suggests that advanced internal control mechanisms will enable Vietnamese organizations to more comprehensively assess ethical behaviors, which are closely linked to their reputation (Nguyen & Tu, 2023). Moreover, promoting ethical behaviors will help these organizations cultivate a positive image among customers and stakeholders, ultimately enhancing their reputation over time (Nguyen et al., 2020). These practical implications underscore the value of this research for organizational management and strategy.

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THE IMPACT OF SERVICE QUALITY IN LAST-MILE DELIVERY ON CUSTOMER SATISFACTION ON TIKTOK: AN EMPIRICAL STUDY OF GENERATION Z CUSTOMERS IN HO CHI MINH CITY

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Abstract: ***Through surveying 173 young individuals between 12 and 27 ages, from April to May 2024 in Ho Chi Minh city, utilizing through email and popular social media platforms such as Facebook and Zalo, the study showed the impacts of last-mile delivery service quality on Gen Z customer satisfaction on Tiktok including: (1) Privacy; (2) Empathy; (3) Assurance; (4) Responsiveness; (5) Compensation; (6) Reliability.***

• Keywords: *last-mile delivery, customer satisfaction, tiktok, gen Z.*

JEL codes : L81, L87, L9

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Introduction

E-commerce presently has been a key component of development in the digital economy context, contributing positively to Vietnam's economic growth. Last-mile delivery, in e-commerce, is considered as the most critical touchpoint in customer online experience that determines whether the customer will repurchase from the business or not in the future. In the context of the e-commerce industry in Vietnam, last-mile delivery still faces many challenges. Therefore, it is practically necessary to study more about dimensions of last-mile delivery affecting customer satisfaction when shopping in e-commerce to comprehend customer needs and expectations with the target of increasing business competitive edges and thriving within the Vietnam e-commerce market.

Review of literature and research methology

Review of literature

Last-mile delivery is the last stage of a business-to-customer (B2C) parcel delivery in which a product is transported from the last transit point to the end customer's selected destination (Gevaers et al., 2009). Goods can be collected from various picking locations besides the customer's home such as a reception box, workplace, brick and mortar stores of retailers, a cluster, or a specific collection point. In other words, orders can be transported directly to home or indirectly when customers can flexibly collect items in any preferred pick-up location.

Last-mile delivery is considered as a crucial stage of the logistics process in e-commerce because it is the only way to interact face-to-face with customers and have a significant impact on customer satisfaction from the first time of physical contact (Brown et al., 2021). If online retailers can take advantage of last-mile delivery, they can complete the brand communication and after-sales service with customers, thus fostering the customer relationship (Hübner et al., 2016). Last-mile delivery is also a source of market differentiation that encourages investment in innovative delivery concepts among businesses to gain competitive advantage

VaKulenko et al. (2019) demonstrates that last-mile delivery experience is frequently one of the most critical criteria for customers making purchase decisions as it directly influences their satisfaction. Factors such as shipment tracking, return shipment, delivery expense, flexible delivery or on-time delivery are highly evaluated by online shoppers. Lead time of the delivery is recommended as another factor impacting customer's decisions (Suguna et al., 2021). Thus, last-mile delivery is one of the most challenging and expensive aspects but the least efficient in the e-commerce activities

The SERVQUAL model was first published by Parasuraman and his colleagues in 1985. The initial model identified ten dimensions to evaluate service quality: (1) Tangibles, (2) Reliability, (3) Responsiveness, (4) Communication, (5) Credibility, (6) Security, (7) Competence, (8) Courtesy, (9) Understanding/ Knowing Customers, and (10) Access. (Parasuraman et al., 1985). However, in 1988, Parasuraman and his colleagues modified the model, in which ten original dimensions were reduced to the currently known five dimensions (Parasuraman et al., 1988). The last two dimensions (assurance and empathy) include seven original research

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dimensions of courtesy, communication, access, credibility, competence, security, and understanding of customers due to no identified distinction between dimensions after purification stages (Parasuraman et al., 1988).

The objective of the E-S-QUAL model is to evaluate and scrutinize factors that influence the excellence of digital services, comprising of 22 items on 4 dimensions: (1) Efficiency, (2) Fulfillment, (3) System Availability, (4) Privacy. While the E-ResS-QUAL model is designed to assess factors that impact the quality of error correction in electronic services, particularly the management of arising issues: (1) Responsiveness, (2) Compensation, (3) Contact (Parasuraman et al., 2005).

The SERVQUAL model evaluates the quality of a service based on two basis gaps - expectation performance and perception (Service quality = Perception - Expectation) (Parasuraman et al., 1988). However, a few theoretical or empirical studies support expectation performance (Carman, 1990) that the evaluation of the gap between expectation and perception to indicate service quality in the model is controversial (Cronin and Taylor, 1992). Therefore, in 1992, Cronin and Taylor published the SERVPERF model, a simpler alternative to the SERVQUAL model.

In the SERVPERF model, the measurement of service quality is based on the value of customer perception towards the service instead of the combination of values of both expectation and perception in the SERVQUAL model. It can be shown in the formula as Service quality = Value of perception.

Cronin and Taylor (1992) also indicated that service quality was "similar to an attitude" and that the model should be an attitude-based conceptualization in which "actual behavior" is more efficient than "value of expectation" to measure the service quality. Therefore, despite scaling on the same performance items used in the SERVQUAL model, the SERVPERF model was built on an attitude-based model while the SERVQUAL model was based on the customer satisfaction model.

The SERVPERF model is considered in various studies due to its convenience and shorter questionnaire that save evaluation time and reduce confusion in differentiating between expectation and perception for respondents. However, in the scope of this paper, the SERVPERF model is not efficient to evaluate the relationship between customer satisfaction and the quality of last-mile delivery service.

In 2015, Lim and partners investigated two critical factors - service quality and service convenience that directly affect customer loyalty in home delivery in Taiwan. The research model is established on the SERVQUAL model with five original dimensions: (1) Tangibles, (2) Reliability, (3) Responsiveness, (4) Assurance, and (5) Empathy. The service quality and service convenience both correlate positively with customer loyalty. Customer loyalty is confirmed to increase parallel with service convenience. However, the value between customers' expectations and their actual experience of the service is negative, which means customers are not satisfied with how the service is performed.

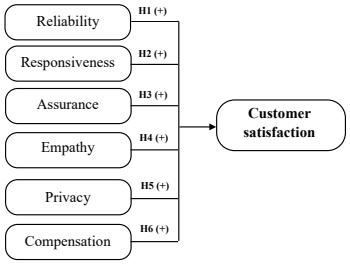
Uzir and partners (2021) evaluate the influence of home delivery on customer satisfaction with trust playing a role as a mediating variable that is impacted by service quality and customer perceived value. Specifically, the quality of service is investigated based on the SERVQUAL model. The findings show that service quality, perceived value and trust impacted customer satisfaction, in which, service quality shows the most significant direct effect on customer satisfaction.

Sjahroeddin (2018) conducted a study to improve customer satisfaction in online food delivery (OFD) in Indonesia by assessing their correlation and direct influence. The E-S-QUAL model (Parasuraman et al., 2005) has been employed with four independent variables: (1) Efficiency, (2) Fulfillment, (3) System Availability, and (4) Privacy. Food quality is indicated as the key element that positively drives customer satisfaction in OFD service. The study also emphasizes the role of service providers in the contribution to overall aspects of food quality. However, maintaining a good quality of e-service is still significantly important to live up to customer expectations.

Proposed research model

Based on relevant concepts discussed above, the author suggests this model include factors are: (1) Reliability, (2) Responsiveness, (3) Assurance, (4) Empathy, (5) Privacy, (6) Compensation

Figure 1: Proposed research model and hypotheses



Source: The author's hypothesis model

Hypothesis

H1. Reliability (REL) has positive effect on customer satisfaction using TikTok's last-mile delivery service.

H2. Responsiveness (RES) has positive effect on customer satisfaction using TikTok's last-mile delivery service

H3. Assurance (ASS) has positive effect on customer satisfaction using TikTok's last-mile delivery service

H4. Empathy (EMP) has positive effect on customer satisfaction using TikTok's last-mile delivery service

H5. Privacy (PRI) has positive effect on customer satisfaction using TikTok's last-mile delivery service

H6. Compensation (COM) has positive effect on customer satisfaction using TikTok's last-mile delivery service

Research methodology

Data collection took place over a span of four weeks about young people between 12 and 27 ages, from April to May 2024 in Ho Chi Minh city, utilizing through email and popular social media platforms such as Facebook and Zalo. In total, out of the 181 responses received, 173 responses are utilized for subsequent statistical analysis.

Result and discussion

Cronbach's alpha coefficient test

Regarding Corrected Item - Total Correlation, the results of Cronbach's Alpha coefficient analysis show that all measuring items have a length greater than 0,30, and almost all of them have an index higher than 0,60.

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

Variables	Abbreviations	Cronbach's Alpha	N of Items
Reliability	REL	0,908	4
Responsiveness	RES	0,909	4
Assurance	ASS	0,767	3
Empathy	EMP	0,897	4
Privacy	PRI	0,916	3
Compensation	COM	0,879	3
Customer satisfaction	CS	0,910	4

Source: SPSS result (2024)

Explanatory factor analysis (EFA)

As summarized in the above table 2, all the requirements for the evaluation on the measurement scales of independent variables are met. Firstly, the KMO coefficient for EFA analysis is 0,873, higher than the standard of 0,5, indicating the consistence of the factor analysis with the survey data.

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

	Result	Threshold	Implication
KMO Measure	0,873	0,5<0,873<1	Appropriate
Sig.	0,000	0,000<0,05	Appropriate
Cumulative of Variancce	82,574%	50%<82,574%<100%	Appropriate
Eigenvalues	1,229	1<1,229	Appropriate

Source: SPSS result (2024)

Bartlett's test with the sig value equals 0,000 < 0,05, indicating the sample's adequacy with correlated observed variables. Besides, the cumulative variance is 82,574%, indicating the ability of selected seven factors to explain 82,574% of the data variation, exceeding the standard of 50%. Therefore, the selected factors in the research model can be confirmed to be statistically meaningful. Finally, the Eigen value stops at 1,229 with the right components, which still meets the requirement of exceeding 1. Therefore, all the measurement items of the independent variables are verified to be statistically significant.

Pearson correlation coefficient test

The sig. values of each pair of independent variables and dependent variables are all lower than 5%, which means that the coefficient of correlation or r value is statistically significant and all independent variables in the model have a correlation with the dependent variable. The Privacy variable has the strongest correlation with r of 0,681, followed by the Empathy and Responsiveness factors connected with the dependent variable with the r values of 0,677 and 0,578 respectively. Meanwhile, the Compensation factor is correlated with the dependent variable in average degree with r being 0,553. In contrast, the correlation between Reliability and Assurance variables and the dependent variable are the weakest, with r values equal to 0,373 and 0,343 respectively.

In conclusion, the absolute coefficients among variables exceed 0,3 and sig. values are less than 0,05 (Sig. < 0,05) lead to the correlations of all variables in the model are accepted in the Pearson Correlation Coefficient analysis. However, the multicollinearity cannot be confirmed immediately and will be evaluated by VIF in the consequent regression analysis.

Table 3. Results of pearson correlation analysis

Variables		CS	REL	RES	ASS	EMP	PRI	COM
CS	Pearson Correlation	1						
	Sig. (2-tailed)		0,000	0,000	0,000	0,000	0,000	0,000
REL	Pearson Correlation	0,373	1					
	Sig. (2-tailed)	0,000		0,001	0,031	0,000	0,000	0,007
RES	Pearson Correlation	0,578	0,262	1				
	Sig. (2-tailed)	0,000	0,001		0,043	0,000	0,000	0,000
ASS	Pearson Correlation	0,343	0,164	0,154	1			
	Sig. (2-tailed)	0,000	0,031	0,043		0,000	0,011	0,173
EMP	Pearson Correlation	0,677	0,296	0,570	0,285	1		
	Sig. (2-tailed)	0,000	0,000	0,000	0,000		0,000	0,000
PRI	Pearson Correlation	0,681	0,305	0,486	0,193	0,571	1	
	Sig. (2-tailed)	0,000	0,000	0,000	0,011	0,000		0,000
COM	Pearson Correlation	0,553	0,205	0,549	0,104	0,519	0,491	1
	Sig. (2-tailed)	0,000	0,007	0,000	0,173	0,000	0,000	

Source: SPSS result (2024)

Multiple regression analysis

The obtained R^2 result is acceptable with the value of 0,641 (> 50%), thereby the regression model is fit to evaluate the customer satisfaction variable. Moreover, the value describes that up to 64,1% of changes in the customer satisfaction variable can be explained by internal factors or independent variables and only 35,9% of the remaining variation is interpreted by external elements which are not inclusive in the model and other random error ε_i.

Based on the results of regression coefficients (table 4), all independent variables possess sig. values below 0.05, which means that they have an impact on customer satisfaction with 95% confidence level. Therefore, the hypothesis H0 is rejected.

Regarding the standardized coefficient, it is utilized to evaluate and compare the impact and the degree of salience of independent variables on customer satisfaction. Derived from the above result table, customer satisfaction is positively affected by all six independent variables (REL, RES, ASS, EMP, PRI, and COM), in which, the Privacy factor has the most significant impact (β5 = 0,335), followed by Empathy and Assurance, with β of 0,259 and 0,152 respectively. In addition, Responsiveness (β2 = 0,141) and Compensation (β6 = 0,140) pose almost an equal degree of influence on customer satisfaction. Finally, in contrast, customer satisfaction is affected the least by Reliability when it only demonstrates a minorly powerful impact with β1 = 0,104.

CS = 0,335PRI + 0,259EMP + 0,152ASS + 0,141RES + 0,140COM + 0,104REL + ε

Table 4. Coefficients table in regression analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	0,244	0,233		1,048	0,296		
	REL	0,084	0,039	0,104	2,129	0,035	0,873	1,145
	RES	0,128	0,055	0,141	2,320	0,022	0,570	1,756
	ASS	0,166	0,053	0,152	3,160	0,002	0,907	1,102
	EMP	0,240	0,059	0,259	4,052	0,000	0,510	1,961
	PRI	0,268	0,048	0,335	5,636	0,000	0,593	1,687
	COM	0,119	0,050	0,140	2,378	0,019	0,605	1,654

Source: SPSS result (2024)

Conclusion and implications

Conclusion of the research

After completing 1 month of data collection, 181 responses were received, with 173 valid responses, and data analysis was conducted. The study used SPSS and SmartPLS software to analyze data and test scales and hypotheses. The study showed the impacts of last-mile delivery service quality on Gen Z customer satisfaction on Tiktok including: (1) Privacy, (2) Empathy, (3) Assurance, (4) Responsiveness, (5) Compensation, (6) Reliability.

Recommendations

Privacy

It is important to invest in data security systems with adequate data encryption. TikTok should periodically update, maintain, and make necessary adjustments to the system in the event of data leaks, breaches, or attacks. Moreover, policies related to the restriction of personal devices and personal email use should be conducted.

Secondly, TikTok should organize training for staff, including delivery personnel about safety and security of using the internal network that they are restricted from sharing any information related to their accounts as well as customers' personal information such as name, phone number, email address or home address. In addition, the firm should provide employees and third-party partners with detailed procedures and policies about data confidentiality.

Thirdly, TikTok must instruct customers on establishing enough strong account passwords and the alert system on the app against suspicious login attempts from other devices. It can be the power to block or terminate any suspicious devices, the login code only provided to the owner account or hidden personal information from outsiders.

Finally, TikTok should have backup plans and copies of data to limit the loss of data due to cyberattack or system disruption. It is important to maintain and protect data privacy infrastructure and its contained information so that the firm can prevent the damage of customer trust and lawsuits.

Empathy

TikTok should supplement the function of selecting a favorable and suitable reception time for customers on the platform. Therefore, customers can always receive their packages on time. This tailored delivery service will reduce the rate of failure in the first-time delivery and costs of operation, and parallelly enhance customer experience, thereby achieving higher customer satisfaction for the service.

Last mile delivery is the only time customers, and the firm interact physically so that it is an opportunity to imprint a good impression towards high service quality in their experience, which affects the contentment. Therefore, training delivery personnel's professional attitudes, and behaviors in dealing with customers' urgent needs is essential. The delivery staff must show their willingness, patience, and effort in supporting customers.

Assurancce

Firstly, to create an impression of a friendly, warming attitude and skillful delivery personnel towards customers, TikTok should build a coursework training deliverymen how to interact with customers and regularly survey customers about the profession and attitudes of the delivery team. Moreover, updating documents for training is essential so that delivery staff can practice in different situations and improve their skills for a more effective handling of parcels and delivery.

Secondly, TikTok can pay attention to feedback and complaints of customers about their experience of the delivery service as it is the most precious objective viewpoint to assess the performance of delivery staff, and the delivery process in general. Customers can comment on the performance of the service based on their expectations and experience which any e-commerce businesses are eager to know in the standing of customers.

Thirdly, regarding the feedback system, the business should routinely collect customer feedback and complaints and analyze them to identify current

delivery problems to provide solutions promptly. Moreover, answering customer feedback and problems timely and professionally is an idea to encourage them to continue contributing to the improvement of the delivery process. TikTok can also apply membership programs for customers who actively leave feedback on products that they can receive vouchers for delivery fee or products.

Responsiveness

TikTok should work closely with logistics third party partners in maintaining and updating the real-time tracking system on the platform that allows customers to supervise the delivery process simply. Customers are more proactive in tracking the order status, instead of relying on customer support service.

Then, adapting to urgent orders is a challenge for all e-commerce businesses, let alone TikTok. It also plays an important role in enhancing customer satisfaction. In case of urgent orders, TikTok and its third partners should provide express delivery within a day or two hours like Shopee's service. Moreover, TikTok can consider that sellers pick up orders and deliver directly to customers themselves without transiting orders through fulfillment centers.

Finally, TikTok should practice a proactive and timely communication system with customers to ensure that problems related to order status and their complaints are updated and resolved promptly. To achieve the goal, period training and evaluation of staff and third-party partners' performance are compulsory. Thereby, they are equipped with professional knowledge and skills to respond to customer requirements precisely, timely and effectively.

Compensation

TikTok should publicize its compensation policies clearly and transparently on the shopping app and the platform so that customers are well informed about compensation regulations. It is also a baseline and a framework for problem settlement to loss, damage, returns and refunds between customers and TikTok. Moreover, TikTok should constantly revise and make necessary adjustments to the current policies based on customers' feedback and performance of both TikTok and third parties to ensure unexpected events are covered in full and detail. Outlining the transparent and reliable compensation policy helps TikTok to preserve customers' relationships and earn their trust in the quality of the firm's delivery service.

Secondly, TikTok should update questions and answers related to compensation issues on the Frequently Asked Questions (FAQ) so that customers can proactively seek appropriate answers to their problems. Moreover, TikTok can consider an online Artificial Intelligent assistant that can support customers immediately at any time. The virtual assistant helps to reduce the workload of customer service staff and the staff's limit on working hours. Therefore, the compensation system can be improved both in quality and time response to customers.

Reliability

Firstly, TikTok should comply with its commitment to customers strictly that right parcels must be delivered to the accurate address and at the right time so that customers will be impressed by the business reputation and their trust in the business is maintained. Besides, the firm should conduct a delivery practice that delivery staff are obliged to take a picture of customers receiving parcels after their checking as a proof of successful delivery and a confirmation that parcels have been delivered to customers in good condition, without damage or loss.

Secondly, to reduce the opportunity of damage during delivery, the packaging team should package orders properly under minimum requirements or instructions. Delivery men also practice handling skills and deliver parcels neatly to avoid breakage, damage, spillage, and dropout which presents the lack of profession and caress, raising the dissatisfaction of customers.

Thirdly, in a fierce competition in the e-commerce market like Vietnam, innovations are becoming the top priority of businesses to gain a competitive advantage. Particularly when Gen Z customers are more concerned about sustainable and ethical practices. They have a great demand for eco-friendly offerings such as reuse packaging, less carbon footprint delivery or electric delivery vehicles. Therefore, TikTok can consider friendly environmental approaches to the delivery process but still maintain the service as accurate and timely as committed to enhance service quality and pertain customer satisfaction.

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BENEFITS AND CHALLENGES WHEN APPLYING IFRS FOR LISTED ENTERPRISES IN VIETNAM

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Abstract: ***This study was conducted to learn about the benefits and challenges of applying IFRS for listed companies in Vietnam. Using qualitative research methods and inheriting previous studies, it shows that the application of IFRS worldwide is growing rapidly, bringing about improvements in accounting quality through financial reporting, strengthening investor protection through transparency and disclosure of accounting information, increasing capital market liquidity, and positively contributing to global economic growth and development (Soderstrom and Sun 2007). For Vietnam, businesses are also in the process of converting financial statements from VAS to IFRS. This conversion brings many benefits to Vietnamese businesses, such as transparency of financial reports, access to global capital markets, competitiveness, and the ability to compare financial reports. However, in addition to these benefits, businesses also encounter some difficulties and challenges when applying IFRS.***

• Keywords: *financial reporting standards, IFRS, listed companies, Vietnam.*

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1. Introduction

In the trend of international globalization, not only does it stop at import and export activities but also aims at the development of the international stock market and foreign capital investment market. Therefore, accounting information is no longer an internal matter of each country but is applied and presented in financial reports according to a common language accepted globally (Rezaee et al. 2010). The purpose of financial reports is to provide capital market information for companies, investors, etc. The great benefits of IFRS help improve the quality of financial reporting information and enhance transparency and accessibility. comparison capabilities, providing users of financial statements with useful information related to management and making investment decisions (Ashok, 2014; Siriyama & Fareedah, 2017). This has implications for developing countries in generating high-quality financial information to access international financial sources (Siam & et al., 2010). Although the experience of other countries shows that immediate investment is needed, in the long term, applying IFRS can help reduce financial reporting costs for businesses, attracting resources from domestic and foreign investment, and raising capital at low costs (Odia & Ogiedu, 2013). Currently, IFRS has been recognized and widely applied by many countries. According to statistics from IFRS. org, as of April 2020, there were 166 countries and territories globally that had or were on the roadmap to apply International Financial Reporting Standards (IFRS). The application of IFRS has had many studies pointing out benefits such as the ability to increase the flow of investment capital and foreign direct investment (FDI) flows.

Vietnam is one of the few countries that has not applied IFRS for the preparation and presentation of financial statements. Currently, Vietnam is still applying 26 accounting standards (VAS) for preparing and presenting financial reports. However, the application of VAS has more and more limitations; some contents are not suitable for transactions of the market economy in the new period, especially in the context of the strong development of the capital market and the emergence of many types of complex financial instruments. To match the trend of international integration and globalization of economic cooperation and development, Vietnam is urgently conducting research on IFRS content, reviewing the differences between VAS and IFRS and assessing the impact. , feasibility, benefits, as well as difficulties and challenges that may occur when applying IFRS, thereby building a roadmap and orientation for IFRS application in Vietnam. On March 16, 2020, the Ministry of Finance officially issued Decision No. 345/QD-BTC approving the project to apply international financial reporting standards in Vietnam. The process of converting

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from using VAS to IFRS requires setting up and changing many account items, especially the work to report changes in equity, fair value, etc. Therefore, research This survey was conducted to collect opinions on the benefits, difficulties, and challenges of business managers and accountants related to IFRS implementation in Vietnam.

2. Literature review

Up to now, there have been many studies related to the application of IFRS in the world. The objective of IFRS is to provide a standard for preparing and presenting financial reports for companies following general guidelines rather than setting specific reporting rules for each country or region. The adoption of IFRS will simplify accounting procedures through consistency in reporting by companies in different countries. Up to now, countries around the world have spent more than 10 years applying IFRS. The authors will research in this article the following works and research articles evaluating empirical evidence on the benefits and challenges of applying IFRS:

2.1. Overview of international financial reporting standards (IFRS)

The term international financial reporting standards (IFRS) is basically known as a single set of accounting standards, developed and maintained by the International Accounting Standards Board for the purpose of such standards. can be applied on a globally consistent basis using a common accounting language that is easy to understand and compare the financial performance of publicly listed companies.

Currently, international financial reporting standards (IFRS) are applied by more than 166 countries (2020). IFRS issued by the International Accounting Standards Council includes 16 different standards. In which the IFRS 17 standard is updated and replaces IFRS 4. And IFRS is focused on general instructions on how to prepare financial statements on the basis of respecting substance over form and is aiming to recognize fair value. It is more reasonable to record at cost.

2.2. Benefits of applying IFRS

Foreign research on the benefits of applying IFRS

Research on the benefits of IFRS adoption has been conducted in many countries, such as the US, UK, Türkiye, EU, etc. Specific benefits include making financial reporting more transparent, reliable, and secure for global comparison, as well as helping to increase national reputation and attract capital from international investors.

In 2015, the European Union (EU) conducted a survey after 10 years of applying IFRS to listed companies; the results showed that IFRS has significantly improved the transparency of accounting information in reports.. The application of IFRS is also credited with improving the liquidity of the capital market by attracting many investors, especially international investors, thereby increasing their confidence in the market … The study also confirms that the benefits from IFRS far exceed the costs of implementation.

The Association of Chartered Certified Accountants (ACCA) conducts its own studies on the impact of IFRS in Europe and China. In Europe, the capital costs of businesses decreased by an average of about 1 %. Although this number is not too large, it brings huge financial value to the entire region's stock market. In China, after the country applied new accounting standards based on IFRS, ACCA research showed that the stock prices of businesses increased sharply. This shows a clear relationship between IFRS adoption and improvements in the market value of businesses. That is also the study of Young and Zeng (2015), qui surveyed businesses in 15 EU countries. Adopting IFRS allows investors to price stocks better. When businesses apply IFRS, international investment tends to increase because the information is explained in more detail, more reliable and easier to compare (Defond et al., 2011).

Vera (2014) studied businesses in 5 European countries and confirmed that IFRS not only improves the quality of financial reporting but also increases transparency and usefulness for investors, which is also Research by Poroy Arsoy & Sipahi (2007). Research by Merve Kilica & et al. (2014) has researched and evaluated that the advantages of applying IFRS will make information on a business's financial statements comparable, reliable, and transparent. transparent and easy to understand.

Another important benefit of applying International Financial Reporting Standards (IFRS) across countries, according to Hail & et al. (2010), is the ability to increase interaction and expand business cooperation. between countries. This happens by reducing information processing time, optimizing costs, and promoting stronger cohesion in communication systems. According to research by Mohammad & et al (2015), applying IFRS to businesses in developing economies brings many benefits: good access to capital markets, increased internationality, reduced capital costs, improve

financial reporting quality. The application of IFRS by FDI companies investing directly from abroad helps improve the value quality of accounting (Golubeva, 2020).

Domestic research on the benefits of applying IFRS

The goal of IFRS is not only to improve the quality of accounting information but also to facilitate efficient financial transactions. This financial reporting system also provides uniformity, thanks to its standardized format, eliminating differences in presentation between countries. So in the workshop on "IFRS: Opportunities and Challenges when Applying in Vietnam," chaired by Associate Professor Dr. Dang Van Thanh in 2019, experts said that applying IFRS is a prerequisite for companies to businesses and organizations around the world to agree on the preparation and publication of financial reporting information. According to research by Dr. Nguyen The Tho, IFRS is increasingly attracting the attention of policymakers, experts, and the business community, especially companies listed on the stock market. Research by Phan Thi Hong Duc, Nguyen Thanh Ha, and Nguyen Thi Phuoc (2016) has shown that when applying international accounting standards, Vietnamese businesses have recorded many positive impacts, such as the ability to access the capital market is easier than applying VAS (82%); increase confidence for potential investors (81%); enhance trust from shareholders (75%); as well as a more favorable ability to receive external capital (69%) and improved relationships with credit institutions (54%).

Applying IFRS to Vietnamese businesses during the integration process has created transparency in financial reporting, reduced capital costs, and accessed capital flows in the international market (Le Van Tan, 2017). In addition, applying IFRS helps increase capital market efficiency, promote cross-border investments, enhance comparability, transparency of financial reporting information, equal competition, and create trust. for investors (Pham Thi Lai, 2016).

In the context that Vietnam's economy is undergoing strong changes due to international integration, applying IFRS has become more urgent than ever. IFRS with fair value regulations will provide a clearer and more accurate view of the financial position and current value of a business, thereby assisting investors and financial reporting users. key in making more accurate decisions. Furthermore, applying the global accounting language IFRS not only helps reduce transaction costs in international financial activities but also enhances transparency in information management. This creates opportunities for businesses to increase profits, attract investment capital, and expand business cooperation possibilities.

2.3. Difficulties and challenges when applying IFRS

Besides the benefits and opportunities for Vietnam, applying IFRS also faces difficulties and challenges that need to be posed to businesses in particular and Vietnam in general.

Foreign research on challenges and limitations when applying IFRS

Research by Mohammad al.et al (2015) al. apply IFRS to a country needs to face a number of challenges: humanal.resource(2007), andtraining costs, auditpolicies,costs, legal framework,... Although there are many Although research proves the benefits of applying IFRS, there are still other views that this system also has certain limitations. Jamal & et al (2010) from the Financial Accounting Standards Committee of the American Accounting Association advocate competition among accounting standards, arguing that the use of a single set of global standards such as IFRS is not the optimal choice. Studies by Ball & et al (2000), Schipper (2005), Soderstrom and Sun (2007), Zeff (2007), Leuz and Wysocki (2008) all emphasize that applying IFRS does not ensure comparability between financial reports, because their quality depends on many factors other than accounting standards, including business culture, legal systems, tax policies and auditing practices.

In addition, conversion costs are also of concern to many countries. Samaha and Khlif (2016), ATU & et al,. said that this cost includes the cost of translating into each country's language, training costs, infrastructure investment costs, testing, implementation, etc. John's research (2018) says Theynecessary to raise the awareness of managers to support their accountants and help them present their financial statements. they follow IFRS. Mohamed (2014) conducted a study in Libya showing that the main barrier to IFRS implementation is the ability of the accounting team to understand and apply IFRS.

The implementation of IFRS between different countries will not be the same due to differences in tax policy regulations and accounting regulations (Samaha and Khlif, 2016, ATU & et al, 2016). Regarding the research of Raoudha (2016), Ballas & et al,; said that the market to apply IFRS needs to be relatively developed to provide reliable information,

because IFRS requires the measurement of assets and liabilities. al. by the enterprise according to the market price at the time of reporting.

Vietnam's difficulties and challenges when applying IFRS

In the study of Tran Hai Long and Nguyen Thi Nga (2018), there are 5 challenges in applying IFRS: (i) the accounting team is not properly trained; (ii) the guidelines quickly standards are heavily conceptual and theoretical, making them difficult to apply; (iii) requirements for applying information technology that is powerful and modern enough to support data collection and processing quickly; (iv) expensive initial application costs; (v) and language barriers have also limited the application of IFRS. Sharing the same opinion, research by Tran Thi Phuong Mai (2018) said that there are still difficulties in recognizing fair value, foreign language capacity, legal framework, and IFRS training facilities are still limited.

In research by Pham Thi Lai (2016), it was found that the number of knowledgeable, experienced and skilled experts in preparing financial statements according to IFRS is still very small. In research by Phan Thi Anh Dao (2021), the results were : 95 % of businesses confirmed that accountants in businesses understand and apply IFRS, which is still very limited ; 85 % of businesses have managers qui do not know or do not care much about building a team of professional accounting staff. And the accounting information systems of businesses are not completely synchronized and do not have the ability to enter IFRS conversion entries, so conversions according to IFRS must be done manually, leading to a lot of effort. and mistakes may be made durant le calculation process.

