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CRYPTO-ASSETS: ECONOMIC NATURE, RISKS AND REGULATION

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MA. Le Bao Nguyen**

Abstract: ***This study analyzes the characteristics, economic nature, and regulatory challenges of crypto-assets. While crypto-assets present numerous opportunities, they also carry significant risks, including price volatility, financial and systemic risks, legal uncertainty, money laundering, and terrorist financing. Divergent regulatory approaches among countries have resulted in legal arbitrage, complicating global supervision. The study emphasizes the need for common regulatory principles focused on issuers, exchanges, and custodial wallet providers to ensure transparency and financial safety. Finally, it proposes key regulatory principles to balance technological innovation with financial stability and offers future research directions on the impact of policies on the crypto-asset market.***

• Keywords: *crypto-assets, distributed ledger technology, regulatory arbitrage.*

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1. Introduction

Over the past decade, the rapid development of information technology and digital finance has given rise to a new type of asset - crypto-assets. These assets are built on distributed ledger technology (DLT), with blockchain being the most prominent application. This technology enables decentralized recording, storage, and transmission of transaction data without the involvement of traditional financial intermediaries such as banks or securities firms.

Initially, crypto-assets mainly emerged in the form of cryptocurrencies. However, as technology and market demand evolved, a wide range of other crypto-assets have been developed, including stablecoins, utility tokens, security tokens, and various decentralized finance (DeFi) products. This expansion has transformed crypto-assets into an integral part of the global financial system. Large corporations such as Tesla, Square, and MicroStrategy have invested in Bitcoin, while traditional banks like JPMorgan and Goldman Sachs have begun offering crypto-asset-related services. However, alongside this rapid growth, crypto-assets also introduce substantial risks to the financial system, including price volatility, financial and systemic risks, legal and fraud risks, as well as risks related to money laundering and terrorist financing. These risks present urgent challenges for financial regulators to develop appropriate regulatory policies to protect investors and maintain global financial stability.

Currently, there is no universally accepted definition of crypto-assets among financial institutions and countries. Classification criteria for crypto-assets vary significantly, and there is no consensus on how to categorize cryptocurrencies, stablecoins, utility tokens, and security tokens. Regulatory policies for crypto-assets remain fragmented and lack international coordination, creating regulatory arbitrage - where companies relocate operations to jurisdictions with looser regulations. Therefore, this study plays an important role in clarifying the economic characteristics of crypto-assets, identifying key regulatory challenges, and evaluating existing policy approaches in order to provide relevant policy recommendations.

In summary, the research context demonstrates that crypto-assets have become a significant component of the global financial market, yet still pose various economic and legal challenges. As international organizations and national governments seek appropriate regulatory approaches, this study aims to offer a comprehensive and academic perspective on crypto-assets, thereby supporting regulators in making more effective policy decisions.

2. Characteristics and Economic Nature of Crypto-Assets

Although there are many differing definitions of crypto-assets provided by international organizations and national authorities, four core characteristics have gained broad consensus. The fundamental features of crypto-assets include: (1) being a digital representation of value or rights; (2) utilizing distributed ledger technology, cryptographic technology, or similar

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technologies; (3) being issued by the private sector; and (4) being stored, traded, and transferred electronically.

Based on these key characteristics, the study by Kochergin (2022) clarifies the economic nature of crypto-assets. From an economic perspective, crypto-assets can be divided into two main categories: virtual currencies and digital tokens.

Cryptocurrencies represent the first generation of crypto-assets, emerging during the early stages of market development. Cryptocurrencies are a decentralized form of virtual currencies, not associated with any specific obligation and lacking a clearly identifiable issuer. Most cryptocurrency systems operate without a centralized management mechanism. The value of cryptocurrencies is determined entirely by market supply and demand, reflecting the belief that they can be accepted for the exchange of goods, services, or conversion into fiat currencies.

Cryptocurrencies use a direct and intermediary-free mechanism for value exchange. Instead of relying on intermediaries such as banks, transactions are secured by consensus algorithms, which verify the authenticity of transactions across the entire network. This means there is no administrator or organization directly responsible for managing the system.

Stablecoins represent the second phase in the development of the crypto-asset market (from 2015 onward), with the aim of minimizing price volatility and improving issuance mechanisms. Stablecoins maintain price stability by pegging their value to low-volatility collateral assets or commodities, or through algorithmic technologies. Based on their stabilization mechanisms, stablecoins can be categorized into asset-backed stablecoins (pegged to traditional assets), crypto-backed stablecoins (pegged to crypto-assets), and algorithmic stablecoins.

Digital tokens, like stablecoins, also emerged in the second phase of the crypto-asset market. Digital tokens are digital assets issued by identifiable entities using distributed ledger technology (usually blockchain) and grant holders rights such as debt claims, equity ownership, dividend entitlement, or access to certain goods or services on the issuer's platform. Unlike virtual currencies, digital tokens are often issued to raise capital for new investment projects, support startups, or develop innovative products or services. The two main types of digital tokens are investment tokens and utility tokens.

Another distinct hybrid category is the token used within decentralized finance (DeFi tokens). In principle, DeFi tokens grant holders governance rights and control over the development direction of the underlying blockchain protocol. Another form of hybrid token is the non-fungible token (NFT). NFTs are digital tokens issued to confirm ownership, grant rights to an object, or secure a specific entitlement. These tokens are unique and recorded on the blockchain. They are non-fungible, meaning they cannot be exchanged on a one-to-one basis with the same type of crypto-asset.

3. Challenges in Regulating Crypto-Assets

A clear understanding of the economic nature of crypto-assets helps identify the key challenges in their regulation.

First, *the lack of consensus on the definition and classification of crypto-assets*: One of the major challenges in regulating crypto-assets is the lack of consistency in their definition and classification across countries and international financial institutions (Blandin et al., 2019). Currently, there is no universally accepted definition of crypto-assets recognized by all countries and global financial bodies. The United States and the European Union (EU) have adopted approaches based on the economic and legal functions of crypto-assets. The U.S. Securities and Exchange Commission (SEC) uses the Howey Test to determine whether a crypto-asset qualifies as a security. Meanwhile, the EU has enacted the Markets in Crypto-Assets (MiCA) Regulation to establish a unified legal framework. China, while imposing a total ban on cryptocurrency transactions, has heavily promoted its central bank digital currency (CBDC) through the Digital Yuan (e-CNY) project. International institutions such as the International Monetary Fund (IMF), the World Bank, and the Financial Action Task Force (FATF) have issued guidance focused on risk management for crypto-assets, addressing concerns such as financial stability, stablecoin oversight, and anti-money laundering and counter-terrorism financing (AML/CFT). These divergent approaches have led to regulatory arbitrage, where companies shift operations to jurisdictions with more lenient regulations, thereby complicating global oversight and supervision (Blandin et al., 2019; PWC, 2023).

Second, *systemic risks and threats to financial stability*:

The high volatility of crypto-assets raises concerns about their imb pact on the traditional financial system. Key risks include: i) Price volatility, as cryptocurrencies often exhibit large fluctuations, making them unreliable as stable means of payment; ii) Financial and systemic risks, since unsupervised use of crypto-assets may lead to defaults, financial bubbles, and risk spillovers into the traditional financial system; iii) Legal risks and fraud, where the lack of tight regulations has contributed to numerous scams and market manipulation in the crypto-asset space; iv) Money laundering and terrorist financing risks, due to

the anonymous and cross-border nature of transactions, which make crypto-assets attractive for illicit activities. Central banks and international financial institutions are concerned that without proper controls, the rapid expansion of crypto-assets could pose a serious threat to global financial stability (IOSCO, 2019).

Third, *challenges in monitoring and supervising crypto-asset transactions*: Unlike traditional financial systems - where central banks and regulators can control monetary flows - crypto-asset transactions occur on decentralized networks, making supervision more difficult. Despite all transactions being recorded on the blockchain, the identities of participants can remain anonymous or obfuscated. The rise of decentralized finance (DeFi), which provides financial services without intermediaries, increases the risk of abuse and money laundering. Additionally, once assets are stolen or involved in fraud, recovery becomes extremely challenging due to the irreversible nature of blockchain transactions (Ocampo et al., 2023; IOSCO, 2019).

Fourth, *the impact of crypto-assets on fiscal, monetary, and capital management policies:* Crypto-assets - especially stablecoins - are challenging the role of central banks in controlling money supply and monetary policy. If stablecoins or other forms of cryptocurrencies become widely adopted as means of payment, central banks may lose the ability to manage the money supply effectively. This threatens the effectiveness of monetary policy, particularly as businesses and households increasingly prefer saving and investing in crypto-assets that are not pegged to fiat currencies. The risk of "cryptoization" is especially concerning for countries with weak currencies and fragile monetary frameworks. In countries with capital controls, cryptocurrencies can be used to move assets abroad without going through the banking system. New fiscal risks may also arise from the financial sector's exposure to the crypto-asset ecosystem, ambiguous tax regimes, and the transnational, often anonymous, nature of these assets - factors that can hinder tax collection and compliance (IMF, 2023).

Fifth, *lack of international coordination in crypto-asset regulation:* Although many international organizations such as the IMF, FATF, and BIS have issued recommendations for crypto-asset regulation, there is still no globally unified legal framework. This has led to problems such as varying tax treatments for crypto-assets across countries, creating complexities in international trade and investment, as well as ineffective cooperation mechanisms for investigating crypto-related fraud (IMF, 2023; FATF, 2021).

Sixth, *investor protection issues:* The growing popularity of crypto-assets has attracted a large number of individual investors to the market, most of whom are not protected against significant risks. If an exchange goes bankrupt or is hacked, investors may lose all of their assets without any regulatory safeguards. Due to the lack of strict oversight, the crypto-asset market is highly susceptible to manipulation by large institutions or influential individuals. Many investors lack the technological knowledge and understanding of the nature of crypto-assets, leading to poorly informed investment decisions. Regulating crypto-assets poses major challenges for governments and financial institutions worldwide. To address these issues, a flexible legal framework is required - one that can keep pace with rapid technological developments while ensuring financial stability and investor protection.

4. Recommended Principles for Regulating Crypto-Assets:

4.1. General principles

According to the IMF, crypto-asset regulation aimed at safeguarding financial security should adhere to the following nine fundamental principles:

Table 1. Regulatory Principles for Crypto-Assets Aimed at Ensuring Financial Security

Ensuring Macroeconomic and Financial Stability Risks related to: - Monetary policy - Cross-border capital flow management and volatility - Fiscal policy	Principle 1: To ensure monetary stability, crypto-assets should not be granted the status of legal tender or official currency.	Principle 2: Limit excessive capital flow volatility and maintain the effectiveness of capital flow management measures.	Principle 3: Analyze and assess financial risks and apply clear tax treatments for crypto-assets.
Legislation, Regulation, and Supervision Activities Risks related to: - Legal certainty in regulations - Safety of the financial system - Consumer protection - Market integrity and discipline	Principle 4: Establish legal certainty for crypto-assets and address associated legal risks.	Principle 5: Develop and implement safety, conduct, and supervisory requirements for all market participants involved in crypto-assets.	Principle 6: Establish a unified supervisory framework among domestic authorities and regulatory bodies.
International Cooperation and the Role of Financial Institutions	Principle 7: Establish international cooperation agreements to enhance supervision and enforcement of crypto-asset regulations.	Principle 8: Monitor the impact of crypto-assets on the stability of the international monetary system.	Principle 9: Strengthen global cooperation to develop digital infrastructure and alternative solutions for cross-border payments and finance.

Source: IMF, 2023

Additionally, due to the borderless nature of crypto-assets, determining their geographic location poses a significant challenge for regulatory activities. The inability to identify the physical location of crypto-assets creates major obstacles for the establishment of legal frameworks governing such assets. According to international best practices, crypto-asset regulation should focus on entities associated with these assets, including issuers and crypto-asset service providers (such as exchanges and custodial wallet providers).

4.2. Specific regulation over Crypto-Assets services providers

The decentralized nature of crypto-assets makes it difficult for regulators to identify the entities responsible for issuing them. The lack of information

about the issuer often results in insufficient data on the crypto-assets being released, making it difficult to determine the technology being used, the purpose of the token issuance, and the beneficiaries of token sales. Regulatory frameworks for crypto-asset issuance should include requirements such as:

• Legal obligations for disclosure of information regarding the issued crypto-assets (e.g., asset type, technology used, rights conferred, issuance method, associated risks, dispute resolution mechanisms, details about the issuer, and leadership);

• Legal requirements for reporting issuance activities to regulatory bodies;

• Legal rules governing the advertisement and marketing of crypto-assets.

4.3. Specific regulation over crypto-asset exchanges

Centralized exchanges allow users direct access to trading and provide custodial services (via exchange wallets). These platforms can also transact directly with users to provide liquidity, which contradicts the decentralized nature of crypto-assets and introduces risks such as price manipulation and transparency issues. Moreover, crypto exchanges are frequent targets of cyberattacks. As such, there is a need for:

• A registration and licensing regime for centralized exchanges;

• Enhanced governance requirements for platform operators;

• Mandatory compliance with anti-money laundering (AML) and counter-terrorism financing (CFT) regulations;

• Adequate internal compliance systems to ensure adherence to domestic and international standards;

• Full and timely disclosure of product risks and benefits to users;

• Public access to reliable, timely, and non-discriminatory information;

• Rules assessing the transparency of platform procedures, such as order execution, error handling, and order cancellation.

4.4. Specific regulation over custodial wallet providers

Legal regulations must clearly distinguish between user wallet addresses and those of service providers. Wallet providers must:

• Ensure cybersecurity and have effective incident management procedures in place, including detection and classification of operational and network incidents;

• Manage customer custodial assets in real time in a secure, flexible, timely, and accurate manner;

• Regularly or upon request, share information with users about any changes in their crypto-asset holdings;

• Comply with requirements on reporting, minimum capital, liquidity maintenance, and insurance;

• Adhere to AML and CFT obligations.

5. Conclusion

This study has clarified the economic nature and regulatory challenges of crypto-assets, a rapidly evolving field that is increasingly attracting the participation of financial institutions and investors worldwide. With their decentralized characteristics and reliance on distributed ledger and cryptographic technologies, crypto-assets offer vast opportunities for innovation, yet also pose significant risks to the traditional financial system.

The findings show that differences in regulatory approaches across countries have resulted in regulatory arbitrage, allowing companies to relocate to jurisdictions with more relaxed oversight. This creates major challenges for the effective supervision and regulation of the crypto-asset market. From a policy perspective, the study underscores the need for a global regulatory framework, coordinated among international financial institutions and national governments. In particular, regulation should focus on entities associated with crypto-assets - such as issuers, exchanges, and custodial wallet providers - rather than the assets themselves. Adopting regulatory principles aligned with international best practices will help balance technological innovation with the need for financial stability.

This study also paves the way for future research directions, including assessing the impact of crypto-asset regulatory policies after implementation, comparing the effectiveness of different national approaches, and analyzing the implications of crypto-assets for monetary policy, fiscal policy, and capital control. As the crypto-asset market continues to grow, regulators must maintain flexibility in policymaking to seize opportunities for innovation while managing risks, thereby fostering a more sustainable and transparent digital financial ecosystem.