On the other hand, legal conditions affect the application of IFRS. Currently, the market for determining fair value in Vietnam is not yet complete, which will greatly affect the preparation of financial statements according to the fair value principle. Besides, the Tax Authority as well as tax officials are not clear about IFRS standards, so when following IFRS, the difference between taxable income and accounting profit will become increasingly different. Therefore, there are still debates between tax authorities and businesses when these agencies receive financial statements according to IFRS from businesses (Le Van Tan, 2017).

3. Conclusion

The trend of economic integration in the region and the world has created many opportunities for Vietnamese businesses, while also posing significant challenges in accounting issues for the presentation and the preparation of financial reports. MAIN. Transitioning to IFRS is a huge task and a major challenge for any economy, as its revolutionary impact requires a lot of determination and commitment. The adoption of IFRS is in the best interests of an Economy, provided that regulators, legislators, auditors and accountants, as well as representatives of the business sector, need to cooperate. together to provide an ideal IFRS for the country, considering all relevant issues such as political, social, legal and above all economic. IFRS Standards have been traveling around the world as the single set of high-quality global accounting standards. But it still needs support and assistance from implementing countries to use it effectively and efficiently.

Applying IFRS brings opportunities such as improving the quality and transparency of financial reporting, accessing global capital markets, increasing competitiveness and business growth. However, businesses also face challenges, including lack of technical expertise and resources, cultural and regulatory differences, and cost and time constraints. To maximize the benefits of IFRS adoption, businesses should focus on (i) improving technical expertise and resources; (ii) invest in IFRS-Training-Programmes for experts, lecturers, auditors, accountants, financial officers. (3) need to agree on the role and meaning of financial-statement-presentation according to IFRS (4) It is necessary to improve the policy mechanism for applying IFRS and then develop regulations and instructions for applying a number of IFRS-Standards such as recording asset losses and accounting for derivatives for risk-prevention purposes. Risk, fair value accounting etc,.

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RIGHTS AND INTERESTS OF INVESTORS IN INFORMATION DISCLOSURE OF COMPANIES LISTED ON THE STOCK EXCHANGE

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Abstract: ***Perfecting the legal framework for the stock market is crucial, including the introduction of strict and comprehensive regulations on the information disclosure activities of companies listed on the stock exchange. This will help make the stock market in Vietnam safer, fairer, and more transparent, ensuring the legal rights and interests of investors, building trust, and making them feel secure when accessing the information published on the stock exchange. This article addresses the shortcomings in protecting the rights and interests of investors in terms of information disclosure and proposes solutions to improve the effectiveness of information disclosure by listed companies, in order to protect the rights and interests of investors in the Vietnamese stock market.***

• Keywords: *stock market, information disclosure, listed companies, investors.*

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Introduction

The stock market plays an extremely important role in the economy. Information in this market is sensitive for stock investors. Holding important, accurate information, combined with the ability to analyze information well, will help investors make high profits. However, it can also seriously affect businesses, the general market, and other investors. Therefore, in order to have a transparent and fair market, creating the trust of investors, especially non-professional stock investors and foreign stock investors, helping the stock market develop sustainably with the true meaning of being an effective financial tool for the economy, requires regulations to protect the legitimate rights and interests of investors in the market in general and in information disclosure activities of companies in particular.

In Vietnam, current legal regulations on protecting the rights and interests of investors in the stock market in information disclosure activities of listed companies are increasingly changing compared to before. However, the legal provisions on protecting the rights and interests of securities investors in information disclosure activities of listed companies are only principled, lacking consistency and synchronization between legal versions. The development and promulgation of a unified legal document on the protection of securities investors helps create a solid legal basis for information disclosure activities of listed companies to be transparent and effective. It is necessary for lawmakers to build a transparent and complete legal corridor.

1. Violations of law related to information disclosure of companies listed on the stock market

In the context of the world and regional economies having many complex and unpredictable fluctuations, having a profound impact on the domestic economic and financial situation, the Vietnamese stock market in recent years has still recorded growth on the index, liquidity, capitalization scale. The market's listed and registered trading scale as of the end of November 2023 reached 2,092 trillion VND, an increase of 5.5% compared to the end of 2022 with 742 stocks and fund certificates listed on 2 Exchanges. Securities and 859 shares registered for trading on UPCoM. According to the State Securities Commission, in 2023, the stock market will continue to attract the active participation of investors. Overall, for the 11 months of 2023, the total number of securities accounts still increased by 355,672 accounts compared to the end of 2022, bringing the total number of securities accounts to more than 7.25 million accounts, equivalent to 7.3% of the population. , exceeding 5% of the population according to the target set by the Government in the Project on Restructuring the Stock and Insurance Market to 2020, with a vision to 2025.

The number of businesses that properly and fully comply with information disclosure obligations on both stock exchanges (HOSE and HNX) is increasing. However, there are still many listed companies violating information disclosure regulations

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according to the law, which has significantly affected the rights and interests of investors in the market. From the beginning of 2024 until now, the State Securities Commission Inspectorate has issued decisions to sanction administrative violations against a series of companies due to information disclosure violations. For example: Saigon Glory Limited Liability Company was fined 92,500,000 VND for failing to submit information disclosure content to the Hanoi Stock Exchange (HNX) for the following documents: Newspaper 2023 semi-annual financial report; The situation of implementing the commitments of the issuing enterprise to the owners of 2023 semi-annual bonds, the situation of using the money from the 2023 semi-annual audited bond issuance. In addition, the company sent periodic information disclosure content to HNX on time for the following documents: Report on the use of capital from the 2021 semi-annual bond issuance; Report on the use of capital from bond issuance in 2021; semi-annual financial report 2021; 2021 financial report; 2021 semi-annual bond interest and principal payment situation, 2021 bond interest and principal payment situation.

Most recently, the State Securities Commission issued a decision to sanction administrative violations against Binh Duong General Printing Joint Stock Company. Accordingly, the business was fined 60 million VND because the company did not disclose information on time according to regulations on the information disclosure system of the State Securities Commission and on HNX's website and documents: Audited financial statements for 2022, annual report for 2022; Sovico Joint Stock Company was fined 92,500,000 VND for not disclosing information to HNX about the 2022 and 2023 semi-annual reports; Report on the use of capital from bond issuance in 2020; Report on the implementation of commitments of the issuing enterprise to bond holders in 2022.

Most of these legal violations greatly and directly affect the rights and interests of investors, especially retail investors.

2. Inadequacies and shortcomings of the law on protecting the rights and interests of investors in the stock market in information disclosure of listed companies

Firstly, through research on current legal regulations on protecting the rights and interests of investors in the stock market in information disclosure activities of listed companies in particular, it shows that there are regulations in place increasingly improved compared to before. However, regulations on protecting the rights and interests of investors in the stock market in the information disclosure activities of listed companies only stop at efforts to regulate and order operations. information disclosure of listed companies but does not ensure a stable legal framework, is not market-oriented and does not protect the actual legal rights and interests of investors.

Secondly, Vietnam's regulations on investor protection only mention at regulating behaviors occurring in the domestic market and lack compatibility with international practices, especially according to the goals and principles recommended by IOSCO: "building a fair, transparent market, protecting investors and reducing systemic risk". To achieve this goal, it is necessary to build and improve the legal system on protecting the rights and interests of investors in the stock market in information disclosure activities of listed companies in the direction of granting broad authority in order to investigate and handle securities law violations for market management agencies, provide strong enough sanctions for fraud and unfair transactions, and require full information disclosure. , transparent.

Thirdly, the provisions of Vietnam's securities law currently do not have regulations on information disclosure management of public companies on the Upcom market (Unlisted Public Company Market) and the OTC market (Over The Counter). Market). It can be seen that, in recent times, the number of legal violations occurring in these two markets has been increasing in both quantity and severity, but the management agency itself has not fully controlled it, to ensure the rights and interests of investors in the market.

3. Solutions to improve the efficiency of information disclosure activities of listed companies to protect the rights and interests of investors in the stock market

In order to ensure safety in the stock market as well as protect the legitimate rights and interests of investors, listed companies are required to disclose and transparent information and comply with the provisions of law, and fully implement commitments to shareholders, apply accounting and auditing systems according to international standards. When perfecting the law on information disclosure of companies listed on the stock market, there should

be regulations on investor protection in information disclosure activities of companies listed on the stock market:

Firstly, it is necessary to improve the legal regulations on information disclosure in a way that is easy to understand and simple in application and enforcement. There should be clear regulations on the concepts of related persons and regulations on groups of relevant persons. Related information disclosure responsibilities for major shareholders owning 5% or more of stocks and investment fund certificates; Related groups of people and people inside the company; and regulate information disclosure standards by group of companies based on capital size and publicness...

Secondly, add regulations on cases where companies are allowed to proactively disclose information due to urgent business requirements. In fact, in Vietnam and around the world, the activities of many businesses bear the imprint of the leader, even the personal name is attached to the brand of the business, each statement and action is recognized by the investor. Investors are interested and have a strong impact on stock prices. How to proactively communicate with investors, helping them have a comprehensive, timely, accurate view of the event or letting investors learn for themselves will determine the investor's view of the event. In particular, in the financial market in Vietnam, where individual investors dominate and transactions are strongly influenced by crowd psychology, information transparency will repel unwanted rumors for businesses, avoiding unnecessary losses for both businesses and investors.

Thirdly, review the necessary regulations to disclose information periodically, unusual information, and information upon request to avoid listed companies missing their information disclosure obligations. At the same time, research regulations to ensure the timeliness of disclosure of company information on the stock market.

Fourthly, the law needs to have regulations on investor protection mechanisms through: Having specific legal regulations on the establishment and operation of the Compensation Fund to protect investors of listed companies; There is a permanent body that plays the role of governance and management of the fund with members appointed by relevant stakeholders. On the other hand, there needs to be a mechanism for collective lawsuits and litigation, through which an organization can be authorized by its members to proactively conduct proceedings when necessary conditions are met. These are also very effective solutions that countries with developed stock markets such as the US, Japan... have applied.

Fifthly, enhance investors' responsibility in accessing and using information. Each investor can search and learn information about listed companies before deciding to invest or control their investment activities through many media channels. At the same time, each investor also needs to be a "wise investor" who always learns and updates market information to protect his or her own rights and interests as well as quickly access the latest information of the market, thereby making the most correct and effective investment decisions.

Conclusion

Information disclosure activities of listed companies play an important role in the market and have a significant impact on other market participants, especially investors. If a listed company's information is fully and accurately disclosed, it will have a very positive effect on investor confidence and the development of the stock market. Conversely, if the company's information is not disclosed transparently and promptly, it can easily lead to group interests that negatively affect investors and the sustainable development of the market. In information disclosure activities, accuracy, objectivity, and timeliness are always the top concerns for securities investors in particular and market participants in general. Inaccurate or non-objective information will directly impact investment results, businesses, and the market. To promote the sustainable development of the stock market, relevant laws related to information disclosure activities of companies listed on the stock market are continuously updated, adapting to each stage of the market. The goal is to build a stock market in Vietnam on par with stock markets in the region and around the world./.

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THE IMPACT OF CAPITAL STRUCTURE ON FIRM VALUE OF FOOD AND BEVERAGE ENTERPRISES LISTED ON THE VIETNAMESE STOCK MARKET

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Abstract: ***The objective of this study is to analyze the impact of capital structure on the firm value (measured by Tobin's Q) of the food and beverage industry listed on the Vietnamese stock market during the period 2017-2023. The study estimates a multivariate regression model using three different methods: OLS, FEM, REM, tests for model selection. FGLS method is used to overcome the model's defects. The research results indicate that firm value has a nonlinear relationship (a cubic relationship) with the capital structure of enterprises. Additionally, research results shows that firm value is also affected by factors such as: Firm size (SIZE), revenue growth (GROW), Current ratio (CR), state ownership (STATE), and the fixed assets ratio (FAS).***

• Keywords: *capital structure, firms value, tobin's Q.*

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1. Introduction

In the context of an increasingly volatile global economy and fierce competition, effective financial management has become a crucial factor determining the success and sustainability of enterprises. The ultimate goal that financial managers should aim for is to maximize asset value for shareholder or maximize firm value. Numerous factors impact firm value, including both internal and external factors of the business. Among these, selecting an appropriate capital structure is a significant factor affecting firm value (Modigliani & Miller, 1963). The capital structure, which refers to the mix of debt and equity (Van Horne & Wachowicz, 2005), not only directly influences the cost of capital but also profoundly impacts financial risk, profitability, and the overall value of the enterprise. Enterprises can raise capital from various sources to finance their production and business activities.

Determining the optimal capital structure is a complex issue and has attracted the interest of many scholars and financial experts. Classic theories such as the capital structure theory (Modigliani & Miller, 1963), agency theory (Jensen & Meckling, 1976), trade-off theory (Kraus & Litzenberger, 1973), and pecking order theory (Myers & Majluf, 1984) provide essential foundations for understanding the relationship between capital structure and firm value. However, applying these theories in practice requires a deep understanding of each enterprise's specifics, market conditions, and access to capital sources.

Currently, there have been some studies on the impact of capital structure on firm value, but not many in Vietnam, especially concerning food and beverage enterprises before and after Covid-19. Therefore, this article studies the impact of capital structure on firm value of 30 food and beverage enterprises listed on the Vietnamese stock market over seven years from 2017 to 2023. This study aims to assess the extent of the impact of capital structure on firm value of the food and beverage industry, providing a scientific basis for managers to make appropriate financial decisions.

Besides the introduction, the article includes the following sections: theoretical background and literature review; research methodology; research results; and discussion of research results.

2. Theoretical background and literature review

The beginning of the theory on the impact of capital structure on firm value is the research of Modigliani & Miller (1958) (M&M theory) in the absence of corporate income tax (CIT) with the assumption: Capital market is a perfect market, there are no transaction costs, financial distress and bankruptcy costs, investors have the same expectations of cash flows from the same investment, capital structure does not affect firm value. Modigliani & Miller (1963) relaxed the assumptions by considering corporate income tax as a factor determining capital structure and concluded that using debt can increase corporate value due to the benefit of tax shield from debt. Therefore, according to Miller & Modigliani (1963), businesses should use debt as much as possible to maximize corporate value.

Based on the M&M theoretical foundation, many studies have been carried out. The trade-off theory of

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capital structure by Kraus and Litzenberger (1973) and developed by Myers (1977) reflects the trade-off between tax benefits (tax shields) due to the use of debt and costs related to debt (financial distress costs and agency costs). According to Kraus and Litzenberger (1973), businesses should only use a certain level of debt to maximize firm value, contrary to the M&M theory that firm value is higher the more it is used. The agency cost theory has considered the agency cost factor (Jensen & Meckling, 2019), the results show that a higher debt ratio will reduce agency costs and increase firm value. Meanwhile, the pecking order theory (Myers & Majluf, 1984), businesses will choose capital sources according to the priority order of capital sources; businesses that generate high profits tend to use retained profits to finance investment needs. Therefore, the relationship between debt usage and firm value is inversely proportional.

Regarding the impact of capital structure on firm value, there have been many empirical studies have been conducted in recent years. Abor (2005) studied the impact of capital structure on firm value through the financial efficiency approach (ROE) of 22 listed enterprises on the Ghana stock market in the period 1998-2002. The research results showed that indicated a positive relationship between the debt ratio and ROE using the OLS method. Sudiyatno et al. (2012) researched listed companies on the Indonesian Stock Exchange from 2008-2010 and found that capital structure has a positive relationship with firm value. These findings are consistent with the studies of Berger & Di Patti (2006) and Abu-Rub (2012).

Conversely, Ahmad et al. (2012) using data including 58 Malaysian enterprises in the period 2005-2011. Research results show that there is a negative relationship between capital structure and ROE, ROA. Khan (2012) studied 36 businesses listed on the Karachi Stock Market in Pakistan in the period 2003-2009 and showed that capital structure has a negative impact on ROA and Tobin's Q. This result is similar to the studies of Rayan (2008), Hasan et al. (2014)

Xu et al. (2005) also pointed out that business performance is greatly influenced by its capital structure. Efficiency is inversely proportional to capital structure when the debt ratio is exceeds 37.6%. When the debt ratio is below 37.6%, the result are the opposite. The relationship between a business performance and its capital structure is a quadratic or cubic function. Ghosh (2008) studied the impact of dividend policy, financial leverage and profitability on firm value, finding a quadratic relationship between the future firm value and financial leverage. Research by Tran & Duong (2011) analyzed data of 126 listed companies in the period from 2006 - 2009. The study used a quadratic regression model to examine the relationship between management ownership ratio and business performance. Research results have shown that management ownership below 59.1% positively affects operational efficiency, and the opposite is true for ownership above this threshold.

3. Research models and methods

3.1. Research samples and data

In this article, the author uses data of 30 food and beverage enterprises listed on the HOSE and HNX stock market for 7 years from 2017 - 2023. The data is collected from the financial reports of these 30 enterprises during the this period, sourced from the website: http://cophieu68.vn. The observed data is in panel form, consisting of 210 observations. The author uses Stata 17 software for data analysis. The study estimates two multivariate regression models using three methods: Pools OLS; Fixed effects model FEM and random effects model REM to examine the impact of factors on firm value as measured by Tobin's Q, particularly focusing on the impact of capital structure on firm value. Additionally, the study conducts F-tests and Hausman tests to select the appropriate model for the dataset, then checks for heteroscedasticity and autocorrelation, and addresses these issues using the GLS model to choose the appropriate model for discussing the research results.

3.2. Research model

3.2.1. Dependent Variable: Firm Value

The author uses Tobin's Q as a representative for firm value because Tobin's Q reflects the value of a company's assets adjusted to market value. Additionally, among the market value ratios, Tobin's Q is a good tool for evaluating firm value. This index has been used in several studies Singh & Bansal (2016); Aggarwal & Padhan (2017), Masidonda et al. (2013).

$$Tobin's\ Q = \frac{\text{Market Value of Equity} + \text{Market Value of Debt}}{\text{Book Value of Total Assets}}$$

In practice, to simplify calculations, the market value of debt is measured by the book value of debt. The market value of equity is calculated by multiplying the market price per share by the total number of outstanding common shares.

3.2.2. Independent Variables

The article studies the impact of capital structure on the value of firms using multivariate regression models. Therefore, the explanatory variable is the capital structure or financial leverage (LEV), measured by the proportion of total debt to total assets of the firm. Additionally, the author uses control variables that affect firm value, including Firm size (SIZE), revenue

growth (GROW), Current ratio (CR), state ownership (STATE), and the fixed assets ratio (FAS).

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

Variable	Symbol	Measurement	References
Tobin's Q	Q	(Market Value of Equity + Book Value of Debt)/Book Value of Total Assets	(Singh & Bansal, 2016); (Aggarwal & Padhan, 2017)
Capital Structure	LEV	Total Debt / Total Assets	(Xu et al., 2005); (Ghosh, 2008); (Sudiyatno et al., 2012)
Firm Size	SIZE	Ln(Total Assets)	(Aggarwal & Padhan, 2017), (Zeitun & Tian, 2007)
Revenue Growth	GROW	(Current Year Revenue - Previous Year Revenue) / Previous Year Revenue	(Glancey, 1998); (Aggarwal & Padhan, 2017); (Maury, 2006)
Fixed Asset Ratio	FAS	Fixed Assets / Total Assets	(Rajan & Zingales, 1995); (Booth et al., 2001)
Current Ratio	CR	Current Assets / Current Liabilities	(Antoniou et al., 2008)
State Ownership	STATE	Proportion of State-Owned Shares	(Yu, 2013), (Nguyen, 2023)

Source: Compilation by the author

The author proposes two multivariate regression models:

Model 1: $Q_{it} = \beta_1 + \beta_2 LEV_{it} + \beta_3 + \beta_4 Size_{it} + \beta_5 GROW_{it} + \beta_6 FAS_{it} + \beta_7 CR_{it} + \beta_8 CR_{it} + u_{it}$

Model 2: $Q_{it} = \beta_1 + \beta_2 LEV_{it} + \beta_3 + \beta_4 \beta_5 Size_{it} + \beta_6 GROW_{it} + \beta_7 FAS_{it} + \beta_8 CR_{it} + \beta_9 CR_{it} + u_{it}$

4. Results of the study

4.1. Testing correlation coefficients and multicollinearity among variables

Table 2: Correlation matrix and multicollinearity among variables

	Q	LEV	LEV2	LEV3	SIZE	FAS	GROW	STATE	CR
Q	1.000								
LEV	-0.2893	1.000							
LEV2	-0.2844	0.9825	1.000						
LEV3	-0.2600	0.9435	0.9879	1.000					
SIZE	0.1805	0.2081	0.1966	0.1925	1.000				
FAS	0.0994	-0.0033	-0.0292	-0.0422	0.0854	1.000			
GROW	-0.0445	-0.0474	-0.0158	0.0040	-0.0382	-0.0135	1.000		
STATE	0.4687	-0.2799	-0.2969	-0.2904	0.1636	0.0284	-0.0770	1.000	
CR	0.1641	-0.7171	-0.6170	-0.5394	-0.2874	0.2117	0.2625	0.0751	1.000

Source: Analysis results from Stata 17 software

The correlation between variables in the model is shown in Table 2. It can be observed that variable Q is strongly correlated with most variables in the model. Specifically, variable Q exhibits statistically significant correlations with LEV, LEV2, LEV3, SIZE, STATE, and CR (sig < 0.05).

4.2. Model selection test

- In Model 1, the coefficients for LEV and LEV2 are -1.520002 and 0.7991155, respectively, with p-values of 0.578 and 0.761 (>0.05). Therefore, this model does not demonstrate a significant impact of capital structure on Tobin's Q. Meanwhile, in the cubic model (Model 2), all three variables LEV, LEV2, and LEV3 have p-values < 0.05, indicating that the cubic model is appropriate for explaining the effect of capital structure on Tobin's Q in the food and beverage industry.

Table 2: Regression result of the Pooled OLS model

	Quadratic Model (Model 1)		Cubic Model (Model 2)	
	Adj R-squared = 0.5588		Adj R-squared = 0.5954	
	Coefficient	P>|t|	Coefficient	P>|t|
LEV	-1.520002	0.578	25.3418	0.003
LEV2	.7991155	0.761	-56.44208	0.001
LEV3			38.97336	0.001
SIZE	.0830616	0.009	.0827509	0.008
FAS	.6142424	0.138	.7140558	0.078
GROW	-.0407324	0.489	-.0660988	0.254
STATE	.0150953	0.000	.0133436	0.000
CR	.0741202	0.450	.320921	0.008
_cons	.2958876	0.766	-4.109444	0.012

Source: Analysis results from Stata 17 software

- The study continues by estimating the cubic model using Fixed Effects Model (FEM) and Random Effects Model (REM), followed by model selection tests.

- The F-test results are: F(29, 171) = 13.56; Prob > F = 0.0000 < 0.05, indicating that the FEM is more appropriate than the pooled OLS model.

- The Hausman test results are: chi2(8) = 61.59; Prob > chi2 = 0.0000 < 0.05, indicating that the FEM is more suitable than the REM. Therefore, the Fixed Effects Model (FEM) is the most appropriate model.

- The author tests for the presence of heteroskedasticity and autocorrelation in the FEM model.

+ The test for heteroskedasticity yields: chi2(30) = 8606.27; Prob > chi2 = 0.0000 < 0.05, indicating the presence of heteroskedasticity.

+ The test for autocorrelation yields: F(1,29) = 12.616; Prob > F = 0.0013 < 0.05, indicating the presence of autocorrelation.

4.3. Multivariate regression model

To address the issues of autocorrelation and heteroskedasticity in the FEM model, estimation was conducted using Generalized Least Squares (GLS). The results are presented in Table 3:

Table 3: Regression results of the GLS model

Q	Coeficient	Std. err	P>|z|
LEV	16.50016	4.923881	0.001
LEV2	-36.00773	10.02665	0.000
LEV3	24.96683	6.684158	0.000
SIZE	.0581012	.021398	0.007
FAS	.3841691	.2190332	0.079
GROW	-.1097466	.039039	0.005
STATE	.0077948	.001864	0.000
CR	.2834488	.0749076	0.000
_cons	-2.622399	.9820644	0.008

Source: Analysis results from Stata 17 software

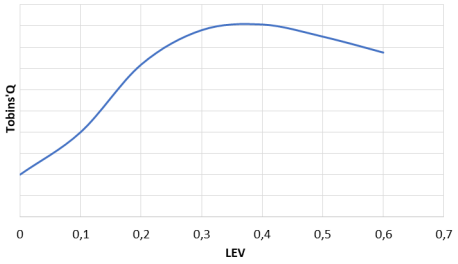
5. Discussion of Research Findings

Explanatory variable: Capital structure

The research findings reveal a cubic relationship between Tobin's Q and the capital structure of businesses. Based on the results of the multivariate

regression, we can illustrate the relationship between Tobin's Q and the capital structure (LEV) in a generalized graph as follows:

Figure 1: Relationship between Tobin's Q and the capital structure (LEV) of enterprises



Through mathematical analysis, the vertex of the curve is found to be approximately at a capital structure ratio of LEV = 37,7%, which is also the optimal point according to the trade-off theory of capital structure. From this, several implications can be drawn:

- Tobin's Q has a cubic relationship with the capital structure (LEV) of enterprises (Total Debt/Total Assets).

- When the debt ratio increases and is less than 38%, Tobin's Q increases. However, when the debt ratio exceeds 37,7%, Tobin's Q decreases. Therefore, businesses can adjust their debt levels accordingly to optimize Tobin's Q.

- This study represents a practical continuation of global research (Xu et al., 2005; Zeitun & Tian, 2007; Ghosh, 2008), and the findings are consistent with the theoretical framework of capital structure trade-off theory, applicable in the current context in Vietnam.

Control variables

According to the results in Table 4, the coefficients of the control variables including firm size (SIZE), revenue growth (GROW), short-term liquidity (CR), state ownership (STATE) are statistically significant at the 1% level, while fixed asset ratio (FAS) is significant at the 10% level. Specific findings include:

- The coefficient of firm size (SIZE) is positive, indicating that firm size positively correlates with Tobin's Q. Larger firms typically have stronger financial capabilities, credibility, and lower bankruptcy risk, thereby reducing financial costs, increasing profitability, and enhancing Tobin's Q. This finding aligns with (Aggarwal & Padhan, 2017; Zeitun & Tian, 2007).

- Revenue growth (GROW) shows a negative relationship with Tobin's Q. Firms experiencing rapid revenue growth require more capital for investment projects. If internal funds are insufficient, these firms tend to prioritize debt. With high debt levels, inefficient business operations can lead to increased costs and decreased profitability, thereby reducing Tobin's Q in the future. This finding is consistent with (Aggarwal & Padhan, 2017; Glancey, 1998).

- Fixed asset ratio (FAS) positively impacts Tobin's Q. According to capital structure trade-off theory, a higher proportion of fixed assets allows firms to pledge more collateral and pursue more investment opportunities, thus reducing bankruptcy risk and increasing Tobin's Q. The findings are in line with (Rajan & Zingales, 1995; Booth et al., 2001).

- Current ratio (CR) positively affects Tobin's Q. Firms with strong liquidity contribute to efficient operations, thereby influencing Tobin's Q positively. This result is consistent with (Antoniou et al., 2008; Aggarwal & Padhan, 2017).

- State ownership (STATE) shows a positive albeit small impact on Tobin's Q. This finding is in agreement with (Yu, 2013; Nguyen, 2023).

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IMPROVING THE APPLICATION OF STRATEGIC COST MANAGEMENT ACCOUNTING TECHNIQUES IN VIETNAMESE GARMENT ENTERPRISES

PhD. Chu Thi Huyen* - Chu Khanh Linh

Abstract: ***The study focuses on evaluating the application of strategic cost management accounting (SCMA) techniques in Vietnamese garment enterprises in order to propose solutions improving the application SCMA techniques in the enterprises. Techniques tested in this study including activity based costing (ABC), target costing (TC), life cycle costing (LCC), cost of quality (COQ) and value chain costing (VCC). To achieve the objectives of the study, the paper employed qualitative and quantitative research methods. The findings show that Vietnamese garment enterprises have applied SCMA techniques, but the degree of the techniques application is quite limited. Based on the research results, the research has proposed recommendations to improve and further promote the application of SCMA techniques in garment firms in Vietnam.***

• Keywords: *strategic cost management accounting, strategic cost management accounting tools, Vietnamese garment enterprises.*

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1. Introduction

Viet Nam has experienced sustained and rapid economic growth over the last decade, which has mainly been driven by widespread growth in the processing and manufacturing sectors. Among them, garment industry plays an important role in socio-economic development, job creation, labor mobility, and economic restructuring. Despite the considerable progress achieved in recent years, Viet Nam's garment sector still faces numerous challenges, such as low value-added products with low-skilled work and weak internal strength of the sector etc… Moreover, the process of increasing intensive international economic integration between Vietnam and other countries around the world has significantly affected the garment industry. To meet the strict import and export standards of countries, managers in Vietnamese garment business need relevant information in general and appropriate costing information in particular to make effective decisions. However, conventional costing systems no longer conform to that revolution, leading to the emergence of modern techniques. Among them, SCMA techniques have enabled accounting information to support managers in enterprises to make strategic decisions and a result, the appearance of SCMA techniques enhances competitive advantages of the firms in an increasingly competitive business environment (Cinquini & Tenucci, 2010)

This article aims to identify and assess the level of application SCMA in garment companies in Vietnam. From analysis presented, the study makes recommendations to improve and further promote the application of SCMA tools in enterprises.

The paper is structured as follows. The next section presents research overview. The third section is research methods. Finally, research results, discussions and recommendations are presented in the last section.

2. Research overview

Although many authors of the strategic management accounting have based their writings on general strategies that provide competitive advantage to companies on the writing of (Porter, 1980 & 2012), which had explained that companies can follow one or more of the following competitive strategies: (1) Cost Leadership Strategy: This strategy focuses on achieving the greatest reduction in cost of production inputs commensurate with the cost that maintains competitive advantage (Wilson, 1995); (2) Product

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Differentiation Strategy: This strategy is based on that companies continue competition by providing goods or services with attractive characteristics that make customers prefer them to the goods and services of other competitors; (3) Focus Strategy: This strategy is based on the selection of a segment of customers, and practically focuses on fulfilling their distinctive needs that are different from the needs of the rest of customers (David, 1993).

Nguyen and Mai (2019) stated that SCMA is techniques used to to help enterprises gain competitive advantages through low-cost leadership. Based on reviewing of domestic and foreign studies, it is possible to summarize some of the basic techniques of SCMA shown in Table 1 below.

Table 1: The techniques of strategic cost management accounting

TT	SCMA techniques	Nguồn
1	Attribute costing	Guilding et al. (2000); Cravens and Guilding (2001); Cinquini and Tenucci (2007); Cravens and Guilding (2008); Fowzia (2011); Nguyen and Mai (2019); Tran and Tran (2020); Dinh and Nguyen (2021); Ngo and Dinh (2022)
2	Activity Based Costing	Cravens and Guilding (2001); Cinquini and Tenucci (2007); Cravens and Guilding (2008); Fowzia (2011); Alnawaiseh (2013); Nuhu et al. (2017); Nguyen and Mai (2019); Dinh and Nguyen (2021); Ngo and Dinh (2022), Nguyen (2021)
3	Life Cycle Costing	Guilding et al. (2000); Cravens and Guilding (2001); Cinquini and Tenucci (2007); Cravens and Guilding (2008); Fowzia (2011); Alnawaiseh (2013); Pavlatos (2015); Nguyen and Vu (2019); Thai (2019); Tran and Tran (2020); Dinh and Nguyen (2021); Nguyen (2021)
4	Cost of Quality	Guilding et al. (2000); Cravens and Guilding (2001); Cinquini and Tenucci (2007); Cravens and Guilding (2008); Fowzia (2011); Alnawaiseh (2013); Nguyen and Vu (2019); Tran and Tran (2020); Nguyen (2021); Ngo and Dinh (2022)
5	Target Costing	Guilding et al. (2000); Cravens and Guilding (2001); Cinquini và Tenucci (2007);Cravens and Guilding (2008); Alnawaiseh (2013); Nuhu và cộng sự. (2017); Nguyen and Vu (2019); Thai (2019); Tran and Tran (2020); Dinh and Nguyen (2021); Nguyen (2021)
6	Value Chain Costing	Guilding et al. (2000); Cravens and Guilding (2001); Cinquini và Tenucci (2007); Cravens and Guilding (2008); Fowzia (2011); Alnawaiseh (2013); Cescon et al. (2019); Nguyen and Vu (2019); Thai (2019); Dinh and Nguyen (2021); Ngo and Dinh (2022)
7	Kaizen costing	Nguyen and Vu (2019); Dinh and Nguyen (2021); Nguyen (2021); Ngo and Dinh (2022)
8	Strategic costing	Cravens and Guilding (2001); Cinquini and Tenucci (2007); Cravens and Guilding (2008); Fowzia (2011)
9	Just In Time	Nguyen (2021)

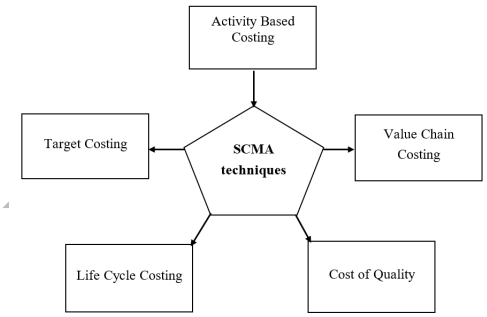
Source: Authors synthesized

3. Research methods

3.1. Qualitative research methods

Qualitative research methods wered used to design questionnaires, adjust and supplement independent variables in order to build scales of the level of application SCMA techniques in garment enterprises in Vietnam. After in-depth interviews with 10 experts and group discussions, the study proposed a research model on the application of SCMA tools in garment enterprises in Vietnam has shown in Figure 1 below:

Figure 1: Research model on the application of SCMA techniques in garment enterprises in Vietnam



Source: Authors synthesized

3.2. Quantitative research method

Based on the research model built in the qualitative research, the quantitative research method was used to evaluate the level of the application of SCMA techniques in Vietnamese garment enterprises using the Likert scale with 5 options and a jump of 0.8. Then the assessment is based on the average value as follows: From 1 to 1.8: do not apply; From 1.81 to 2.6: very low; From 2.61 to 3.4: Average; From 3.41 to 4.2: high and from 4.21 to 5.0: very high (Nguyen Dinh Tho, 2013).

3.2.1. Building variables and scales

The variables are identified and coded in Table 2 as follows.

Table 2: List of observed variables

No	Variables	Items	Encryption
1	Activity Based Costing (ABC)	4	ABC1, ABC2, ABC3, ABC4
2	Target Costing (TC)	6	TC1, TC2, TC3, TC4, TC5, TC6
3	Life Cycle Costing (LCC)	6	LCC1, LCC2, LCC3, LCC4, LCC5, LCC6
4	Cost of Quality (COQ)	5	COQ1, COQ2, COQ3, COQ4, COQ5
5	Value Chain Costing (VCC)	3	VCC1, VCC2, VCC3

Source: Authors synthesized

3.2.2. Sample selection and data collection

We sent 80 questionnaires to respondents including managers, chief accountants and people who are directly working as management accountants at garment enterprises in Vietnam from 05/11/2022 to 15/12/2022. We received 65 ones (accounting for 81.3%). However, only 63

suitable questionnares were used for analysis purpose.

4. Research results, discussions and recommendations

4.1. Research results and discussions

The results of descriptive statistics show that the level of application of SCMA techniques in Vietnamese garment enterprises is different among tools. In which, the level of application of each specific technique is as follows:

The results described in Table 3 show that the mean value of ABC technique is 1.6865 lower than 1.8. It means that Vietnamese garment enterprises do not apply ABC. The mean value for ABC1, ABC2 and ABC4 at 1.75; 1.56 and 1.55 respectively are lower than 1.8 except for the ABC3 with Mean of 1.89. Thus, garment enterprises cannot determine the list of activities in the product process as well as determine the necessary costs for each activity and allocate costs of activities to products. Although enterprises have allocated indirect costs for activities, the level is still very low (average value is only 1.89).

Table 3: The application of ABC technique in Vietnamese garment enterprises

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
ABC1- The company determines the list of activities in the product process	63	1	3	1.75	.671
ABC2- The company determines the cost required for each activity	63	1	3	1.56	.562
ABC3- The company allocates indirect costs to activities	63	1	3	1.89	.625
ABC4- The company allocates the cost of the activities to the products	63	1	3	1.56	.590
ABC	**63**	**1.00**	**2.75**	**1.6865**	**.37289**
Valid N (listwise)	63				

Source: Data analysis based on SPSS 26

In terms of the application of TC technique: According to Table 4, the mean value for this technique of 3.2 is lower than 3.4 and higher than 2.6. Therefore the level of adoption of TC tool in Vietnamese garment enterprises see an average level. The mean value for all variables including TC4, TC3, TC 1 and TC2 are higher than 3.2. It means that: The companies have seek to reduce the cost of a product at an early stage of production; The companies have determined total cost of the product before the start of the production process, based on selling price and target profit; The companies have determined the target profit of the product before production. However, the continuous application of strategy of product designing and improving and determination of the target profit of the product based on the expected sales volume of the product have not been given adequate attention.

Table 4: The application of TC technique in Vietnamese garment enterprises

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
TC1- The company determines the selling price of the product based on market studies before starting the production process.	63	1	5	3.25	.803
TC2- The total cost of the product is determined before the start of the production process, based on selling price and target profit	63	1	5	3.21	.919
TC3- The company determines the target profit of the product before production	63	1	5	3.35	.806
TC4- The company seeks to reduce the cost of a product at an early stage of production	63	1	5	3.38	.888
TC5- The company continuously adopts a strategy of product designing and improving	63	1	5	3.03	.933
TC6- The company determines the target profit of the product based on the expected sales volume of the product	63	1	5	3.14	.998
TC	**63**	**1.33**	**5.00**	**3.2275**	**.73342**
Valid N (listwise)	63				

Source: Data analysis based on SPSS 26

Table 5: The application of LCC technique in Vietnamese garment enterprises

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
LCC1- The company analyzes product life cycle costs	63	1	4	3.03	.803
LCC2- The company uses the cost techniques to reduce costs for each stage of the product life cycle	63	1	4	2.95	.792
LCC3- The managers takes into consideration customer desires at every stage of the product life cycle	63	1	5	3.22	.812
LCC4- The management works to reduce costs at each stage of the product life cycle	63	1	4	2.98	.772
LCC5- The management makes assessments for expected time of each stage of the product life cycle	63	1	5	3.25	.782
LCC6- The company aggregates all costs incurred as apart of product cost	63	1	4	3.27	.787
LCC	**63**	**1.67**	**4.17**	**3.1190**	**.61742**
Valid N (listwise)	63				

Source: Data analysis based on SPSS 26

The survey results (Table 5) show that the mean value related to the usage LCC technique

in garment enterprises in Vietnam reached 3.1, ranging from 2.61 to 3.4. Therefore, LCC and TC adopted in these units is the same because of being medium. Because the mean value for LCC6, LCC5, LCC3 và LCC1 are more than 3.0, garment enterprises in Vietnam pay their attention on gathering all costs happened; The managers have taken into consideration customer desires at every stage of the product life cycle; The companies have analyzed product life cycle costs. However, The mean value of LCC2 and LCC4 is only 2.95 and 2.98 respectively. It means that the usage of the cost techniques to reduce costs for each stage of the product life cycle as well as works to reduce costs at each stage of the product life cycle is not high.

Similarly, it is clear from Table 7 that the mean value related to the usage COQ technique in garment enterprises in Vietnam reached 2.26, ranging from 1.81 to 2.6. The results indicate that the application of the COQ tool has obtained the low level.

Table 6: The application of COQ technique in Vietnamese garment enterprises

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
COQ1- The company determines the costs associated with the design, implementation and maintenance of the company's quality standard system	63	1	4	2.49	.780
COQ2- The company sets standards for the quality of their services and products	63	1	4	2.17	.908
COQ3- The company determines the costs associated with measuring, evaluating and validating inputs and outputs to ensure that products meet product's quality standards	63	1	4	2.08	.848
COQ4- The company determines the costs covering internal risks when the products and inputs do not meet the standards and quality requirements	63	1	4	2.03	.861
COQ5- The company determines the costs covering external risks when the products and inputs do not meet the standards and quality requirements	63	1	4	2.56	.799
COQ	**63**	**1.00**	**3.80**	**2.2667**	**.65451**
Valid N (listwise)	63				

Source: Data analysis based on SPSS 26

Table 7 appears that the general mean of COQ technique equals 1.7884 ranging from 1 to 1.8 this means that garment firms don't use this tool. Aspects related to the performance of activity-based costing include VCC1 and VCC3 of 1.79 and 1.73 respectively, which are both lower than 1.8, except for the standard VCC2 with a mean value of 1.84. Therefore, garment enterprises do not allocate costs to the designing activity, marketing and distributing activities. Although garment enterprises have allocated costs to the producing activity, the level of application is still very low.

Table 7: The application of VCC technique in Vietnamese garment enterprises

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
VCC1- The company allocates costs to the designing activity	63	1	4	1.79	.826
VCC2- The company allocates costs to the producing activity	63	1	4	1.84	.766
VCC3- The company allocates costs to the marketing and distributing activities.	63	1	4	1.73	.807
VCC	**63**	**1.00**	**4.00**	**1.7884**	**.68601**
Valid N (listwise)	63				

Source: Data analysis based on SPSS 26

The general average value (Table 8) related to the application of SCMA techniques equals approximately 2.42, it can be concluded that Vietnamese garment enterprises have applied SCMA's techniques but the level of application of these techniques is low. When considering specifically the level of application of each specific technique, the level of application of each technique is different. Vietnamese garment enterprises do not apply ABC and VCC techniques. The rest techniques have applied by Vietnamese garment enterprises, but the level of application of each technique is not the same: The two most commonly applied techniques are TC and LCC, but the level of adoption is also only average. Meanwhile, the level of application COQ in Vietnamese garment enterprises is low.

Table 8: The application of SCMA techniques in Vietnamese garment enterprises

	Descriptive Statistics						The level of application
	N	Minimum	Maximum	Mean	Rank	Std. Deviation	
ABC	63	1.00	2.75	1.67	**5**	.37289	No
TC	63	1.33	5.00	3.23	**1**	.73342	Average
LCC	63	1.67	4.17	3.12	**2**	.61742	Average
COQ	63	1.00	3.80	2.27	**3**	.65451	Low
VCC	63	1.00	4.00	1.79	**4**	.68601	No
Total				**2,42**			

Source: Data analysis based on SPSS 26

4.2. Recommendations

Examining Table 8 the results indicate that Vietnamese garment enterprises have applied 3 techniques of SCMA including TC, LCC and COQ. However, the level of application is only

low and medium. Meanwhile, ABC and VCC have not yet been used. Therefore, the research gives two groups of recommendations: (1) Improve the application of TC, COQ and LCC and (2) recommendations to promote the application of ABC and VCC in the future.

First, *recommendations to improve the application of target cosing and life cycle costing and product quality costs*

Improving the usage of target costing technique: In the coming time, Vietnamese garment enterprises need to continue paying more attention to: (1) seek to reduce the cost of a product at an early stage of production; (2) determine the selling price of the product based on market studies before starting the production process; (3) determine total cost of the product before the start of the production process, based on selling price and target profit; (4) determine the target profit of the product before production; (5) adopt a strategy of product designing and improving and (6) determine the target profit of the product based on the expected sales volume of the product

Improving the application of life cycle costing technique: In the coming time, Vietnamese garment enterprises need to continue and pay more attention to: (1) analyze product life cycle costs; (2) use the cost techniques to reduce costs for each stage of the product life cycle; (3) take into consideration customer desires at every stage of the product life cycle; (4) work to reduce costs at each stage of the product life cycle; (5) make assessments for expected time of each stage of the product life cycle and (6) aggregate all costs incurred as apart of product cost.

Improving the application of cost of quality technique: In the coming time, Vietnamese garment enterprises need to better perform the following tasks: (1) determine the costs associated with the design, implementation and maintenance of the company's quality standard system; (2) set standards for the quality of their services and products; (3) determine the costs associated with measuring, evaluating and validating inputs and outputs to ensure that products meet product's quality standards; (4) determine the costs covering internal risks when the products and inputs do not meet the standards and quality requirements and (5) determine the costs covering external risks when the products and inputs do not meet the standards and quality requirements.

Second, *recommendations to promote the application of activity-based costing and value chain costing in Vietnamese garment enterprises*

Recommendations to promote the adoption of activity-based costing: In the next time, Vietnamese garment enterprises need to pay attention and perform the following tasks: (1) determine the list of activities in the product process; (2) determine the cost required for each activity; (3) allocate indirect costs to activities and (4) allocate the cost of the activities to the products. However, because the ABC technique will be effective when there are more and more three factors appearing: (1) overhead manufacturing costs account for a large proportion; (2) Complicated production technology; (3) Flexible and diversified products; (4) Using a variety of inputs and manufacturing costs should be assessed regularly.

Recommendations to promote the adoption of value chain costing: In the next time, Vietnamese garment enterprises need to pay attention and perform the following tasks: (1) allocate costs to the designing activity; (2) allocate costs to the producing activity and (3) allocate costs to the marketing and distributing activities.

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CREDIT RISK MANAGEMENT FOR INDIVIDUAL CUSTOMERS AT TECHCOMBANK VIETNAM

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Abstract: ***Techcombank is one of the leading commercial banks in Vietnam, operating as a joint-stock company and playing a vital role in the country's banking sector. Risk management, particularly in credit and lending to individual customers, is a critical focus of its operations. However, there are notable limitations, such as the inadequate assessment of potential risks in credit-related processes, insufficient attention to business risks associated with loan portfolios, and instances of subjective attitudes among credit officers. This article examines the current state of credit risk management for individual customers at Techcombank during the period 2020–2022. By applying fundamental theories of credit risk management in commercial banks, the study analyzes Techcombank's practices and proposes solutions to enhance its management of credit risks for individual customers.***

• Keywords: *personal customer credit; personal customer credit risk management, techcombank.*

JEL codes: G21

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1. Basic issues of credit risk management for individual customers of commercial banks

a. Concept of individual customer credit risk

Risks in individual customer credit are determined based on the assessment of various factors that could potentially cause damage to the bank, including the possibility of non-payment or delayed repayment, unfavorable changes in the customer's financial situation or income, risks related to collateral, and other factors that may affect the customer's ability to repay.

b. Concept of individual customer credit risk management

Individual customer credit risk management involves the process of identifying, evaluating, preventing, and controlling risks that may arise from granting credit to individual customers. It plays a crucial role in protecting the interests of both banks and customers while contributing to the overall improvement of the financial industry's operational efficiency.

2. Current status of Techcombank's individual customer credit risk management

a. Current status of individual customer credit risk management at Techcombank

Current status of individual customer credit risk identification

Currently, the risk identification process includes: (1) Each credit officer collecting and documenting risk indicators related to individual customer credit during professional processes, and (2) the Head of the Business Planning Department at each Techcombank branch forwarding these indicators to the Retail Banking and Small Business Risk Management Department for evaluation. The evaluation results are then sent back to the branches and presented to the Branch Director for approval. Risk indicators for individual customer credit are statistically recorded, including their frequency, potential causes, and proposed remedial solutions. At present, all branches within the system are required to submit appraisal documents, with final loan approval decisions made at the headquarters.

* *Results of risk identification in individual customer credit*

Pre-disbursement stage: Signs at this stage can be evaluated by the bank through collecting customer information, checking your credit history, evaluating your financial capacity and assets, and assessing your guarantees. If there are signs of risk, the bank may decide to refuse the loan or propose stricter loan conditions to minimize credit risk.

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Table 1: Results of risk identification before disbursement of individual customer credits at Techcombank in the period 2020 - 2022 (Trillion)

No	Criteria	2020	2021	2022	Difference 2021/2020		Difference 2022/2021	
					+/-	%	+/-	%
1	Signs	2,2528	3,712	4,2496	1,4592	64,77	0,5376	14,48
2	There are no signs	108,36	152,92	198,78	44,56	41,12	45,86	29,99

Source: Retail Banking and Small Business Customer Credit Risk Management Department - Techcombank

Identifying risks before disbursement is very important. If identified correctly, it helps banks avoid credit risks in the future. The table shows that loans displayed signs of rapidly increasing risks in 2021, with an increase rate of 64.77% compared to 2020. In the first quarter of 2022, the rate of increase is expected to decrease to 14.48% compared to 2021. The reasons for this decrease include many customers returning to work and their incomes gradually stabilizing after a long period of social relaxation. Signs of credit risk for individual customers at Techcombank before disbursement include: excessive debt load, insufficient income, lack of guaranteed assets, high loan demand (which is too large compared to their income and ability to repay), all of which indicate a higher credit risk. These signs suggest that customers may be facing difficulties in their financial situation.

Post-disbursement phase: This is the stage when the customer has received the disbursement according to the signed product.

Table 2: Results of risk identification after disbursement of individual customer credits at Techcombank in the period 2020 - 2022 (Trillion)

No	Criteria	2020	2021	2022	Difference 2021/2020		Difference 2022/2021	
					+/-	%	+/-	%
1	Signs	0,88	1,45	1,66	0,57	64,77	0,21	14,48
2	There are no signs	110,26	160,21	215,79	49,95	45,30	55,58	34,69

Source: Retail Banking and Small Business Customer Credit Risk Management Department - Techcombank

The results of risk identification after the disbursement of individual customer credits at Techcombank increased from 2020 to 2021 and continued to rise slightly into 2022. This increase demonstrates sensitivity and caution in identifying risks after disbursing funds and credit. While credit balances showed signs of risk, increasing from 0.88 billion in 2020 to 1.66 billion in 2021, the credit balances in 2022 did not show any additional signs of risk, even as they increased from 110.26 billion in 2020 to 215.79 billion in 2022. This indicates that the bank has increased its monitoring and focused on identifying credit accounts with potential risks after disbursement, while continuing to provide credit to customers with no signs of risk after disbursement. Some signs that Techcombank assesses as potential credit risks include: delays in debt repayment, failure to meet debt repayment conditions, insufficient funds in the customer's backup account to make monthly debt payments, changes in financial situation, and loss of customer contact."

Current status of risk measurement in individual customer credit activities

** Measurement tools and measurement scales*

The Credit Risk Management Department handles retail banking and small business customers, focusing on the current identification of credit risks. This is done by establishing a rating system for the credit portfolio to measure risk in terms of the likelihood of customer debt repayment when using products at Techcombank. The scoring scale for evaluating individual customers is divided into 5 debt groups, corresponding to the following PCB points levels:

Table 3: Ranking of individual customers at Techcombank

No	Credit rating type	Score achieved	Debt classification	Explain
1	**AA**	**576 or more**	Debt group 1	Customers have very good repayment capacity. Low risk of capital loss
	Aaa	Above 656		
	Aa1	Above 639		
	Aa2	Above 612		
	Aa3	Above 576		
2	**A**	**491 - 576**	Debt group 2	Customers have good repayment capacity. Low risk of capital loss
	A1	Above 541		
	A2	Above 519		
	A3	Above 491		
3	**B**	**386 - 491**	Debt group 3	Customers have good repayment capacity. Average risk of capital loss
	B1	Above 446		
	B2	Above 406		
	B3	Above 386		
4	**C**	**321 - 386**	Debt group 4	Customers have good repayment capacity. Average risk of capital loss
	C1	Above 364		
	C2	Above 345		
	C3	Above 321		
5	D	**Below 321**	Debt group 5	Customers have poor ability to repay debt High risk of capital loss
	E	**Below 151**		

Source: Retail Banking and Small Business Customer Credit Risk Management Department - Techcombank

** Measurement results*

During each period, the Credit Risk Management Department for Retail Banking, Small Business, and Business Sales will assign a minimum rating to

each customer. Customers are assigned credit scores and points for each rating category, following the regulations set by the Director. Specifically, in the 2020-2022 period, the Credit Risk Management Department for Retail Banking and Small Business Customers performed detailed ratings of individual customers as follows:

Table 4: Personal customer credit rating situation at Techcombank in the period 2020 - 2022 (Trillion, %)

No	Credit rating type	2020	2021	2022	Difference 2021/2020		Difference 2022/2021	
					+/-	%	+/-	%
1	AA	109,11	158,66	213,14	49,55	45,42	54,48	34,34
2	A	1,15	1,55	2,65	0,40	34,78	1,09	70,39
3	B	0,10	0,14	0,24	0,04	36,54	0,10	75,62
4	C	0,18	0,15	0,20	(0,03)	(16,31)	0,05	36,21
5	D, E	0,60	1,16	1,22	0,56	92,28	0,06	5,49
Total		**111,14**	**161,66**	**217,45**	50,52	45,45	55,80	34,51

Source: Retail Banking and Small Business Customer Credit Risk Management Department - Techcombank

Overall, Techcombank's credit ratings from 2020 to 2022 show a gradual upward trend, indicating that Techcombank has improved its ability to evaluate and manage the credit risks of individual customers. Specifically, the AA credit rating increased from 109.11 billion VND in 2020 to 213.14 billion VND in 2022, representing a 54.48% increase compared to 2021. This indicates that the number of customers with high credit ratings has significantly increased during this period. Similarly, other credit ratings, such as A, B, and C, also increased significantly, suggesting that customers' ability to repay their debts has improved. However, the D and E credit ratings increased the fastest during this period, rising by 92.28% from 0.60 thousand billion VND in 2020 to 1.16 thousand billion VND in 2021, and increasing by 5.49% to 1.22 thousand billion VND in 2022. This suggests that customers with low credit ratings remain a concern for Techcombank and need better management and handling. In summary, the table above shows that Techcombank has made improvements in its ability to assess and manage credit risk for individual customers during the 2020-2022 period. However, challenges remain in terms of managing low credit ratings and customer management.

Depending on results ranking level level of risk credit in lending customer individual Bank application policy Credit policies and credit risk management measures are as follows:

- AA rating: Post-loan control according to regulations every 3 months.

- Rated A: Issuing credit after analyzing and evaluating the entire financial system and according to the customer's ability to repay debt row; Check real estate business operations, assets guarantees of customers loans and business records 3 times/year; Check real estate assets guarantees and occupations activities businesses customers loans real estate and property car .. twice/year.

- Rated B: Issuing credit after analyzing and evaluating all financial and financial assets according to the customer's ability to repay debt; Control after loan once a month; Check real estate, business operations assets guarantees of customers loans and business records 3 times/year; Check real estate assets guarantees and occupations activities businesses customers loans real estate and property car...twice/year.

- Ranked C: Pay attention to checking the purpose and plan for using capital, and the situation of collateral assets; Closely implement monthly post-loan control.

- Rating D, E: Consider the plan to recover capital.

Current situation of risk control in individual customer credit activities

If the customer does not meet the credit risk assessment requirements, Techcombank will refuse to provide credit services, helping the bank avoid potential risks. In addition, checking and monitoring will help Techcombank detect abnormalities and handle them promptly to avoid potential risks. Besides that, credit insurance will protect Techcombank against undesirable risks when customers cannot repay their debts.

Table 5: Current status of individual customer credit risk control at Techcombank implemented in the period 2020 - 2022 (Times)

No	Measures applied	2020	2021	2022	Difference 2021/2020		Difference 2022/2021	
					+/-	%	+/-	%
1	Credit denied	86.625	97.600	126.198	10.975	12,67	28.598	29,30
2	Financial measures	45.024	47.784	66.399	2.760	6,13	18.615	38,96
3	Carry out inspection and supervision before, during, and after granting credit	56.728	68.952	82.124	12.224	21,55	13.172	19,10
4	Buy credit insurance	32.924	37.030	49.773	4.106	12,47	12.743	34,41

Source: Retail Banking and Small Business Customer Credit Risk Management Department - Techcombank

Credit denials increased from 86,625 instances in 2020 to 126,198 instances in 2022, an increase of more than 29% compared to 2021 and 12.6% compared to 2020. This indicates that Techcombank has implemented strict regulations to assess credit risk and reject credit applications from customers who cannot meet the requirements or assess credit risks. The use of insurance to mitigate credit risk has also increased sharply during the 2020-2022 period, rising from 32,924 instances in 2020 to 49,773 instances in 2022, a more than 34% increase compared to 2021 and more than 12.4% compared to 2020. This shows that Techcombank has utilized insurance solutions to minimize credit risks. However, the financial and real-time monitoring measures before, during, and after credit disbursement have grown more slowly compared to other measures. This suggests that Techcombank needs to focus on improving its ability to implement these measures to ensure effective control of individual customer credit risks. In general, Techcombank has introduced effective measures to control individual customer credit risks during the 2020-2022 period. However, there is a need to improve and enhance the ability to implement other credit risk control measures to ensure the safety and effectiveness of the bank's credit activities.

Table 6: Situation of provisioning for individual customer credit risks at Techcombank in the period 2020 - 2022 (Trillion, %)

Targets	2020	2021	2022	Difference 2021/2020		Difference 2022/2021	
				+/-	%	+/-	%
Total credit risk provisions in loans to individual customers actually deducted at the Bank. In there:	0,849	1,577	1,690	0,73	85,86	0,11	7,16
Deduction for group 2 debt	0,007	0,010	0,016	0,00	41,73	0,01	67,19
Deduction for group 3 debt	0,024	0,034	0,059	0,01	43,58	0,02	72,33
Deduction for group 4 debt	0,106	0,093	0,124	(0,01)	(11,99)	0,03	33,66
Deduction for group 5 debt	0,713	1,441	1,491	0,73	102,19	0,05	3,51
Total credit risk provisions in loans to individual customers must be deducted at the Bank	0,717	1,268	1,385	0,55	76,74	0,12	9,21
Ratio of credit risk provisions in personal customer loans actually set aside/ credit risk provisions in personal customer loans that must be set aside at the Bank (%)	118,30	124,40	122,07	6,10	5,16	(2,33)	(1,87)

Source: Retail Banking and Small Business Customer Credit Risk Management Department - Techcombank

This table includes indicators such as total credit risk provisions in individual customer loans actually set aside at banks, debt provisioning for groups 2, 3, 4 and 5, total credit risk provisions in loans. customer individual must be deducted at the bank, and ratio of provisions Credit risk actual deduction provision Credit risk must be deducted at the bank goods.

Total provisions, credit risk, loans, customers, individuals, actual provisions at banks have increased significantly in the period 2020-2022, from 0.849 billion VND billion in 2020 to 1,690 billion VND billion in 2022, an increase of more than 85.86% compared to 2021 This is 7.16% higher than in 2020. This shows that Techcombank has implemented measures to set up risk provisions. credit risks, customers, individuals, and effectively, helping banks minimize risks in credit activities.

Debt provisioning for groups 2, 3, 4 and 5 all increased during this period, in which debt provisioning for group 5 increased the most. This shows that Techcombank has focused on setting up provisions for debts with higher risk, helping to Banks minimize risks in credit operations.

Ratio of provisions Credit risk in loan customer individual actual deduction provision Credit risk in loan l customer individual right Bank deductions also increased significantly from 118.30% in 2020 to 124.40% in 2021 and decreased slightly down 122.07% in the year 2022. This shows that Techcombank has maintained the reserve ratio of credit risk in loans, customers, and individuals. multiplies at level of safety and minimizes risk in credit operations.

The table above shows that Techcombank has implemented measures such as provisioning and provisioning for risks, credit risks, customers, individuals, and effectiveness. In the period 2020-2022, it will help banks minimize risks in credit operations. These measures include concentration, setting up of provisions, for debts, with higher risk, maintaining the provision ratio Credit risk in lending to individual customers is at a safe level and minimizes risks in credit activities.

Current status of risk handling in individual customer credit activities

Currently, the Risk Management Department of credit, banking, retail, and customers, small businesses, and Techcombank is applying a number of measures. restructuring, time limit, debt repayment, asset handling, guarantees and provisioning, provisions, risks, credit, customers goods personal to handle when risk credit occur. Specifically:

Table 7: Handling credit risks in individual customer loans at Techcombank in the period 2020 - 2022

Targets	2020	2021	2022
Ratio of outstanding debt with restructured repayment term/ Total outstanding debt of individual customers	0,21%	0,22%	0,25%
The ratio of outstanding bad debts handled is equal to special assets/Total outstanding loans from individual customers	0,13%	0,15%	0,18%
Ratio of use of credit risk reserve fund / Total outstanding loans of individual customers	0,13%	0,29%	0,30%

Source: Retail Banking and Small Business Customer Credit Risk Management Department - Techcombank

The first indicator of the outstanding debt ratio is restructured, time, debt repayment/Total outstanding debt, individual customers, trend, increasing gradually, over the years. from 0.21% in 2020 to 0.25% in 2022. Indicator second second ratio ratio outstanding bad debt handled equals special assets/Total outstanding debt Individual customers also has a trend gradually increase over the years, from 0.13% in 2020 to 0.18% year 2022. Indicator third ratio utilization ratio fund reserve Credit risk/ Total outstanding debt individual customers sudden increase variable from 0.13 % in 2020 increased to 0.29% in 2021, then continued to increase slightly to 0.30% in 2022. This shows that Techcombank is are using credit risk reserve funds to reduce credit risks, however this ratio is still low compared to a number of banks. other goods. The use of credit risk reserve funds in lending to individual customers makes the bank's finances healthier, but does not mean completely eliminating loan debt for customers. The loans have risk after are offset by reserve fund risk will be Bank transfer foreign balance sheet to monitor and collect, the bank will continue to use remedial and handling measures to collect and recover debts.

Overall, the indicators in the table show that Techcombank is taking measures to handle credit risks in lending to individual customers, however, it is necessary to continue to improve these indicators to ensure risk handling. Credit is more efficient and meets the requirements of the financial industry.

b. Assessing the current status of individual customer credit risk management at Vietnam Technological and Commercial Joint Stock Bank

** Limitation*

First, potential risks have not been adequately evaluated in most credit reports. Techcombank has either not evaluated these risks or has evaluated them incompletely during the credit appraisal process. These risks can affect the solvency of customers and pose credit risks to the bank. Some customers may have significant debts at other banks that Techcombank is unaware of, or they may face other risks, such as health problems or changes in their business situation. If these risks are not fully evaluated and incorporated into the credit report, the bank may face credit risk if the customer is unable to repay the debt on time or at all.

Second, risk monitoring for the loan portfolio has not received adequate attention, and there are no centralized risk management measures by product or region.

Third, there is a tendency among credit staff to have a subjective attitude and place too much trust in familiar customers during the process of checking and evaluating borrowers. This is a serious issue in the bank's lending activities. This behavior can lead to lending to customers who lack the ability to repay, resulting in risks for the bank and damaging the bank's reputation in the market.

Additionally, the staff's knowledge in inspection and control is still weak. One of the reasons for the high increase in bad debts is the inadequate recognition of issues in post-loan inspection and control by staff. Many loans focus only on checking at the time of contract signing, with limited follow-up afterward. This work is often carried out in a formal and rule-bound manner, leading to oversight or incomplete monitoring of customers' capital usage and debt repayment ability.

** Reasons*

Causes from Techcombank:

Lack of Specialized Human Resources: Techcombank may lack human resources with expertise in areas such as risk control and credit management. This can result in staff members not having the necessary skills and experience to properly evaluate loans and manage risks.

Incomplete Training and Support for Staff: Techcombank may not be able to provide comprehensive training and support programs to help officers, managers, and employees master the processes of risk management and credit evaluation. This can lead to officials and employees not fully understanding the procedures and standards required to assess risks.