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HUMAN CAPITAL IN VIETNAM'S DIGITAL ECONOMY

PhD. Le Thi Dan Dung* - PhD. Bui Tien Hanh**

Abstract: ***In the context of global digital transformation, human capital plays a crucial role in promoting economic growth and sustainable development. This article analyzes the current state of human capital in Vietnam's digital economy, focusing on aspects such as digital skills, soft skills, foreign language proficiency, and labor productivity. While Vietnam benefits from a young workforce and access to advanced technologies, several challenges persist, including a low proportion of workers with professional qualifications, limited digital skills, a skills gap between urban and rural areas, and a shortage of foreign language proficiency and lifelong learning capabilities. These challenges necessitate a comprehensive human capital development strategy for Vietnam, emphasizing digital skills training, educational reform, promotion of lifelong learning models, and the refinement of labor policies to adapt to the evolving digital economy.***

• Keywords: *human capital; digital economy; digital skills.*

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1. Introduction

In the context of global digital transformation, human capital - encompassing the skills, knowledge, and creativity of individuals - has become a critical foundation for promoting sustainable development across nations (OECD, 2022). According to the World Economic Forum (WEF, 2020), the rapid advancement of technology is projected to displace 85 million jobs globally by 2025. Human capital is not only considered an invaluable resource for economic development but also a decisive factor in building a sustainable society in the digital age. As technologies such as artificial intelligence, big data, and automation reshape production methods and operational processes across most industries, the adaptability of the workforce becomes paramount in maintaining and expanding productivity, thereby ensuring the competitiveness and progress of nations on the international stage. Therefore, human capital is an increasingly important resource.

For developing countries like Vietnam, developing human capital to adapt to the digital society is particularly urgent. A World Bank survey (2021) indicates that approximately 70% of Vietnam's workforce lacks basic digital skills, a concerning statistic given the increasingly demanding requirements of the labor market in the technological era. This digital skills deficit within the labor force poses significant barriers to the integration and development of the Vietnamese economy in the current context of globalization and digital transformation. To address this challenge, Vietnam requires a comprehensive and well-structured human capital development strategy. This plan needs to prepare a workforce equipped with the necessary skills, knowledge, and creativity to confront changes in technology and the workplace. Policies are needed to promote education and vocational training tailored to the actual needs of the digital economy, and promote collaboration between educational institutions, businesses, and the government in designing flexible training programs that respond to the demands of the labor market. This article presents an analysis of the current state of human capital in Vietnam's digital society and subsequently proposes several recommendations aimed at assisting Vietnam in building a highly skilled workforce capable of adapting effectively to digital technologies, contributing to the nation's competitiveness in the digital age.

2. Human Capital in the Digital Economy: Roles and Challenges

Human capital encompasses the skills, knowledge, and competencies acquired through learning, training, and experience. The OECD (2022) indicates that, in the digital age, the concept of human capital expands to include digital skills and the ability to adapt to new technologies, enabling workers to cope with rapid changes in the labor market. The World Economic Forum (2020) has emphasized that, to meet the demands of the digital society, nations need to focus on emerging digital skills such as data analytics, cybersecurity, and artificial intelligence (AI). These skills not only improve labor productivity but also enable workers to thrive in high-tech and innovative fields.

Digital skills are understood as a collection of abilities to use digital devices, communication applications,

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and the internet to access and manage information. These skills facilitate the creation and sharing of digital content, communication, collaboration, and problem-solving effectively and creatively in both work and life. UNESCO (2023) defines digital skills as ranging from basic skills (such as using digital devices and online applications) to advanced skills, which entail the ability to leverage advanced digital technologies (AI, machine learning, big data analytics, etc.) to enhance performance and adaptation in specialized fields. The World Bank (2021) also provides a digital skills framework with seven main competency groups: software and device operation; data and information literacy; communication and collaboration; digital content creation; information security; problem-solving; and specialized digital competencies - each group is divided into four levels of proficiency, from basic to advanced. Thus, the digital competence of workers is not limited to knowing how to use computers and the internet but also encompasses the ability to think critically, innovate, and adapt to new technologies. According to the International Labour Organization (ILO, 2023), in a knowledge- and technology-based economy, skills training - particularly skills related to digital technology - is essential for promoting economic growth.

Beyond economic benefits, human capital development in the digital age also yields social advantages. Individuals with digital skills can more easily access digital services (such as e-government services, healthcare, and online education), thereby promoting social inclusion. Particularly in the context of the COVID-19 pandemic, digital skills have become essential for workers to adapt to remote work and online learning models. However, significant disparities in digital skills persist globally across demographic groups and nations, creating a "digital divide." UNESCO (2023) cautions that, although 95% of the world's population lives in areas with 2G mobile coverage, a lack of digital skills is causing severe inequality in both developed and developing countries.

The robust growth of the digital economy not only necessitates enhanced digital skills but also transforms the organization and operation of work, posing new requirements and challenges for human capital. Digital transformation is not merely about applying technology; it also entails a shift in labor models, work skills, and professional mindsets of workers. These changes are placing significant pressure on workforce training and development, demanding a substantial adjustment in human capital development strategies in Vietnam. One of the most evident impacts of the digital economy is the shift from traditional work models to flexible work arrangements. Digital technology has broken down the physical boundaries of the office, enabling workers to work remotely through digital tools such as online meetings, digital project management, and cloud computing. According to a Microsoft report (2022), a large proportion of the global workforce desires to maintain remote work or a hybrid model combining office and remote work, and many businesses are also willing to embrace this model. In Vietnam, this trend became more apparent after the COVID-19 pandemic, especially in the information technology, finance, and digital marketing sectors. This places demands on workers not only for flexibility and self-management skills but also for mastery of remote work support tools. Workers are now being evaluated not only based on hours worked but, more importantly, on efficiency and output.

In addition to changes in work models, the rapid advancement of automation and artificial intelligence is creating fundamental shifts in the labor market. Technologies such as artificial intelligence, machine learning, chatbots, and process automation are gradually replacing many repetitive tasks, particularly in manufacturing, finance, customer service, and even healthcare. The World Economic Forum (2020) predicts that a significant proportion of current jobs will be affected by automation within the next few years. This poses a major challenge to the workforce: without timely adaptation and upskilling, workers may face job losses or have to transition to jobs requiring higher-level skills. Instead of being replaced by technology, workers need to learn how to use technology to enhance their productivity and increase value for businesses. This is not only a technical requirement but also a challenge in terms of adaptability and a lifelong learning mindset.

3. The Current State of Human Capital in Vietnam's Digital Economy

3.1. Skills and Labor Productivity

The proportion of formally trained workers in Vietnam remains low. As of the end of 2023, the workforce possessing qualifications or certifications (from elementary vocational level and above) reached only 14.1 million people, accounting for 27% of the total workforce. Conversely, 38.3 million workers (73%) had not received any professional training (General Statistics Office, 2023). In other words, the majority of Vietnam's labor force consists of unskilled workers who have not been systematically equipped with professional skills, including technological skills. This poses a significant challenge to improving digital skills proficiency, as most workers lack the fundamental technical knowledge to acquire advanced digital skills.

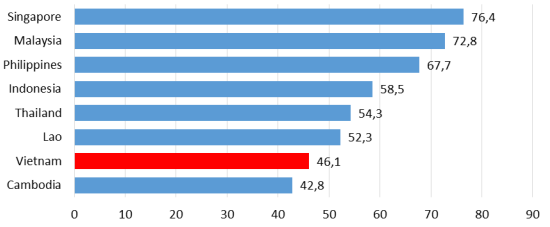
Highly skilled workers constitute only 11.67% of the total workforce, lagging behind other countries in

the region such as Thailand (15.08%) and Malaysia (28%) (Manpower Group, 2022). The skill level of Vietnamese workers ranks seventh among the ASEAN 9 countries and falls into the middle group, positioned 93rd out of 141 countries and territories assessed (Government of Vietnam, 2021). International statistics also indicate that the overall skill level of Vietnamese workers is limited compared to many countries. According to estimates by the ILO, the majority of Vietnamese workers fall into the medium-skilled category, while the proportion of highly skilled workers is very low.

Although the productivity of Vietnamese workers has increased compared to previous years, it remains low within the region. In terms of purchasing power parity (PPP), Vietnam's labor productivity in 2020 reached USD 18,400, only 11.3% of Singapore's productivity level; 23% of South Korea's; 24.4% of Japan's; 33.1% of Malaysia's; 59.1% of Thailand's; 60.3% of China's; 77% of Indonesia's; and 86.5% of the Philippines'. Labor productivity in Vietnam within Southeast Asia is only higher than that of Cambodia (2.4 times higher); Myanmar (1.6 times higher); and Laos (1.2 times higher). If calculating labor productivity per hour worked in terms of purchasing power parity in 2019, Vietnam's productivity is only 8.99% of Singapore's level; 9.13% of Brunei's; 23.21% of Malaysia's; 40.31% of Thailand's; 49.31% of Indonesia's; 57.35% of the Philippines'; and 99.51% of Laos'. Labor productivity in Vietnam within Southeast Asia is only higher than that of Cambodia (2 times higher) and Myanmar (nearly 1.6 times higher) (General Staticsticsal Office, 2021).

3.2. Digital Skills

Figure 1. Digital Skills Scores of the Workforce in some Asia-Pacific Countries in 2019



Source: World Economic Forum, 2019

Digital transformation demands a workforce with advanced digital skills; however, a significant gap exists in Vietnam between market demand and the actual skills of the labor force. Vietnam continues to lag behind global standards. According to the World Economic Forum's ranking, the digital skills of Vietnam's workforce in 2019 ranked 97th out of 141 countries assessed. This index measures a nation's ability to develop, attract, and retain digital talent; a ranking of 97 indicates that Vietnam has considerable work to do to improve digital skills among its workers. The digital skills score of Vietnam's workforce is only 46.1 out of 100, significantly lower than that of other Asia-Pacific countries (World Economic Forum, 2019).

The skill score of graduates in Vietnam, including digital skills, is only 46.1 out of 100 points, ranking 116th out of 141 countries assessed, significantly lower than that of other countries in the region such as Indonesia and Malaysia (Figures 2 and 3).

Figure 2. The skill score of graduates in Vietnam (2019)

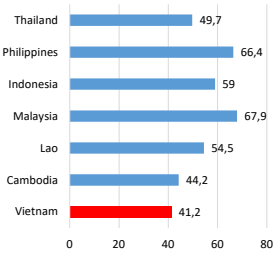
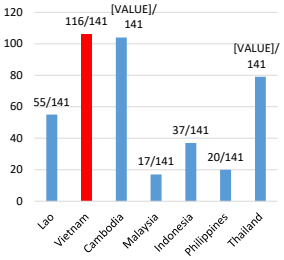


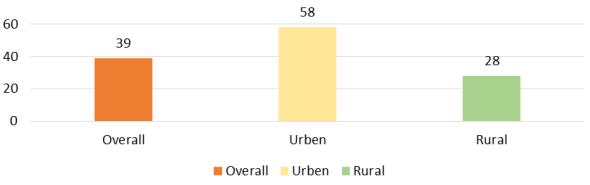
Figure 3. Skill Ranking of Vietnam Graduates (2019)



Nguồn: World Economic Forum, 2019

A study by UNICEF (2022) reveals that information technology skills among Vietnamese youth aged 15-24 are limited, with only 39% possessing digital skills. Notably, a significant disparity exists between urban and rural areas, with 58% of urban youth possessing information technology skills, compared to only 28% in rural areas - less than half. This situation raises concerns about digital human capital. As industries increasingly transition to digital platforms, if youth - the future workforce - are not equipped with adequate information technology skills, their access to digital employment opportunities will be limited, leading to the risk of exclusion from the modern labor market. While businesses increasingly demand workers with digital skills, the imbalance in technology access between urban and rural areas may create a labor divide, where the urban workforce has an advantage in participating in the digital economy, while rural workers are confined to traditional jobs with limited opportunities for advancement.

Figure 4. IT Skills Among Youth Aged 15-24 (%)



Source: UNICEF, 2022

3.3. Foreign Language Proficiency and Soft Skills

Beyond digital skills, soft skills are also becoming a crucial factor in the digital transformation era. However, numerous surveys indicate that Vietnamese workers still lack communication skills, critical thinking abilities, and teamwork skills. According to a LinkedIn survey (2023), 85% of employers in Vietnam consider soft skills a decisive factor in hiring, but only 35% of workers are assessed as having good communication and teamwork skills. A McKinsey & Company report (2021) also emphasizes that 76% of businesses in Vietnam desire employees with problem-solving and creativity skills, but training programs at many universities and vocational centers still do not focus on these skills. The education system in Vietnam remains theoretically oriented, while the labor market demands practical skills and rapid adaptation to changes in the work environment.

Foreign languages, especially English, are increasingly becoming an important skill in the context of economic integration, but this remains a weakness of Vietnamese workers. According to the EF English Proficiency Index (2023), Vietnam ranks 60th out of 111 countries, lower than many countries in Southeast Asia such as Singapore, the Philippines, and Malaysia. A recent report by ManpowerGroup Vietnam indicates that Vietnam has a much lower proportion of workers with working-level English skills compared to other countries in the APAC region, such as Indonesia (10%), Malaysia (21%), or Thailand (27%), with only 5% of local workers meeting the foreign language requirements for the job (Manpower, 2023). A survey by Navigos Group (2022) reveals that 64% of businesses in Vietnam require employees to have English proficiency in their work, especially in the finance, information technology, and tourism industries. However, only about 30% of office staff have English proficiency that meets the requirements, while this rate is almost negligible among unskilled workers. This reduces job opportunities for Vietnamese workers in foreign-invested enterprises, as well as hinders the development of domestic businesses seeking to expand into international markets.

Adaptability and lifelong learning are also significant challenges for the Vietnamese workforce. In the context of rapidly changing technology and labor markets, updating new skills is essential for maintaining employment and improving labor productivity. A PwC survey (2023) shows that 83% of Vietnamese workers are willing to learn new skills to improve their job opportunities, but only 41% have the opportunity to be retrained. Although many large enterprises such as FPT, Viettel, and VinGroup have implemented internal training programs, small and medium-sized enterprises still lack the resources to invest in personnel training. This leads to disparities in opportunities to improve skills among different labor groups, increasing the risk of being excluded from the labor market for those workers who do not have access to regular training.

4. Conclusion

Digital transformation is profoundly reshaping production organization, business operations, and the labor market, creating an urgent need to enhance the quality of human capital. Vietnam currently faces numerous obstacles, including a low proportion of formally trained workers, disparities in digital skills across regions, low labor productivity compared to the region, and limitations in soft skills and foreign language proficiency. Without timely investment and reform strategies, Vietnam will encounter significant difficulties in keeping pace with the development of the global digital economy.