Over-Focus on a Limited Number of Customers: Techcombank may concentrate too much on a limited number of customers, leading to incomplete

and inaccurate risk assessments. This can result in a lack of understanding of the customers' financial situation, which may cause loans to be misaligned with the customer's ability to repay.

Causes from the Customer's Side:

Failure to Provide Sufficient Information: Customers may not provide enough information about their financial situation, making it difficult to assess their financial health and ability to repay loans. This can lead to credit risk if the customer is unable to repay the debt in full and on time.

Failure to Meet Asset Guarantee Requirements: Customers may not meet the bank's requirements for asset guarantees, which reduces the bank's ability to recover debt in the event of a risk. This can cause risks to the bank and negatively impact its business operations.

Poor Financial Management: Customers may have poor financial management, which can lead to their failure to repay debts in full and on time. This can result in risks for both the customers and the bank.

Failure to Meet the Bank's Credit Requirements: Customers may not meet the bank's credit requirements, such as providing proof of income, documentation of assets, or business-related documents. This can indicate that the customer lacks the ability to repay the debt, thus increasing the bank's credit risk.

Lack of a Specific Financial Plan: Customers may not have a specific financial plan for borrowing, which leads to the failure to develop a clear plan for repaying the debt in full and on time. This can result in risks for both the customers and the bank.

Causes from the Credit Environment:

Impact of the General Economy: In recent years, the economic recession, inflation, unemployment, and slow economic growth have increased credit risk for Techcombank. Customers may struggle to repay their debts due to these unfavorable economic conditions.

Volatility of Price Ratios and Interest Rates: Fluctuations in price ratios and interest rates have contributed to an increase in bad debts and credit risks for Techcombank. Over the past period, strong fluctuations in prices and interest rates have caused difficulties for customers in repaying their debts, which in turn has led to increased risk for the bank.

3. Some solutions to improve individual customer credit risk management activities of Techcombank

a. Complete risk identification in individual customer credit activities

To improve risk identification in individual customer credit activities at Techcombank, the bank needs to pay attention to the following points: (i) Strengthen data analysis capabilities; (ii) Strengthen the ability to train employees; (iii) Strengthen the ability to manage risks.

b. Complete risk measurement in individual customer credit activities

To improve risk measurement in individual customer credit activities, Techcombank can apply the following measures: (i) Forecast and add new risk factors; (ii) Measure the level of risk more often; (iii) Apply technology to measure risk and combine it with risk prediction; (iv) Build a multi-dimensional risk measurement model.

c. Complete risk control in individual customer credit activities

To improve risk control in individual customer credit activities at Techcombank, Techcombank can implement the following measures: (i) Strengthen internal management; (ii) Applying advanced technology; (iii) Carry out periodic inspections; (iv) Increase information for customers.

d. Complete risk handling in individual customer credit activities

To improve risk handling in individual customer credit activities, Techcombank can take the following measures: (i) Assess credit risk; (ii) Develop measures to prevent and control risks; (iii) Quickly handle bad debts; (iv) Diversified credit portfolio; (v) Strengthen risk management; (vi) Applying advanced technology.

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HOW INFORMATION TECHNOLOGY APPLICATION MEDIATES THE MOBILIZATION OF CAPITAL INVESTMENT IN THE AGRICULTURAL SECTOR IN TAY NINH PROVINCE

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Abstract: ***This study investigates the role of Information Technology Application in mediating the mobilization of investment capital in the agricultural sector of Tay Ninh Province. The research employs a quantitative design, utilizing a survey of 262 agricultural enterprises and investors, analyzed through Structural Equation Modeling (SEM) via SmartPLS 4 software. The findings reveal that ITA significantly enhances investment mobilization, acting as a crucial mediator between supportive policies, human resources, infrastructure, and investment promotion programs. The results underscore the importance of integrating IT into agricultural strategies to attract investments and drive sectoral growth, providing valuable insights for policymakers and stakeholders in the region.***

• Keywords: *information technology application, mobilization of investment capital, Tay Ninh province, argricure sector*

JEL codes: D53, D51, D57, G24, O13

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1. Introduction

Tay Ninh Province, located in Vietnam's southern key economic region, is a vital agricultural hub with a strategic position that bridges Ho Chi Minh City and Cambodia. Agriculture remains the backbone of Tay Ninh's economy, employing a significant portion of the population and contributing substantially to the province's GDP. As of 2023, agriculture accounted for approximately 25% of Tay Ninh's gross regional domestic product (GRDP) and provided livelihoods for over 50% of the local population (Tay Ninh Statistical Office, 2023). The province is particularly known for its production of staple crops such as cassava, sugarcane, and rice, as well as its burgeoning livestock sector. Despite its potential, the agricultural sector faces challenges, including outdated farming techniques and limited access to capital, which hinder its ability to maximize productivity and economic output.

The mobilization of capital investment is crucial for transforming Tay Ninh's agriculture from traditional practices to a more modern and efficient industry. Investment is needed to improve infrastructure, adopt advanced agricultural technologies, and support sustainable farming practices that can increase productivity and reduce environmental impact. Studies have shown that regions with higher levels of capital investment in agriculture experience significant improvements in crop yields and overall economic growth (Duc Truong, Dat, & Huan, 2022). However, Tay Ninh has historically struggled to attract sufficient investment, with investment capital for agriculture lagging behind other sectors. Between 2016 and 2020, the province's total investment in agriculture was only 15% of its total development investment, highlighting a critical need for strategies to enhance capital mobilization (Đào, 2022).

Information technology (IT) has emerged as a powerful tool to enhance the mobilization of capital investment in agriculture. IT applications can provide solutions for many of the challenges faced by investors and farmers, such as improving transparency in financial transactions, facilitating access to credit, and enabling better risk management through data analytics. According to a study by Hair (2020), the use of next-generation IT tools in financial processes can significantly reduce transaction costs and increase the efficiency of capital deployment. In the context of Tay Ninh, adopting IT in agricultural finance can help overcome barriers related to limited infrastructure

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and bureaucratic inefficiencies, making it easier for both domestic and foreign investors to channel funds into the sector. Moreover, IT can support the development of digital platforms that connect farmers with investors, providing a more dynamic and accessible investment environment.

Conducting research on how IT applications can mediate the mobilization of investment capital in Tay Ninh's agricultural sector is critical to addressing these challenges. By examining the intersection of technology and finance, this study aims to provide evidence-based recommendations for enhancing capital flows into agriculture, thereby supporting the province's broader economic development goals. This research will build on existing studies, such as those by Quang (2019) and Tien (2019), which have explored investment strategies in the region but have not fully addressed the role of IT in capital mobilization. The findings will be invaluable for policymakers, investors, and agricultural stakeholders in Tay Ninh, offering a roadmap for leveraging technology to drive sustainable growth in the province's agricultural sector.

2. Literarure Review

2.1. The mobilization of capital investment

Capital Investment refers to the funds invested in a business or project to acquire long-term assets such as machinery, land, buildings, and technology. These investments are crucial for the growth and expansion of businesses, as they enable the acquisition of resources that generate future income and improve operational efficiency (Đào, 2022). In the context of economic development, capital investment plays a fundamental role in increasing productivity, fostering innovation, and enhancing the competitive advantage of industries. For the agricultural sector, capital investment can involve expenditures on advanced farming equipment, irrigation systems, high-yield seeds, and modern agricultural technologies. These investments are essential to improving agricultural productivity, reducing costs, and ensuring sustainable farming practices.

The mobilization of capital investment towards the agricultural sector in Tay Ninh Province is of paramount importance for several reasons. Agriculture is a critical component of the province's economy, contributing significantly to employment and income generation for the local population. However, the sector faces challenges such as outdated farming practices, limited access to modern technology, and inadequate infrastructure (Quang, 2019; Tien, 2019). By mobilizing capital investment, Tay Ninh can address these challenges by facilitating the adoption of advanced agricultural technologies, improving infrastructure, and enhancing the overall efficiency of agricultural production. This, in turn, can lead to increased agricultural output, higher incomes for farmers, and greater economic resilience for the province. Moreover, capital investment in agriculture can also contribute to the sustainable development of Tay Ninh by promoting environmentally friendly practices and ensuring food security for the region.

2.2. Hypotheses development

2.2.1. Support and investment attraction policies

Research indicates that well-structured policies, such as subsidies, tax incentives, and infrastructure development programs, can significantly encourage the adoption of IT by reducing costs and risks associated with technological investments (Hair, 2020). These policies can create a favorable environment that incentivizes farmers and agricultural businesses to integrate IT solutions, leading to increased efficiency and productivity in the sector. Moreover, support and investment attraction policies play a pivotal role in drawing both domestic and foreign investments into agriculture. Policies that offer clear and consistent investment guidelines, coupled with financial incentives, are shown to increase investor confidence and attract the necessary capital for agricultural development (Tien, 2019). As a result, the following hypotheses are constructed as:

H1a: Support and Investment Attraction Policies have a positive impact on the application of Information Technology towards the agricultural sector in Tay Ninh Province.

H1b: Support and Investment Attraction Policies have a positive impact on the mobilization of investments towards the agricultural sector in Tay Ninh Province.

2.2.2. Quality and quantity of human resources

A well-educated and sizable workforce is needed to deploy and use IT in agriculture. Highly skilled workers can operate advanced technologies, adapt to new IT systems, and innovate agricultural practises, increasing productivity and efficiency (Dang, Visseren-Hamakers, & Arts, 2017). A skilled staff ensures that technology and other resource

investments are managed well, improving returns and investor trust. Skilled labor lowers investment risks, making agriculture more appealing to domestic and global investors (Duc Truong, Dat, & Huan, 2022). Consequently, the following hypotheses are constructed:

H2a: Quality and Quantity of Human Resources have a positive impact on the application of Information Technology towards the agricultural sector in Tay Ninh Province.

H2b: Quality and Quantity of Human Resources have a positive impact on the mobilization of investments towards the agricultural sector in Tay Ninh Province.

2.2.3. Infrastructure system

An extensive infrastructure, encompassing dependable transportation networks, electricity provision, and digital connectivity, is essential for the efficient integration of information technology in agriculture. Access to high-speed internet and stable electricity allows farmers and agricultural enterprises to incorporate new technology like precision farming, real-time data analytics, and automated machinery. This, in turn, enhances production and efficiency (Hair, 2020). In addition, a strong infrastructure increases the appeal of the agricultural industry to investors by lowering expenses and overcoming logistical obstacles. Investors are more inclined to allocate capital when they have confidence that their investments will be backed by a robust infrastructure that enables streamlined production, distribution, and communication processes (Quang, 2019). Therefore, the following hypotheses are constructed:

H3a: Infrastructure System has a positive impact on the application of Information Technology towards the agricultural sector in Tay Ninh Province.

H3b: Infrastructure System has a positive impact on the mobilization of investments towards the agricultural sector in Tay Ninh Province.

2.2.4. Investment promotion programs

Investment promotion programs, which often include incentives such as tax breaks, subsidies, and grants, are designed to attract both domestic and foreign investors by reducing the costs and risks associated with investing in agriculture. By offering specific incentives for technology adoption, these programs can significantly encourage agricultural enterprises to integrate IT solutions, thereby improving productivity, efficiency, and competitiveness (Tien, 2019). Moreover, investment promotion programs create a favorable environment that boosts investor confidence, making the agricultural sector more attractive by demonstrating government commitment and support for sustainable agricultural development (Tran, 2023). Thus, we propose the following hypotheses:

H4a: Investment Promotion Programs have a positive impact on the application of Information Technology towards the agricultural sector in Tay Ninh Province.

H4b: Investment Promotion Programs have a positive impact on the mobilization of investments towards the agricultural sector in Tay Ninh Province.

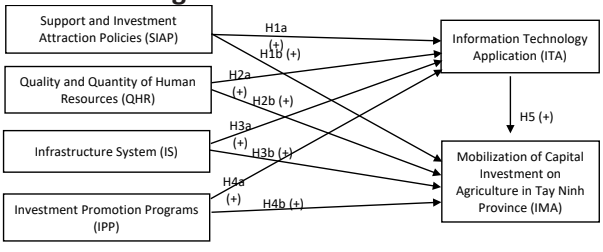
2.2.5. Information tehnology application

The application of IT enhances transparency, efficiency, and productivity in agriculture, which are key factors that attract investors. For example, digital platforms can provide real-time data on crop conditions, market prices, and supply chain logistics, enabling investors to make informed decisions and reduce risks associated with agricultural investments (Hair, 2020). Moreover, application of IT such as precision farming, automated irrigation systems, and data-driven decision-making tools can significantly improve the efficiency and profitability of agricultural operations, making the sector more appealing to investors (Duc Truong, Dat, & Huan, 2022). By demonstrating the potential for higher returns and reduced operational risks, the adoption of IT in agriculture directly contributes to increased investor confidence and capital inflows. Therefore, the following hipothesis is constructed:

H5: The application of information technology has a positive impact on the mobilization of investments towards the agricultural sector in Tay Ninh Province.

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

Figure 1. Research model



3. Data colleciton and analysis

3.1. Data collection and sampling

Participants in this study completed a self-administered questionnaire on repurchase intention. To guarantee broad reach and ease, agricultural investors were surveyed via face-to-face and email. To easily collect data from a varied sample, researchers used convenience sampling (Hair, 2020). The demographic survey assesses support and investment policies, human resources, infrastructure, and capital mobilization of capital investment measures. Ten internet users took a pre-test to ensure the questionnaire was clear and relevant. They made modest changes to improve comprehension. May and June saw 262 surveys. The sample size in this study met structural equation modeling criteria of 10 units per latent variable (Hair, 2020). The SEM-PLS analysis showed a shift in investment focus to the agriculture sector in Tay Ninh Province.

3.2. Data analysis

Table 1. Demographic information of the respondents

Variable	Category	Frequency	Percentage (%)
Business Location	in Tay Ninh province	109	41.6
	outside Tay Ninh province	153	58.4
Business Scale	Small-sized business	40	15.3
	Medium-sized business	141	53.8
	Large-sized business	81	30.9
Investment Experience	Under 3 years	38	14.5
	From 3 to under 10 years	128	48.9
	From 10 to under 20 years	96	36.6
	Under 3 years	38	14.5
TOTAL		262	100.0

Source: From the authors' data analysis results

Table 1 shows the varied characteristics of the Tay Ninh Province study participants on information technology in agriculture. Only 41.6% of the enterprises examined were in Tay Ninh Province, while 58.4% were outside. Most businesses were medium-sized (53.8%), followed by large (30.9%) and small (15.3%). About 48.9% of respondents had 3 to 10 years of agricultural investing experience, while 36.6% had 10 to 20 years. Only 14.5% had less than 3 years of investment experience. This broad sample illuminates Tay Ninh's agricultural sector's IT application and the mobilization of capital investment elements.

Table 2. Reliability and discriminant validity tests

	α	CR (rho_a)	CR (rho_c)	AVE	IMA	IPP	IS	ITA	QHR	SIAP
IMA	0.924	0.927	0.946	0.814						
IPP	0.919	0.920	0.939	0.756	0.442					
IS	0.900	0.902	0.926	0.715	0.395	0.690				
ITA	0.914	0.916	0.936	0.744	0.126	0.378	0.784			
QHR	0.890	0.891	0.919	0.694	0.597	0.379	0.349	0.157		
SIAP	0.925	0.927	0.944	0.771	0.157	0.406	0.671	0.453	0.077	

Source: From the authors' data analysis results

Table 2 provides evidence that the constructs included in the study are both reliable and capable of distinguishing across different variables. The Cronbach's Alpha (α) values for all constructs exceed the acceptable threshold of 0.70, with values ranging from 0.890 to 0.925, showing a high level of internal consistency across the measurements. The Composite Reliability (CR) values, including both rho_a and rho_c, exhibit high levels, ranging from 0.902 to 0.944, which further confirms the reliability of the constructs. The Average Variance Extracted (AVE) for each construct surpasses the 0.50 benchmark, with values ranging from 0.694 to 0.814. This indicates that a significant portion of the variance is captured by the constructs themselves, rather than being attributed to measurement error. Furthermore, the discriminant validity is verified by observing that the square root of the average variance extracted (AVE) for each construct is greater than the correlations between constructs. This indicates that each construct is separate and unique from the others. The data presented here together illustrate the strength and reliability of the measuring methodology used in this research.

3.3. Structural equation modelling

Table 3. Path coefficients

Hypothesis	Relationship	Original sample	Mean	STDEV	T statistics	P values	Result
H1a	SIAP -> ITA	0.172	0.172	0.071	2.418	0.016	Acepted
H1b	SIAP -> IMA	0.270	0.270	0.068	3.953	0.000	Acepted
H2a	QHR -> ITA	0.172	0.173	0.057	3.042	0.002	Acepted
H2b	QHR -> IMA	0.265	0.266	0.053	4.971	0.000	Acepted
H3a	IS -> ITA	0.130	0.130	0.055	2.368	0.018	Acepted
H3b	IS -> IMA	0.145	0.145	0.057	2.523	0.012	Acepted
H4a	IPP -> ITA	0.501	0.499	0.053	9.447	0.000	Acepted
H4b	IPP -> IMA	-0.214	-0.215	0.066	3.230	0.001	Acepted
H5	ITA -> IMA	0.482	0.482	0.060	7.997	0.000	Acepted

Source: From the authors' data analysis results

Table 3 reveals significant relationships between the constructs examined in the study. All hypothesized relationships were supported, with path coefficients indicating positive impacts

across the variables. Specifically, the Support and Investment Attraction Policies (SIAP) showed a significant positive impact on both the application of Information Technology (ITA) (β = 0.172, p = 0.016) and the mobilization of capital investments (IMA) (β = 0.270, p = 0.000). Similarly, the Quality and Quantity of Human Resources (QHR) positively influenced both ITA (β = 0.172, p = 0.002) and IMA (β = 0.265, p = 0.000). The Infrastructure System (IS) was also found to have a positive effect on ITA (β = 0.130, p = 0.018) and IMA (β = 0.145, p = 0.012). Investment Promotion Programs (IPP) demonstrated the strongest impact on ITA (β = 0.501, p = 0.000), while also significantly affecting IMA (β = -0.214, p = 0.001). Lastly, the application of Information Technology (ITA) had a robust positive impact on the mobilization of investments (IMA) (β = 0.482, p = 0.000). These results highlight the critical role of policies, human resources, infrastructure, and IT in enhancing mobilization of capital investment in Tay Ninh's agricultural sector.

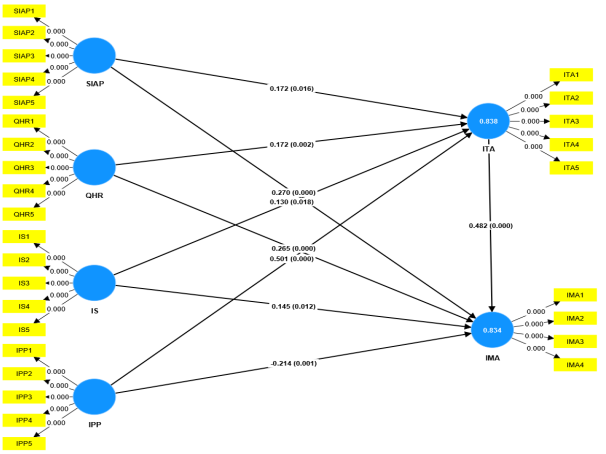
Table 4. Specific indirect effects

Relationship	Original sample	Sample mean	STDEV	T statistics	P values	Result
IPP -> ITA -> IMA	0.242	0.241	0.042	5.785	0.000	Supported
IS -> ITA -> IMA	0.063	0.063	0.028	2.256	0.024	Supported
QHR -> ITA -> IMA	0.083	0.083	0.029	2.837	0.005	Supported
SIAP -> ITA -> IMA	0.083	0.083	0.036	2.328	0.020	Supported

Source: From the authors' data analysis results

Table 4 illustrates how Information Technology Application (ITA) acts as a mediator between different elements and the mobilization of capital investments in the agricultural sector of Tay Ninh Province. The findings indicate that Support and Investment Attraction Policies (SIAP) have an indirect impact on Mobilization of capital investment (IMA) through ITA (β = 0.083, p = 0.020), emphasizing the significant importance of ITA as a mediator. Similarly, the influence of the Quality and Quantity of Human Resources (QHR) on IMA is indirect and occurs through ITA (β = 0.083, p = 0.005). This suggests that having a trained staff improves the adoption of IT, which then helps in mobilizing investments. The Infrastructure System (IS) indirectly affects IMA through ITA (β = 0.063, p = 0.024), indicating that a strong infrastructure allows for more efficient IT deployment, resulting in improved investment returns. Furthermore, Investment Promotion Programs (IPP) have a significant impact on IMA via means of ITA mediation (β = 0.242, p = 0.000), highlighting the crucial role of promotional measures in promoting IT adoption, which in turn stimulates mobilization of capital investment. These findings emphasize the crucial role of IT in improving the effectiveness of policies, human resources, infrastructure, and promotional campaigns in mobilizing capital investments in agriculture.

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



Source: From the authors' data analysis results

4. Findings discussion

The findings of this study align with and expand upon existing research on the role of Information Technology Application (ITA) in the agricultural sector, particularly in the context of investment mobilization. Similar to the conclusions drawn by Hair (2020), this study confirms that ITA significantly enhances the efficiency and attractiveness of agricultural investments, acting as a crucial mediator between supportive policies, human resources, infrastructure, and investment outcomes. The strong direct impact of investment promotion programs on ITA observed in this study corroborates the findings of Tien (2019), who emphasized the importance of government-led initiatives in driving technological adoption in agriculture. By confirming that ITA not only facilitates investment mobilization but also amplifies the effectiveness of policy support, this research provides further evidence that comprehensive strategies integrating IT can optimize the mobilization of capital in agriculture, particularly in regions like Tay Ninh Province.

Moreover, the study's results also resonate with the findings of Duc Truong, Dat, and Huan (2022), who highlighted the importance of a skilled workforce in adopting climate-smart agriculture practices. This study similarly demonstrates that the quality and

quantity of human resources positively impact ITA, which in turn enhances investment mobilization. Additionally, the study extends the work of Quang (2019) by showing that a robust infrastructure system not only directly supports IT adoption but also indirectly contributes to attracting investments through the mediation of ITA. These comparisons indicate that while the study builds on existing literature, it also provides a nuanced understanding of how ITA functions as a pivotal element in connecting various enablers such as policies, human resources, and infrastructure with successful investment mobilization in the agricultural sector of Tay Ninh Province. This comprehensive approach highlights the need for an integrated strategy that emphasizes the role of IT in overcoming traditional barriers to investment, thus supporting the broader development goals of the region.

5. Implications

In Tay Ninh Province and other agricultural regions, this research has major policy consequences. A strong policy framework that encourages farmers to use IT is one of the main ramifications. The study shows that investment promotion initiatives significantly affect IT adoption and the mobilization of capital investment. Thus, policymakers should develop and improve regulations that attract investments and promote IT integration in agriculture. This could include tax incentives, technological subsidies, and IT training grants. The province can modernize its agriculture sector and attract investors by promoting such efforts.

The study emphasizes using IT to boost efficiency and productivity for agricultural companies and investors. Due to the strong association between IT adoption and investment mobilization, agricultural enterprises may gain from adopting sophisticated technologies. This could incorporate precision farming, data analytics for decision-making, or automated technologies to maximize resource utilization. However, investors may regard IT-enabled firms as lower-risk, higher-potential possibilities, increasing their willingness to invest. Thus, agricultural firms should actively enhance their technology to attract capital and boost competitiveness.

The results of data analysis also show that human resources are crucial to IT adoption and investment mobilization. This means that any development strategy should prioritize agricultural workforce quality and quantity. Data management, software use, and technical maintenance training programmes for agricultural could help modernise the sector. Educational institutions in Tay Ninh could also work with the agricultural business to update their courses to meet technological needs. Tay Ninh can use IT to attract investment and boost agricultural productivity with a competent workforce.

Infrastructure development is another key topic of research. Increasing the region's physical and digital infrastructure should be a priority because it boosts IT adoption and investment. This could entail providing remote internet access, updating transportation networks to convey commodities, and ensuring a reliable electricity source for IT operations. By investing in infrastructure, the province can foster technological innovation and investment, boosting agricultural prosperity. This also supports regional development goals because increased infrastructure promotes agriculture and other industries.

Finally, the research implies that a holistic strategy is needed to maximize agricultural IT adoption benefits. Policymakers, corporations, and schools must collaborate to foster technology innovation and investment. PPPs could involve the government providing infrastructure and policy assistance while corporations invest in IT and personnel development. Research and development should also be encouraged to find new technologies and methods that boost agricultural output and investment. By encouraging such collaboration, Tay Ninh may become a pioneer in agricultural innovation, drawing local and foreign investment and assuring economic sustainability.

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FACTORS AFFECTING THE CASH HOLDING RATE OF NON-FINANCIAL ENTERPRISES LISTED ON HOSE BEFORE AND AFTER THE COVID-19 PANDEMIC

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Abstract: ***The study examines the impact of various factors on the cash holding ratio of 347 non-financial firms listed on the HoSE during the period 2017-2022 - the period before, during, and after the Covid-19 pandemic using panel data regression methods (OLS, REM, FEM, and FGLS). The research results show that the factors that have a positive impact on the cash holding ratio of non-financial firms include: The ratio of net working capital to total assets, Cash flow from business operations, Financial leverage, and Return on Assets (ROA). The factor of firm size is not statistically significant. The COVID-19 factor has an inverse relationship with the cash holding ratio of non-financial firms. Based on this, the article proposes some implications related to the cash holding of non-financial firms.***

• Keywords: *cash holding ratio, covid-19, non-financial firms.*

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1. Introduction

Money is one of the important resources of a business, helping the business meet payment, investment, and risk prevention needs. However, holding cash incurs opportunity costs, causing businesses to miss investment opportunities. Therefore, the decision on what proportion of cash a business should hold is an important problem in business financial management. Previous studies have shown that many factors affect the cash holding ratio of non-financial businesses, such as business size, cash flow, capital expenditure, leverage, net working capital, dividend payment, state ownership, foreign ownership, etc. (Opler et al., 1999; Ozkan and Ozkan, 2004; Afza and Adnan, 2007; Kafayat et al., 2014; Rukh et al., 2014; Nguyen et al., 2018).

In countries around the world and in Vietnam, the cash holding ratio has become one of the research topics of authors such as Lin Ziang (2022), Kai Wu (2023), Xunan Feng (2022). However, there are still quite few domestic studies on the cash holding ratio of businesses during periods affected by adverse macro fluctuations such as the Covid 19 pandemic, especially non-financial businesses listed in Vietnam in the period from 2008 to 2022. Over time, many businesses have run out of cash, leading to a loss of solvency due to incorrect determination of the cash holding ratio. Therefore, this article conducts research on the factors affecting the cash holding ratio of non-financial businesses listed on the HoSE in Vietnam in order to determine the direction and level of impact of each factor on the cash holding ratio of businesses, thereby making management implications related to the cash holding ratio, ensuring financial stability for businesses.

The article consists of five parts: Part 1 introduces the reasons for choosing research, Part 2 will overview previous empirical studies related to the topic of the article, Part 3 explains the data and research hypothesis, Part 4 presents the research results, and Part 5 is the conclusion and management implications.

2. Overview of previous studies

From a theoretical perspective, there are several theories that discuss the impact of various factors on a business's cash holding ratio. The Trade-Off Theory by Fischer et al. (1989) suggests that a company's optimal cash holding level is optimized by comparing the marginal cost and marginal benefit of holding cash. The Pecking Order Theory by Myers and Majluf (1984) suggests that there is no optimal cash holding level for a business, and cash only acts as a buffer between retained earnings and investment needs. When there is a need for capital, businesses will follow a pecking order to mobilize capital in the following order: internal capital, debt issuance, preferred equity, and common equity. The Free Cash Flow Theory by Jensen (1968) suggests that managers have a motive to hoard cash to increase the assets under their control and can use it for the benefit of ownership in the company's investment decisions.

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Pham Thanh Tu (2017) suggests that the factors affecting a business's cash holding ratio include: profit on total assets, cash flow, financial leverage, company size, net working capital, operating time, and state ownership. The study also shows that the average cash holding ratio of listed companies in Ho Chi Minh City is 13%. Ngo Quynh Trang (2023) shows that company size, net working capital, cash flow, financial leverage, profit on total assets, operating time, and state ownership are factors that affect the cash holding ratio of construction businesses. Donghua Zhou et al. (2022) found that businesses heavily affected by the COVID-19 pandemic have a higher current cash holding level, the proactiveness of each business's management towards the supply chain and government policies lead to a decrease in the current cash holding level, while serious impacts on operational efficiency, especially the impact of the pandemic on the supply chain, demand, production and operations, and government policies, reduce the future cash holding level of businesses. Atif Kafayat, Khalil Ur Rehman, Farooq M. (2014) show that the factors affecting the cash holding level include: company size, net working capital, capital expenditure, dividends, financial leverage, profit on total assets, and revenue growth. The average cash holding level of businesses is 6.5%. Gabe de Bondt et al. (2021) show that the COVID-19 pandemic has threatened the profitability and operational efficiency of non-financial businesses in the euro area. Therefore, businesses increase the cash holding ratio when the COVID-19 pandemic occurs.

In this study, the authors delve into the quantitative research of the group of factors affecting the cash holding ratio of non-financial businesses in Vietnam under the conditions before and during the COVID-19 pandemic.

3. Research data and hypotheses

The article uses secondary data from 347 non-financial businesses listed on the HoSE in Vietnam during the period 2017-2022. The period 2017-2022 was chosen because there were changes in the adjustment of the cash holding ratio of businesses due to the impact of the COVID-19 pandemic in two periods 2017-2019 and 2019-2022.

Based on the research of Pham Thanh Tu (2017), Ngo Quynh Trang (2023), Donghua Zhou et al. (2022), Atif Kafayat, Khalil Ur Rehman, Farooq M. (2014), Gabe de Bondt et al. (2021), the research team proposes the following research model:

$$CASH_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 NWC_{it} + \beta 3CF_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 Covid19_t + \varepsilon_{it}$$

In which: Dependent variable: CASHit: The cash holding ratio of business (i) in year (t). Independent variables: SIZEit: The size of business (i) in year (t); NWCit: The ratio of net working capital to total assets of business (i) in year (t); CFit: The ratio of cash flow to total assets of business (i) in year (t); LEVit: The financial leverage of business (i) in year (t); ROAit: The profit on total assets of business (i) in year (t); Covid19t: The dummy variable for Covid - 19 in year (t); β_0, β_1, β_2, β_3, β_4, $\beta 5$, $\beta 6$ are the regression coefficients, representing the corresponding contribution of each independent variable to the dependent variable; εit is the random error in the t-th observation.

The dependent variable and the independent variables of the model are described in the following table:

Table 1: Table describing variables of the model

	Variables	Sign	Reference	Expectations	Measurement	Source
Depend	Cash holding ratio	CASH	Pham Thanh Tu (2017), Atif Kafayat, Khalil Ur Rehman, Farooq M. (2014)		Cash and Cash equivalents / Total Asset	Financial statement of company
Independent variables	Business size	SIZE	Ngo Quynh Trang (2023)	-	Logarit (Total Asset)	
	Ratio of net working capital to total assets	NWC	Ogundipe et al (2012), Kafayat et al (2014)	+	Current Assets − Current Liabilities / Total Asset	
	Ratio of cash flow to total assets	CF	Chen and Liu (2013)	+	Operating cash flow / Total Asset	
	Financial leverage	LEV	Vijayakumara & Atchyuthan (2017), Anton & Nucu (2019), Rocca & et al (2019), Ifada & et al (2020)	+	Debt / Total Asset	
	Return on total assets	ROA	Pham Thanh Tu (2017)	+	Net profit / Total Asset	
	Dịch bệnh Covid 19	Covid 19	Pham Thanh Tu (2017), Atif Kafayat, Khalil Ur Rehman, Farooq M. (2014)	+	Gets value 1 if the year is affected and gets value 0 if the year is not affected by the Covid – 19 pandemic.	