To address these challenges, a coordinated effort is required among the government, businesses, and the education system to develop a highly skilled workforce ready to adapt to the digital economy. Solutions include educational innovation towards integrating digital and soft skills, promoting vocational training linked to business practices, expanding access to lifelong learning opportunities, and enacting policies to support workers in the context of digitalization. In particular, Vietnam needs to focus on narrowing the skills gap between urban and rural areas to ensure a comprehensive and sustainable digital economy. The success of a human capital development strategy will not only determine Vietnam's competitiveness in the region but is also a key factor in helping the country maximize the potential of the Fourth Industrial Revolution, moving towards a modern and inclusive digital economy.

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GREEN FOREIGN DIRECT INVESTMENT: TRENDS AND HOST COUNTRY POLICIES OF VIETNAM

PhD. Nguyen Thanh Thao*

Abstract: ***This article analyzes the increasingly important role of green foreign direct investment (green FDI) in the context of global green transformation and sustainable development transition. It highlights the key characteristics of green FDI, global development trends, experiences from several developing countries in attracting green FDI, and the current situation in Vietnam. Based on this analysis, the article proposes policy implications to enhance the capacity to attract and absorb green FDI effectively, contributing to the achievement of net-zero emissions commitments and the promotion of a green growth model in Vietnam.***

• Keywords: *green FDI; sustainable development; foreign investment; investment policy; green growth.*

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1. Introduction

In the context of deepening globalization and increasingly urgent environmental issues, foreign direct investment (FDI) continues to play a key role as one of the main drivers of economic growth in developing countries. FDI is expected not only to provide additional capital but also to facilitate access to advanced technologies, improve labor productivity, expand export markets, and enhance the competitiveness of domestic enterprises. However, there have been growing concerns about the negative impacts of traditional FDI flows, particularly their contribution to greenhouse gas emissions, overexploitation of natural resources, and environmental pollution when appropriate regulatory and monitoring mechanisms are lacking (UNCTAD, 2022). This poses an urgent requirement for FDI-receiving countries: not only to attract capital but also to ensure that such capital contributes to long-term sustainable development goals.

Against this backdrop, green FDI has emerged as a new global investment trend. These are foreign investments aimed at environmentally friendly sectors such as renewable energy, waste treatment, energy-saving technologies, ecological agriculture, or low-emission manufacturing. A distinctive feature of green FDI is that it does not solely pursue financial returns but also emphasizes environmental and social standards, making a positive contribution to the host country's green transition (OECD, 2021). Over the past decade, especially following the Paris Climate Summit (COP21), green FDI has increasingly become a part of the investment strategies of many multinational corporations as well as investment attraction policies of governments. This shift not only reflects corporate social responsibility but also arises from the practical need to transform growth models toward low-carbon development and climate change adaptation.

For developing countries like Vietnam, green FDI is not merely an option but increasingly a strategic necessity. In the context of Vietnam's commitment to achieve net-zero emissions by 2050, as declared at COP26, attracting green FDI projects with clean technologies and environmentally friendly approaches is essential to realizing this goal. Moreover, green FDI serves as a catalyst for energy transition, domestic technological advancement, and the creation of green jobs for the rapidly growing young workforce. However, effectively attracting and utilizing green FDI presents new challenges, requiring a coherent policy system, a clear legal framework, and strong institutional capacity to select suitable investors, monitor implementation, and ensure the diffusion of green technology and knowledge within the domestic economy. Therefore, research on green FDI is not only timely but also strategically important for investment policy formulation and sustainable development planning in Vietnam and other developing countries.

2. Basic characteristics of green FDI

Amid the global economy's strong shift toward sustainable development, green foreign direct investment (green FDI) is regarded as a strategic form of investment that harmonizes economic growth with environmental protection. Unlike traditional FDI flows, which primarily focus on maximizing financial returns and expanding production, green FDI emphasizes environmental considerations throughout

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the entire project lifecycle - from design, production, and consumption to waste treatment. According to the OECD (2021), green FDI includes foreign investments in sectors, activities, and technologies that not only have a neutral or positive impact on the environment but also contribute to emissions reduction, conservation of natural resources, and the transition to a low-carbon economy.

Sectors that attract green FDI are typically innovative and strategic industries such as renewable energy (wind and solar power), water and waste treatment technologies, smart transportation, organic agriculture, circular manufacturing, and digital environmental services. A prominent feature of green FDI is its high level of clean technology, often accompanied by modern governance systems and closed-loop production processes designed to minimize negative impacts on ecosystems. This requires investors to possess substantial technical and financial capacity to meet the technical standards, environmental regulations, and sustainable governance principles of the host country (Doytch & Narayan, 2016).

Moreover, green FDI is characterized by its long-term nature and its potential for positive spillovers to the local economy. Green FDI enterprises often build environmentally friendly supply chains and collaborate with local firms to transfer technology and skills, thereby enhancing the competitiveness of the entire production ecosystem. One of the most critical aspects of green FDI is its close alignment with ESG (Environmental - Social - Governance) standards, which are increasingly becoming indispensable indicators for assessing the sustainability of investment projects. Green FDI investors typically adopt ESG principles such as transparent governance, respect for workers' rights, and efficient use of energy and resources - thereby generating not only economic gains but also long-term social and environmental value (UNCTAD, 2022).

Another key difference between green and traditional FDI lies in the dual objectives pursued by green investment. While traditional FDI focuses mainly on financial profitability and return on investment, green FDI aims for both economic efficiency and tangible environmental benefits. This dual-target approach is a major reason why green FDI is becoming a dominant trend in international investment strategies, particularly as countries commit to emission reductions under the Paris Agreement and the United Nations' Sustainable Development Goals (SDGs). Therefore, a clear understanding of the fundamental characteristics of green FDI is essential for designing appropriate policies to attract, screen, and support such investments - ultimately maximizing the long-term value they bring to the development of host countries.

3. Global trends in green FDI development

In recent years, green foreign direct investment (green FDI) has emerged as a global trend, reflecting a strategic shift in cross-border investment activities toward sustainable development goals. According to the *World Investment Report* by the United Nations Conference on Trade and Development (UNCTAD, 2022), the proportion of green FDI projects in total global FDI projects increased by over 30% during the period 2015-2021. This indicates a growing interest among international investors in environmentally friendly sectors. Notably, not only has the number of green FDI projects increased, but the scale of investment per project has also expanded significantly, focusing on key sectors of the green economy such as renewable energy, electrified transportation, waste treatment technologies, and digital solutions for environmental management.

This trend is most prominent in regions with high levels of development and relatively mature institutional infrastructure, such as Europe, North America, and some advanced economies in the Asia-Pacific region. In Europe, many countries have introduced green investment incentive packages, including tax credits, clean energy subsidies, preferential loans, and mandatory ESG compliance regulations. Meanwhile, the United States and Canada have embedded carbon reduction targets into public investment laws and established multi-billion-dollar green investment funds, significantly promoting FDI flows into offshore wind energy, energy storage batteries, and green transportation infrastructure (OECD, 2021). In Asia, countries such as South Korea, Singapore, and Japan have become regional hubs for green FDI - both as destinations and as outward investors - with a clear focus on sustainability.

One of the key driving forces behind the rise of green FDI is increasing international pressure to reduce greenhouse gas emissions and fulfill commitments under the 2015 Paris Agreement. Many countries have set targets for carbon neutrality by the mid-21st century, creating a new legal framework that compels both domestic and foreign enterprises to align their investment strategies with sustainable development goals (IEA, 2021). In addition, shifting expectations among consumers, financial investors, and civil society have generated a "bottom-up" pressure, forcing multinational corporations to green their global supply chains - from input materials to final products - to protect brand reputation and mitigate legal risks. Integrating ESG standards into investment strategies also enables firms to access cheaper capital from financial markets,

particularly from sustainable investment funds or green credit facilities (Sachs et al., 2019).

Moreover, the rapid advancement of digital technologies and the circular economy has made it easier and more cost-effective to implement green FDI models than in the past. Many businesses are now utilizing big data platforms, artificial intelligence, and environmental sensors to monitor and optimize the environmental performance of investment projects from the planning stage onward. This is a clear demonstration of how technology is serving as a crucial catalyst in transforming traditional FDI into green FDI, accelerating the global transition to a low-carbon economy. Overall, the convergence of sustainable development demands, policy commitments, and technological innovation is ushering in a new era for green FDI, positioning it as a cornerstone of foreign investment strategies in many countries around the world.

4. Green FDI reception policies in some countries and Vietnam

4.1. Experience in implementing green FDI reception policies in some countries

As developing countries adapt to the global trend of sustainable investment, many have proactively issued green FDI policies with a selective and long-term orientation. These policies aim not only to attract high-quality investment flows but also serve as important tools to domesticate international climate change commitments and promote domestic green transformation. Experiences from countries such as Malaysia, Chile, and Morocco show that developing nations can effectively build a green investment ecosystem by flexibly combining financial incentives, institutional reform, and green infrastructure development.

Malaysia is one of the pioneers in Southeast Asia in implementing dedicated incentive policies for green FDI. Through its lead agency - the Malaysian Investment Development Authority (MIDA) - the country has issued a list of industries eligible to be classified as "green investment" and applied incentives such as up to 10 years of corporate income tax exemption, tax reimbursements for investments in energy-saving technologies, and financial support for green R&D centers (Malaysia Investment Development Authority [MIDA], 2021). Additionally, Malaysia prioritizes land approvals in environmentally friendly industrial zones - most notably the Gebeng Eco Industrial Park, which has attracted many FDI enterprises in wastewater treatment, solar energy, and bio-chemical sectors.

In Latin America, Chile is considered a model in attracting green FDI thanks to its policy mix of private investment incentives and strategic resource planning. The Chilean government has proactively directed the development of the renewable energy sector with a clear roadmap, committing to phase out coal-fired power entirely by 2040 while vigorously expanding solar energy in the Atacama Desert - one of the sunniest regions in the world. To attract FDI into this sector, Chile has implemented transparent energy auction mechanisms, exempted green equipment from import taxes, and established green credit guarantee funds to reduce investor risks (International Renewable Energy Agency [IRENA], 2020).

In North Africa, Morocco has asserted its leadership in clean energy development across the continent with large-scale FDI projects such as the Noor Ouarzazate solar power plant - one of the world's largest renewable energy facilities. Morocco's success is largely attributed to a proactive policy strategy, including the creation of a National Energy Legal Framework, the establishment of the Moroccan Agency for Sustainable Energy (MASEN), and the implementation of public-private partnerships (PPP) to mobilize green FDI and ODA. The country has also developed eco-industrial parks that house clean production enterprises with integrated infrastructure such as centralized waste treatment, decentralized renewable energy systems, and low-carbon logistics networks.

From these international experiences, a key lesson emerges: effective green FDI policies must go beyond isolated tax or financial incentives. They should be part of a comprehensive policy framework that includes green development planning, inter-agency institutional coordination, and transparent monitoring and evaluation mechanisms. Creating a stable, transparent, and investor-friendly environment for green FDI is essential for developing countries to successfully compete in attracting high-quality investment and realize their national sustainable development goals.

4.2. Current status of Vietnam's reception policies on green FDI

In recent years, Vietnam has demonstrated a clear effort to integrate sustainability into its foreign investment attraction policies, particularly by prioritizing projects that utilize environmentally friendly technologies. Through the 2020 Investment Law and its accompanying guidelines, the government has introduced various incentives such as corporate income tax reductions, import tax exemptions on equipment, and R&D expense deductions for projects involving clean technologies or environmentally friendly products. Additionally, investment projects in renewable energy sectors - such as wind and solar power - have benefited from supportive policies related to electricity pricing, flexible bidding mechanisms, and access to electricity transmission infrastructure

(Ministry of Planning and Investment, 2021).

Notably, Vietnam has adopted the *National Green Growth Strategy for the 2021-2030 period, with a vision to 2050*, with the overarching goal of "promoting economic restructuring towards green, low-carbon growth, enhancing resource efficiency, and ensuring social equity." This strategy explicitly emphasizes the role of the private sector and FDI in transforming the development model, and it encourages investment projects that meet green, clean, and circular economy criteria. Furthermore, Vietnam's commitment at COP26 to achieve net-zero emissions by 2050 has provided a strong policy impetus to reorient foreign investment attraction toward more selective, prioritized green and high-tech FDI projects with low emissions.

However, despite these positive developments, several significant challenges remain in the implementation of green FDI policies in Vietnam. First and foremost, the country currently lacks a clear, unified legal framework to define, classify, and prioritize green FDI. Terms such as "green investment project," "sustainable investment criteria," and "ESG standards" are still scattered across a few sectoral strategies and have yet to be integrated into a robust regulatory system capable of effectively governing the investment market (UNDP Vietnam, 2022).

Second, the investment licensing process in many provinces remains cumbersome, fragmented, and not conducive to green FDI. Many enterprises report that access to information, land, infrastructure, and administrative procedures still takes considerable time and varies greatly between localities. This inconsistency diminishes Vietnam's attractiveness in the eyes of international investors, who are placing increasing importance on environmental factors and procedural efficiency.

Third, Vietnam's ecosystem for receiving green technologies remains underdeveloped, reflected in the shortage of technical experts, environmental engineers, and high-quality labor in green industries. Furthermore, the limited internal capacity of domestic enterprises hinders their ability to absorb, learn from, and diffuse green technologies introduced by FDI projects. This shortcoming weakens the spillover effects of green FDI and constrains its role in boosting productivity and the overall technological level of the economy.

Finally, a significant barrier lies in the current system of standards, technical regulations, and environmental monitoring mechanisms, which remain fragmented and insufficiently robust to ensure that investors comply strictly with sustainability criteria. The absence of a comprehensive and transparent environmental impact assessment mechanism throughout the project lifecycle makes it difficult to distinguish between genuine green FDI and "greenwashing."

5. Policy implications for Vietnam

In an increasingly competitive global environment for attracting FDI - especially capital linked to high technology and sustainable development - developing countries urgently need to establish effective green FDI policy frameworks. To not only attract but also effectively absorb such investment, governments must proactively design and implement a strategic policy system based on clear, transparent, and adaptive long-term development criteria.

First, it is essential to establish a dedicated legal framework for green FDI, with a clear definition, classification criteria, and scope of application. Precisely defining what constitutes a "green investment project" provides the foundation for designing appropriate incentive policies and helps distinguish genuine green FDI from "greenwashing" - projects that appear sustainable on the surface but offer no real environmental value (OECD, 2021). In addition, legal regulations should integrate ESG-based project evaluation criteria and be updated regularly in line with international best practices to ensure flexibility and alignment with global standards.

Next, there must be strong inter-agency coordination among ministries, sectors, and local authorities to design and operate a specialized one-stop service mechanism for green FDI investors. This model should go beyond administrative reform to include technical consultation, market information access, value chain linkage support, and post-licensing accompaniment. Experiences from countries such as Singapore and Chile demonstrate that an efficiently organized "one-stop green investment desk" can act as a strategic intermediary between investors and the public sector, shortening investment timelines and reducing transaction costs (IRENA, 2020).

Another necessary policy is to design green performance-linked incentives. Rather than offering blanket incentives to all projects, the government can implement a "reward-for-green-performance" mechanism - where tax breaks, preferential loans, or infrastructure support are granted only if investors meet specific environmental performance indicators such as emission reductions, renewable energy usage, resource savings, or the number of green jobs created. This mechanism helps ensure the authenticity of green investment and encourages investors to maintain their environmental commitments throughout the project lifecycle (UNCTAD, 2022).

At the same time, investing in human resource

development in environmental technology is a key condition for enhancing the absorptive capacity and spillover effects of green FDI. The government should promote a triple-helix model of cooperation between the state, universities, and businesses to develop specialized training programs in environmental engineering, green supply chain management, sustainable finance, and ESG standards. Additionally, policies should be introduced to attract foreign experts and high-tech engineers to work in green investment projects, thereby helping to build endogenous capacity in the domestic labor market.

Finally, to ensure that green FDI projects truly generate environmental and social value, it is crucial to establish a comprehensive environmental monitoring and evaluation system. This system should measure not only quantitative environmental indicators - such as emissions, water usage, and recycling rates - but also indirect impacts like shifts in green consumption behavior, technology transfers across supply chains, and knowledge spillovers to local businesses. Evaluation results should be made public and transparent to facilitate social oversight and strengthen investor accountability.

In summary, green FDI policy implications go beyond merely "attracting investors"; they involve a strategic regulatory approach to ensure that these capital flows genuinely contribute to an equitable, green, and sustainable economic transition. As a dynamic developing country, Vietnam has strong potential to become an attractive destination for green FDI - provided that it promptly improves its institutional framework, enhances its ability to demonstrate environmental commitments, and builds a comprehensive green investment ecosystem.

6. Conclusion

In the context of a global shift toward green growth and sustainable development - an irreversible trend - green foreign direct investment (FDI) is emerging as a key factor in reshaping the international investment landscape. This is not merely a passing trend but a strategic opportunity, offering the potential to restructure economies on a more sustainable, environmentally friendly, and globally aligned foundation - consistent with international commitments such as the Paris Agreement and the Sustainable Development Goals (SDGs). Green FDI not only brings financial resources and advanced technology but also introduces a new value system in corporate governance, where environmental and social considerations are placed on par with financial returns - an especially critical factor for developing countries that are more vulnerable to climate change and resource degradation.

For Vietnam, proactively embracing the wave of green FDI is not just about attracting high-quality capital; it also serves as a measure of the country's commitment and capacity to implement a sustainable development transition. Establishing priority policies, defining a clear legal framework, and building effective institutional coordination between ministries and sectors are fundamental to creating a green investment environment that is fair, transparent, and stable. In addition, investing in human resources, technical infrastructure, and innovation is essential to enhance Vietnam's capacity to absorb and diffuse the positive impacts of green FDI throughout the domestic economy.

However, to fully realize the potential of green FDI, there must be a shift in policy thinking - from a "growth at all costs" approach to a "strategic selection" mindset, prioritizing projects that generate synergistic value in terms of environmental protection, technological advancement, and local development. The pursuit of sustainability must be operationalized through technical standards, transparent environmental performance evaluation mechanisms, and genuine incentive policies - avoiding the risk of turning green FDI into a symbolic concept or a "greenwashing" tool in an increasingly complex global competition.

In conclusion, green FDI presents an opportunity for Vietnam and other developing countries to redefine their role in the global economy - as responsible partners and as green innovation hubs in their regions. If leveraged effectively, green FDI will not only yield short-term economic benefits but also contribute significantly to building a future where growth and environmental stewardship go hand in hand - the ultimate goal for every nation in the 21st century.

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IMPACT OF ECONOMIC FACTORS, CAPACITY OF PROJECT PARTICIPANTS AND STATE MANAGEMENT AGENCIES ON THE EFFICIENCY OF IRRIGATION DEVELOPMENT INVESTMENT IN THE MEKONG DELTA

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Abstract: ***The Mekong Delta is a key agricultural region of Vietnam. To contribute to promoting the development of this economic region, irrigation infrastructure plays an important role, because synchronous and modern investment in irrigation infrastructure will ensure irrigation for crops, increasing income for farmers. This paper studies the impact of economic factors, capacity of project participants and state management agencies on the effectiveness of investment in irrigation development using state budget capital in the Mekong Delta. Through a survey of 348 officials working in project management boards and state management agencies on irrigation in the Mekong Delta, the results show that the capacity of project participants has the greatest impact on the efficiency of irrigation development investment using state budget capital in the region.***

• Keywords: *efficiency, development investment, irrigation.*

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1. Introduction

The Mekong Delta is the region at the end of the Mekong River, stretching across 6 countries and flowing into the East Sea. After more than 30 years of renovation, this is an economic region that contributes more than 33% of the country's agricultural GDP, 56% of rice output, 60% of fruit output, 95% of rice export output and about 60% of Vietnam's seafood export output (Ministry of Agriculture and Rural Development, 2023).

In recent years, the region's irrigation infrastructure has received attention from the state. In the period of 2021 - 2024, the investment capital from the state budget for irrigation development investment in the Mekong Delta reached more than 8,609 billion VND, accounting for about 29% of the total state budget capital for irrigation development investment in Vietnam. Thanks to the investment in irrigation infrastructure, it has contributed to flood control in the region, acidification and alum washing, preventing salinity and preserving fresh water, expanding the area of cultivated land, increasing productivity and crop yield, and ensuring the people's domestic water source (Le Manh Hung, 2015). However, irrigation development investment from the state budget in the region has not been highly effective, the irrigation infrastructure is incomplete, lacking in synchronization, degraded, and there is overlap in management and coordination of resources and stakeholders.

Regarding the effectiveness of irrigation development investment, there have been many studies by domestic and foreign scientists. Regarding foreign studies, Leslie E. Small and Mark Svendsen (1990), Eliakim C. Matekere and Ninatubu M. Lema (2011) proposed a research framework and identified factors affecting the efficiency of irrigation projects, however, the authors only mentioned small irrigation projects in Tanzania. In domestic studies, the efficiency of investment in infrastructure development is mentioned in different fields, specifically Nguyen Van Phuc (2023) researched in the field of airport infrastructure, Cu Thanh Thuy (2018) researched in the field of road traffic infrastructure, Hoang Thu Ha (2013) researched in the field of seaports... With studies on the efficiency of investment in irrigation infrastructure development, Le Manh Hung (2015), Bui Thi Bong Trang (2017), Nguyen Hong Nhung (2020)... mainly focused on analyzing the current investment status and proposing solutions to improve investment efficiency without quantifying the factors affecting the efficiency of investment in irrigation infrastructure development.

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2. Literature review

Economic factors

Policies related to investment in developing irrigation infrastructure: According to Cu Thanh Thuy (2018), if policies related to investment and development are built synchronously and scientifically, investment efficiency will be improved. These policies also demonstrate investment incentives and investment encouragement from the state, thereby affecting the efficiency of investment and development activities (Pham Van Hung and Nguyen Thi Ai Lien, 2024)

Compensation, site clearance, and resettlement support policies: Compensation, site clearance, and resettlement support are a step in the process of implementing investment and development activities. This is a factor that affects the investment costs of building irrigation systems during the construction phase (Tran Thi Hong Phuc, 2020), thereby affecting the efficiency of investment and development activities. If this policy is built synchronously, satisfying the interests of the parties involved in the project, it will make the project quickly deployed and put into operation, achieving high efficiency. On the contrary, it will slow down the progress, prolong the construction time, causing waste of investment capital.

Socio-economic development planning: Development investment projects that are consistent with the socio-economic development planning of the region, economic sector or country will have the opportunity to be accepted and implemented. Socio-economic development planning is the scientific basis and a factor affecting the effectiveness of development investment (Cu Thanh Thuy, 2018; Nguyen Van Phuc, 2023). Public investment structure: If the public investment structure is not reasonable, investing too much in areas where the private sector is ready to invest, not finishing investing in important projects, lacking investment in sectors that have spillover effects on the development of other sectors... it will negatively affect the efficiency of public investment (Pham Minh Hoa, 2017).

Capacity of project participants

In order to invest in developing irrigation infrastructure, there is the participation of many parties such as investors, design consultants, construction contractors, supervision consultants... Research by Esfahani, H. and Ramirez, M. (2003); Haque, M., and Kneller, R. (2008) has the same view that the capacity to manage and implement investment projects affects investment efficiency. If the investment project is poorly managed, it will be a factor leading to low efficiency of investment activities. In addition, the capacity of the units participating in the project includes management capacity, financial capacity, technological capacity, etc.

Capacity of the investor: the capacity of the investor affects the use of capital economically and effectively in the process of implementing and operating the investment project (Hoang Thu Ha, 2013; Phan Thi Thu Hien, 2015). If the investor has good management skills, allocates the work of the investment project effectively and reasonably; has the ability to apply advanced science and technology to implement and operate the investment project, it will improve investment efficiency.

Experience of the investor: If the investor has little experience in the field of development investment, it will lead to risks for the investment project during the implementation process, negatively affecting the results and efficiency of the investment (Cu Thanh Thuy, 2018).

Contractor capacity: If the contractor has poor professional and technical capacity, the quality of the project will not meet the requirements. If the contractors implementing the investment project are experienced and have good financial resources, the project will ensure the right schedule as well as limit the risks that occur during the project construction process (Pham Minh Hoa, 2017; Le Tuan Loc et al., 2021). Yami Mastewal (2016) believes that the recruitment and capacity improvement of project staff or ineffective project financial management capacity negatively affects irrigation investment projects. Moreover, the capacity of design engineers and contractors participating in the construction is also a challenge that affects irrigation investment projects. If the project participants have financial capacity, management capacity, technological capacity, etc., it will speed up the project progress, reduce project costs, and contribute to improving investment efficiency (Cu Thanh Thuy, 2018).

Contractor experience: if the contractor has experience in implementing the work in the investment project, it will ensure the progress of the project according to the plan, limiting risks during

the project construction process. If the contractor does not have much experience, it will lead to shortcomings, mistakes, increasing investment costs, thereby reducing investment efficiency (Larsen et al., 2015; Abdul Rahman, 2006).

Coordination between the investor, contractor and project participants: if there is a lack of coordination between the investor, contractor and project participants, it will lead to incorrect information during the implementation of the investment project, which can lead to the destruction and re-construction, slowing down the progress and increasing the project investment costs, greatly affecting the efficiency of the development investment project (Abdul Rahman, 2006).

State management agencies

Management capacity of state management officials related to investment in developing irrigation infrastructure: weak management capacity of management officials will prolong the settlement and payment process when investing in construction works, delaying investment progress and reducing investment efficiency (Yami Mastewal, 2016). The capacity of the leader also affects making the right decisions, avoiding wasting investment capital (Phan Thi Thu Hien, 2015; Cu Thanh Thuy, 2018).

Professional qualifications of managers related to investment in developing irrigation infrastructure: if the staff lack professional qualifications in the field of investment implementation such as lack of knowledge related to the location of the investment project, the use of a top-down approach in planning... will affect the efficiency of irrigation investment (Yami Mastewal, 2016).

Quality and ethics of managers related to investment in developing irrigation infrastructure: if managers of management agencies related to investment and development have good qualities and ethics, it will positively affect the promulgation and organization of the implementation of investment and development plans, affecting the efficiency of investment and development (Phan Thi Thu Hien, 2015; Cu Thanh Thuy, 2018). In addition, some activities in investment and development such as bidding are not transparent, investment project appraisal does not comply with legal regulations... will lead to a decrease in the efficiency of investment in using state budget capital (Pham Minh Hoa, 2017).

3. Research method

Research method

The author uses a combination of qualitative and quantitative research to measure the level of influence of the following factors: Economy, State management agencies, Capacity of units participating in the project on the effectiveness of investment in developing irrigation infrastructure using state budget capital.

5-level Likert scale is used to assess the level of influence of factors on the effectiveness of investment in developing irrigation infrastructure. The assessment level from 1 to 5 is arranged in increasing order of the level of influence of factors on the effectiveness of investment in developing irrigation infrastructure using state budget capital.

The study uses the method of processing collected data using SPSS software. The data is preliminarily cleaned, then coded before analysis. The author uses a multivariate linear regression model to study the level of influence of factors on the efficiency of investment in irrigation development

The quantitative analysis method is used for the main analysis part of the study with the following steps: Testing the reliability of the scale; Exploratory factor analysis EFA; Correlation analysis and multiple linear regression. These steps are carried out to assess the level of influence of factors on the efficiency of investment in infrastructure development using state budget capital in the Mekong Delta.

Data collection

The author uses a survey form to interview officials directly working at units and state management agencies related to investment in irrigation infrastructure development using state budget capital, including the Ministry of Planning and Investment, the Ministry of Agriculture and Rural Development and affiliated units; staff working at Project Management Boards, construction contractors, consulting contractors, and contractors supervising irrigation works using State budget capital in the Mekong Delta.

The sampling method used is convenience sampling, which is a suitable sampling method that the author can approach and interview the survey subjects (Nguyen Van Thang, 2015).

Sample

With a sample size of 348, it is enough to ensure

the sampling principle according to Yamane (1967) and Rao (1985). The questionnaire was coded, entered using Excel software and processed using SPSS 20 software for analysis.

The economic factor group includes 4 scales: policies related to investment in irrigation infrastructure development; compensation policies, site clearance, resettlement support; socio-economic development planning; public investment structure. The group of factors of state management agencies includes 3 scales: management capacity of state management officials, professional qualifications of officials related to investment in developing irrigation infrastructure, qualities and ethics of officials related to investment in developing irrigation infrastructure

The group of factors of capacity of units participating in the project includes 5 scales: capacity of investors, experience of investors, capacity of contractors, experience of contractors; coordination between investors, contractors and parties participating in the project in the stages of the investment project.

4. Research results

Reliability results of scales

Conducting a reliability test of the scales, the results show that only the scale of public investment structure of the economic factor has a total correlation coefficient of less than 0.3, so this variable is eliminated; All factors have Cronbach's Alpha coefficients > 0.7 and the total correlation coefficients are all greater than 0.3. Therefore, the scales of the factors meet the reliability requirements.

Table 1: Cronbach's test results of the research factors

No	Factor	Cronbach's Alpha
1	Economic factors (KT)	0,692
2	State management agencies (QLNN)	0,874
3	Capacity project participants (DVTG)	0,890
4	Effectiveness of irrigation development investment (HQ)	0,915

Table 2: KMO and Bartlett's test with independent variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.683
Bartlett's Test of Sphericity	Approx. Chi-Square	2516.124
	Df	55
	Sig.	.000

The results of the EFA exploratory factor analysis with the independent variables in the research model gave quite good results. This is shown in the KMO coefficient = 0.683 corresponding to the significance level Sig = 0.000 < 5%. This result indicates that the results of the EFA exploratory factor analysis have high reliability. In addition, the total value of the extracted variance of the third factor and the convergence coefficient of eigenvalues of this factor are 72.181% > 50% and 1.449 > 1, respectively. In addition, the rotated matrix table of factors shows that the loading factors of the observed variables are all greater than 0.5. Thus, the factors after performing the EFA exploratory factor ensure the ability to represent the original survey data and are eligible to perform multivariate regression. Three factors were extracted after conducting EFA analysis including: Economy, State management agencies and Capacity of project participants.