Source: Authors compiled

4. Result

4.1. Descriptive statistics of variables

Table 2 presents the descriptive statistics including the mean, standard deviation, minimum, and maximum values of the variables in the research model:

Table 2: Descriptive statistics

Variables	Amount	Mean	Standard deviation	Minimum values	Maximum values
CASH	2082	0.0796	0.0871	0.0001	0.8551
SIZE	2082	12.3339	0.6281	10.5562	14.7615
NWC	2082	0.2283	0.2151	-0.6739	0.9470
CF	2082	0.0543	0.1320	-1.1000	0.9698
LEV	2082	0.4722	0.2114	0.0027	1.2945
ROA	2082	0.0745	0.0938	-0.9518	0.8177
Covid-19	2082	0.6667	0.4715	0.0000	1.0000

Source: Data processing results from Stata

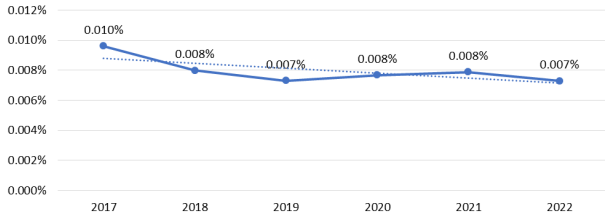
Table 2 presents the descriptive statistics for the variables in the research model, specifically:

The cash holding ratio of non-financial businesses in Vietnam during the period from 2017 to 2022 reached an average of 7.96% with a standard deviation of 8.71%. In particular, Nhon Trach 2 Oil Power Joint Stock Company had the lowest cash holding ratio of 0.015% in 2021, while ST8 Development Investment Joint Stock Company had the highest cash holding ratio of 85.51% in 2022.

On average, the cash holding ratio of businesses tended to decrease during the period from 2017 to 2019.

However, when the Covid-19 pandemic occurred in 2019, the average cash holding ratio tended to increase again in 2020 and 2021. Meanwhile, in 2022, the cash holding ratio of non-financial enterprises on the HoSE tended to decrease sharply. The average size of businesses is 12.33 with a standard deviation of 0.62, in which, Vietnam Brand Investment JSC has the smallest size of 10.56 in 2018 and Vingroup has the largest size of 14.76 in 2022.

Firgure 1: Average cash holding ratio of non-financial enterprises on HoSE



Source: Authors compiled

The net working capital ratio on total assets of businesses reached an average of 22.83% with a standard deviation of 21.51%, in which, Vietnam Airlines Corporation has the lowest net working capital ratio of -67.38% in 2022 and TCO Holdings JSC has the highest net working capital ratio of 94.70%.

The cash flow ratio on total assets of businesses reached an average of 5.43% with a standard deviation of 13.20%, in which, Industrial Development and Transportation Investment JSC has the lowest cash flow ratio of -1.10% in 2017 and Icapital Investment JSC has the highest cash flow ratio of 96.98% in 2019. The financial leverage of businesses reached an average of 47.22% with a standard deviation of 21.14%, in which, Saigon Orient Technology JSC has the lowest leverage ratio of 0.27% in 2019 and Truong Thanh Furniture Corporation has the highest leverage ratio of 129.44% in 2019.

The average ROA is 7.45% and the standard deviation is 9.38%, in which, Ninh Van Bay Travel Real Estate JSC has the lowest ROA of -95.17% in 2017 and ST8 Development Investment JSC has the highest ROA of 81.77% in 2022.

The COVID variable reached an average value of 0.6667 with a standard deviation of 0.4592; specifically, the value 1 represents the years affected by the Covid-19 pandemic (2019 to 2021) and the remaining years have a value of 0 (2017, 2018).

4.2. Experimental results

The results of the correlation matrix analysis show that the correlation coefficients between variables range from -0.5872 to 0.4270. The absolute values of the correlation coefficients are all.

less than 0.8, so there is no multicollinearity among the independent variables in the research model.

The study uses the Hausman test to choose between the FEM and REM models, with the null hypothesis H0: Choose the REM model. With a significance level of 1%, we have: Prob > chi-square = 0.0236 > 1% so we accept the null hypothesis H0, meaning we choose the REM model to determine the factors affecting the cash holding ratio of non-financial enterprises listed on the HoSE.

The study uses the Collin test to check for multicollinearity in the model. The results of the Collin test show that the variance inflation factor (VIF) of the independent variables in the model is all less than 2, so the multicollinearity in the model is assessed as not serious (Gujarati, 2004). The study uses the Breusch and Pagan Lagrangian test to check for the phenomenon of changing error variance. The results show that, with a significance level $\alpha = 5\%$, the Breusch and Pagan Lagrangian test on Stata 17.0 software gives a P-value less than 5%, thereby rejecting the null hypothesis H0. Therefore, it can be concluded that the model has the phenomenon of changing error variance.

The study uses the Wooldridge test to check for autocorrelation in the model. The results show that, with a significance level $\alpha = 1\%$, the Wooldridge test gives a result Prob > F = 0.0000. Thus, Prob < α so the model has autocorrelation. Through the above test results, it can be seen that the phenomenon of multicollinearity occurring in the model is assessed as not serious. However, the model has the phenomenon of autocorrelation and changing error variance. Therefore, to correct the model's defects, the study uses the Feasible Generalized Least Squares (FGLS) model.

After regressing the model using FGLS, the results obtained are as follows:

Table 3: Summary of estimation results using the FGLS method

Independent variables	FGLS model		
	θ coefficient	Standard deviation	P - value
SIZE	-0.0015	0.0021	0.456
NWC	0.0722***	0.0070	0.000
CF	0.0990***	0.0072	0.000
LEV	0.0164**	0.0074	0.027
ROA	0.0776***	0.0152	0.000
Covid19	-0.0060***	0.0018	0.001
Constant	0.0488**	0.0246	0.048
Prob > Chi2	0.000		
Observations	2082		
Groups	347		

****, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.*

Source: Data processing results from Stata

The regression results in Table 3 show that the P-value = 0.000 is less than 0.01, so the model is

statistically significant at the 1% level. In addition, 5 out of 6 explanatory variables included in the model are statistically significant at the 1%, 5%, and 10% levels, including: Net Working Capital ratio on Total Assets (NWC), Cash Flow ratio on Total Assets (CF), Financial Leverage (LEV), Return on Assets (ROA), and Covid19. The SIZE variable is not statistically significant.

4.3. Discuss research results

Based on the regression results in Table 3, the final regression equation constructed for the model is as follows:

CASH = 0,0488 + 0,0722NWC + 0,099CF + 0,0164LEV + 0,0776ROA - 0,006Covid19 + ε

Accordingly, the factors affecting the cash holding ratio of non-financial enterprises on the HoSE stock exchange before and after the pandemic are explained as follows:

Company size (SIZE): The size of the company has an inverse effect on the cash holding ratio of non-financial enterprises on the HoSE in the period 2017 - 2022. This means that the larger the business size, the lower the cash holding ratio and vice versa. The research results, although similar to previous studies by Donghua Zhou et al. (2022); Atif Kafayat, Khalil Ur Rehman, Farooq M. (2014); Ngo Quynh Trang (2023); Pham Thanh Tu (2017), however, in this study, the SIZE variable is not statistically significant when P - value > 10%. It can be seen that non-financial enterprises often have very large differences in size and each enterprise will have a certain cash holding strategy. In addition, there have been and are many non-financial enterprises on the HoSE with different sizes. Generally, within the scope of the study, the impact of company size on the cash holding ratio of non-financial enterprises on the HoSE in the period 2017 - 2022 is not clear.

Net working capital ratio on total assets (NWC): The net working capital ratio on total assets has a positive effect on the cash holding ratio of non-financial enterprises on the HoSE under the condition that other factors are unchanged with a statistical significance level of 1%. This research result is consistent with the expectation of the research group, as well as the results of Atif Kafayat, Khalil Ur Rehman, Farooq M. (2014); Pham Thanh Tu (2017); Ngo Quynh Trang (2023). Specifically, when the net working capital ratio on total assets increases by 1%, the cash holding ratio of non-financial enterprises on the HoSE will increase by 0.0722%. This is also completely consistent with the business situation of enterprises when enterprises with more net working capital will have the ability to convert into cash more easily, so enterprises with more working capital will hold more cash.

Cash flow ratio on total assets (CF): The cash flow ratio on total assets has a positive effect on the cash holding ratio of non-financial enterprises on the HoSE under the condition that other factors are unchanged with a statistical significance level of 1%. This research result is completely consistent with the expectation of the research group and consistent with the results of Atif Kafayat, Khalil Ur Rehman, Farooq M. (2014); Pham Thanh Tu (2017); Ngo Quynh Trang (2023). Specifically, when the cash flow ratio on total assets increases by 1%, the cash holding ratio of non-financial enterprises on the HoSE will increase by 0.099%. Non-financial enterprises with larger cash flows will usually hold more cash according to the research of Pham Thanh Tu (2017).

Financial leverage (LEV): Financial leverage has a positive effect on the cash holding ratio of non-financial enterprises on the HoSE under the condition that other factors are unchanged with a statistical significance level of 5%. It can be seen that this research result is completely consistent with the expectation of the author as well as the previous studies of Atif Kafayat, Khalil Ur Rehman, Farooq M. (2014); Donghua Zhou et al. (2022); Pham Thanh Tu (2017); Ngo Quynh Trang (2023). Specifically, when financial leverage increases by 1%, the cash holding ratio of non-financial enterprises on the HoSE will increase by 0.0164%. This is appropriate because enterprises tend to use external funding sources often have a higher risk of bankruptcy, so increasing the cash holding ratio ensures that these enterprises do not fall into a state of financial exhaustion and reduces the risk of bankruptcy as well as strengthens customer confidence in the enterprise.

Return on total assets (ROA): Return on total assets has a positive effect on the cash holding ratio of non-financial enterprises on the HoSE under the condition that other factors are unchanged with a statistical significance level of 1%. In addition, this research result is consistent with the expectation of the author and the studies of Atif Kafayat, Khalil Ur Rehman, Farooq M. (2014); Gabe de Bondt et al. (2021); Donghua Zhou et al. (2022); Pham Thanh Tu (2017); Ngo Quynh Trang (2023). More specifically, under the condition that other factors are unchanged, when the return on total assets increases by 1%, the cash holding ratio of non-financial enterprises on the HoSE will increase by 0.0776%. This can be explained by the fact that enterprises with high profits will generate large cash flows from business operations, thereby increasing the cash holding ratio of enterprises.

Covid-19 variable (Covid-19): The result of the study is not as the original hypothesis of the research group set out when the Covid-19 variable has an inverse effect on the cash holding ratio of non-financial

enterprises on the HoSE in the period 2017 - 2022. This can be explained by the input data compared to previous studies. In the study of Donghua Zhou et al. (2022), the input data only includes the years affected by the Covid -19 pandemic without considering the periods before the pandemic occurred. The study of Nguyen Hoang Minh & Le Quang Minh (2022) limits the research time during the outbreak of the pandemic. From the results of the study, it can be seen that the period of the Covid - 19 pandemic has somewhat reduced the cash holding ratio of non-financial enterprises on the HSE compared to the period before the pandemic broke out.

Conclusion

The research results show that the factors that have a positive impact on the cash holding ratio of non-financial enterprises include: Net Working Capital ratio on Total Assets, Cash Flow from Business Operations, Financial Leverage, and Return on Assets. The SIZE variable is not statistically significant. The COVID variable has an inverse relationship with the cash holding ratio of non-financial enterprises. Based on the research results, the authors propose the following management implications:

The cash holding ratio of non-financial enterprises is influenced by the size of the enterprise. However, holding cash inappropriately with growth in scale can also lead to unpredictable consequences. Therefore, non-financial enterprises need to ensure a cash holding ratio appropriate to their size. Strict control over financial and investment activities, as well as regular assessment of the company's financial situation, is necessary. In the current economic context, with challenges from the aftermath of the Covid-19 pandemic and unstable inflation, businesses need to carefully consider between holding cash and growing in scale. Regular review of investments and finances is necessary to promptly address arising issues, reduce bad debts, and ensure that investment activities yield high efficiency.

To effectively enhance net working capital, businesses need to build a flexible financial management strategy, suitable for current economic - financial conditions, while diversifying revenue sources and optimizing expenses. Negotiating to adjust the debt term from short-term to long-term debt, adjusting the growth rate to slow down, cutting the progress of new investment, selling assets and capital contributions at non-core member companies to pay off debt in order to gradually balance finance, implement restructuring business operations to improve profitability, thereby, enhancing equity capital.

Regular cash flow needs to be thoroughly analyzed to understand how to collect and spend money, thereby supporting businesses in making smart financial decisions. Facing directly and detecting early cash flow problems not only helps businesses quickly remedy but also avoids negative impacts on business operations. Optimizing the cash cycle, including effective management of receivables and payables, as well as optimizing investments, is an integral part in cash flow management. Finally, debt management and adjusting financial plans based on the actual situation of the business is an important step to manage debt effectively, ensuring stability and sustainable development for the business.

Financial leverage, when used reasonably, can help businesses take advantage of investment opportunities, increase profit rates, and overcome financial difficulties caused by the pandemic. However, this also requires a careful risk management strategy, to ensure that the level of risk is kept at an acceptable level, especially in an uncertain economic context. Considering the debt ratio compared to the ability to repay debt is an important factor to avoid over-indebtedness, especially when businesses have to face a decline in revenue due to blockade measures. Optimizing capital structure, considering between equity and borrowed capital, also becomes more necessary than ever to achieve optimal profit rates without increasing financial risk too much.

To improve the return on assets, businesses need to focus on standardizing asset management operations through the application of standardized processes, helping to optimize the use of assets and thereby, improving profitability. In addition, it is necessary to increase net profit by finding ways to increase revenue and reduce costs.

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FASHION PRODUCT INNOVATION IN GARMENT 10 CORPORATION JOINT STOCK COMPANY: A CASE STUDY APPROACH

PhD. Do Phuong Thao* - MSc. Nguyen Dac Thanh*

Abstract: ***Nowadays, Vietnamese listed textile firms need to pursue the inclusive growth by focusing on product innovation strategies. This study aims at considering the current situation of product innovation at garment 10 corporation JSC. The paper applied qualitative research method by using a single case study. Data were collected from a various source, such as firm's financial statement, annual report as well as in-depth interview, and focus group discussion. The finding confirmed that May 10 is one of the very few textile enterprises capable of developing their own fashion brand, investing heavily in automation, and creating the prerequisites for successful digital transformation. Finally, several recommendations have been proposed and discussed.***

• Keywords: *case study; digital transformation; fashion brand; product innovation, research and development.*

JEL code: L15, L67, O14

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1. Introduction

The fashion industry is experiencing a shift towards eco-friendly materials, circular fashion concepts, and integrating digital technologies to enhance personalized consumer *experiences*. As consumer expectations evolve, innovation strategy, market orientation, and product design innovation jointly shape the ever-evolving fashion landscape.

Product innovation plays an essential role in creating and maintaining a firm competitive *advantage*. Product life cycles are changing as competition intensifies, making product innovation strategy a crucial approach for sustainable development. The introduction of new products is considered as a key successful factor of garment companies. Meeting current and potential customer needs through innovative products has been the key to successful product innovation

Product innovation emerges as a powerful tool in new markets, boosting the idea of high-quality fashion product at reasonable prices. Despite developments in new materials research, the lack of comprehensive connections between product design and marketing & sales strategy in global apparel value chain, thereby contributing to the deeper understand fashion product design innovation is main objective of this study.

The article entitled *"Fashion Product Innovation: A Case Study at Garment 10 Corporation Joint Stock Company"* delves into the present state of product design innovation.

The paper is organized as follows: First section is about introduction which describes the necessity and research context. The next section discusses research design method. This is follows by a description of the perceptions about types of product innovation as well as situation of Garment 10 corporation joint stock company. The paper ends with recommendations and conclusions.

2. Research method

2.1. Research design

This study employs a single case study method to investigate the product design innovation offered at a Vietnamese listed textile firm. According to Yin (2009), the case study method enables to comprehensive explanations of a phenomenon within its practical setting. As such, the strength of a single case study rests in its capacity to explain specific features the reported occurrence and thus enhances our comprehension of a complicated subject. Additionally, it adds credibility to existing studies (Eisenhardt & Graebner, 2007; Shih & Huang, 2017).

The single case study is used in this paper to understand the product innovation capabilities and process of M10. Because this is a research subject, it has received limited attention and interest and requires further investigation. The case study

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method allows researchers to replicate logical reasoning.

2.2. Data collection

The sampling method is a purposive sampling strategy, which allows researchers to select appropriate respondents. M10 could meet the demand for sampling because this company possesses its own local fashion brand. Participants included:

+ The senior managers consist of the CEO, the export manager and a board member

+ Mid-level managers: Chief of Staff of the Corporation, Head of R&D Department, Head of Fashion Design Department and Director of International Fashion Centre

+ Other participants: Other participants include the designer of the Detheia brand.

In - depth interviews and focus group discussions were conducted with all participants. The purpose of the data collection techniques is to provide a more detailed and in-depth understanding of the process of implementing apparel product innovation from idea selection to product commercialization.

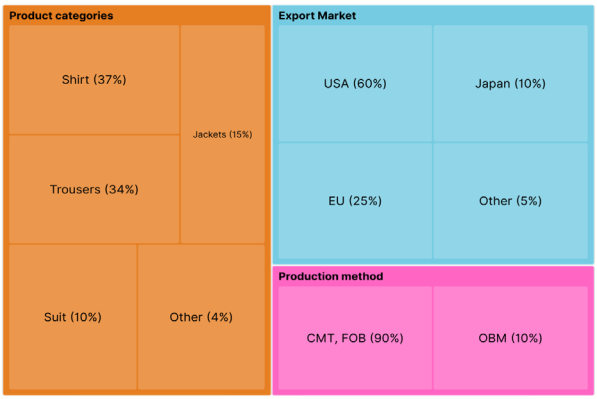
3. Situation product innovation at M10

3.1. Case presentation

Introduction to garment 10 Corporation - may10 brand

Established in 1946, going through two periods of resistance and more than 75 years of formation and development, May 10 brings together all the qualities of a leading brand in Vietnam, a leading office brand, and a competitor. Providing additional pages for corporations, corporations. Currently, Garment 10 is a multi-industry enterprise, operating in many fields such as manufacturing and exporting fashion textiles and garments, retail fashion businesses, and hotel & restaurant services; There are 18 member units in 7 provinces and cities nationwide, more than 12,000 employees with over 60 stores, and nearly 200 agents nationwide. May 10 is proud to bring customers who love Vietnamese fashion world-class costumes but with pure Vietnamese Asian characteristics through product lines that have become iconic, such as: Etenity GrusZ, May10 M Series, May10 Expert, May10 Prestige, May10 Classic, May10 Advancer, Big Man, Cleopatre, Pretty Woman, and Freeland. Many big names in the prestigious fashion garment industry in the world market have cooperated in production with Garment 10 Corporation, such as Vineyard Vines, Banana Republic, Vanheusen, Abercrombie & Fitch, ANF, Express, Calvin Klein, DXL, PVH, Gap, Next, Marks & Spencer, Marc o'Polo, Tom Tailor, Esprit, Seidensticker, Jaques Britt, Next, Moss Bross, Ted Baker, Regal, Ortovox, Toray, Aoyama... With the desire to bring high-class fashion products, purely Vietnamese but with international fashion trends and inspiration, May10 always strives to perfect its products and services to bring core values to customers.

Figure 1: Overview of product categories, production method, and export market



Source: Garment 10 corporation joint stock company, 2023

May10 boasts a diverse range of product categories that cater to various markets. At the top of the list, shirts account for 37% of export revenues, trousers come in second at 34%, and jackets and suits represent 15% and 10%, respectively. In terms of the export market, the US and the EU are the two largest customers with 75%, the percentage of the Japanese market is about 10%, and the proportion of other markets is around 5%.

May10 primarily operates using two main production methods: CMT and FOB. CMT is the simplest processing and export method, but the profit is very low. FOB is a strategy to enhance the value-added aspect of the industry. When operating in this form, enterprises will be involved in production, material self-sufficiency, cutting, and sewing. The method's strength lies in its proactive approach towards garment manufacturers. On the other hand, the percentage of ODM and OBM is quite modest, only 10%. ODM and OBM are two production methods that require innovation and creativity in all operations from design to cutting, sewing, marketing, and sales. Particularly, the design phase necessitates significant investment

from fashion manufacturers, which is the primary weakness of Vietnamese garment companies

3.2. M10 fashion brand

Office fashion M10 is varied in terms of design and product line; fashion products fit everyone. May10 bring customers office fashion products from mid-range to high-end office fashion, with a variety of products including men's office fashion, women's fashion, children's fashion, as well as different accessories. Various fashion products could meet the high demand of customers. Actually, there are 4 local fashion brands as below.

Table 1: Fashion brand of May10

Number	Fashion brand	Main attributes
1	May 10 Expert (M10)	Diversified design, manufactured on a modern line, high-quality products.
2	Grusz	A luxury fashion brand serves the middle class, businessmen, and artists with formal, elegant, and modern designs.
3	Detheia	The luxury fashion brand cater to women with global styles.
4	Generos	Men's fashion brands towards young customers and gen Z

Source: Garment 10 corporation joint stock company, 2023

In 2010, Garment 10 Corporation JSC launched the GrusZ brand, which is of higher quality than the M10 brand, along with a more impressive design. The designs are thoroughly censored from material selection, sampling, and finishing to a global standard. The price ranges from 700,000 to 2 million for a product in this segment. Generos products serve men with dynamic, young designs and a variety of code models that keep up with the trend, with prices ranging from 300,000 to 1 million for each product. There are two separate stores for this product in Hanoi.

In 2022, Garment 10 Corporation presented the premium women's fashion brand DeTheia+. With the aim of providing women in modern society with high-quality products, good aesthetics, and reasonable prices, DeTheia's products aim for luxury style, femininity, clever harmony between traditional values and modern aesthesia, and investment in international processes, from design, production, and media. With the main products such as dresses, shirts, blazers, jeackets, skirts, the fashion line of this class of Detheia products has a price range of 1 to 3 million per product.

3.3. Research results

a) Process of office fashion product innovation in Garment 10 Corporation JSC

Step 1: Generating and refining design ideas

This step aimed at creating new products that serve the current and potential needs of customers. The phrase encompasses the primary tasks listed below:

+Market research: Understand and identify better customers demand, demographic characteristics of clients such as gender, age group, income,...

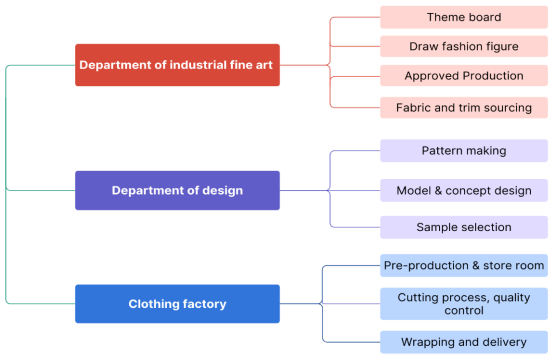
+ Generate design ideas that will help in the choice of a suitable pattern and trend, such as green consumer, circular economy, AI.

+ Turn design ideas into a fashion project that has clear trends and product lines; mood boards in order to help guide the department of creative.

+ Draft a design proposal; describe the shape, texture, colors, materials, and office fashion design projects.

The International Fashion Center is divided into operational departments. The process started in the department of industrial fine art, where the designers composed fashion design styles. Here the employees do the work, from putting up the mood board idea to presenting the design idea to the whole room in line with the company's fashion product lines. And then the lead is drawn, and the lead sample is examined by the team leader and head of the design department. With the selected patterns, May10 will deploy the pattern to color onto the technical drawing fabric (Graphic Design on the computer).

Figure 2: The step of product innovation process in Garment 10 Corporation JSC



Step 2: Pilot production and evaluation of innovative products

From the designs selected to the mass production, they will pass through the department of fashion design in order to make thin samples and browse thin ones. Then, the product is tested, and the sample is reviewed with the departments

to give an opinion as to whether there are any modifications or whether the model is fit or not. The council board consists of various participants, including the general director of the corporation, head of functional departments, and manager of the International Fashion Center of May10. The board will make a sensory analysis of the costume patterns to assess whether or not they are suitable before moving to the factory for pre-production. With the samples selected for pilot production, the pattern will be made and drafted along with the technical requirements to pass through the clothing factory, fused (if any), then the plugging process will be performed, next to industrial hygiene, quality assurance testing, and finally the wrapping of the product.

Garment 10 Corporation JSC always focuses on product quality, so piece-goods has specific technical requirements from the stitch and seam so that the worker can know well. In addition, in order to control the output quality of the clothing, the department of QA is responsible for checking and inspecting all of the phrases to see if quality control failed and making adjustments to meet the requirements (e.g., body parts).

Step 3: Commercialize innovative products May10

Garment 10 Corporation JSC is deploying a number of clothing launch venues with international standard design, eye-catching layouts, and luxury that will help to better position the May10 brand in the domestic market. These product launch venues have been developed in the model of global fashion brands, featuring large event spaces, attractive interior design, and luxury. By enhancing customer service, May10 aims to expand their fashion shops in the future. However, in order to upgrade the current traditional small-store chain of May10 at different locations, the manager will have to face many difficult challenges in terms of cost and labor force.

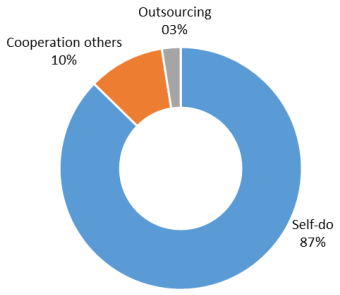
In general, besides several office fashion venues recently, most of the May10 store layouts are not even luxurious compared to foreign brands; the local fashion brand has not really attracted customers and this becomes a main weakness. In addition, there is an uneven distribution of wealth across the fashion brand system from the North to the South; specifically, the Northern chain store clothing is overlapped but is narrow in Hanoi and some northern provinces such as Hai Phong and Quang Ninh. On the other hand, in the southern and central parts of the country, there has been a lack of big chain store clothing. This creates imbalances and sometimes creates shopping inconveniences for brand-loyal consumers.

The in-depth interview from a director of the Detheia brand in May 10 (Vinatex, 2023) also confirms our survey results, showing that as a reason for building a local fashion brand, he mentioned:

"There are still a number of brands on the market today that can be entered, even women's fashion brands. DeTheia, a luxury women's fashion brand offers a reasonable price compared to main competitors. Although building a fashion brand exists in several niche markets, production planning has to meet them in terms of quantity and technologies. During the economic crisis period, business expansion and mass production are relatively high risks. For a luxury fashion product, building a new fashion brand requires a large budget along with a long-term vision."

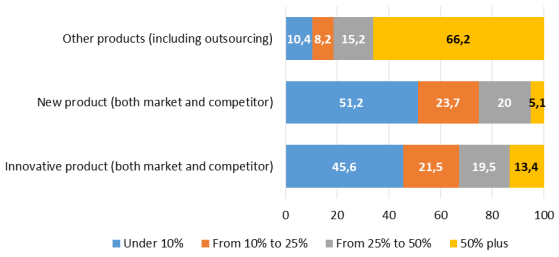
b) Situation of product innovation in May10

Figure 3: Method of new product launch at May10



Source: Author's calculation

Figure 4: The ratio of sales of innovative products



Source: Author's calculation

Product innovation is about the introduction of new or improved goods or services in comparison to competitors in the market. In order to innovate a

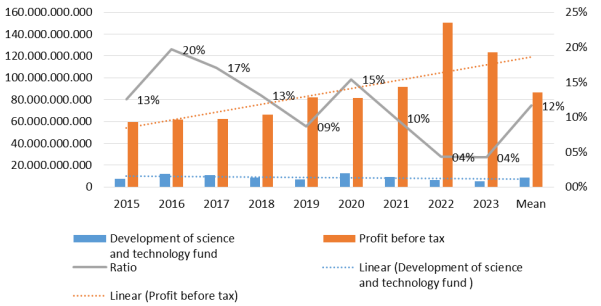
product that the textile and garment manufacturers could perform on self-operation through their own designer, tailor, or worker, another way is cooperation with an external partner or outsourcing.

On the one hand, May10 mainly does self-operation to introduce and launch new products in the market (just under 90%); on the other hand, cooperation or outsourcing methods are very low, 10.2% and 2.5%, respectively. Besides, in terms of the ratio of May10 fashion products, generally the ratio of sales of innovative products are quite modest; one-half of innovative product revenue is less than 10% of total revenue, whereas two thirds of revenue come from other products (including outsourced product).

In terms of development of science and technology fund (356 account)

May10 Corporation is one of the very few textile companies on the stock market that has a science and technology development fund. Based on the calculation of the Consolidated Financial Statement from 2015 to 2023, it can be noticed that there is an abnormal fluctuation in this indicator, namely, divided into two phases. Between 2015 and 2020, there is a steady increase in the fund for scientific and technological development that reaches a peak of more than VND 12.5 billion by 2020, followed by a significant decrease from 2020 to now. On average, during this period, the science and technology development fund is allocated to about 8.8 billion VND annually.

Figure 5: Development of science and technology fund and ratio of fund per profit before tax



Source: author's calculation from Garment 10 Corporation joint stock company (2024)

According to Vietnam's Goverment (2014) Article 9 No.95 of Decree 95/2014/ND-CP dated October 17, 2014 stipulates that "State enterprises shall annually deduct between 3% and 10% of their income from corporate income tax to fund the scientific and technological development of their enterprises; Non-State enterprises are entitled to deduct from corporate income tax income at a reasonable rate, up to 10%, to fund the scientific and technological development of their enterprises." On average, in the period 2015-2023, the ratio of science and technology development funds to profits before tax was 11.7% higher than threshold 10% level of Decree 95/2014/ND-CP, but it is worrying that since 2020 this ratio tends to decline sharply.

c) Situation of digital transformation at May10

In terms of industrial sewing machinery, May10 has possessed the world's most modern hardware and software support. Besides modern machines, such as automatic suspension stations, multi-function digital cutters, multi-use interlock machines with software for spreading carpets, and other special sewing machines. Moreover, May10 utilizes sophisticated management software, digitizing it to streamline administrative tasks like managing raw material inventories and finished goods. These apps help managers follow the import, export, and inventory reports; transition from the traditional management method to the digital text document method. It also serves as a means to assist executive management during challenging times.

In terms of clothing factories, managers are implementing a software system that manages and monitors productivity, connects data from devices at all stages of sewing, and synthesizes data across the plant. The manager can monitor the phone and the computer from any location. The intelligent system can control the operating parameters of the equipment and the performance of the work in real time, allowing the manager to grasp the production situation, and help balance passes, work layout, and equipment; In the operational departments, May 10 is implementing advanced software for 2D design, Fit 3D testing moderation, style, balance of the sample, and measurement of the parameters of the fabric like the finished product. In particular, customers can browse the template remotely.

In terms of the operational activities, the application connects software from fabric and trim sourcing to accounting finance tasks. The procurement of supplies and supplies is built on the software for managing supplies, then transferring the data to the accounting software, not having to enter twice, and the data is updated in time;

the financial department only checks and bills; Domestic business applies purchasing management of supplies and accessories on the software; when finished production of goods and finished products, the data is transferred to the sales software, and from the sales data is linked to the accounting software for inspection and recording. Reduce manual input on accounting software. This helps to unify data and reduce errors. With electronic invoices connected from asset management software, raw materials and sales software, and to the accounting and financial department, reducing input by twice. In addition, the accounting data of the dependent units, the decentralized report on the common software, and the financial results of the units are audited by the headquarters.

With the first steps to automation technology and converting numbers, May 10 noticed there were cities working, the simplification of processes, and the system's done. Reduce intermediaries, reduce manpower, and reduce time. I'm going to take care of things. The application of devices modern technology has made it easier to reach out to human resources. The company has more knowledge and experience set for the next steps of the transition change numbers.

4. Managerial implementation for Vietnamese textile and garment manufacturers

First, *focus on building your own creative fashion brand.*

Through the analysis of the case study at Garment 10 Corporation JSC, creating a fashion brand plays a critical role in sustainable development. The corporation is one of the main members of the Vinatex, with a huge financial budget as well as large human resources, so it needs to soon have its own fashion brand. The starting point is to prioritize market research and understand your audience's needs and preferences, specifically the domestic market. This insight helps identify opportunities, anticipate challenges, and craft effective strategies.

Second, *invest in building strong relationships and partnerships*

Collaborations and partnerships with influencers, industry experts, and thought leaders are crucial for adopting a proactive market orientation. These collaborations provide potential opportunities for Vietnam garment manufacturers to engage in fashion design innovation practices. In addition, the cooperation could help to explore new design concepts and materials based on market trends and consumer behavior.

In order to get a global fashion brand that runs around ideas, market research, supply, testing, design, and manufacturing, it is essential to a seriously invest from time in a team of designers, working with a celebrity stylist, and KOL, KOC. After identifying the novelty pattern in a season, it is necessary to undertake the process of introducing the product to the market prior to commencing mass production.

Finally, *enhancing the customer experience by using VR and AR technologies*

Textile and garment companies should up-to-date consumer experience trends with VR (virtual reality) and AR (augmented Reality). In the past, face-to-face and offline used to be for clothing and apparel companies; textile and garment manufacturers had to bring samples to present, from design ideas to materials. With samples of various sizes and color codes, invisible generic suppliers have to prepare a lot of samples that make the process of preparation from the raw materials more complicated, sometimes there are shortcomings in the preparation process. As the 4.0 industrial revolution and digital transformation have more and more changed the fashion industry in many ways, the world fashion industry took a new step in building VR spaces. Therefore, clothing and apparel manufacturers need to soon deploy their own applications, such as VR and AR, to reach consumers faster, and provide a more enjoyable shopping experience when consumers can try online on clothes that fit their measurements. Virtual gallery is one of the best examples of user experience marketing that helps customers understand the retail market and allows them more time to choose products before shopping.

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THE EFFECT OF CAPITAL STRUCTURE ON THE OPERATIONAL EFFICIENCY OF LISTED PROCESSING AND MANUFACTURING ENTERPRISES IN VIETNAM

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Nguyen Minh Dung - Nguyen Duc Huy****

Abstract: ***This article aims to assess the current status and effect of capital structure on the operational efficiency of listed enterprises in the processing and manufacturing (P&M) sector in Vietnam. A dataset about 138 firms within the sector during the period from 2015 to 2023 is employed for regression analysis using three approaches: Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects Model (FEM), and Random Effects Model (REM), which allows the evaluation of the most suitable model for the research. The research findings reveal the negative influence of the short-term debt-to-total assets ratio and the long-term debt-to-total assets ratio (both representing capital structure) on Return on Assets (ROA) and Tobin's Q (representing operational efficiency regarding book value and market value, respectively). Additionally, the research highlights the positive effect of firm size on both ROA and Tobin's Q, as well as the positive influence of the growth rate variable on ROA. Based on these results, several recommendations are presented to enhance the operational efficiency of enterprises in the P&M sector in Vietnam.***

• Keywords: *capital structure, operational efficiency, processing and manufacturing sector.*

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1. Introduction

During the period from 2011 to 2023, the P&M sector played a pivotal role, consistently serving as a key driver of economic development in Vietnam (General Statistics Office, 2023). The sector gradually increased its share in GDP, replacing the agriculture sector, thereby fostering economic growth and enhancing integration into global value chains. However, in spite of being recognized as the driving force of economic development, the current level of the P&M sector in Vietnam remains relatively low in relation to the requirements of other industrialized nations. Its competitiveness ranking is only slightly higher than Cambodia, Laos, and Myanmar, and considerably lower than Malaysia, Indonesia, Singapore, and Thailand.

Regarding Vietnamese P&M enterprises, enhancing their operational efficiency needs careful consideration of capital structure, because it is a determinant of their operational efficiency (Tran Thi Bich Ngoc and Pham Hong Trang, 2016). Capital structure is the mix of debt and equity used to finance business operations, and also represents a critical financial decision for any enterprise, moreover, the percentage of debt usage within a firm's capital structure significantly influences financial decision and managerial behavior, thereby effecting overall firm's operational efficiency (Graham & Harvey, 2001). In general, the relationship between capital structure and enterprise's operational efficiency is evaluated as a widely discussed topic, but it still remains controversial due to conflicting empirical findings. Consequently, further evidence and robust analyses are required to understand this relationship accurately, particularly for P&M enterprises in the Vietnamese stock market as no research has been conducted on this topic during the period of 2015-2023. Therefore, the research on the effect of capital structure on the operational efficiency of these listed enterprises is crucial for theoretical consolidation and for analyzing the relationship between capital structure and firm's operational efficiency.

2. Theoretical background

It can be seen that the relationship between capital structure and firm efficiency has been explored through various foundational theories. Typically,

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Modigliani and Miller (1958) theory of capital structure: Modigliani & Miller (1958) presume in an ideal market, capital structure is independent of company value. However, this assumption does not hold in reality, leading many later studies to use it as a foundation for examining how capital structure influences firm value and operational efficiency. In their later research, Modigliani & Miller (1963) evaluated corporate income tax serving as a factor in capital structure and suggested that the tax shield from debt can enhance a firm's value. Consequently, this research emphasizes the concept of increasing debt as a tool to enhance a firm's value.

Moreover, the relationship between capital structure and operational efficiency attracts attention by both domestic and international experimental researches with a considerable volume of studies and diverse methodological approaches. Typically, in the world, Abor (2007) conducted a case study on SMEs in South Africa and Ghana, where capital structure was represented by the ratio of short-term debt, long-term debt, total debt to total assets, and trade credit, while efficiency was reflected through gross profit margin, ROA, and Tobin's Q. The research emphasized that the nature and extent of the effect of capital structure on efficiency would be adjusted depending on the criteria representing capital structure and efficiency, as well as the national context being considered. For instance, ROA was negatively affected by capital structure for companies in Ghana, while for South African companies, there was a positive relationship between the ratio of short-term debt, trade credit, and ROA. The study concluded that, in general, capital structure, especially the ratio of total debt and long-term debt, tends to have a negative relationship with the efficiency of SMEs.

In Vietnam, Tran Thi Bich Ngoc and Pham Hong Trang (2016) analyzed data from 68 listed P&M companies on the Ho Chi Minh City Stock Exchange during the period of 2009-2013. In addition to ROA and ROE, the study includes Tobin's Q as a measure for operational efficiency, while capital structure is represented by four variables: the ratios of short-term debt, long-term debt, total debt to total assets, and the ratio of total debt to equity. The study also considers the effect of a firm's size and growth opportunities on operational efficiency. The results indicate a negative relationship between capital structure and firm's operational efficiency both in terms of book value and market value. Meanwhile, a firm's size and growth improve operational efficiency only when measured by book value indicators. The study also emphasizes that the ratio of short-term debt has an ambiguous relationship between ROE and ROA, partly due to the very limited use of long-term debt by companies or the inefficiency of the stock market at that time.

3. Research methodology

This quantitative research was employed to measure the effect of independent variables on the dependent variable of the proposed research model and to test hypotheses, particularly regarding the influence of capital structure on operational efficiency. The study utilized data collected originating in the consolidated financial statements of 138 publicly listed Vietnamese enterprises in P&M sector, which was audited and published on the Finpro platform for the period 2015-2023. Data was transformed into a panel dataset and subsequently analyzed through regression using three approaches: Pooled Ordinary Least Squares (OLS), Fixed Effects Model (FEM), and Random Effects Model (REM), to evaluate the most suitable model.

The primary models used are:

$$(1)\ \mathrm{ROA}_{i,t} = \alpha_0 + \alpha_1 \mathrm{STD}_{\mathrm{TA}\,i,t} + \alpha_2 \mathrm{LTD}_{\mathrm{TA}\,i,t} + \alpha_3 \mathrm{SIZE}_{i,t} + \alpha_4 \mathrm{GROWTH}_{i,t} + \varepsilon_{i,t}$$

$$(2)\ \mathrm{TOBINQ}_{i,t} = \beta_0 + \beta_1 \mathrm{STD}_{\mathrm{TA}\,i,t} + \beta_2 \mathrm{LTA}_{\mathrm{TA}\,i,t} + \beta_3 \mathrm{SIZE}_{i,t} + \beta_4 \mathrm{GROWTH}_{i,t} + \mu_{i,t}$$

Table 1: Description of variables

Variable name	Code	Measurement method	Previous research
Dependent variables			
Return on assets (ROA)	ROA	$\frac{\text{Net profit after tax}}{\text{Average total assets}}$ x100%	Abor, 2007; Tran Thi Bich Ngoc & Pham Hong Trang, 2016
Tobin's Q	TOBINQ	$\frac{\text{Market value of equity + liabilities}}{\text{Total assets}}$	Abor, 2007; Tran Thi Bich Ngoc & Pham Hong Trang, 2016
Independent variables			
Short-term debt ratio	STD_TA	$\frac{\text{Short - term debt}}{\text{Total assets}}$	Abor, 2007; Tran Thi Bich Ngoc & Pham Hong Trang, 2016
Long-term debt ratio	LTD_TA	$\frac{\text{Long - term debt}}{\text{Total assets}}$	Abor, 2007; Tran Thi Bich Ngoc & Pham Hong Trang, 2016
Control variables			
Firm size	SIZE	Natural logarithm of total assets	Tran Thi Bich Ngoc & Pham Hong Trang, 2016; Zeitun & Tian, 2007
Growth rate	GROWTH	Annual revenue growth	Tran Thi Bich Ngoc & Pham Hong Trang, 2016; Zeitun & Tian, 2007

Source: Compiled by the author from various studies

Meanwhile, variables are as in Table 1. Based on previous domestic and international research, the following initial hypotheses are proposed:

Hypothesis H1: STD_TA negatively effects ROA.

Hypothesis H2: STD_TA negatively effects TOBINQ.

Hypothesis H3: LTD_TA negatively effects ROA.

Hypothesis H4: LTD_TA negatively effects TOBINQ.

Hypothesis H5: GROWTH positively effects ROA.

Hypothesis H6: GROWTH positively effects TOBINQ.

Hypothesis H7: SIZE positively effects ROA.

Hypothesis H8: SIZE positively effects TOBINQ.

4. Research findings

Correlation analysis

Table 2: Correlation matrix of variables

	ROA	TOBINQ	STD_TA	LTD_TA	SIZE	GROWTH
ROA	1.000					
TOBINQ	0.5028	1.000				
STD_TA	-0.2656	-0.1206	1.000			
LTD_TA	-0.2300	-0.0661	-0.1392	1.000		
SIZE	0.0268	0.2205	0.0354	0.2614	1.000	
GROWTH	0.0661	-0.0021	-0.0060	0.0292	0.0271	1.000

Source: The research result

Regression analysis of the two main models through three approaches, pooled OLS, FEM, and REM, yielded results as shown in Table 3.

Table 3: Regression results of 3 models for 2 equations

Variable	ROA Equation			Tobin's Q Equation		
	Pooled OLS	FEM	REM	Pooled OLS	FEM	REM
STD_TA	-0.128***	-0.119***	-0.128***	-0.677***	0.144	-0.099
	(0.000)	(0.000)	(0.000)	(0.000)	(0.312)	(0.457)
LTD_TA	-0.216***	-0.152***	-0.167***	-1.205***	0.38**	0.168
	(0.000)	(0.000)	(0.000)	(0.000)	(0.048)	(0.375)
SIZE	0.005***	-0.011***	-0.0014	0.14***	-0.165***	-0.045**
	(0.000)	(0.000)	(0.502)	(0.000)	(0.000)	(0.055)
GROWTH	0.0065***	0.009***	0.009***	-0.005	0.022	0.022
	(0.007)	(0.000)	(0.000)	(0.835)	(0.178)	(0.187)
Intercept	-0.022	0.446***	0.172***	-2.332***	5.76***	2.504***
	(0.545)	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)
Observations	1,242	1,242	1,242	1,242	1,242	1,242

Source: The research result

*Note: Coefficients with ***, **, * are statistically significant at α=1%, 5%, 10% levels*

Subsequently, the study conducted an F-test for FEM, a LM test for REM, and a Hausman test for both models simultaneously with the research data and returned results rejecting the null hypotheses at the 1% significance level, implying that the FEM is more approriate than the Pooled OLS and REM models within the scope of the study. Conducting tests for heteroscedasticity, autocorrelation, and cross-correlation for the evaluated model, which is the FEM, the research results indicate that the model suffers from the aforementioned defects with all null hypotheses being rejected at the 1% significance level. In this case, the FGLS model will be implemented as a replacement to avoid biases in the results and increase the reliability of the model as it can overcome the above defects. Table 4 shows the estimation results according to the adjusted FGLS model.

Table 4: Estimation results of the effect of capital structure on firms' operational efficiency (OE) by book value (model 1) and market value (model 2)

Variable	Model 1 (FGLS)	Model 2 (FGLS)
	ROA	Tobin's Q
STD_TA	-0.1076***	-0.3092***
	(0.000)	(0.000)
LTD_TA	-0.1516***	-0.3311***
	(0.000)	(0.000)
SIZE	0.0025***	0.0650***
	(0.002)	(0.000)
GROWTH	0.0122***	-0.0018
	(0.000)	(0.932)
Intercept	0.0451**	-0.5505***
	(0.043)	(0.002)
Observations	1,242	1,242

Source: The research result

*Note: Coefficients with ***, **, * are statistically significant at α=1%, 5%, 10% levels*

Results discussion

Firstly, the research results in Table 4 show the negative effect of both short-term and long-term debt-to-total assets ratio on both ROA and Tobin's Q, thereby predicting that the debt-to-total asset ratio will also have a negative effect on the variables representing operational efficiency. Because if these debts are not monitored, supervised, used, and managed effectively, they can put pressure on and increase interest expenses, continuously overshadowing the benefits from financial leverage, which can lead to negative financial leverage amplification and reduce operational efficiency of enterprises. In Vietnam, in the liabilities of enterprises, the proportion of debt from credit institutions such as banks often accounts for a high

proportion, due to the fact that other markets such as bonds are not really developed. The characteristics of enterprises in the P&M sector are frequent use of financial leverage, dependence on bank credit, and the use of a lot of working capital, so when there are large fluctuations in interest rates from the market, the cost of capital will increase significantly. The negative effect of debt variables on operational efficiency is also consistent with previous researches by Abor (2007), Zeitun & Tian (2007).

The study also showed a positive effect of firm size on ROA and Tobin's Q. This indicates that economic efficiency increases with scale, and large-scale enterprises in the P&M sector have conditions to access more diverse and modern technology and technology compared to small-scale enterprises in the same sector. Large enterprises create greater credibility due to the stability of cash flow, liquidity, and profit-generating capital use, thereby facilitating the signing of debt contracts in terms of amount, interest rate, repayment term, and easier capital mobilization from credit institutions. The above conclusion is completely consistent previous studies such as Zeitun & Tian (2007).

Finally, the study showed a positive effect of growth rate on ROA as in the studies of Abor (2007), Zeitun & Tian (2007), however, the results showed that growth rate had no obvious effect on Tobin's Q, which points out the company's operational efficiency regarding market value is not in relation with the growth rate. This can be explained by the fact that the Vietnamese stock market is not really efficient and there are still information asymmetries, herd mentality, and many enterprises with very low market values, leading to an unclear relationship between growth rate and the company's market value. This result contradicts the research results of Tran Thi Bich Ngoc and Pham Hong Trang (2016) when they found a negative relationship between growth rate and Tobin's Q.

5. Conclusion and recommendations

Conclusion

The research results show a negative effect of both short-term and long-term debt-to-total assets ratio on both ROA and Tobin's Q, thereby predicting that the debt-to-total asset ratio will also have a negative effect on the variables representing operational efficiency. In addition, the study also showed a positive effect of firm size on ROA and Tobin's Q, as well as a positive effect of growth rate on ROA, however, growth rate had no obvious effect on Tobin's Q.

Recommendations

Some recommendations based on the research results above, the author provides some recommendations for the state, enterprises, and managers as follows: For the state and relevant authorities, it is necessary to establish and adjust policies appropriately to support enterprises in the processing & manufacturing sector in enhancing operational efficiency by reducing debt, increasing size, and accelerating growth rates. First, the tax policy should be reasonably regulated by the state for each specific enterprise. Second, the state ought to foster a supportive environment for enterprises to raise equity capital more easily through the stock market. Third, the state should facilitate enterprises to effectively leverage debt financing through bonds. Finally, the state should create favorable conditions for enterprises to access capital when needed to increase firm size and build a conducive investment and business environment, promoting healthy competition among enterprises to expand revenue growth opportunities for the sector. For enterprises and managers, it is necessary to adjust the capital structure toward minimizing debt to improve the company's profitability and market value. Additionally, enterprises can issue short-term bonds to financial institutions in the primary capital markets to supplement working capital and finance their production and business activities. Capital-raising and utilization activities that do not increase the company's asset size should be carefully considered, such as issuing additional bonds or taking on debt to restructure maturing debts or to repurchase company shares. Finally, enhancing management capacity and production, as well as business organization, should be prioritized to drive revenue growth and explore further market potential.

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BOOSTING SUSTAINABLE INDUSTRY IN THAI NGUYEN PROVINCE AMID DEEP GLOBAL INTEGRATION

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Abstract: ***Thai Nguyen province, one of the major industrial centers in Northern Vietnam, is facing significant challenges and opportunities in the context of deep international economic integration. The industrial development in Thai Nguyen not only contributes to the economic growth of the province but also plays a crucial role in the industrialization and modernization of the country. However, to achieve sustainable development, industrial production in Thai Nguyen needs to comply with economic, social, and environmental criteria. This paper focuses on analyzing the current situation, challenges, and proposing solutions to promote sustainable industrial production in Thai Nguyen during the phase of increasingly deep international integration.***

• Keywords: *Thai Nguyen province, production, industry, sustainability, international integration.*

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1. Introduction

In the context of globalization and deep international integration, provinces across the country, particularly major industrial centers like Thai Nguyen, are facing significant opportunities and challenges. Thai Nguyen Province, with its strategic geographical location and abundant resources, has become a bright spot on the industrial map of Northern Vietnam. The rapid development of the industrial sector here not only contributes to the province's economic growth but also plays a crucial role in the national process of industrialization and modernization. However, this development also brings significant pressures on the environment, society, and economy. While expanding production and attracting foreign investment create opportunities for growth and improving product quality, it also imposes strict requirements for environmental protection, efficient use of resources, and ensuring benefits for the local community.

The deep international integration has opened many opportunities for Thai Nguyen, from accessing advanced technology, expanding export markets, to attracting high-quality investment capital. However, this also comes with intense competitive pressure and the requirement to meet international standards for sustainability. This paper reflects the current state of industrial production in Thai Nguyen, identifies the difficulties and challenges the province is facing, and proposes specific solutions to promote sustainable industrial development. The goal is to provide a comprehensive perspective and guidance for managers, investors, and stakeholders in building and implementing sustainable industrial development strategies in Thai Nguyen, while also contributing to the overall development of the national economy.

2. Current status of industrial development in Thai Nguyen province

Thai Nguyen Province has emerged as an important industrial center with a diverse range of industries and strong development in recent years. The industrial sector in Thai Nguyen not only significantly contributes to the province's GDP but also positively impacts regional and national economic development. The industrial production value in 2023 reached VND 972.7 trillion, an increase of 5.13% compared to the previous year. Among this, local industry accounted for VND 44.6 trillion, up 8.5% from the previous year (Thai Nguyen Provincial People's Committee, 2023). The Industrial Production Index (IIP) for the first seven months of 2024 increased by 7.15% compared to the same period last year.

Table 1: Cumulative IIP for the first 7 months of Thai Nguyen province compared to the same period in previous years (2020-2024) (%)

Sector	2020	2021	2022	2023	2024
Total Industry	97,11	108,07	111,27	103,94	107,15
Mining	94,62	87,89	79,92	95,72	101
Manufacturing	97,04	108,55	112,01	103,29	107,27
Electricity Generation and Distribution	103,79	100,99	96,03	107,32	100,29
Water Supply, Waste Management, and Waste Treatment	93,41	103,24	99,06	119,15	121,28

Source: Report on economic - social situation for July 2024 in Thai Nguyen province by the Thai Nguyen statistics department, 2024

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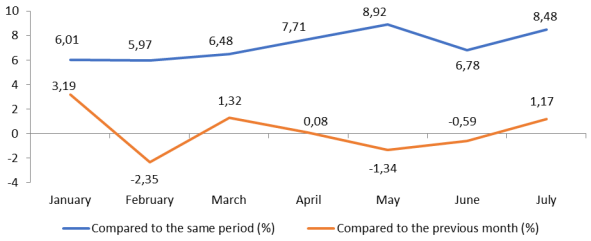
The IIP of the water supply, waste management, and wastewater treatment sector increased the most, by 21.28%. Following this, the manufacturing and processing industry grew by 7.27%; the mining sector increased by 1%; and the electricity distribution and production sector rose by 0.29%. The first seven months of 2024 have witnessed new developments in industrial production in Thai Nguyen province.

Chart 1: Monthly IIP for 2024 of Thai Nguyen province compared to the previous month and the same period last year



Source: Report on economic - social situation for July 2024 in Thai Nguyen province by the Thai Nguyen statistics department, 2024

In July 2024, the IIP increased by 1.17% compared to the previous month and by 8.48% compared to the same period last year. In the manufacturing and processing sector, several industries saw "double-digit" production index increases in July 2024 compared to the same period, such as: apparel manufacturing up 12.93%; electronic product manufacturing up 12.99%; rubber and plastic product manufacturing up 17.59%; other manufacturing and processing industries up 31.98%; and motor vehicle manufacturing up 51.22%.

For the first seven months of 2024, some major industrial products had significant increases in production compared to the same period last year, including: iron ore and unroasted iron concentrate at 353.9 thousand tons, up 36.5%; other motor vehicle parts at 60.6 thousand units, up 45.2%; medical equipment and instruments at 1,156.2 million units, up 19.9%; clothing products at 64.3 million units, up 6.2% compared to the same period and reaching 56% of the plan; various types of steel at 774.6 thousand tons, up 16.5% compared to the same period and reaching 51.3% of the plan; electronic products at 175.2 million units, up 22.8% compared to the same period and reaching 61.5% of the plan; commercial electricity at 3,780.5 million kWh, up 16.9% compared to the same period and reaching 63% of the plan; and commercial water at 25.6 million m^3, up 24.4% compared to the same period and reaching 63.9% of the plan.

The positive results in the industrial production sector in Thai Nguyen Province are also reflected in the increasing number of employees working in industrial enterprises (Tran Nhung, 2024). For the first seven months of 2024, the number of employees in industrial enterprises increased by 1.3% compared to the same period last year. Among them, state-owned enterprises decreased by 2%; non-state enterprises increased by 10.9%; and foreign-invested enterprises decreased by 1.9%. By sector, mining decreased by 2.5% compared to the same period; manufacturing and processing increased by 1.33%; electricity production and distribution increased by 1.2%; and water supply, waste management, and wastewater treatment increased by 0.8% (Thai Nguyen Statistics Department, 2024).

Despite the achievements made, industrial development in Thai Nguyen Province still faces certain limitations. These limitations have been and continue to affect the sustainable development of the industrial sector in the region. Samsung and its South Korean supporting companies, with advanced and modern technology, are key players in the production of electronic products in Thai Nguyen. This sector strongly attracts foreign direct investment (FDI). However, the degree of local content remains low, accounting for only a small portion of the supply chain. Since the launch of Samsung's smartphone and tablet production project in 2014, the electronics manufacturing sector has quickly accounted for over 90% of the province's total industrial production value. Nevertheless, the production value from supporting industries is only about 7-9% of the total industrial production value, indicating a high dependence on external raw materials and technology (Trinh Viet Hung, 2023).

The steel industry in Thai Nguyen has made significant investment strides, focusing on increasing capacity and adopting some new technologies. However, overall, the technology and equipment used in this sector remain at a moderate level. The steel products are not diversified and mainly focus on basic products such as rolled steel, pig iron, tin ingots, and zinc ingots. The level of deep processing is still low, and high-end products for machinery manufacturing, shipbuilding, and other industrial sectors are not yet widely produced. In the mining and mineral processing sector, Nui Phao Mining and Mineral Processing Co., Ltd. is the only entity in Thai Nguyen that has invested in modern mining technology, improving efficiency and

reducing environmental impact. Meanwhile, other mining facilities continue to operate with outdated technology, low productivity, and largely rely on manual labor. This not only leads to resource loss and waste but also causes significant environmental pollution…

Moreover, the linkages between businesses in the production value chain in Thai Nguyen are still limited, resulting in an inefficient and suboptimal production process. Small and medium-sized enterprises face difficulties accessing necessary resources, such as capital, technology, and markets, to enhance their competitiveness and achieve sustainable development. Additionally, the connectivity between businesses within the province and with those in other regions is not yet strong, leading to reliance on foreign suppliers and customers. Although there have been many improvements in transportation infrastructure and industrial zones, Thai Nguyen still faces significant issues in developing infrastructure in a coordinated manner. The transportation system connecting industrial zones with neighboring areas has not been upgraded in a timely manner, creating difficulties in goods transportation and investment attraction. Despite the province's efforts to implement various industrial development support policies, these policies have not been applied or executed consistently and effectively. Businesses, especially small and medium-sized enterprises, still struggle to access support programs related to capital, technology, and human resource training. The lack of guidance and support for businesses transitioning to green and high-tech production is also a limitation that needs to be addressed.

Industrial activities in Thai Nguyen have caused several negative environmental impacts, such as air, water, and soil pollution… Mining areas and heavy industrial production sites are the most severely affected, with many issues related to waste and wastewater management that have not been fully addressed. This not only affects the health of local communities but also reduces the province's attractiveness for sustainable investment. The limitations in industrial development in Thai Nguyen present both challenges and opportunities for the province to adjust and improve its development policies and strategies. Addressing these limitations requires close cooperation between the government, businesses, and the community, along with the application of effective technological and managerial solutions. Only in this way can Thai Nguyen achieve its goal of sustainable industrial development in the context of international integration.

3. Some solutions to promote sustainable industrial development in Thai Nguyen province during deep international integration

In order to promote sustainable industrial development in Thai Nguyen Province during the increasingly deep international integration phase, several solutions need to be implemented strongly and comprehensively.

Firstly, it is essential to increase investment in high technology and innovation, particularly encouraging businesses to adopt new technologies to enhance production efficiency, save energy, and minimize negative environmental impacts. The development of information and communication technology plays a crucial role in digitizing production processes and business management, helping to improve operational efficiency and resource management. Additionally, promoting domestic research and development (R&D) is a critical strategy; supporting research centers and universities in the province to develop technology solutions tailored to local industrial characteristics is necessary. This also includes facilitating partnerships between local businesses and international partners to develop and transfer new technologies.

Secondly, developing a high-quality workforce is a key factor in enhancing the competitiveness of businesses in Thai Nguyen. Training programs need to be designed according to market demands, focusing on high-tech skills and production management. Close cooperation with universities, colleges, and training institutions both domestically and internationally is necessary to improve training quality and meet labor market needs. Furthermore, effective policies and incentives to attract talent and skilled labor to the province need to be developed and implemented. Improving the working environment and living conditions for employees is crucial to retaining skilled and experienced individuals, enabling them to maximize their potential and stay committed to their companies.

Thirdly, strengthening value chain linkages and supporting businesses is one of the important solutions to promote sustainable industrial development in Thai Nguyen. Building and developing networks of connections between businesses within and outside the province will help increase added value for products and reduce dependence on external

materials and technologies. Developing supply chains, especially in manufacturing and processing industries, will create strong connections between businesses, thereby enhancing competitiveness in the market. Simultaneously, supporting small and medium-sized enterprises in accessing necessary resources such as capital, technology, and markets is essential for increasing competitiveness and sustainable development. Tax incentives, fee reductions, and financial support for businesses undergoing technology transitions and developing green production should also be effectively applied.

Fourthly, environmental protection and efficient resource use are indispensable factors in sustainable industrial development. Encouraging businesses to adopt green production standards, minimize emissions, and use resources efficiently will help reduce negative environmental impacts. Investing in recycling and waste treatment technologies is also crucial to ensuring that business activities do not harm the surrounding environment. Additionally, enhancing environmental management and monitoring, developing strict environmental management and monitoring systems, will help ensure that businesses comply with environmental protection regulations. Conducting environmental impact assessments (EIAs) for all new industrial projects and upgrading existing projects will help minimize negative impacts on the environment and community.

Fifthly, developing modern and synchronized industrial infrastructure is crucial for enhancing competitiveness and attracting investment to the province. Investing in transportation and logistics systems, upgrading and expanding transportation infrastructure connecting industrial zones and neighboring areas, will support production and business activities. Developing modern industrial zones with synchronized technical and social infrastructure is also an important solution to meet the needs of domestic and foreign businesses. Furthermore, supporting renewable energy projects such as wind and solar power to provide clean energy for industrial zones should be promoted. Investment in water supply and waste treatment systems to ensure that business operations do not negatively impact the environment is also a necessary solution.

Sixthly, strengthening international cooperation and economic integration is an important solution to promote sustainable industrial development in Thai Nguyen. Participating in free trade agreements and international economic forums will help expand markets and attract investment to the province. Enhancing cooperation with international organizations in technology transfer, human resource training, and financial support is also a crucial strategy to improve the competitiveness of businesses in Thai Nguyen. Developing e-commerce is another important solution to expand distribution channels and reach global customers. Boosting industrial product exports and facilitating businesses in applying e-commerce will help increase product value-added and reduce dependence on the domestic market.

Seventhly, improving the legal and policy framework is a necessary solution to create favorable conditions for businesses to operate and develop sustainably. Continuing to reform administrative procedures and create a business-friendly environment is essential for improving operational efficiency and reducing costs for businesses. Developing policies that encourage sustainable development, particularly in high-tech investment, green production, and environmental protection, will provide incentives for businesses to transition and develop sustainably. Strengthening the management and oversight capabilities of state agencies will ensure the effective and consistent implementation of policies and regulations. Supporting businesses in transitioning to sustainable production through consulting and technical support programs is also a necessary solution to ensure the sustainable development of the industrial sector in Thai Nguyen.

These solutions require close coordination between local authorities, businesses, and the community to create a favorable environment for sustainable industrial development in Thai Nguyen during the phase of deep international integration. Sustainable industrial development will not only contribute to the province's economic growth but also help protect the environment and improve the quality of life for residents.