Correlation analysis results

Based on the results of the correlation analysis, we can see that the dependent factor (HQ) has a positive correlation with the independent factors: KT, QLNN, DVTG, which is shown through the Pearson correlation coefficient of these relationships being greater than 0. This close relationship is highly desirable because the close, linear relationships between the variables explain the influence of the model results. Therefore, these independent variables can be included in the regression analysis to explain the influence on the results of the research model.

Regression result analysis

Multiple linear regression results

The results of the model show that the adjusted R^2 is 0.775, which means that 77.5% of the variation in the dependent variable HQ is explained by the independent variables in the model. In addition, the results also show that the F test also gives a very small Sig. value, which proves that the research model is suitable for the data set being surveyed.

On the other hand, the independent variables KT, DVTG are all statistically significant with a significant level of Sig. < 0.05, the variable QLNN is statistically significant with a significance level of Sig. < 0.1.

The regression model results also show that the tolerance coefficient is quite high from 0.814 to 0.963, while the VIF variance inflation factor is low (from 1.039 to 1.229) less than 2.

On that basis, we can conclude that the relationship between these independent variables is insignificant and there is no multicollinearity.

Table 3: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
Constant	-.067	.147		-.457	.648					
KT	.144	.028	.143	5.135	.000	.460	.267	.131	.841	1.189
QLNN	.051	.026	.050	1.911	.057	.195	.102	.049	.963	1.039
DVTG	.820	.029	.806	28.550	.000	.871	.839	.727	.814	1.229

From the results of the regression model, we can draw a multiple regression equation representing the relationship between the independent variables and the dependent variables as follows:

*HQ = 0.143*KT + 0.050*QLNN + 0.806*DVTG*

Results of the multivariate regression model: Based on the results of the multivariate regression analysis, it is shown that there are 3 factors affecting the efficiency of investment in developing irrigation infrastructure using state budget capital, including: (1) Economic factors, (2) State management agencies, (3) Capacity of project participants. In which, the factor "Capacity of project participants" has the greatest impact on the efficiency of investment in developing irrigation infrastructure using state budget capital with a regression coefficient of 0.806.

The results of the regression analysis show that the factors affecting the efficiency of investment in developing irrigation infrastructure using state budget capital are as follows:

+ Economic factor: The results of the regression analysis show a positive correlation between the factor "economic" and "the efficiency of investment in developing irrigation infrastructure using state budget capital". The regression coefficient is 0.143, which means that under the condition that other factors remain unchanged, when the factor "economic" increases by 1 unit, the efficiency of investment in developing irrigation infrastructure using state budget capital will increase by 0.143 units.

+ State management agency factor: The regression analysis results show a positive correlation between the factor "state management agency" and "investment efficiency in developing irrigation infrastructure using state budget capital". The regression coefficient is 0.050, which means that under the condition that other factors remain unchanged, when the factor "state management agency" increases by 1 unit, the investment efficiency in developing irrigation infrastructure using state budget capital will increase by 0.050 units.

+ Capacity factor of project participating units: The regression analysis results show a positive correlation between the factor "capacity of project participating units" and "investment efficiency in developing irrigation infrastructure using state budget capital". The regression coefficient is 0.806, which means that under the condition that other factors remain unchanged, when the factor "capacity of project participants" increases by 1 unit, the efficiency of investment in developing irrigation infrastructure using state budget capital will increase by 0.806 units.

5. Conclusion

The article has studied the level of influence of 3 groups of factors: Economy, State management agencies, Capacity of project participants. The results show that these factors all have a positive impact on the efficiency of investment in developing irrigation using state budget capital. This result is consistent with some previous studies in the field of investment in developing infrastructure (Cu Thanh Thuy, 2018; Nguyen Van Phuc, 2023). In particular, this study has shown that the capacity of the units participating in the project has the strongest impact on the efficiency of investment in developing irrigation infrastructure using state budget capital. Therefore, improving the capacity of investors and contractors such as financial capacity, professional capacity... will contribute to improving the efficiency of investment in developing irrigation using state budget capital.

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LABOR SUPPLY AND DEMAND DYNAMICS IN VIETNAM AMID THE DIGITAL TRANSFORMATION ERA

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Abstract: ***In the course of socio-economic development, labor has always played a central role, determining production efficiency and national productivity. The effective operation of the labor market, where labor supply and demand intersect, is a core driver of sustainable growth. However, in reality, the labor market in Vietnam and many other countries is facing various challenges: imbalances between labor supply and demand, an oversupply of low-skilled workers, a shortage of highly skilled labor, and rapid shifts in employment structure driven by digital transformation and globalization. This paper aims to analyze the current dynamics of labor supply and demand and to propose several policy implications to help develop a more flexible, modern, and adaptive labor market that aligns with the digital age and contributes to sustainable growth and human capital development in the future.***

• Keywords: *labor supply, labor demand, labor market.*

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1. Introduction

In the context of the Fourth Industrial Revolution, digital transformation has become an inevitable trend in the global economy, including in Vietnam. Digital transformation not only influences business models and production activities but also significantly reshapes the structure, quality, and skill requirements of the labor market.

In Vietnam, rapid digital transformation across various industries poses new demands for the workforce. Additionally, post-COVID-19 fluctuations in labor supply and demand exert further pressure on the transition process, as traditional industries shrink while emerging fields (such as data analytics, cybersecurity, AI, digital marketing, etc.) experience a shortage of high-quality labor supply. Hence, studying labor market fluctuations under digital transformation is essential to identify changes in skill demand, industry structure, age, and education levels, and to propose policy implications for a more flexible, modern, and adaptive labor market to foster sustainable growth and human capital development.

2. Theoretical Background

2.1. Labor Supply

Concept: Labor supply is the total number of workers that people of working age are willing and able to participate in economic activities (work) for a certain period of time, at a certain wage.

Factors affecting labor supply: Population size in working age; Labor force participation rate (labor force participation rate); Labor quality (education level, vocational skills, health...); Expected salary and working conditions; Socio-cultural factors (gender roles, occupational concepts, customs, etc.); State policies on education, vocational training and social security.

Characteristics of labor supply: Proactive on the part of employees; Fluctuations are slower than labor demand (due to demographic and training factors); Strongly influenced by salary, working conditions, and career prospects; It is uneven according to industry, region, and professional level.

2.2. Labor Demand

Concept: Labor demand is the number of workers that enterprises, organizations, and employers need to recruit to carry out production and business activities in a certain period, corresponding to a specific salary.

Factors affecting labor demand: The level of economic development (when the economy grows, labor demand increases); Structure of industries (service and high-tech industries often have different labor demand from agriculture and traditional production); Technological level (automation reduces the demand for unskilled workers but

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increases the demand for high-quality labor); Salary and benefits (high salaries can reduce the number of positions to be recruited due to high costs); State policies (regulations on minimum wage, tax policies, business support, etc.).

3. Research Methodology

The data used in the study are secondary data for the period 2022 - 2024 from the statistical yearbook of the General Statistics Office and the Ministry of Labor, War Invalids and Social Affairs.

All collected data is processed by the Excel program on the computer. For information that is quantitative data, the necessary indicators, such as absolute numbers, relative numbers, and averages are calculated and made into tables and graphs.

The methods of analyzing the collected information used in the article include: Descriptive statistical method, comparison method.

4. Research Results

4.1. Current Status of Labor Supply

In the period of 2022 - 2024, the total number of employed workers increased steadily over the years, from 50,6 million people in 2022 to 51,9 million people in 2024, showing the recovery and development of Vietnam's labor market.

4.1.1. Labor Supply by Economic Sector

The structure of employed labor divided into 3 economic sectors (agriculture, forestry & fisheries; industry & construction; services) in the 2022-2024 period shows a positive trend: The proportion of workers in the agriculture, forestry and fishery sector gradually decreased over the years, from 27,5% in 2022 to 26,5% in 2024. In contrast, the service sector increased from 39,0% to 40,1%, indicating a shift in the labor structure from agriculture to services. The labor rate in the industrial and construction sectors remained stable at around 33,5%, reflecting stability in this sector.

Table 1. Labor Supply Structure by Economic Sector

Year	Total Employed (Million)	Agriculture, Forestry & Fisheries		Industry & Construction		Services	
		Number (Million)	Share (%)	Number (Million)	Share (%)	Number (Million)	Share (%)
2022	50,6	13,9	27,5	17,0	33,5	19,7	39,0
2023	51,3	13,8	26,9	17,2	33,5	20,3	39,6
2024	51,9	13,7	26,5	17,4	33,4	20,8	40,1

Source: General Statistics Office (GSO) and Ministry of Labor, Invalids and Social Affairs (MOLISA)

4.1.2. Labor Supply by Age Group

The labor structure by age group is mostly stable, with the majority of the workforce concentrated in the middle-aged age group (25-54) - this is the main "main worker" group contributing to the labor market. The youth group (15-24) accounts for a smaller proportion, and the older working group (55 and older) tends to increase slightly due to the aging of the population.

Table 2. Labor Supply by Age Group

Year	Total Labor Force (million)	Age 15-24		Age 25-54		Age 55+	
		Number (Million)	Share (%)	Number (Million)	Share (%)	Number (Million)	Share (%)
2022	51,7	6,3	12,2	36,1	69,8	9,3	18,0
2023	52,4	5,9	11,26	36,7	70,04	9,8	18,70
2024	53,2	5,8	10,90	36,8	69,17	10,6	19,92

Source: General Statistics Office (GSO) and Ministry of Labor, Invalids and Social Affairs (MOLISA)

In 2022, the total labor force is 51,7 million people, of which the 15-24 age group accounts for about 12.2% (6,3 million people); the 25-54 age group accounted for 69,8% (36,1 million people), and 55 years old and over accounted for 18%. Thus, about two-thirds of the workforce belongs to the 25-54 age group, which is considered the main working age group of the economy.

In 2023, the age structure has not changed much. Young workers aged 15-24 account for 11.26% of the workforce; the group aged 25-54 accounted for 70,04% of the total labor force (36,7 million people); the remaining 18.7% are in the elderly group (55+). As the population is entering an aging phase, the proportion of elderly workers shows signs of increasing slightly, while the proportion of young people decreases compared to the previous decade.

In 2024, the aging trend within Vietnam's labor force became more evident, although it continued to evolve at a relatively slow pace. It is estimated that the share of employed workers aged 55 and over rose slightly to 19,92%, while the proportion of young workers aged 15-24 remained stable at 10,9%. The core working-age group, comprising individuals aged 25-54, continued to dominate the labor market, accounting for more than two-thirds of the total labor supply.

Although the structural change in workforce age composition during this period was not abrupt, demographic forecasts suggest that the labor force will continue to age gradually in the future. This trend is expected to be driven by declining birth rates and rising life expectancy, two key demographic forces reshaping the labor supply over the long term.

From 2022 to 2024, the 15-24 age group (representing young labor market entrants) showed a gradual downward trend, declining from 12,2% in 2022 to 10,9% in 2024. This decline reflects a combination of demographic shifts, extended educational periods, and delayed workforce entry among youth. Meanwhile, the 25-54 age group - the backbone of Vietnam's productive workforce - maintained a relatively stable share of around 70%, though with a slight downward trend, hinting at a broader population structure transition.

In contrast, the 55+ age group witnessed a steady rise in labor market participation, increasing from approximately 18% in 2022 to 19,92% in 2024. This upward trend clearly signals an aging labor force and underscores the growing importance of policies aimed at extending working life, improving elderly employability, and adapting labor market institutions to the realities of an aging society.

4.1.3. Labor Supply by Educational Attainment

The structure of Vietnam's labor force by educational attainment during the 2022-2024 period reveals a gradual improvement in the qualifications of the workforce. The proportion of workers holding degrees or certificates increased slightly from 26,2% in 2022 to 27,8% in 2024, indicating a positive trend toward upskilling and professional development.

Despite this progress, untrained workers still constitute the overwhelming majority of the labor force, accounting for 72,2% in 2024. This highlights the urgent need to strengthen vocational training and technical education systems to improve workforce quality and meet the demands of an increasingly knowledge-based economy.

Table 3. Labor Supply by Educational Attainment (2022-2024)

Year	Total Labor Force (million)	With Degrees/Certificates		Untrained Labor	
		Number (Million)	Share (%)	Number (Million)	Share (%)
2022	51,7	13,5	26,2	38,2	73,8
2023	52,4	14,1	27,0	38,3	73,0
2024	53,2	14,8	27,8	38,4	72,2

Source: *General Statistics Office (GSO) and Ministry of Labor, Invalids and Social Affairs (MOLISA)*

4.1.4. Labor Structure by Economic Sector

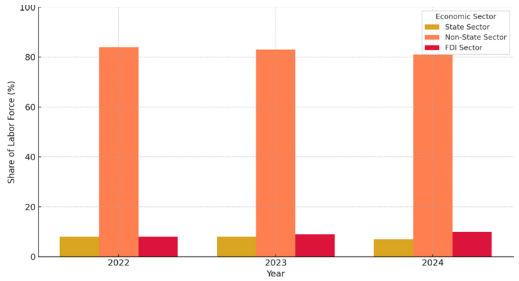
Vietnam's labor force structure by economic sector in the 2022-2024 period reflects notable trends in employment distribution across different types of ownership.

Non-State Sector: The non-state sector consistently accounts for the largest share of employment, maintaining a level of approximately 81-84% during 2022-2024. This underscores the leading role of the domestic private sector, particularly household businesses and private enterprises, in generating employment across the economy.

Foreign Direct Investment (FDI) Sector: The proportion of labor employed in the FDI sector rose slightly, from around 8% in 2022 to approximately 10% in 2023 and 2024, indicating increasing foreign investment and the expansion of production capacity in foreign-invested enterprises. This sector plays a significant role in driving structural transformation toward industrialization and modernization.

State Sector: Employment in the state sector exhibited a mild downward trend, decreasing from around 8% in 2022 to about 7-8% in 2024, reflecting the effects of administrative streamlining and equitization (partial privatization) of state-owned enterprises.

Figure 1. Labor Distribution by Economic Sector



Source: General Statistics Office (GSO) and Ministry of Labor, Invalids and Social Affairs (MOLISA)

The structure of employment by economic sector in Vietnam indicates that the domestic private sector remains the largest absorber of labor, reflecting the critical role played by household-based economies and private enterprises.

Although the foreign direct investment (FDI) sector accounts for less than one-tenth of total employment, it has shown a gradual upward trend thanks to increased foreign capital inflows. This sector has significantly contributed to shifting employment toward modern industries and service-based economies, reinforcing Vietnam's industrial transformation and integration into global value chains.

Meanwhile, the state sector has maintained a relatively low and declining share of total employment. This reduction is largely attributed to the effectiveness of public administration reforms and the equitization (partial privatization) of state-owned enterprises (SOEs). These developments

reflect the government's efforts to streamline public-sector employment and promote efficiency.

Overall, these trends signify a positive evolution toward a more dynamic and flexible labor market. However, they also raise new challenges, particularly the need to improve labor productivity and enhance workforce skills in the private and FDI sectors - areas that are highly competitive and increasingly demand specialized knowledge and technical qualifications.