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FINANCIAL STRUCTURE AND R&D INTENSITY: INTERNATIONAL EVIDENCE

PhD. Le Quynh Lien*

Abstract: ***This paper investigates the impact of financial structure on research and development (R&D) intensity. The author uses data from the Compustat database, covering 21,215 global firms from 2009 to 2023, resulting in 163,641 firm-year observations. The author conducts multiple regression methods to address potential model issues and test the robustness of the results. These findings show a negative relationship between both short-term and long-term debt and R&D intensity, with higher levels of short-term debt reducing R&D investment and increased long-term debt similarly constraining R&D due to elevated financial obligations. These results also indicate a non-linear relationship between debt and R&D investment, where short-term debt begins to positively influence R&D after reaching a certain threshold, and long-term debt also supports R&D investment once it exceeds a specific level, suggesting that while moderate debt levels may initially hinder R&D, excessive debt can potentially be leveraged to enhance R&D efforts.***

• Keywords: *compustat; financial structure; global firms; R&D intensity.*

JEL codes: G32, G34, O32

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1. Introduction

Research and Development (R&D) has emerged as a key driver of economic growth and competitiveness in today's rapidly evolving technological landscape. As a primary indicator of innovation, R&D investment is strongly linked to firm performance and productivity (Darfo-Oduro, 2023). By reducing costs, improving operational efficiency, and introducing new products, R&D enhances a company's market position (Bernstein and Mamuneas, 2006). It plays a crucial role in technological advancement, giving firms a competitive edge and fostering market leadership, particularly in technology and manufacturing sectors (Hall and Orian, 2006). Studies indicate that firms with higher R&D investments experience greater profitability (Wang, 2011), while R&D intensity is positively correlated with firm performance (Connolly and Hirschey, 2005; Xu and Jin, 2016).

To fund R&D initiatives, many organizations turn to debt financing. Compared to internal funds, debt financing offers several advantages, including tax relief and deductibility. Investors are often willing to fund high-risk R&D projects due to the potential for substantial returns. Additionally, issuing debt allows companies to avoid dilution of ownership and pay only the market interest rate, making it a more attractive option compared to equity financing (Martinsson, 2009).

The relationship between debt and research and development (R&D) plays a pivotal role in shaping a company's innovation landscape and overall financial health. Companies often rely on various financial structures, including debt financing, to fund their R&D initiatives, which are essential for fostering innovation and maintaining competitive advantage. This reliance on borrowed capital can provide the necessary resources to develop new technologies and products, yet it also introduces challenges related to financial risk and potential constraints on future investment (Whited, 1992). Conversely, a well-structured approach to debt can empower companies to pursue ambitious projects that drive long-term success. Understanding this dynamic is essential for leaders aiming to navigate the complexities of financial strategy while fostering a robust culture of innovation.

This study investigates the effects of financial structure on R&D intensity for several important reasons. First, the relationship between these two factors has been explored through various theoretical frameworks, often producing mixed empirical results. Given the inconclusiveness of existing data, this research aims to provide deeper insights into the issue. Second, while some evidence from developed

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markets (Whited, 1992; Mishra and McConaughy, 1999; Singh and Faircloth, 2005) indicates a connection between financial structure and R&D intensity, there is a lack of data from international contexts, particularly in today's globalized accounting environment. This study seeks to broaden the understanding of how financial structure and R&D intensity relate to each other and how this relationship varies across different countries, regions, and industries. Third, while previous studies often treat debt as a single factor, this research separates short-term and long-term debt to investigate their individual effects on R&D intensity.

2. Literature review and hypothesis development

Previous studies show the negative relationship between debt and research and development (R&D) investment, primarily due to the financial burdens imposed by high debt levels. As highlighted by Mishra and McConaughy (1999), a higher debt ratio increases the probability of bankruptcy and complicates the financing of R&D projects. Supporting this perspective, Whited (1992) argues that firms with higher leverage face greater financial constraints, which correlates with a reduction in R&D investments. Singh and Faircloth (2005) examined a sample of 392 large U.S. manufacturing corporations and confirmed a strong negative relationship between financial leverage and R&D expenditure. This suggests that debt overhang may compel firms to forgo valuable long-term investment opportunities. Consequently, leveraging may impose hidden costs, driving managers to become myopic and neglect investments that could yield significant long-term benefits. Therefore, increased leverage is generally associated with less commitment to innovation.

Liquidity issues also contribute to the negative relationship between debt and R&D investment. Hoshi et al. (1991) report that high leverage is associated with reduced liquidity, which can further inhibit R&D investment. Similarly, Lang et al. (1996) found a negative relationship between leverage and investment expenditures for firms that are not accurately valued by the market, suggesting that excessive debt can constrain a firm's ability to invest in R&D.

Companies with high debt often have high cash flow uncertainty, which also presents a complex dynamic in corporate investment decisions. Some scholars, like Boyle & Guthrie (2003), suggest that heightened cash flow uncertainty can prompt firms to increase current investments to avoid future financing costs. Conversely, other research indicates that significant cash flow uncertainty may lead firms to adopt a more conservative stance, resulting in reduced investment levels (Almeida & Campello, 2007; Minton & Schrand, 1999). Innovative firms, when confronted with high cash flow uncertainty, are often reluctant to commit resources to R&D. Opler et al. (1999) note that such firms tend to hold more cash and cash equivalents to mitigate risks. This tendency is reinforced by findings from Keefe and Tate (2013), indicating that firms facing high cash flow risk typically reduce their investments by about 5%. This duality emphasizes the need for financial flexibility; firms that face financial constraints may find cash flow uncertainty particularly inhibitive to R&D investment.

Besides, debt holders typically prefer that firms focus on generating cash flows over the short term rather than invest in the long-term and often unpredictable nature of R&D ventures (Peyer, 2001). This focus can shift management's priorities toward immediate cash generation, thereby creating a negative causal relationship between leverage and R&D expenses. Yang (2022) found a negative correlation between this ratio and R&D investment, suggesting that increasing debt levels diminish a company's willingness to innovate. In fact, high debt burdens necessitate stable cash flows to manage interest payments, making firms wary of investing in long-term, high-risk R&D projects. As a result, the pressure of debt can significantly hinder a firm's innovative potential. Moreover, research by Denis and Denis (1993) indicates that cash flows tend to improve after a firm undergoes leveraged recapitalization. However, this may lead management to concentrate more on cash generation at the expense of long-term investments in R&D.

The interplay of high debt levels, cash flow uncertainties, and management priorities reveals a consistent negative relationship between debt and R&D investment. This dynamic underscore the challenges firms face in balancing financial obligations with the need for innovation in a competitive landscape.

Based on the literature review, the following hypothesis is proposed:

H1: Short-term debt has a negative impact on R&D intensity

H2: Long-term debt has a negative impact on R&D intensity

Debt often acts as a double-edged sword in the context of research and development (R&D) investment. Initially, when companies take on debt, they may face constraints that limit their capacity to invest in innovative projects. This is particularly true when the debt levels are low; firms may prioritize debt servicing over long-term investments in R&D, fearing the financial burden that comes with higher leverage. However, once a company surpasses a certain threshold of debt, the dynamic shifts. At this point, the increased access to capital can be leveraged to support and enhance R&D efforts. With sufficient resources, companies can embark on ambitious projects, fund research initiatives, and explore new technologies that drive innovation. High debt can also provide the necessary funds to invest in large-scale R&D projects that might otherwise be unaffordable. Awad and Ali (2022) identified an optimal debt threshold, indicating that companies with low levels of debt often lack sufficient leverage in their capital structures to maximize market value due to agency costs and the costs of debt stemming from asymmetric information. However, once firms exceed this ideal debt level, they can leverage additional borrowing to capitalize on benefits such as tax savings, which in turn can enhance their market value and support greater investment in R&D efforts. This transition illustrates how, contrary to initial constraints, higher levels of debt can eventually empower firms to invest in their future growth and competitiveness.

Based on the literature review, the following hypothesis is proposed:

H3: There is a non-linear relationship between short-term debt and R&D intensity

H4: There is a non-linear relationship between long-term debt and R&D intensity

3. Research methodology

3.1. Model specification and variables

3.1.1. The regression model

Equation (1) is developed based on the literature review related to financial structure and R&D intensity as follows:

$$R\&D\ intensity_{i,t} = \beta_0 + \beta_1 Short\text{-}term\ debts_{i,t} + \beta_2 (Short\text{-}term\ debts_{i,t})^2 + \beta_3 Long\text{-}term\ debts_{i,t} + \beta_4 (Long\text{-}term\ debts_{i,t})^2 + \gamma Control_{i,t} + Year + \varepsilon_{i,t} \quad (1)$$

Where: R&D intensity$_{i,t}$ is the proxy of R&D intensity for firm i in year t; The key independent variable, Short-term debts$_{i,t}$ and Long-term debts$_{i,t}$ represents financial structure for firm i in year t; β_0, β_1, β_2, β_3, β_4 captures the impact of financial structure on R&D intensity. Control refers to the set of control variables described in Table 1.

3.1.2. Variables

Table 1 describes all the variables included in the regressions as follows:

Table 1. Variable descriptions

Variable	Symbol	Description	References	Data source	Min	Mean	Max
I. Dependent variables							
R&D intensity	RDEI	The ratio of R&D expenses to total assets	Berchicci (2013), Usman và cộng sự (2017)	Compustat	0.0000309	0.0395928	0.4994864
R&D intensity	LNRDE	The square of the ratio of R&D expenses to total assets	Osma & Young (2009), Freimane & Bāliņa (2016)	Compustat	-3.729702	3.758924	11.02038
II. Independend variables							
Short-term debt	STD	The ratio of current assets to current liability	Yang (2022)	Compustat	0.9110651	0.0243384	11.07438
(Short-term debt)^2	STD2	The square of the ratio of current assets to current liability	Awad and Ali (2022)	Compustat	2.721893	0.0005955	122.7381
Long-term debt	LTD	The ratio of non-current assets to non-current liability	Yang (2022)	Compustat	0.3541018	0	3.93688
(Long-term debt)^2	LTD2	The quare of the ratio of non-current assets to non-current liability	Awad and Ali (2022)	Compustat	0.4028767	0	15.53052
III. Control variables							
Sales growth	Growth	The ratio of change in Sales to Sales	Lee and Lee (2019), Yang (2022)	Compustat	2.084566	-1.222965	130.4009
Firm size	Size	Natural logarithm of total assets	Yang (2022)	Compustat	7.5203	-0.0325232	15.94412
Audit	Audit	The ranking of audit firms	Al-Matari et al. (2016)	Compustat	2.595706	2	5

3.2. Sample and Methodology

The author utilized data from the Global Compustat database, available through WRDS (https://wrds-web.wharton.upenn.edu/wrds/), which offers comprehensive international financial information. Our sample includes 21,215 non-financial firms spanning from 2009 to 2023. We excluded financial institutions due to their distinct financial activities compared to non-financial firms. To ensure dataset integrity, we removed missing data points. We applied winsorization to the main variables, trimming the top and bottom one percent of observations to mitigate the impact of

outliers. The final dataset comprises 163,641 firm-year observations, providing a robust basis for our analysis.

In this study, the author explores how the results might vary with different estimation methods. First, we apply ordinary least squares Pooled OLS with firm dummies to regress Equations (1). Then, we test alternative fixed-effects settings and alternative additional regression analyses such as fixed effects model (FEM), and random effects model (REM) to evaluate the robustness of the results. Additionally, we conduct tests for Pooled OLS, FEM, REM and REM robust to resolve potential issues in the models.

4. Results and discussions

4.1. Summary statistics

Table 1 reports the descriptive statistics of variables included in this study to provide insight into both R&D expenditure and financial structure across a substantial dataset.

RDEI and LNRDE are two measures of R&D expenditure. RDEI, based on 166,195 observations, has a mean of 0.0396 and a standard deviation of 0.0741, indicating relatively low average R&D investment compared to firm size, with some firms allocating nearly half of their expenditures to R&D. LNRDE, with 166,340 observations, has a mean of 3.7589 and a standard deviation of 2.9835, providing a broader view of R&D expenditure distribution.

STD and LTD reflect firms' financial structures. STD, with 407,491 observations, shows a mean of 0.9111 and a standard deviation of 1.3749, indicating variability in short-term debt usage. STD2 has the same sample size but a higher mean of 2.7219 and a substantial standard deviation of 13.7141, indicating significant dispersion. LTD, with 404,371 observations, has a mean of 0.3541 and a standard deviation of 0.5263, while LTD2 shows a mean of 0.4029 and a standard deviation of 1.7522, both reflecting long-term debt usage.

Regarding growth and size, Growth has 480,890 observations with a mean of 2.0846 and a standard deviation of 14.3691, indicating diverse growth rates. Size, with 497,256 observations, reveals a mean of 7.5203 and a standard deviation of 3.3074, reflecting significant variation in firm scale. Lastly, Audit has the largest sample size of 499,750 observations, with a mean audit quality of 2.5957 and a standard deviation of 1.1084, indicating diversity in the audit environment.

4.2. Empirical results and discussions

Table 2 presents the estimation results of Equation (1). The variance inflation factors (VIFs) are all below 1.07, suggesting that multicollinearity is not a significant issue among the variables (Hair et al., 2010).

The findings indicate that short-term debt has a negative effect on R&D intensity for both measures, suggesting that higher levels of short-term debt are associated with decreased R&D investment. Thus, H1 hypothesis is accepted. This finding is consistent with DeAngelo and Masulis (1980), who argue that higher leverage may limit R&D spending due to increased financial obligations. This suggests that firms with high short-term debt face financial constraints that reduce their ability to invest in long-term projects such as R&D.

The study also reveals a negative effect of long-term debt on R&D intensity. Therefore, H2 hypothesis is accepted. This aligns with Myers (1984) and the pecking order theory, which posits that firms prefer internal funding for R&D and may cut R&D expenditures when external financing costs are high. Consequently, higher long-term debt is linked to reduced R&D intensity, as increased financial obligations limit the resources available for R&D investment.

Furthermore, Table 2 shows a positive effect of the squared term of short-term debt on R&D intensity, indicating a non-linear relationship where the impact of short-term debt on R&D becomes positive beyond a certain threshold. Thus, H3 hypothesis is accepted. This result is consistent with Korteweg (2010), who observed that while initial short-term debt might constrain R&D, higher levels can facilitate more effective debt utilization. Similarly, Brown and Petersen (2009) noted that moderate debt levels can enhance firm innovation and R&D activities, suggesting that increased short-term debt, after surpassing a certain level, can help firms leverage their resources more effectively for R&D.

Besides this, the squared term of long-term debt also shows a positive effect on R&D intensity, mirroring the non-linear relationship found with short-term debt. These findings show that the impact of long-term debt on R&D becomes positive after a certain threshold, indicating that firms may balance their debt levels to optimize R&D investment. Therefore, H4 hypothesis is accepted. This is consistent with Korteweg (2010), who found that while moderate debt can support innovation, excessive debt may hinder it, which aligns with the non-linear effects observed in this study.

Furthermore, growth exhibits a positive influence on R&D expenditure, with significant values for both RDEI and LNRDE. This suggests that growth has a relatively limited effect on R&D investment. In contrast, size demonstrates a notable positive impact on R&D intensity, indicating that larger firms are more likely to allocate greater resources to R&D. However, the negative relationship of size with RDEI may imply that larger companies maintain a more consistent R&D budget in relation to their overall size. This finding aligns with Brown et al. (2009), who note that larger firms generally have more resources for R&D, reinforcing the observed positive connection between firm size and R&D intensity in this study. Finally, audit quality positively influences R&D expenditure, while it has a negative impact on R&D intensity. This may suggest that higher audit quality correlates with improved financial reporting and potentially more conservative R&D investment strategies.

Table 2. Multivariate analysis

VARIABLES	(1)	(2)	(3)	(4)	VIF
	RDEI		LNRDE		
STD	-0.013***	-0.013***	-0.773***	-0.767***	1.03
	(0.000)	(0.000)	(0.012)	(0.012)	
STD2	0.002***	0.002***	0.073***	0.072***	1.01
	(0.000)	(0.000)	(0.002)	(0.002)	
LTD	-0.014***	-0.014***	-0.869***	-0.848***	1.02
	(0.001)	(0.001)	(0.021)	(0.021)	
LTD2	0.012***	0.012***	0.293***	0.286***	1
	(0.000)	(0.000)	(0.007)	(0.007)	
Growth	0.000***	0.000***	0.001***	0.002***	1
	(0.000)	(0.000)	(0.000)	(0.000)	
Size	-0.007***	-0.007***	0.820***	0.818***	1.04
	(0.000)	(0.000)	(0.002)	(0.002)	
Audit	0.003***	0.003***	-0.098***	-0.095***	1.07
	(0.000)	(0.000)	(0.005)	(0.005)	
Constant	0.099***	0.094***	-2.104***	-2.415***	
	(0.001)	(0.001)	(0.019)	(0.040)	
Mean VIF					1.03
Firm FE	No	Yes	No	Yes	
Observations	163,641	163,641	163,582	163,582	
R-squared	0.163	0.164	0.660	0.661	

*Notes: This table reports the baseline regression results of the impact of financial structure and R&D intensive. Firm fixed effect is included in the regressions. Standard errors are double-clustered by firm-year. Robust t-statistics are in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.*

The results in Table 3 reveal the following that Heteroskedasticity, skewness, and kurtosis are significant in both models, indicating that the residuals vary widely, are not normally distributed. The Wooldridge test shows autocorrelation, suggesting that past values influence current observations. In Table 3, the Hausman test results show chi2(7) = 3900.62 and chi2(7) = 2304.41, with p-values of 0.000 for both RDEI and LNRDE. These results indicate that fixed effects models are more suitable than random effects models for both measures, suggesting that accounting for individual-specific effects is crucial in the analysis. These issues will be addressed by implementing FEM robust, as shown in the results of Table 4.

Table 3. Tests for fixed and random effects

	RDEI	LNRDE
White's test		
Heteroskedasticity	22865.99(0.000)	3128.9(0.000)
Skewness	9893.95(0.000)	6263.07(0.000)
Kurtosis	2109.01(0.000)	1213.44(0.000)
Wooldridge test		
Hausman test	F(1, 17670) = 709.238 Prob > F = 0.0000	F(1, 17665) = 2141.409 Prob > F = 0.0000
	chi2(7) = 3900.62 Prob > chi2 = 0.0000	chi2(7) = 2304.41 Prob > chi2 = 0.0000

4.3. Sensitivity tests

Table 4 confirms the robustness of the findings presented in the previous analysis as follows:

Table 4. Alternative analysis regressions

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	FEM		REM		FEM Robust	
	RDEI	LNRDE	RDEI	LNRDE	RDEI	LNRDE
STD	0.011***	0.066***	0.009***	0.010	0.011***	0.066***
	(0.000)	(0.008)	(0.000)	(0.008)	(0.001)	(0.008)
STD2	-0.001***	-0.005***	-0.000***	0.000	-0.001***	-0.005***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
LTD	0.005***	-0.036***	0.002***	-0.113***	0.005***	-0.036***
	(0.001)	(0.014)	(0.001)	(0.014)	(0.001)	(0.014)
LTD2	0.001***	0.013***	0.002***	0.036***	0.001	0.013***
	(0.000)	(0.004)	(0.000)	(0.004)	(0.001)	(0.004)
Growth	-0.000***	-0.001***	-0.000***	-0.001***	-0.000***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size	-0.017***	0.758***	-0.012***	0.776***	-0.017***	0.758***
	(0.000)	(0.004)	(0.000)	(0.003)	(0.001)	(0.004)
Audit	0.001***	0.012***	0.001***	0.007***	0.001***	0.012***
	(0.000)	(0.003)	(0.000)	(0.003)	(0.000)	(0.003)
Constant	0.166***	-2.536***	0.121***	-2.882***	0.166***	-2.536***
	(0.001)	(0.032)	(0.001)	(0.027)	(0.004)	(0.032)
Observations	163,641	163,582	163,641	163,582	163,641	163,582
R-squared	0.091	0.240			0.091	0.240
Number of firmid	21,215	21,209	21,215	21,209	21,215	21,209

*Notes: This table reports the regression results of the baseline model (Equation (1)) using alternative analysis regressions. Robust t-statistics are reported in parentheses. *, ** and *** denote statistical significance of 10, 5 and 1% level, respectively.*

In Table 4, the patterns observed in the Fixed Effects Model (FEM), Random Effects Model (REM), and FEM with robust standard errors are consistent, indicating that the effects of short-term and long-term debt on R&D expenditure and intensity are stable across different estimation methods. This consistency reinforces the reliability of the results and suggests that the observed relationships are not artifacts of a particular modeling approach.

5. Conclusions and implications

This paper examines the impact of financial structure on R&D intensive. Using a comprehensive dataset of global firms spanning from 2009 to 2023, this study indicates a negative relationship between short-

term debt and long-term debt on both proxies of R&D intensity. The results reveal that both short-term and long-term debt negatively impact R&D expenditure and intensity. Specifically, higher levels of short-term debt reduce R&D investment, while increased long-term debt similarly constrains R&D spending due to elevated financial obligations. However, the relationship between debt and R&D is non-linear. For short-term debt, once it surpasses a certain threshold, it starts to positively influence R&D. Similarly, higher levels of long-term debt eventually have a positive effect on R&D investment after reaching a certain point. This indicates that while initial debt levels can constrain R&D, excessive debt may be leveraged to support R&D efforts more effectively.

The findings suggest several key implications for financial management and corporate strategy as follows: (1) Debt Management: Firms should strategically manage their debt to optimize R&D investment. While high short-term debt may initially hinder R&D, it could become beneficial beyond a certain level. Long-term debt, similarly, can constrain R&D at lower levels but may support it at higher thresholds. Balancing debt structure is crucial for leveraging financial resources effectively for R&D; (2) Financial Planning and R&D Policies: Companies should account for the non-linear effects of debt on R&D in their financial strategies. Financial managers must assess the type and amount of debt to avoid excessive constraints while benefiting from optimal debt levels. Policymakers should recognize that, although high debt can limit R&D initially, additional debt might enhance R&D activities once certain thresholds are crossed; (3) Long-Term Planning and Flexibility: Firms should maintain manageable debt levels and plan for adjustments to ensure they do not excessively limit R&D capabilities. Financial flexibility, achieved through a balance of short-term and long-term debt, is essential for adapting to changing conditions and optimizing R&D investments for long-term innovation goals.

Besides this, investors should carefully evaluate a company's financial structure, focusing on its debt levels, as an optimal debt ratio supports stable R&D investment and long-term growth. Priority should be given to companies with well-defined R&D strategies, regardless of debt. Financial institutions should create flexible credit policies to support R&D investment, such as offering special loans with favorable rates for innovative activities. Evaluating a company's R&D commitment in credit assessments and providing advisory services on debt management can optimize financial resources and reduce the negative impact of debt on R&D. For regulatory authorities, implementing policies like tax incentives and improved monitoring of corporate debt can promote sustainable financial practices. Transparency in R&D and financial disclosures is crucial for informed decision-making, contributing to the long-term growth and innovation of firms.

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IMPACT OF DIGITAL ECONOMY ON CARBON EMISSION REDUCTION IN SOUTHEAST ASIA

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Abstract: ***Asia stands out with one of the fastest-growing digital economies in the world. This rapid growth also presents significant challenges in balancing economic expansion with carbon emission reduction. In this study, a regression model is used in combination with the moderating effects of the Kuznets curve to examine the impact of the digital economy on carbon emission intensity, using panel data from nine countries in Southeast Asia during the period 2010-2022. A system of indicators has been established to measure the level of digital economy development in each country through the Entropy weighting method. The research results show that in the early stages of digital economy development, carbon emissions increased significantly, but once the digital economy became more advanced, carbon emissions decreased considerably.***

• Keywords: *digital economy, carbon emission reduction, southeast asia, entropy method, environmental kuznets curve, sustainable development.*

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1. Introduction

In this context of the climate change as one of the most urgent challenges the world, the digital economy has emerged as a new driving force for economic growth. The digital economy can be defined as a part of the economy where economic value is primarily or entirely generated from digital technologies, with business models based on digital goods or services (Bukht & Heeks, 2017a). However, the digital economy not only brings new development opportunities but also poses significant environmental challenges, particularly regarding carbon emissions (Said et al., 2022) . This study focuses on analyzing the impact of the digital economy on CO2 emissions in Southeast Asia, where the digital economy is rapidly growing due to increased mobile connectivity, high internet usage rates, and the boom of e-commerce.

Many foundational theoretical studies have examined the Environmental Kuznets Curve (EKC) hypothesis, aiming to identify the correlation between economic development and environmental degradation, proposing that there exists an inverted U-shaped relationship between environmental degradation and economic growth. According to this hypothesis, environmental degradation, such as CO2 emissions, initially increases with economic growth, reaches a peak, and then declines as economies mature and adopt cleaner technologies (Rashid Gill et al., 2018) . Recent studies have applied the EKC framework to various aspects of economic activity, including the digital economy. Some research suggests that digitization can reduce carbon emissions by improving energy efficiency and resource allocation (Shi et al., 2024) , while other studies emphasize the potential for increased emissions due to higher energy demand associated with digital infrastructure (Che et al., 2024).

Although there is extensive literature on the EKC and the digital economy, there remains a gap in understanding the specific impact of digital economic growth on carbon emissions in Southeast Asia. Most existing studies focus on developed economies or use linear models that may not fully capture the inherent non-linear dynamics in the relationship between digitization and environmental impact. Moreover, very few studies have employed comprehensive indices to measure the development of the digital economy, particularly in the context of emerging markets like Southeast Asia.

The current research landscape still leaves many important questions unanswered, such as: How does the growth of the digital economy in Southeast Asia affect CO_2 emissions, and does this relationship follow the EKC hypothesis? Are there differences in this relationship among countries in the region, and how do factors such as urbanization and industrialization influence both digital economic growth and carbon emissions? Furthermore, there is a

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need for a more detailed understanding of the impact of the digital economy, incorporating nonlinear modeling approaches that can better capture the complex interactions between economic development and environmental sustainability. This article offers unique contributions in several key areas of Southeast Asia's economy, distinct from previous research: (1) The authors use the entropy method to synthesize indicators from the digital economy and examine the non-linear effects of digital economic development on carbon emission intensity. The authors observe that as the digital economy advances, carbon intensity may initially rise; however, continued growth in the digital economy leads to a reduction in carbon emissions intensity; (2) Panel data regression models are used, employing four models: Pooled OLS, Fixed Effects (FEM), Random Effects (REM), and Generalized Least Square (GLS). The results are compared, interpreted, and the best model is selected to provide the most robust analysis.

This research focuses on examining the impact of the digital economy on carbon emission reduction in Southeast Asia and is structured into six sections. Section 1 introduces the context and significance of the digital economy's impact on CO_2 emissions in Southeast Asia. Section 2 reviews the EKC theory and previous studies to identify gaps in the literature. Section 3 covers the data and methodology, describing the data from nine Southeast Asian countries and the construction of the digital economy index using the entropy weighting method. Section 4 discusses the results and analyzes the impact of the digital economy on CO_2 emissions. Section 5 summarizes the main findings, and provides policy recommendations, proposing ways to balance digital economic growth with the reduction of CO_2 emissions.

2. Literature review

The digital economy, as defined by Bukht and Heeks, refers to a segment of the economy where value is primarily generated from digital technologies and business models based on digital goods and services. This economy is built upon information and communication technologies (ICT), encompassing online services, e-commerce, digital platforms, and global digital service networks. The development of digital infrastructure, such as the expansion of broadband usage and mobile devices, contributes to accelerating the digitization of economies. The Internet and ICT not only enhance the efficiency of economic activities but also help reduce energy consumption and carbon emissions through smart systems based on AI and IoT. These technologies optimize energy use in smart grids and urban infrastructure, thus minimizing CO_2 emissions. Southeast Asian countries like Singapore and Malaysia have developed digital economy solutions alongside green initiatives to reduce emissions in industries and transportation. The digital economy also aids traditional sectors such as manufacturing and energy in reducing emissions through the application of digital technologies. While the digital economy has a positive impact on emission reduction, the degree of its impact varies across countries and regions.

The EKC theory suggests that the relationship between economic development and environmental degradation follows an inverted U-shape. In the early stages of economic development, when countries focus on industrialization and resource extraction, environmental pollution increases due to the high consumption of energy and natural resources. However, as economies reach a certain level of income, countries begin transitioning to service and high-tech industries, utilizing energy more efficiently and placing greater emphasis on environmental protection. As a result, environmental pollution gradually declines as national income rises. This theory has been applied to explain shifts in the relationship between economic development and environmental impact in many developed countries, where pollution has decreased after the industrialization phase. However, EKC is not a universal law, and its applicability depends on factors such as environmental policies, technological advancement, and the economic resources of each nation. Some critics also argue that this theory may not fully address the challenges posed by global climate change today.

The digital economy plays a crucial role in reducing carbon emissions through advanced technologies such as artificial intelligence (AI) and the Internet of Things (IoT). These technologies optimize energy use and reduce waste through real-time data. AI systems in smart grids and smart city initiatives have significantly reduced the carbon footprint in urban areas (Ran et al., 2022; Ma et al., 2023). Simultaneously, the growth of digital financial services, fintech, and e-commerce also helps reduce energy demand in industrial production, thereby lowering carbon emission intensity (Wang & Guo, 2023). Moreover, the integration of renewable energy into digital infrastructures, particularly in data centers, has greatly contributed to reducing carbon emissions (Bai et al., 2022). The digital economy also optimizes supply chains, reduces waste, and enhances resource efficiency. E-commerce platforms not only improve

logistics management but also reduce the carbon footprint in transportation and retail. The concept of a circular economy, where digital technologies support the reuse and recycling of resources, is also gaining traction, helping to minimize the overall environmental impact (Moyer & Hughes, 2021; Ran et al., 2022). The rapid development of digital economies is advancing and expanding significantly, alongside the global shifts in climate change, particularly CO_2 emissions. The potential risks and deep relationship between the digital economy and CO_2 emissions have drawn the attention of many researchers. According to Li et al. (2020), the digital economy encompasses various aspects, from digital infrastructure, and digital industrialization, to the innovation and application of digital technologies. The level of digital economy development can have long-term negative impacts on carbon emission intensity, while also indicating a long-term equilibrium between the digital economy and carbon emission intensity (Zhao et al., 2023). It has been observed that in the early stages of digitization, carbon emissions increase and reach a peak, then decrease as digital activities continue. The digital economy is considered important to achieve carbon peaking and carbon neutrality. This paper explores the impact of the digital economy on carbon emissions and renewable energy development using panel data for 67 countries from 2005–2019. The results show that there is an inverted U-shaped relationship between the digital economy and carbon emissions, which is consistent with the Environmental Kuznets Curve (EKC) hypothesis, and a U-shaped relationship with renewable energy consumption, which is consistent with the Renewable energy Kuznets Curve (RKC) hypothesis. Compared with gross domestic product (GDP), the digital economy is more likely to accelerate the process of energy transition and carbon reduction, which is a key factor for carbon peaking. In addition, it is also found that the turning point of the RKC precedes the EKC, which means that the RKC reaching its turning point is a prerequisite for the corresponding EKC to reach its peak.Therefore, the digital economy should be accelerated to push RKC to cross the turning point as soon as possible, thereby accelerating EKC to cross the turning point (Wang et al., 2023) (Bùi Thu Trang et al., 2023). Furthermore, two of the main causes of increased carbon emissions from the digital economy are inefficient industrialization and rapid urbanization. The EKC hypothesis has also been tested, with technological innovation, technology adoption, and trade liberalization used as control variables for sustainable development (Chi-Wei Su et al., 2021). The results of several studies show that two out of three technological innovation tools landline phones and broadband subscriptions increase CO_2 emissions. Meanwhile, mobile subscriptions help reduce CO_2 emissions in BRICS countries. Technology adoption indicators, high-tech exports, and energy consumption also lead to an increase in CO_2 emissions. The digital economy presents unprecedented opportunities to address the current dilemma between economic growth and environmental protection (Yajing LI, 2023). The advancement of the digital economy not only contributes to reducing local carbon emissions but also demonstrates spatial spillover effects on neighboring areas. Digital development allows businesses to transform and upgrade, with digital and green transitions historically intersecting (Guo, Z., Yuan et al., 2024). Green technology innovation capabilities demonstrate a technological dividend effect, which is also an important way for digital transformation to promote carbon emission reduction. The study by Xiaoyan Li et al. (2021) incorporates the digital economy into the Solow growth model as technological progress and finds a non-linear, inverted U-shaped relationship between CO_2 emissions and the digital economy, supporting the EKC hypothesis. By establishing a mathematical model and conducting empirical tests, The authors find a significant inverted U-shaped relationship between CO_2 emissions and the digital economy in high-income and upper-middle-income groups, while the opposite holds true for lower-income and lower-middle-income groups. In the early stages of digitization, CO_2 emissions continue to rise. As digitization progresses to a higher level, CO_2 emissions begin to decline after reaching a peak. Therefore, it is necessary to implement risk prevention policies to mitigate the adverse effects of the digital economy to prevent industrial CO_2 emissions. All countries need to adhere to the development of the digital economy to shorten the pollution period caused by it and better leverage it to achieve the goal of global environmental protection cooperation. Although the digital economy may help reduce carbon emission intensity, its effectiveness may vary by region and depends on the development level of digital factors. Additionally, the impact of scientific and technological innovation on the carbon footprint has a "rebound effect." Scientific and technological innovation can accelerate the process of industrial structural advancement (Dai et al., 2022). The digital economy has become an essential pillar of energy conservation and carbon reduction (Wang

et al., 2023). However, not all studies agree with the view that the digital economy will reduce carbon emissions (Salahuddin & Alam, 2016) pointed out that the development of information and communication technology (ICT) can sometimes lead to an increase in carbon emissions due to the expansion of production scales and increased energy consumption. This is particularly true in economies where the adoption of new technologies is not accompanied by appropriate environmental control measures.

Existing research has provided a multifaceted view of the impact of the digital economy on reducing CO_2 emissions; however, significant gaps remain, particularly in the context of Southeast Asia. Much of the current literature focuses on global trends or developed countries, while Southeast Asia characterized by rapid economic growth and accelerated urbanization has not been studied extensively. Countries within the region exhibit varying levels of digital infrastructure and renewable energy development, necessitating more nuanced studies that explore the digital economy's effects on CO2 emissions at the national level to propose more tailored policy recommendations. Furthermore, while urbanization and industrialization are acknowledged as contributing to increased CO_2 emissions during the early stages of digital transformation, there is insufficient analysis of these processes in Southeast Asia, where such transformations are occurring rapidly. The emissions generated by digital infrastructure, such as data centers, have also not been thoroughly examined in this region, despite Southeast Asia's growing role as a data hub. Additionally, there is a lack of quantitative research on the effectiveness of CO_2 reduction in sectors such as e-commerce and fintech, particularly within the region's diverse economic landscapes. The concept of the "rebound effect" from the adoption of digital technologies has been recognized, yet there is limited investigation into whether Southeast Asia is similarly impacted. Lastly, while environmental policies and regulatory measures play a crucial role in mitigating emissions from digital technologies, there is scant research on whether the current regulations in Southeast Asia are robust enough to address this challenge. These gaps highlight the need for more in-depth studies to better understand the true impact of the digital economy on CO2 emissions in Southeast Asia.

3. Methodology and data

In this article, the authors use carbon emissions as the dependent variable. The authors collect carbon emissions data from nine countries over a 10-year period, sourced from World Bank and EDGAR. The measurement of carbon dioxide emissions is based on fossil fuel combustion and cement production, including both fuel consumption and gas flaring, with the unit of measurement being kilotons (kt).

The entropy weighting method was applied to avoid biases caused by human factors. Specifically, the indicators were standardized, and the entropy method was used to calculate the weight of each indicator. This process led to the creation of the composite variable DE, which measures the digital economy level. The authors selected the degree of development in the digital economy as the principal explanatory factor. Due to the absence of a standardized, official methodology for measuring the full extent of the digital economy, The authors based our analysis on available data and a detailed description of its characteristics. This study incorporates eight key indicators to evaluate the relationship between the digital economy and CO_2 emissions.

The indicators are grouped into categories, with four related to infrastructure: fixed broadband subscriptions (FixB), fixed telephone subscriptions (FixE), mobile cellular subscriptions (MB), and the individuals using the Internet (IV). To capture the economic aspect of digital business, The authors include Medium and High-tech manufacturing value added (MHT), as well as ICT goods exports (ICTE) and imports (ICTI) as percentages of total goods trade. Lastly, for social support, The authors use the per capita value added of the service industry (PCV).

These eight indicators, sourced from reliable organizations such as the World Bank and UN, provide a comprehensive view of how digital economy development interacts with CO_2 emissions. By using these indicators, The authors aim to capture the broader trends and patterns across different countries, allowing us to draw meaningful conclusions about the impact of the digital economy on environmental outcomes. The model is expressed as follows:

$$lnCO_{2it} = \alpha + \beta_1 DE_{it} + \beta_2 DE_{it}^2 + \beta_3 Electric_{it} + \beta_4 Urban_{it} + \varepsilon_{it}$$

With:

$lnCO_{2it}$ is the natural logarithm of carbon emissions for country at time

DE_{it} represents the digital economy index in country at time

DE^2_{it} is the squared term of the digital economy index to capture the nonlinear relationship between digitalization and carbon emissions.

$Electric_{it}$ measures the level of electrification.

$Urban_{it}$ is the urbanization rate.

ε_{it} is the error term capturing all unobserved factors.

Table 1. Evaluation system of the country's digital transformation level

Prime Index	Secondary indicators	Weights of indicators	Symbol	Source	Indicator Nature
Infrastructure	Fixed broadband subscriptions (per 100 people)	12.537%	FixB	World Bank	+
	Fixed telephone subscriptions (per 100 people)	12.371%	FixE	World Bank, Lao Statistic	+
	Mobile cellular subscriptions (per 100 people)	12.416%	MB	World Bank, UN	+
Social effect	Individuals using the Internet (% of population)	12.515%	IV	World Bank	+
Digital Business	Medium and High tech manufacturing value added (%)	12.476%	MHT	World Bank	+
	ICT goods exports (% of total goods exports)	12.540%	ICTE	World Bank	+
	ICT goods imports (% of total goods imports)	12.519%	ICTI	World Bank	+
Social support	Per capita value added of service industry ($US/ person)	12.626%	PCV	World Bank	+

Source: The author's calculation by STATA

The authors employed the entropy method to aggregate the digital economy indicators. This approach ensures objectivity and eliminates human bias by using the entropy value method to calculate the information entropy of the indicators. Notably, this method does not require any specific data distribution, preserving all the information in the dataset. After standardizing the data, The authors calculated the level of digital economy development for each country in our sample. The authors incorporated urban population (Urban), calculated as the percentage of the population living in urban areas, as a control variable. Urbanization can drive CO_2 emissions due to increased energy demand, but it also offers opportunities for more efficient infrastructure, which may reduce emissions. The complex relationship between urbanization and carbon output necessitates its inclusion to account for its potential mixed effects. Additionally, The authors included access to electricity (Electric), which measures the percentage of the population with electricity access. While greater electrification often leads to increased energy consumption and higher emissions, its impact depends on the energy mix of a country those using more renewable energy may see less of an increase in emissions. Both variables are sourced from the World Bank and are used to control for broader socio-economic influences on CO_2 emissions, ensuring more accurate attribution of effects from digital economy development.

Both of these variables were sourced from the World Bank and serve as important controls to better isolate the effects of digital economy development on CO_2 emissions, allowing for a more robust analysis of the data. These control factors help ensure that any observed changes in CO_2 emissions are more accurately attributed to the variables of interest within the digital economy rather than broader socio-economic trends. To account for the characteristics of the panel data structure, this study employs a Random Effects Model (REM) as the primary estimation method. The decision to use REM is motivated by the assumption that the unobserved individual effects, which vary across countries, are randomly distributed and uncorrelated with the independent variables. This contrasts with the Fixed Effects Model (FEM), which assumes that these individual effects are constant and correlated with the regressors and is more suitable when focusing on within-country variations. REM is more efficient than the Fixed Effects Model (FEM) when the assumption holds that country-specific effects are uncorrelated with the independent variables. This allows for the inclusion of both time-varying and time-invariant variables, which is crucial for this study as it aims to capture the effects of digital economy development alongside structural factors such as electrification and urbanization. REM accounts for both between-country and within-country variations, offering a comprehensive understanding of the relationship between digitalization and carbon emissions. It considers how differences across countries, as well as changes within countries over time, influence the dependent variable. The authors conducted the Hausman test to confirm the suitability of REM over FEM. The test results supported the use of REM, indicating no significant correlation between country-specific effects and the independent variables, further justifying our choice of model. Then, use Robustness Checks and Diagnostic Methods to provide further confidence in the robustness of our findings. As a further robustness check, this study also employs Generalized Least Squares (GLS) regression. GLS is applied to correct for any heteroscedasticity and serial correlation that may still exist after controlling for random effects. The GLS model adjusts the variance-covariance matrix of the errors, making it possible to obtain efficient parameter estimates even in the presence of these issues. Additionally, the GLS method allows for flexible modeling of both the error

structure and the relationships between variables, making it highly suited for panel data analysis.

4. Results and discussion

Table 2. Statistical summary of dependent and independent variables

Variable	Obs	Mean	Std. dev.	Min	Max
CO_2	117	1.09661	1.071032	-1.027484	3.08436
DE	117	0.3719999	0.2073936	0.0188673	0.8888907
DE2	117	0.1804338	0.1921231	0.000356	0.7901267
Electric	117	93.53761	13.06209	31.1	100
Urban	117	54.61905	23.58644	20.294	100

Source: The author's calculation by STATA.

Table 2 offers a descriptive overview of the main dependent and independent variables used in the analysis. It reveals that the natural logarithm of CO_2 emissions ($lnCO_2$) has a mean of 1.09661, with a standard deviation of 1.071032, and ranges from a minimum value of -1.027484 to a maximum of 3.08436. This suggests that the distribution of CO_2 emissions varies significantly across the observations.

For the independent variables, DE has an average of 0.3719999, with a standard deviation of 0.2073936, and ranges between 0.0188673 and 0.8888907. Meanwhile, DE2, which captures the nonlinear effects of the digital economy, shows an average of 0.1804338 with a standard deviation of 0.1921231, with values ranging from 0.000356 to 0.7901267.

The variable Electric, representing the level of electrification, has a mean value of 93.53761 and a standard deviation of 13.06209, ranging from 31.1 to 100, indicating a wide distribution of electrification levels across the dataset. Lastly, Urban, which represents the level of urbanization, has an average value of 54.61905, with a standard deviation of 23.58644, and ranges between 20.294 and 100. These statistics show substantial variation in both electrification and urbanization across the observations, suggesting their potential impact on the dependent variable ($lnCO_2$).

Model (1) using POOLED OLS shows that DE has a positive impact on CO_2 emissions, with a coefficient of 1.902 and statistically significant at the 10% level. This implies that when digitalization increases by 1 unit, CO_2 emissions will rise by approximately 1.902%, holding other factors constant. However, the second-order term of DE (DE2) shows a negative result with a coefficient of -3.563 and statistically significant at the 5% level, indicating a nonlinear relationship between digitalization and CO_2 emissions, which tends to decrease when digitalization reaches a certain threshold. The Electric and Urban variables in this model are also statistically significant, at 1% and 10% respectively, with positive coefficients of 0.0223 and 0.0399, indicating that urbanization and electricity usage tend to increase CO2 emissions.

In model (2) using FEM, DE has a significant positive impact with a coefficient of 3.833 and statistical significance at the 1% level. Simultaneously, the second-order DE2 term has a negative coefficient of -3.282 and is statistically significant at the 5% level. This further reinforces the notion that initial digitalization may increase CO_2 emissions, but then tends to decrease as digitalization progresses further. The Electric variable in this model remains statistically significant at the 1% level, with a positive coefficient of 0.0208, while Urban is no longer statistically significant.

Model (3) using REM reveals a similar trend to the FEM model, with the DE coefficient being 3.824 and statistically significant at 1%, and DE^2 being -3.425 (significant at 5%). Both Electric and Urban variables are statistically significant at the 1% level, with respective coefficients of 0.0208 and 0.0280.

The results of the Hausman test show Prob > chi2 = 0.8595. Therefore, the authors do not reject the null hypothesis, meaning the difference between the estimators of the FEM and REM is not statistically significant.

This indicates that the REM model is more appropriate than the FEM, as the REM estimator is efficient under the null hypothesis. These results allow us to proceed with using the REM or GLS regression method to obtain more reliable estimates, as the REM is more efficient when there is no systematic difference in the estimators.

Table 3. GLS results

$lnCO_2$	Coefficient	Std. err.	z	P>	[95% conf. interval]	
DE	1.961935	.7864218	2.49	0.013	.4205768	3.503294
DE2	-2.399925	.8435723	-2.84	0.004	4.053296	.7465533
Electric	.0125007	.0034819	3.59	0.000	.0056763	.019325
Urban	.0327295	.0038178	8.57	0.000	.0252467	.0402123
_cons	-2.075753	.3317103	-6.26	0.000	2.725893	-1.425613

Finally, model (4) using GLS shows that DE and DE^2 remain statistically significant, with coefficients of 1.962 and -2.400, confirming the inverted U-shaped relationship between digitalization and CO_2 emissions. The Electric and Urban variables continue to be highly significant, with positive coefficients of 0.0125 and 0.0327, respectively.

The models clearly demonstrate a nonlinear relationship between digitalization and CO_2 emissions, where initial digitalization increases emissions but later decreases as digitalization

advances. Results from all four models show that Electric and Urban positively influence CO_2 emissions, with varying degrees of impact. Comparing the POOLED OLS, FEM, REM, and GLS regressions, GLS appears to be the more suitable model due to its consistent coefficients and statistical significance.

In this analysis, the research team used the Random-effects GLS regression method combined with robust and clustered standard errors to adjust for issues related to heteroskedasticity and autocorrelation. Additionally, the Driscoll-Kraay method was applied to address the problem of cross-sectional dependence and heteroskedasticity across countries. This method ensures that the estimates are accurate and reliable, even when the data exhibits spatial and temporal dependence among countries in the sample. The adjusted results with robust and Driscoll-Kraay standard errors are presented in the table, providing clear evidence of the reliability of the model's estimates. The best model can be written as follows:

$$lnCO_{2it} = -3.177 + 3.824DE_{it} - 3.425DE_{it}^2 + 0.0208Electric_{it} + 0.0280Urban_{it} + \varepsilon_{it}$$

The model shows that all explanatory variables arThe model shows that all explanatory variables are statistically significant at the 1% or 5% level, confirming their importance and impact on CO_2 emissions. Specifically, variables such as DE, DE^2, Electric, and Urban have effects on the dependent variable, consistent with theoretical predictions. The DE variable has a positive impact on CO_2 emissions, indicating that as the digital economy develops in its early stages, CO_2 emissions increase. However, the DE^2 variable has a negative coefficient, reflecting an inverse relationship, where CO_2 emissions begin to decrease once the digital economy reaches a certain threshold. This phenomenon can be explained by the Kuznets inverted U-curve theory, which suggests that initial economic development leads to increased pollution, but as development reaches higher levels, more efficient technology and management help to reduce emissions.

The coefficients for the Electric and Urban variables are both positive and highly statistically significant, indicating that electricity consumption and urbanization increase CO_2 emissions, aligning with expectations about the negative environmental impacts of these factors.

Conclusion

This study analyzed the impact of the digital economy on CO_2 emissions in Southeast Asia from 2010 to 2022. The results show that the digital economy has a nonlinear effect on CO_2 emissions, consistent with the inverted Kuznets curve theory. In the early stages of digital economy development, CO_2 emissions tend to increase due to rapid industrialization and urbanization. However, as the digital economy reaches a certain maturity, CO_2 emissions begin to decrease thanks to technological advancements and more efficient management practices.

To achieve sustainable development and transition to a low-carbon economy, Southeast Asian governments should invest in digital infrastructure, such as expanding internet access and building data centers. This will enhance productivity and support environmentally friendly practices. Implementing tax incentives and financial support can encourage businesses to adopt digital technologies and renewable energy solutions. Additionally, international cooperation is essential for sharing experiences and technologies to reduce carbon emissions.

Future research could expand by adding various control variables and collecting data over longer periods to gain a more comprehensive understanding of the relationship between the digital economy and CO_2 emissions, providing a foundation for developing sustainable emission management and environmental policies.

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EXPERIENCE IN DEVELOPING DIGITAL ECONOMY IN SOME COUNTRIES AND LESSONS FOR VIETNAM

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Abstract: ***Developing the digital economy involves leveraging digital technology and data to create innovative business models that transform traditional production processes into ecosystem-based operations. This integration enhances productivity and responds effectively to consumer needs. Learning from the experiences of developed countries is crucial for Vietnam as it formulates policies for its own digital economy amidst global integration. This article analyzes international digital economy development experiences, assesses Vietnam's current status, identifies existing advantages and challenges, and recommends policies to foster the growth of Vietnam's digital economy.***

• Keywords: *: digital economy, international experience, e-commerce, economic development.*

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1. Introduction

In today's era, the digital economy is not just a trend but a force that is completely changing the way we work, communicate and consume. From the explosion of the internet to the spread of artificial intelligence and blockchain, the digital economy has created a wave of innovation and constant transformation. In this context, it is extremely important to grasp and understand the trends, challenges and opportunities of the digital economy.

The digital economy is a concept that refers to the use of digital technology to create and distribute economic value. It includes the widespread application of information and communication technology (ICT) in all aspects of business operations, from business management to production, marketing, delivery and customer service. Key elements of the digital economy include:

Information and communications technology (ICT): Includes the internet, computers, mobile phones, business applications and software to create and share information, manage production and distribution processes, and interact with customers.

E-commerce: An important part of the digital economy, e-commerce allows the purchase and sale of goods and services over the internet or other online platforms without the need for face-to-face meetings.

FinTech: Includes convenient financial services such as online payments, online loans, personal finance management and other technology-based financial services.

Artificial Intelligence (AI): AI plays an important role in generating analytical and predictive information, improving business process automation and enhancing customer experience through chatbots and automated support systems.

Blockchain: Blockchain technology is used to authenticate and record transactions in a transparent and secure manner, especially in the financial and supply chain sectors.

The digital economy is not simply the use of digital technology, but also proposes a new approach to creating value and improving performance in the global economy.

In recent decades, Vietnam has witnessed rapid growth in the digital economy, especially in the following areas:

According to a report by the Ministry of Industry and Trade, in 2023, the size of the retail e-commerce market will increase by about 4 billion USD (up 25%) compared to 2022, reaching 20.5 billion USD. It is forecasted that in the period 2022 - 2025, Vietnam's Internet economy will have a leading growth rate in the region at about 31%/year. According to Modor Intelligence, in January 2024, Vietnam was recognized as one of the 10 countries with the highest e-commerce growth rate in the world, leading Southeast Asia. According to Modor Intelligence, the size of Vietnam's e-commerce market is estimated to reach 14.7 billion USD in 2024 and is expected to reach 23.77 billion USD in 2029, growing at a CAGR of 10.09% during the forecast period (2024-2029).

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The value of investment deals in the Fintech sector in Vietnam reached 294 million USD. According to the survey and synthesis information of HyperLead, in terms of the number of transactions, Vietnamese Fintech startups have received about 14 investments, the leading affiliate marketing platform in Vietnam specializing in providing products and services in the field of Finance - Banking - Fintech, the number of Startups has increased by nearly 13% (from 156 companies in 2021 to 176 companies in 2022). In which, Payment is still the most vibrant Fintech Startup field in Vietnam, accounting for 22.6% of the number of Fintech companies in Vietnam, followed by Personal Lending and Blockchain/Crypto.

Vietnam is becoming one of the countries with strong potential for digital economic development, with support from the development of information technology infrastructure and the government's strategic vision of promoting the Industrial Revolution 4.0.

In addition to the introduction presented above, the rest of the study is presented as follows: In the next part, the study conducts the review on advantages and difficulties in developing digital economy in Vietnam, then the study proceeds experience in developing digital economy in some countries around the world. Finally, the study proposes reference lessons for developing digital economy in Vietnam.

2. Advantages and difficulties in developing digital economy in Vietnam

2.1. Advantages in developing digital economy in Vietnam

Young population and number of internet users: With a significant youth demographic and a growing number of internet users, Vietnam has emerged as a substantial market for digital economic offerings. Statistics indicate that approximately 72% of the population owns smartphones, and 68% engage with videos and music daily via mobile devices. Furthermore, around 70% of mobile subscribers utilize 3G or 4G networks, indicating robust mobile connectivity.

Rapid growth of the e-commerce market: The proliferation of smartphones and internet access has spurred a flourishing e-commerce landscape. Vietnam is home to about 30,000 technology companies, including 10,000 rapidly expanding software firms. The market features over 50 financial technology companies and transportation apps like Grab and Uber, alongside tourism startups such as Mytour and Luxstay that compete with global platforms. Annually, thousands of innovative digital startups emerge, many successfully executing high-tech initiatives.

Government support policies: The Vietnamese government has rolled out various supportive policies for the digital economy, focusing on the 4.0 industrial revolution and fostering technology startups and national digital platforms. The Prime Minister has endorsed the National Digital Transformation Program for 2025 and the e-commerce development Master Plan for 2021-2025, emphasizing that digital transformation is crucial for Vietnam's development. These initiatives aim to modernize distribution systems, enhance enterprise competitiveness, and stimulate both domestic market growth and exports.

Development of the information and communication technology (ICT) industry: Vietnam's ICT sector is rapidly advancing, featuring established technology enterprises and research and development centers. By the end of 2020, major mobile operators such as Viettel, VNPT, and Mobifone introduced 5G services, positioning Vietnam among the early adopters of this technology globally. The country is transitioning from a reliance on imported technologies to mastering and producing 5G equipment, marking a strategic leap in its telecommunications landscape.

Labor potential: Vietnam's labor force is characterized by low costs and a capacity for rapid adaptation to new technologies, providing favorable conditions for businesses to implement digital economic projects effectively.

Growing consumer market: The rise in income levels and the expanding middle class in Vietnam are driving demand for digital products and services, further fueling the growth of the digital economy.

2.2. Difficulties in developing digital economy in Vietnam

Information technology infrastructure: Despite rapid development, information and communications technology (ICT) infrastructure in Vietnam is still limited in some areas, especially in rural and mountainous areas.

Cybersecurity and information security: Cybersecurity and information security issues are a major challenge to the development of the digital economy in Vietnam, such as the risk of cyberattacks, information security violations and online crimes. Cybersecurity measures need to be strengthened to ensure the safety of data and online transactions.

Access and digital divide: Despite the increase in internet and smartphone access, there are still disparities in access to digital technology between regions and social classes in Vietnam. The infrastructure for the digital economy is not synchronous, a common national database has not been built; the logistics system is weak; the rate of enterprises applying digital technology and software is still very low, of which 59% is for human resource management applications, 29% for supply chain management, and 32% for customer relations.

Human resource development: To promote the digital economy, Vietnam has invested in developing highly skilled human resources in the field of information and communication technology, as well as in applying digital technology to other business areas. However, the shortage of quality human resources in this field still exists. Training and attracting talents with high professional knowledge and creativity remains a major challenge.

Policy and legal regulations: The institutional and legal environment for digital economic development is still loose, inconsistent, lacking transparency and creativity.

3. Experience in developing digital economy in some countries around the world

Most countries worldwide, both developed and developing, prioritize the development of the digital economy as a crucial step for future economic models and transformation. Each nation, however, employs distinct mechanisms, policies, and measures tailored to its unique characteristics and strengths. The following section highlights the experiences of various countries in developing their digital economies, focusing on examples from Southeast Asia and beyond.

Germany: Germany is advancing its digital economy through a comprehensive strategy encompassing national, industry, and enterprise levels. The government has established the Industry 4.0 Department within the Ministry of Economic Affairs and Energy to oversee digital transformation, supported by specialized working groups focused on areas like standards development, training, and cybersecurity. Leveraging its strengths in heavy industrial production, Germany emphasizes the application of digital technologies in emerging industries such as robotics, smart vehicles, and smart energy, while also transforming human resource training to promote flexibility and digital skills through collaboration between educational institutions and businesses. Additionally, Germany is developing smart manufacturing systems and factories that utilize IoT and automation, linking all production processes to operate cohesively as a large smart factory.

Estonia: Estonia has effectively advanced its digital economy through initiatives like the "Estonian Broadband Infrastructure - Network Project" (EstWin), launched in 2009 to install 6,600 km of fiber optic cables in rural areas. By 2020, 98% of households and organizations were within 1.5 km of EstWin, with 85% of the funding sourced from the European Regional Development Fund and the remainder from network operators. Additionally, the Estonian government has implemented programs such as Digital Agenda 2020 and the Estonian Lifelong Learning Strategy 2020, creating a robust digital information infrastructure (X-road) for citizens to access services like electronic voting and online healthcare. These efforts have been complemented by a focus on enhancing human resources, highlighted by the "Tiger Leap" initiative, which has helped Estonia rank 10th in human resources performance among EU countries, emphasizing the importance of digital skills for sustainable economic growth.

Japan: Japan's digital economic development program is integrated into its broader Society 5.0 initiative, featuring several key strategies and policies. These include an investment strategy aimed at restructuring economic sectors and employment to adapt to the digital economy, enhancing information security infrastructure, and promoting IT usage across various sectors. Additionally, Japan seeks to become the world's leading information technology nation, positioning IT as a cornerstone of its growth strategy, while also implementing a Cybersecurity Strategy that focuses on leveraging technological advances and developing skilled human resources to effectively combat cyber threats.

Korea: Korea recognizes the digital economy and the 4.0 industrial revolution as key drivers of future economic development, prioritizing these sectors in its economic policies. The government is actively promoting science, technology, and innovation, enhancing the authority of the Science and Technology Innovation Agency (STI) and increasing budget allocations for research and development. Additionally, a Fourth Industrial Revolution Committee has been established to strategize for future

industries, while comprehensive interdisciplinary development is emphasized across various sectors, particularly in industry and information technology. Supportive policies have been implemented to foster new technology projects, reduce risks for innovative startups, and invest in high-quality human resources, facilitating the advancement of the digital economy in Korea.

China: The development of China's digital economy is significantly driven by supportive policies and strategic planning aimed at fostering domestic digital technology. China prioritizes the protection of its domestic digital market, allowing local enterprises to establish and maintain a strong presence while supporting advancements in science, technology, and innovation within the digital sector. Initial efforts focus on moderately complex sectors like e-commerce, gradually progressing to more advanced fields such as artificial intelligence and robotics. By banning Western tech giants like Meta and Google, China simultaneously nurtures domestic firms such as Weibo, Baidu, and Bytedance, enabling them to develop new technologies and patents. This approach has cultivated a comprehensive digital ecosystem encompassing production, transportation, trade, and payment, optimizing national resources and facilitating economic growth. Moreover, the government emphasizes the transition to digital methods and transactions, promoting initiatives in e-government, e-banking, and e-commerce.

Singapore: Singapore aspires to become a global leader in the digital economy by implementing comprehensive strategies that support digital transformation across various industries. This includes financial assistance for businesses to develop digital capabilities, with funding incorporated into the government's annual budget, along with ongoing advisory support to tailor digitalization plans. To foster human resource development, Singapore emphasizes training programs for digital skills, particularly targeting unskilled workers and those at risk of job displacement due to digital changes. Additionally, the education system integrates digital skills into curricula, covering areas such as coding and design thinking. To create a secure environment for its digital economy, Singapore has enacted the Cybersecurity Law 2018 and the Personal Data Protection Law, enhancing protections for critical information infrastructure and personal data while establishing a legal framework for data management.

Malaysia: Malaysia has taken significant steps to enhance its digital economy, being the first Southeast Asian country to enact the Data Protection Act and implementing various infrastructure projects, including the High-Speed Broadband (HSBB) initiative aimed at expanding broadband access. The government has launched programs like the "Malaysia Tech Entrepreneur Program" (MTEP) to attract foreign direct investment by offering tax incentives and visa opportunities for tech entrepreneurs. Additionally, Malaysia emphasizes e-commerce development in alignment with new-generation trade agreements and focuses on digital transformation in public services through the Malaysian Administrative Management and Modernization Unit (MAMPU), which aims to improve service delivery using information and communication technology. The country also invests in workforce training programs, such as eUshawan and eRezeki, to equip young entrepreneurs and create job opportunities for digital workers across various sectors.

Thailand: Thailand has created a comprehensive legal framework to support digital economic development by consolidating three existing laws and drafting eight new regulations, including the Cybersecurity Law and the Personal Data Protection Law. The Digital Development Law establishes the Digital Economy Commission and the Digital Economy and Society Promotion Agency, tasked with fostering digital industry growth and technology application for economic benefits. Additionally, Thailand has set up the Digital Economy and Society Development Fund to enhance telecommunications infrastructure, funded by the government's budget and licensing fees, while prioritizing network security and content regulation in cyberspace.

4. Reference lessons for developing digital economy in Vietnam

From the analysis of the experiences of some European countries (Germany, Estonia), Asian countries (Japan, Korea, China, Malaysia, Singapore, Thailand) on digital economic development (strategy, policy) above, it is possible to draw some policy implications to apply to develop the digital economy in Vietnam in the period 2024 - 2030:

First, perfecting institutions and policies on digital economic development

Vietnam should prioritize developing and refining institutions and policies to establish a robust

framework for digital economic growth across provinces and cities. Enhancing these frameworks will boost local capabilities to attract investments in digital technology and venture capital, streamline processes for capital contributions, and facilitate mergers and acquisitions in the tech sector. Additionally, Vietnam must create specific digital transformation plans for businesses, ensuring these are linked to financial resources and annual budgets, while also addressing potential negative impacts of digitalization, such as job displacement and consumer rights protection, to foster a balanced and secure digital economy.

Second, clearly identify breakthrough industries and fields to develop the digital economy.

Vietnam needs to base on the strengths and characteristics of each locality to clearly identify breakthrough industries and fields to develop the digital economy. In the immediate future, provinces and cities should focus on developing digital economic fields to help expand the market and promote consumption because these fields help localities take advantage of opportunities from international integration, especially the new generation free trade agreements that Vietnam has signed (CPTPP, EVFTA, EVIPA) but also do not require high technology level. At the same time, provinces and cities should develop the fundamental fields of the digital economy, such as digital infrastructure, digital resources, digital services, digital markets and have a methodical plan and strategy to access and master important, core technologies of the digital economy through support policies and in cooperation and attracting foreign investment.

Third, promote awareness of the digital economy in society.

Vietnam needs to focus on propaganda activities to raise awareness among people and businesses about the digital economy, its benefits and challenges, with specific content for each industry and field, especially through agencies, businesses and schools. At the same time, press and media agencies need to guide public opinion, helping businesses, people and the whole society have a correct understanding of the digital economy, thereby being best prepared to adapt to the above development trend. This measure also helps to enhance the responsibility of the Government, businesses and people in building the digital economy.

Fourth, focus on developing human resources for the digital economy.

This issue has long been focused on by developed countries, but for developing countries like Vietnam, the issue of human resource development for the digital economy has not received due attention. Therefore, Vietnam needs to devote more resources to human resource development for the digital economy. In particular, it should focus on developing and attracting digital technology experts and digital entrepreneurs through appropriate policies. At the same time, it is necessary to orient the development of local education and training in conjunction with the socio-economic development strategy and the development orientation of high-tech industries and fields, smart manufacturing of the knowledge economy; innovate and modernize university and vocational training programs in provinces and cities, strongly shifting from training based on ability to training based on social needs.

Fifth, focus on investing in infrastructure in the process of developing the digital economy.

Infrastructure is crucial for advancing Vietnam's digital economy; thus, significant investment in upgrading technology and mastering core technologies is essential. The central government should collaborate with localities to develop a cohesive national digital infrastructure that supports data connection, storage, and processing while ensuring network security. This includes enhancing broadband infrastructure, upgrading 4G networks, and rolling out 5G to provide universal access to high-speed internet, cloud computing services, and advanced technologies for all citizens, while also encouraging participation from various economic sectors in infrastructure investment, with careful attention to national security concerns.

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