4.2. Labor Demand by Economic Sector in Vietnam (2022-2024)

Labor demand by economic sector in Vietnam during the 2022-2024 period reveals significant structural differentiation: *Services Sector*: Continues to lead in terms of employment, reflecting the ongoing economic restructuring and the rising demand in fields such as trade, tourism, and information technology; *Industry & Construction:* Demonstrates stable growth, particularly in manufacturing and construction activities, to meet infrastructure development and industrialization needs; *Agriculture, Forestry & Fisheries:* Shows a slight decline in labor demand, indicating a transition toward sectors with higher value-added potential.

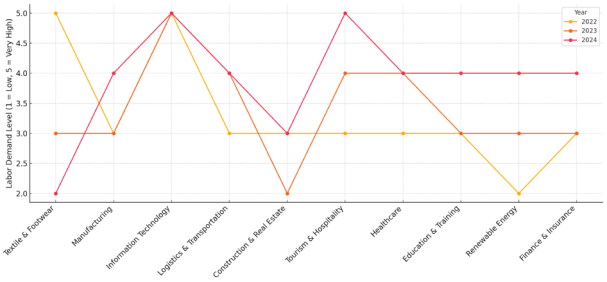
Table 4. Number of Employed Workers by Sector (Million people)

Sector	2022	2023	2024
Agriculture, Forestry & Fisheries	13.9	13.8	13.8
Industry & Construction	17.0	17.2	17.5
Services	19.7	20.3	20.6
Total	50.6	51.3	51.9

Source: General Statistics Office (GSO) and Ministry of Labor, Invalids and Social Affairs (MOLISA)

Labor demand during this period also reveals a clear distinction between traditional and modern sectors: *Information Technology (IT):* Maintains very high demand across all years, driven by digital transformation and the growing need for high-skilled technical labor. *Tourism, Hospitality, and Banking*: Witness sharp increases in demand after the pandemic, supported by a booming domestic tourism sector. *Healthcare and Social Care:* Labor demand continues to rise due to population aging and public health challenges. *Textile and Footwear:* Experiences a significant decline due to a shortage of international orders and global supply-demand shifts. *Manufacturing:* Shows mild recovery as domestic demand strengthens. *Renewable Energy:* Gradually expands, spurred by government policies promoting sustainable development.

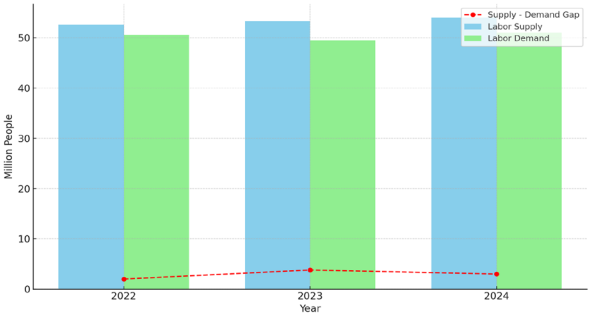
Figure 2. Labor Demand Trends by Sector (2022-2024)



Source: Author's compilation from GSO and MOLISA data

4.3. Labor Supply-Demand Imbalances.

Figure 3. Labor Market Supply-Demand Balance in Vietnam (2022-2024)



Source: Author's compilation from GSO and MOLISA data

Throughout all three years - 2022, 2023, and 2024 - the labor supply (the number of individuals willing and able to work) consistently exceeded labor demand (the number of actual job vacancies provided by businesses and employers).

In 2022, the labor surplus was estimated at approximately 2 million workers. In 2023, the supply-demand imbalance widened slightly due to the impact of the global economic slowdown, which caused labor demand to decrease to 49.5 million. By 2024, the labor market began to show signs of mild recovery; however, labor supply still exceeded demand by roughly 3 million people.

This persistent supply-demand mismatch in the labor market has increased the risk of unemployment and employment instability, particularly among low-skilled workers and youth. It has also placed mounting pressure on vocational education and training systems, especially in terms of reskilling and upskilling the existing workforce to meet changing economic demands.

The key contributing factors to this imbalance include:

Between 2022 and 2024, Vietnam's labor market has continued to experience persistent mismatches

between labor supply and demand, as the number of individuals willing and able to work consistently exceeds the actual number of job vacancies offered by enterprises. This imbalance has contributed to rising unemployment and underemployment, particularly among low-skilled and young workers, while placing increasing pressure on vocational training systems and labor market institutions. Several underlying causes can be identified:

First, the structural transformation of the economy has lagged behind labor market needs.

Despite progress in industrialization and modernization, a significant proportion of the workforce remains concentrated in traditional sectors such as agriculture, while emerging industries, such as digital technology, logistics, and renewable energy, face chronic labor shortages.

Second, the skills mismatch remains a critical constraint.

Many workers lack the technical and professional competencies required for high-skilled jobs. According to ILO (2021), nearly 75% of Vietnam's labor force lacks formal vocational qualifications, which severely limits access to decent employment and raises the risk of structural unemployment.

Third, vocational and tertiary education systems are not well aligned with labor market demands.

Curricula remain overly theoretical and insufficiently responsive to technological advancements or practical workplace needs. As a result, a large proportion of graduates face difficulties finding jobs that match their qualifications, leading to the so-called "overeducation-underemployment" paradox.

Fourth, digital transformation and automation are reshaping labor demand patterns.

The widespread adoption of digital technologies has reduced the demand for routine, low-skilled labor, while increasing the demand for digital and data-literate workers. However, Vietnam's digital skills training ecosystem has yet to keep pace with these evolving requirements.

Fifth, global economic fluctuations and the slowdown in export-oriented sectors have impacted labor demand.

The downturn in global demand has negatively affected key export industries such as textiles, footwear, and seafood processing. In addition, many returning migrant workers have faced difficulties reintegrating into the domestic labor market post-COVID-19.

Sixth, Vietnam's demographic dividend remains underutilized.

Although the country is in a "golden population structure" phase, only 26-28% of the workforce held formal qualifications or certificates during the 2022-2024 period (GSO, 2024), underscoring persistent challenges in workforce quality and the underutilization of demographic advantages.

5. Conclusion and Policy Recommendations

The 2022-2024 period shows that the imbalance between labor supply and demand is a long-standing and worrying problem in Vietnam. The urgent solution is to promote high-quality human resource training, forecast the labor market more accurately, and restructure training occupations to narrow the gap between supply and demand in the coming time.

Recommending some solutions to narrow the gap between labor supply and demand in Vietnam

(1) Innovate and link the education and training system with practical needs: Design training programs according to business orders. Promote vocational education models linked to practice, soft skills training, and digital skills. Strengthen the three-party linkage: state - business - school in forecasting labor demand.

(2) Strengthen forecasting and updating labor market information: Build a transparent labor market data system, continuously updated. Conduct periodic surveys on labor supply and demand by industry and region.

(3) Promote the shift of labor structure towards modernization: Encourage workers to change careers from labor surplus sectors (such as agriculture, textiles) to labor shortage sectors (IT, logistics, green energy). Support retraining and skill improvement for vulnerable labor groups.

(4) Attract investment in industries that use a lot of high-quality labor: prioritize the fields of high technology, digital services, logistics, healthcare, renewable energy. Build a favorable investment environment to create more good-quality jobs.

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APPLICATION OF LINEAR REGRESSION MODEL IN FORECASTING CORPORATE INCOME TAX REVENUE: A CASE STUDY OF TAX SUB-DEPARTMENT REGION I

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Abstract: ***This study analyzes the applicability of the multiple linear regression model in forecasting corporate income tax revenues based on firm-level financial performance indicators. Utilizing data from 213 enterprises under the jurisdiction of Regional Tax Office I during the 2023-2024 period, the research examines the influence of variables such as cost of goods sold (COGS), liquidity ratio, and asset utilization efficiency on return on sales (ROS), which is used as a proxy for financial performance. The regression results indicate that these variables significantly explain the variation in ROS, thereby reflecting a correlation with corporate income tax obligations.***

• Keywords: *corporate income tax, revenue forecasting, financial performance, linear regression, tax administration.*

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1. Introduction

Forecasting corporate tax revenues plays a crucial role in shaping fiscal policy and public budget planning. In many developing economies particularly at the local level tax authorities often face difficulties in constructing accurate forecasting models due to the lack of dynamic tools tailored to the characteristics of local enterprises. While macroeconomic indicators provide a top-down perspective, they often fail to capture micro-level factors such as the financial health or operational efficiency of individual firms.

Traditional tax forecasting methods typically rely on historical trends or fixed growth assumptions, which can lead to misestimations of actual fiscal performance. As a result, budget allocation and compliance planning may be adversely affected. In this context, adopting a quantitative approach specifically regression analysis to forecast tax revenues based on firms' financial indicators emerges as a potentially viable solution.

2. Research Objectives

To develop and validate a multiple linear regression model for estimating the return on sales (ROS) based on key financial indicators.

To identify the relationships between financial performance and variables such as firm size, financial leverage, liquidity, tangible assets, cost of goods sold (COGS), and asset utilization efficiency.

To apply the model for forecasting corporate income tax obligations and enhancing the accuracy of public revenue projections.

This study contributes to the body of tax analysis literature by proposing a replicable quantitative model, particularly useful for local tax authorities. It aims to improve forecasting precision and support risk management in tax administration.

3. Data and Research Methodology

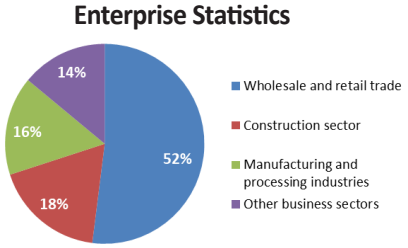
3.1. Research Sample

The dataset comprises financial statements and corporate tax declarations from 213 enterprises for the period 2023-2024, extracted from the centralized taxpayer database. The selection of enterprises was based on the following criteria:

Availability of complete financial reports and tax declarations for three consecutive years.

The industry distribution of the sample is as follows:

+ 67% operate in wholesale and retail trade,
+ 15% in the construction sector,
+ 13% in manufacturing and processing industries,
+ 5% in other business sectors.



3.2. Research Model

The author employs STATA software version 17 to

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** *Cau Giay district Tax Team*

estimate the regression equations.

A multiple linear regression model is constructed to examine the impact of corporate financial variables on financial performance. The model includes the following variables:

ROS: Return on Sales

SIZE: Firm size (logarithm of total assets)

LIQ: Liquidity ratio (logarithm of the liquidity ratio)

LEV: Financial leverage ratio (logarithm of financial leverage)

TANG: Tangible asset ratio

COGS: Cost of Goods Sold as a percentage of revenue

AUT: Asset utilization ratio (revenue / total assets)

The linear regression model is applied to test the linear relationship between financial performance and influencing factors, including financial health and operational efficiency. Linear regression is a data analysis technique used to predict the value of a dependent variable based on the known values of one or more independent variables.

The linear regression equation is specified as follows:

$$ROS = \beta_0 + \beta_1 SIZE + \beta_2 LIQ + \beta_3 LEV + \beta_4 TANG + \beta_5 COGS + \beta_6 AUT + \varepsilon$$

Dependent and Independent Variables

The dependent variable (i.e., the variable being influenced) is financial performance, measured by Return on Sales (ROS). Financial performance is linearly related to the amount of corporate income tax payable. This means that, assuming other factors remain constant, a one-unit increase in financial performance will correspond to an increase in corporate income tax obligations.

The independent variables (i.e., influencing variables) are grouped into two categories of indicators:

Financial Health Indicators

These serve as fundamental factors in evaluating a firm's ability to meet financial commitments, withstand economic downturns, and sustain ongoing operations. The group includes:

Firm Size (SIZE): Measured by the total assets (both current and non-current assets) of the enterprise.

Liquidity Ratio (LIQ): Calculated as the ratio of total current assets to total short-term liabilities. A higher liquidity ratio enhances the firm's ability to overcome financial challenges and focus on profit growth, while a lower ratio indicates vulnerability.

Financial Leverage (LEV): Defined as the ratio of total debt to total assets. This indicator assesses the level of financial risk associated with using debt to support business activities and investment. While increased leverage can positively impact financial performance, excessive leverage may raise financial costs, ultimately impairing the firm's performance.

Asset Tangibility (TANG): Represents the ratio of fixed assets to total assets. A higher asset tangibility is generally favorable as it implies lower reliance on external financing, which in turn positively affects financial performance.

Operational Efficiency Indicators

These are related to a firm's ability to utilize its resources efficiently to generate revenue and control costs:

Cost of Goods Sold (COGS): Defined as the ratio of direct production and service delivery costs to total revenue. COGS has a correlational relationship with financial performance; higher production costs may reflect increased production volumes, potentially leading to greater sales and revenue.

Asset Utilization (AUT): Measured by the ratio of revenue to total assets. This indicator reflects a firm's ability to convert its asset base into revenue, profit, and returns on investment.

4. Results and Analysis

Descriptive Statistics of Variables

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Variable	Obs	Mean	Std. dev.	Min	Max
ROS	213	.002242	.0021982	-.0008228	.0142917
LNSIZE	213	24.0394	1.395724	20.25312	27.5387
LNLIQ	213	.710974	.8233719	-.4107543	4.398157
LNLEV	213	-.7571754	.8154032	-4.398157	.1545786
TANG	213	.0358495	.0504298	0	.2335832
COGS	213	.8637047	.1602276	.0026224	1.211508
AUT	213	1.199244	.8614815	.0435044	3.564527

Multicollinearity Diagnostics

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Variable	VIF	1/VIF
LNLEV	4.42	0.226057
LNLIQ	4.17	0.239994
COGS	1.46	0.682634
LNSIZE	1.38	0.726684
AUT	1.18	0.845315
TANG	1.13	0.882910
Mean VIF	2.29	

The Variance Inflation Factor (VIF) values for all independent variables ranged from approximately 1.13 to 4.42. The mean VIF was 2.29, which is well below the commonly accepted threshold of 5, indicating that multicollinearity is not a significant concern in the model.

Regression Results and Interpretation

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. regress ROS LNSIZE LNLIQ LNLEV TANG COGS AUT
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Source	SS	df	MS	Number of obs	=	213
				F(6, 206)	=	43.49
Model	.000572445	6	.000095408	Prob > F	=	0.0000
Residual	.00045197	206	2.1940e-06	R-squared	=	0.5588
				Adj R-squared	=	0.5460
Total	.001024415	212	4.8321e-06	Root MSE	=	.00148

ROS	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
LNSIZE	-.0000519	.0000855	-0.61	0.545	-.0002204	.0001167
LNLIQ	.0009802	.0002522	3.89	0.000	.000483	.0014774
LNLEV	-.0001746	.0002624	-0.67	0.507	-.0006919	.0003428
TANG	.0022538	.0021469	1.05	0.295	-.0019789	.0064864
COGS	-.0061047	.0007685	-7.94	0.000	-.0076198	-.0045897
AUT	.0002538	.0001284	1.98	0.049	6.16e-07	.0005071
_cons	.0075474	.0020735	3.64	0.000	.0034593	.0116354

None of the variables exceeded the VIF > 5 threshold, reinforcing the absence of serious multicollinearity. While LIQ (liquidity ratio) and LEV (financial leverage) may exhibit a slight degree of correlation, their VIF values remain within acceptable limits. Therefore, the regression analysis can proceed without the need to remove or adjust any of the independent variables.

With a sample of 213 observations, the regression model produced an R-squared value of 0.5588, indicating that approximately 55.88% of the variation in Return on Sales (ROS) is explained by the independent variables in the model. The adjusted R-squared is 0.5460, which accounts for the number of predictors used and confirms a consistent model fit. The F-statistic is F(6, 206) = 43.49 with a p-value < 0.0000, demonstrating the overall statistical significance of the model.

The intercept (_cons) is estimated at 0.00754, indicating the predicted value of ROS when all independent variables are equal to zero. The model is considered statistically sound and relatively effective in predicting financial performance (ROS).

Liquidity Ratio (LIQ): An increase of 1 unit in the previous year's liquidity ratio is associated with an increase of 0.00098 units in ROS in the following year.

Cost of Goods Sold (COGS): A decrease of 1 unit in the previous year's cost of goods sold ratio results in an increase of 0.0061 units in ROS.

Asset Utilization (AUT): An increase of 1 unit in asset utilization leads to an increase of 0.00253 units in ROS in the subsequent year.

Other variables, including firm size (SIZE), financial leverage (LEV), and asset tangibility (TANG), were found to have no statistically significant impact on financial performance in this model.

Based on the linear regression results, the study confirms that liquidity, cost of goods sold, and asset utilization from the previous fiscal year significantly affect financial decision-making and operational performance, and thus impact the financial performance and corporate income tax obligations in the subsequent year.

5. Application in Tax Forecasting

Indicator	Liquidity Ratio (LIQ)	Cost of Goods Sold (COGS)	Asset Utilization Ratio (AUT)	Corporate Income Tax Payable (VND)
2023	0,47733	0,90903	1,06497	129.753.799.572
2024	0,40951	0,91554	0,88842	378.568.987.945
Change 2023 - 2024	-14,21%	0,72%	-16,58%	

Using the model coefficients and financial dynamics from the 2023-2024 period, the regression model forecasts an estimated 0.7% increase in corporate income tax revenue in 2025.

The author applies the results of the multiple linear regression model to predict corporate income tax revenue for the sample of 213 enterprises in 2025. Key financial indicators were evaluated using median values, and the expected tax obligations were computed based on actual data from the enterprises' corporate income tax declarations.

Based on the Table Above

The author observes that in 2024, the liquidity ratio increased by 14.21%, the cost of goods sold (COGS) rose by 0.72%, while the asset utilization ratio declined by 16.58% compared to 2023. Based on these developments, the author applied the results of the multiple linear regression model and estimated a 0.71% increase in corporate income tax revenue in 2025. From the perspective of analyzing firm financial performance, it is projected that corporate income tax collections will rise 0.71% in 2025 relative to 2024.

6. Discussion

The results confirm the hypothesis that financial indicators can predict firm performance and indirectly estimate corporate tax obligations. Sectoral differences observed in the dataset suggest the need for industry-specific forecasting models.

Among the tested variables, LIQ (liquidity), COGS (cost of goods sold), and AUT (asset utilization) were found to have statistically significant effects on ROS (Return on Sales). In contrast, SIZE (firm size), LEV (financial leverage), and TANG (asset tangibility) did not show significant impacts within this model.

Model Limitations: This study has several limitations. It does not incorporate macroeconomic variables or account for policy changes, both of which can influence tax revenues. Future models should integrate a broader economic context and explore time-lagged effects to enhance forecasting precision.

7. Conclusion

This research proposes a practical and replicable quantitative model for forecasting corporate income tax revenues based on firm-level financial indicators. The regression analysis confirms that liquidity, cost of goods sold, and asset utilization have statistically significant impacts on financial performance (ROS), which is directly linked to tax obligations.

The multiple linear regression model demonstrated a relatively high explanatory power, highlighting its potential application in local-level fiscal planning. However, the model is constrained by a narrow sample scope and the absence of macroeconomic factors. Therefore, future studies should aim to develop industry-specific models and incorporate contextual and macro-level variables to improve accuracy and enhance policy relevance.

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THE ROLE OF ACCOUNTING IN THE CONTEXT OF A CIRCULAR ECONOMY IN VIETNAM IN THE CURRENT PERIOD

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Abstract: ***In the context of globalization and sustainable development, the circular economy is emerging as an advanced economic model, promising to address the resource and environmental challenges that Vietnam is facing. The transition from the traditional linear economic model to a circular economy requires a comprehensive change in the way businesses operate and manage, in which accounting plays a crucial and indispensable role. Recognizing the strategic importance of accounting in promoting and supporting the circular economy model, this study conducts a multi-dimensional analysis of the role of accounting in the context of the circular economy in Vietnam. Based on a comprehensive analysis of roles and challenges, the study proposes solutions to promote the application of accounting in the context of the circular economy in Vietnam. Through this research, we not only gain a better understanding of the important role of accounting in the circular economy model but also have a basis for developing a specific roadmap to optimize the contribution of accounting in the transition to a sustainable and circular economy in Vietnam.***

• Keywords: *accounting, circular economy, businesses.*

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1. Introduction

Accounting and circular economy are two fields with significant intersections, especially in the context of globalization and sustainable development becoming top priorities for many countries and organizations. The circular economy is an economic model in which products, services, and processes are designed to optimize resource use and minimize waste, aiming to create a sustainable economic ecosystem. In this model, materials and products are reused, recycled, and recovered to extend their lifecycle, minimizing negative environmental impacts. The characteristics of the circular economy model encourage the circulation of resources and products, helping to reduce waste, optimize the use of natural resources, and minimize the depletion of non-renewable resources. This not only helps protect the environment but also creates new economic opportunities, promotes innovation, and enhances the competitiveness of businesses.

In Vietnam, the circular economy is gaining increasing attention and application across many industries. Many businesses have recognized the benefits of the circular economy and have begun to adopt sustainable business models. In the manufacturing and processing sector, many companies have started implementing recycling and material recovery processes to minimize waste and optimize resource use. In the service industry, businesses such as restaurants and hotels have begun applying energy-saving measures and waste-reduction techniques, thereby improving operational efficiency and minimizing environmental impact. In the construction industry, many companies have started using recycled materials and applying sustainable construction methods to reduce environmental impact and optimize costs.

In this context, accounting plays a crucial role in promoting and managing the circular economy through measuring, reporting, valuing, and managing costs and benefits. As financial and information supervisors, accountants can help businesses identify and assess opportunities and risks related to the circular economy. Accountants can assist businesses in tracking and reporting their environmental impacts, thereby making strategic decisions to minimize negative effects. They can also help value resources and products, manage costs and benefits, and develop sustainability indicators to measure the effectiveness of circular economy activities. However, implementing accounting in the circular economy also faces many challenges, requiring close cooperation between stakeholders to overcome and promote the development of this economic model.

2. Overview of the Circular Economy

The circular economy is an emerging economic model in recent years, aimed at replacing the traditional

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linear economic model of "extract - produce - consume - dispose". The circular economy model emphasizes efficient resource use, waste minimization, and maximizing product value throughout their lifecycle. This concept has attracted widespread attention from policymakers, businesses, and scholars globally as a potential solution to the environmental and resource challenges facing the world. There are various approaches and definitions of circular economy, depending on the perspective and focus of each organization or individual. However, most definitions emphasize redesigning production and consumption systems towards greater sustainability, optimizing resource use, and minimizing negative environmental impacts.

One of the most popular and comprehensive definitions of circular economy comes from the Ellen MacArthur Foundation, a non-profit organization leading the transition to a global circular economy. According to the Ellen MacArthur Foundation, a circular economy is an economic system designed to eliminate waste and maximize resource use. It is based on three fundamental principles: eliminating waste and pollution from the design stage; keeping products and materials in use; and regenerating natural systems. This definition emphasizes the importance of systems thinking and purposeful design in building a sustainable economy. The Organization for Economic Co-operation and Development (OECD) provides another perspective on the circular economy, defining it as an economic model aimed at maintaining the economic value of products, materials, and resources in the economy for as long as possible while minimizing the environmental impact of their use and disposal. This definition not only emphasizes value preservation but also focuses on minimizing environmental impact throughout the entire production and consumption cycle. The World Economic Forum (WEF) states that a circular economy is an industrial system that is restorative or regenerative by intention and design. It shifts towards the use of renewable energy, and eliminates the use of toxic chemicals that impair reuse and return to the biosphere through superior design of materials, products, systems, and business models.

Despite various approaches, definitions of circular economy also focus on some common points. First is the emphasis on maintaining the value of resources and materials in the economy for as long as possible. This requires changing how we design, produce, and use products, from a "use once and throw away" model to a "use - reuse - recycle" model. Second is the focus on minimizing waste and pollution, not only at the end of product life but from the design and production stages. Third is the regeneration of natural capital, recognizing that the economy is part of a larger ecosystem. Another important aspect in many definitions of circular economy is the emphasis on innovation and technology. Transitioning to a circular economy requires breakthroughs in product design, production processes, business models, and recovery systems. Digital technologies, artificial intelligence, and the Internet of Things (IoT) are seen as important tools to promote resource efficiency and create new business models based on circular principles.

Additionally, many definitions also address the social aspect of the circular economy. This model not only aims to protect the environment but also to create social value, including creating new jobs, improving working conditions, and enhancing quality of life. This reflects a more comprehensive approach to sustainable development, combining economic, environmental, and social goals.

Some scholars and organizations have expanded the definition of circular economy to include the concepts of "biological circularity" and "technical circularity". Biological circularity refers to the cycles of biodegradable materials, while technical circularity relates to the reuse and recycling of non-biodegradable materials. This approach emphasizes the need for different strategies for different types of materials, reflecting the complexity of modern production and consumption systems.

Some researchers have further expanded the definition of circular economy to include the energy aspect. They argue that a truly circular economy must be based entirely on renewable energy sources, eliminating dependence on fossil fuels. This definition closely connects the concept of circular economy with climate change and energy transition goals.

In summary, the definition of circular economy is a multidimensional and evolving concept, reflecting the complexity of environmental and economic challenges facing the world. Although there are many different approaches and emphases, most definitions share some common elements: optimizing resource use, minimizing waste, and regenerating natural capital. The diversity in these definitions reflects the flexibility and wide applicability of the circular economy concept in various contexts, from public policy to business strategy and academic research.

3. The role of accounting in the circular economy

Accounting plays an extremely important role in promoting and supporting the development of

the circular economy. In the context of increasingly urgent environmental and resource challenges, the circular economy model has emerged as a promising solution to achieve sustainable development. Unlike the traditional linear economic model following the "extract - produce - consume - dispose" chain, the circular economy aims to maximize resource use, minimize waste, and regenerate natural systems. In this model, resources are used more efficiently through recycling, reuse, and regeneration, creating a closed loop between production and consumption. To successfully transition to a circular economy, the participation and contribution of many stakeholders are needed, in which accounting plays a key role.

First, accounting provides important financial information to measure and manage the effectiveness of circular economic activities. Accounting experts can collect, analyze, and present data on resource use, waste management, and recycling processes in businesses. By establishing appropriate tracking and reporting systems, accounting helps organizations have a clear view of their resource efficiency, thereby identifying opportunities for improvement and optimization. For example, accounting can track costs related to waste collection and treatment, material recycling costs, as well as revenue from selling recycled products. This information helps leadership make informed decisions about investing in new technologies and processes to improve resource efficiency.

Moreover, accounting plays a role in developing and applying new valuation and assessment methods that align with the principles of a circular economy. Traditional accounting methods often do not fully account for the environmental and social impacts of business activities. In a circular economy, new approaches are needed to assess the true value of assets, including the environmental and social benefits they bring. For example, accounting can develop methods to quantify and report on the value of conserving natural resources, reducing greenhouse gas emissions, or improving working conditions for employees. This requires creativity and innovation in accounting approaches but will provide a more comprehensive view of business performance in the context of the circular economy.

Accounting also supports the formulation of new policies and regulations related to the circular economy. With expertise in financial systems and reporting, accounting professionals can contribute to developing new standards and guidelines for measuring and reporting on circular economy performance. They can advise regulatory bodies on how to design tax policies and financial incentives to encourage businesses to adopt circular economy principles. For example, accounting can propose carbon tax mechanisms or incentive programs for investing in green and clean technologies. These contributions help create a favorable legal and policy environment for the development of the circular economy.

Another role that accounting can play is integrating circular economy principles into business strategy and operations. By providing detailed financial information and analysis, accounting helps leadership better understand the opportunities and risks associated with transitioning to a circular business model. They can assess the feasibility of investment projects in recycling technology, analyze the cost-benefits of adopting sustainable production processes, and forecast the long-term financial impact of circular economy initiatives. This information is an important basis for businesses to make strategic decisions and allocate resources effectively towards sustainable development goals.

In addition, accounting also holds a key role in enhancing the transparency and accountability of organizations in the circular economy. Through the development and application of new reporting standards, accounting helps businesses disclose full and accurate information about their resource efficiency, environmental impact, and social contributions. This not only helps stakeholders such as investors, customers, and communities have a clearer view of the business's operations but also creates motivation for organizations to continuously improve their performance. For example, accounting can develop new key performance indicators (KPIs) to measure the degree of circularity in resource use, waste recycling rates, or carbon emission reductions. This information can be integrated into financial and non-financial reports, creating a comprehensive picture of the business's contribution to the circular economy.

Accounting is also essential in managing risks and opportunities related to the circular economy. In the context of increasingly stringent environmental regulations and growing consumer demand for sustainable products and services, businesses face many new risks. Accounting can help identify, assess, and manage these risks through financial analysis and forecasting. At the same time, they can also help businesses recognize and take advantage of new business opportunities arising from circular economy trends, such as developing new products from recycled materials or providing waste management consulting services. By providing detailed information and in-

depth analysis, accounting helps businesses make wise strategic decisions in the context of transitioning to a circular economy.

In addition, the role of accounting in the circular economy is also reflected in supporting decision-making processes and policy planning at the macro level. By providing data and analysis on resource efficiency, and environmental and economic impacts of production and consumption activities, accounting helps policymakers have a basis for making important decisions. For example, accounting can contribute to developing new economic indicators to measure a nation's sustainable development, such as the Green GDP or the Genuine Progress Indicator. These indicators not only take into account economic growth but also consider factors such as environmental degradation, resource depletion, and social welfare. By providing a more comprehensive picture of economic performance, accounting helps guide national policies toward sustainable and circular development.

Moreover, accounting plays a role in developing and applying new financial instruments to promote the circular economy. This includes designing green financial products such as green bonds, sustainable investment funds, or financing mechanisms based on environmental performance. Accounting can help define evaluation criteria and monitor, and report on the effectiveness of these financial instruments, ensuring transparency and reliability for investors and stakeholders. For example, in the case of green bonds, accounting can develop methods to measure and report on the environmental impact of funded projects, helping investors assess the real effectiveness of their investments in promoting sustainable development.

Accounting also supports efforts in managing and reporting on natural capital, an aspect that is increasingly emphasized in the circular economy. Natural capital includes natural resources and ecosystem services that businesses and society depend on. In the context of increasing awareness of the value of natural capital, accounting needs to develop new methods to assess, recognize, and report on the use and conservation of natural capital. This may include developing natural capital accounting frameworks, calculating hidden environmental costs, or assessing the impact of business activities on biodiversity. By integrating these factors into accounting and reporting systems, businesses can better understand their dependence on nature and make more sustainable business decisions.

The role of accounting in the circular economy is also reflected in promoting corporate social responsibility (CSR) and responsible investment. Accounting can help businesses identify, measure, and report on CSR activities related to the circular economy, such as waste reduction initiatives, recycling programs, or sustainable community development projects. By providing transparent and reliable information about these activities, accounting helps businesses build reputation, enhance stakeholder trust, and attract investment from responsible investors. Moreover, accounting also plays an important role in evaluating and reporting on environmental, social, and governance (ESG) factors - criteria that are increasingly valued in investment decisions.

In summary, the role of accounting in the circular economy is incredibly diverse and significant. From providing critical financial and non-financial information, developing new measurement and reporting methods, supporting decision-making and policy planning, to fostering innovation and creativity in the financial and accounting fields, the accounting profession plays a pivotal role in driving the transition to a sustainable and circular economic model. To address these challenges and opportunities, accounting professionals must continuously update their knowledge, develop new skills and adapt to changes in the business environment. By doing so, the accounting profession not only contributes to the advancement of the circular economy but also enhances its role and value in society.

4. Implication to promote accounting applications in the circular economy context

To effectively implement accounting practices in the circular economy, a comprehensive and synchronized set of solutions is required from various stakeholders, including regulatory agencies, professional organizations, businesses, and educational institutions.

One of the primary solutions is the development and standardization of new accounting frameworks aligned with the principles of the circular economy. This requires close collaboration among international accounting standards organizations, regulatory agencies, and experts in the circular economy to establish new guidelines and standards. These frameworks must be flexible and comprehensive, capable of capturing and reporting not only traditional financial transactions but also resource flows, environmental impacts, and social values generated by circular economic activities. For instance, new methods can be developed to record and evaluate the value of assets designed for reuse or recycling, as well as innovative ways to allocate costs and benefits in circular business models such as "product-as-a-service."

Alongside developing new accounting frameworks, investing in advanced technology and information

systems is also crucial for implementing accounting in the circular economy. Technologies such as the Internet of Things (IoT), blockchain, and artificial intelligence (AI) can be applied to automate the collection, processing, and analysis of data on resource flows and environmental impacts. For example, IoT sensors can track real-time resource usage and waste generation, while blockchain can ensure transparency and traceability of materials in circular supply chains. AI and machine learning can analyze patterns and trends in data, helping to predict resource demand and optimize recycling processes. Integrating these technologies into accounting systems will provide more accurate, timely, and comprehensive information for decision-making in the context of the circular economy.

Another important solution is the development of new valuation and assessment methods for assets and resources in the circular economy. This requires a combination of traditional accounting methods with environmental and social assessment techniques. For example, the "life-cycle costing" method can be applied to calculate the total cost of an asset throughout its lifecycle, including production, operation, maintenance, and recycling costs. Additionally, natural capital valuation and ecosystem service assessment methods can be integrated into accounting systems to fully reflect the value of natural resources and environmental impacts. Developing and standardizing these methods will provide a more comprehensive view of business performance in the context of the circular economy.

To effectively implement these solutions, training and capacity-building for accounting professionals are essential. Educational institutions and professional organizations need to update training programs to incorporate new knowledge and skills related to the circular economy. This includes adding courses on environmental accounting, product lifecycle analysis, sustainable supply chain management, and data analytics. Furthermore, continuous training programs and professional certifications in accounting for the circular economy should be developed to help current professionals update their knowledge and skills. Businesses can also play a critical role by investing in internal training and encouraging employees to participate in relevant courses.

Finally, to ensure the effectiveness and sustainability of these solutions, supportive policies and regulations are necessary. Regulatory agencies could consider enacting new requirements for businesses to report on their circular performance or providing financial incentives for adopting circular accounting practices. Additionally, developing national reporting guidelines and standards for the circular economy will create a favorable environment for implementing new accounting solutions.

In conclusion, applying accounting practices to the circular economy requires a comprehensive and multidimensional approach, including the development of new accounting frameworks, investment in technology, workforce training, fostering collaboration and information sharing, developing new performance indicators, and supportive policies. By synchronously implementing these solutions, the accounting profession can play a significant role in driving the transition to the circular economy, contributing to sustainable development and efficient resource utilization on a global scale.

5. Conclusion

The circular economy is a sustainable and necessary economic model to minimize negative impacts on the environment and optimize resource use. Accounting plays an important role in promoting and managing the circular economy through measuring, reporting, valuing, and managing costs and benefits. In Vietnam, the circular economy is gaining increasing attention and application in many industries, bringing benefits to both businesses and the environment. However, the implementation of the circular economy also faces many challenges, requiring close cooperation between stakeholders to overcome difficulties and challenges and promote the development of this economic model.

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World Economic Forum, 2023, Climate Governance and the Circular Economy: A Primer for Boards

UNDERSTANDING POSTGRADUATE STUDY INTENTIONS IN VIETNAM: A QUALITATIVE EXPLORATION OF CONTEXTUAL AND MOTIVATIONAL DRIVERS

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Abstract: ***This study explores the contextual factors and motivational dimensions influencing Vietnamese students' intentions to study postgraduate. Addressing gaps in quantitative literature, the research adopts a qualitative approach which consits of integrated motivation framework, self-determination theory, social cognitive theory, ecological systems theory, and sociocultural theory to investigate how motivation is formed and shaped by contextual factors. In-depth interviews with 36 participants found that students' intentions are driven by three distinct motivational types outcome-based, process-based, and identity-based and it is shaped by five key contextual factors: perceived subjective norms, perceived financial well-being, perceived wellness, job satisfaction, and educational service satisfaction. The findings suggest that motivation is not a fixed internal trait but a socially embedded construct. This study offers recommendations for universities and policymakers to align postgraduate program design and enrollment strategies such as adapting communication to motivational types, enhancing student support services.***

• Keywords: *motivation to study, higher education, postgraduate intention, Vietnam.*

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1. Theoretical framework

Motivation denotes the psychological processes that activate, direct and sustain goal-directed action (Deci and Ryan, 1985; Reeve, 2018). In psychological terms, it indicates both the justification for engaging in a certain action and the drives that determines its intensity and duration. Motivation is essential in consumer research for explaining the reasons behind consumers behaviors (Gnoth, 1997). Diverse types of motivation affect specific decision-making processes and behavioral outcomes. Three principal sources of motivation that generally influence consumer behavior, as identified in interdisciplinary study, are outcome-based, process-based, and identity-based motivations.

Outcome-based motivation aligns with the instrumental perspective of behavior, in which individuals are initially driven by the desire to attain a specific end state or external reward (Heath et al., 1999; Kivetz et al., 2006). Research indicates that outcome-based goals are often influenced by extrinsic motivation, suggesting that the action is performed not for its intrinsic value, but for its consequential benefits (Förster et al., 1998). This corresponds with extrinsic motivation in self-determination theory (Deci and Ryan, 2000), where the behavior is a means to an end. In contrast, process-based motivation emphasizes the intrinsic value and emotional satisfaction derived from the task itself. This perspective encourages individuals to engage in specific action driven by fun, curiosity or satisfaction, irrespective of the ultimate result (Shah and Kruglanski, 2000; Laran and Janiszewski, 2011). Related concepts, such as flow (Csikszentmihalyi, 1990) and intrinsic motivation (Deci and Ryan, 1985), stated that the pursuit of goals is self-reinforcing. This might be understood as individuals who find fulfillment in the processes of exploration, learning or contextual immersion. The activity is esteemed for fulfilling internal psychological requirements such as curiosity, competence, or autonomy, rather than for specific external benefit (Deci and Ryan, 2000). Identity-based motivation states that individuals are driven to behave in manners that validate or strengthen their self-concept (Oyserman, 2009). Individuals pursue goals that correspond with their aspirational identity, social affiliations, or ethical principles, even in the absence of concrete or emotional incentives. This type of motivation often operates indirectly, shaping decisions that correspond with an individual's self-identity or ambitions. Prospective students may seek a master's degree to satisfy a self-image of professional ambition or academic aptitude theories of symbolic self-completion (Wicklund and Gollwitzer, 1982) connect

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with identity-based motivation, emphasizing the effect of social identity and group affiliation on behavior. This is especially evident in collectivist cultures where self-concept is constructed by community and social norms (Markus and Kitayama, 1991).

The integrated model of motivation offers a thorough comprehension of behavior by recognizing that extrinsic rewards (outcome), intrinsic fulfillment (process), and self-concept congruence (identity) may serve as the motivating factors for goal-oriented action. This model serves as the theoretical framework to examine and classify the fundamental motivations for enrolling in higher education.

2. Method

The qualitative phase aimed to investigate the intricate aspects of motivation and the environmental elements influencing it. Due to the exploratory nature of this phase, the purposive sampling method was chosen to ensure that the sample size is dictated by theoretical saturation. Specifically, the data review and analysis conducted in conjunction with data collection, when the sample size reached 36, subsequent data ceased to contribute further to interview's aims. The respondents were intentionally selected to encompass a diverse array of gender, age, educational level and professional experience, reflecting different motivation to study master degree. Participants for the in-depth interviews were recruited using snowball sampling, initially reaching out to students known to the researcher who met the qualifications for the interviews. Table 1 presents details of the sampling criteria and structure for the in-depth interview.

Table 1. In-depth interview sampling structure

Characteristics	Frequency
Gender	
Female	22
Male	18
Age	
18-25	27
26-35	10
36-49	3
Years of graduate	
Undergraduate	13
From 1 to less than 3 years	10
3 years and above	13

Source: Created by author

Prior to the interview, we sent invitations to all participants and clearly stated the purpose of the face-to-face interview to obtain their consent in advance. Each interview lasted for about 30 minutes. Given the permission of the respondents, all qualitative data collected were handwritten. Following the definition of motivation (Deci and Ryan, 1992) and motivation orientation (Boshier, 1977) and the social cognitive theory, key motivational dimensions and the contextual factors were identified through two questions including (1) the motivation to study Master degree (2) factors affecting motivation to study Master degree. To ensure the accuracy of qualitative data and hence, reduce administrative bias, each participant's responses were noted by two interviewers. Consensual qualitative research methodology was used in the design and analysis of the data (Hill et al., 2005). Accordingly, the final data set was examined by two coders to identify relevant themes and core concepts. In line with this, the categories' frequency of occurrence was also recorded. We only record and apply categories that were mentioned at least twice for the construction of hypotheses, as recommended by Hill et al. (2005). The core ideas were used to conceptualize motivational dimension and contextual factors.

3. Results

3.1. Three sources of motivation to pursue higher education

Findings from the qualitative phase reveal three motivational dimensions including outcome-based, process-based, and self-identity based motivations. (See Table 2).

Table 2. Findings about motivational dimensions from the in-depth interview phase

Themes/ constructs	Core ideas	Frequency		
		Undergraduate	Graduated 1 years	Graduated 3 years and above
Outcome-based motivation	Secure professional advancement (need to upgrade knowledge)	1	11	13
	Acquire higher status in job (for higher position's requirement)	7	8	11
	Comply with employer's policy (a job requires degree as fundamental requirement)	8	9	12
	Help me earn a degree, diploma or certificate (higher educational level is a proxy of qualified employee)	9	7	12
	Seek knowledge for its own sake (lack of knowledge or do not have ability to accomplish requirement at work; need to expand knowledge of new area)	6	8	11
Process-based motivation	Break a routine of work (get tired of overtime)	3	6	7
	Fulfill a need for personal associations and friendship (Have more valuable relationship)	1	6	9
	Learn for just the joy of learning (good at learning, enjoy learning new knowledge)	8	5	4
Self-identity based motivation	Keep up with others (friends, colleagues)	8	7	12
	People with status and prestige attend Master class			12
	Maintain and improve social position		3	

Source: Created by author

A considerable amount of participants-particularly those with one or more years of work experience-expressed a clear outcome-based motivation for pursuing a master's degree. Respondents frequently expressed the desire to gain promotions, fulfil employer requirements, improve their job status, and obtain qualifications perceived as necessary for professional

success. This orientation is consistent with expectancy-value theory, which emphasizes that individuals make decisions based on the perceived usefulness and expected value of an outcome (Eccles and Wigfield, 2002). Correspondingly, it conforms to goal-gradient theory (Kivetz et al., 2006), which posits that individual has higher motivation as they perceive themselves to be closer to achieving a desired goal. These motives also reflect extrinsic regulation in self-determination theory (SDT), whereby the learner's engagement is driven primarily by external rewards or social contingencies (Deci and Ryan, 1985, 2000). Hence, the organisational policies and requirements, job market competitiveness, and perceived employability emphasizes that many individuals view postgraduate education as a mean to achieve instrumental outcomes rather than an intrinsically rewarding activity.

In contrast, several respondents, particularly undergraduates and 1 year graduates, expressed process-based motivation, focusing on intrinsic satisfaction, curiosity, and enjoyment emerged from learning. Participants indicated they were motivated by the pleasure of acquiring new knowledge and the inherent value of educational engagement. This joins with theories of intrinsic motivation and flow as the activity of learning is self-rewarding and pursued for its own sake (Csikszentmihalyi, 1990). Following the SDT framework, motivation reflects autonomous regulation, which consists of continuing engagement, well-being, and deeper learning outcomes (Deci and Ryan, 2000). These findings are in the same vein with previous research in higher education which identifies intellectual curiosity and personal development as critical drivers of postgraduate enrolment intentions (Laran and Janiszewski, 2011; Reeve, 2018). Although less frequently mentioned than extrinsic motives, the process-based motivation highlights a meaningful segment of learners who pursuit further study is rooted in self-oriented learning goals and intrinsic psychological needs.

The third motivational source (i.e identity-based motivation) is also emerged themes relating to social comparison, normative expectations, and aspirational self-concept. Respondents were influenced by the actions and achievements of peers, colleagues, and importance individuals in their social circles. Statements such as "keeping up with friends" and "people with status and prestige attend Master class" demonstrate a motive to affirm or enhance one's identity in relation to others. According to identity-based motivation theory, individuals are motivated to engage in behaviors that are congruent with their self-concept or desired identity (Oyserman, 2009). Moreover, such motives conform with symbolic self-completion theory (Wicklund and Gollwitzer, 1982), suggesting that educational qualification is perceived as symbols of competence and social prestige. In collectivist contexts, these motives may be especially notable as individuals internalize group norms and seek to fulfil social acceptance roles (Markus and Kitayama, 1991). Hence, extrinsic motivations (i.e complying with family or peer suggestion) may reflect internalized identity standards, in which merging external influence with deeply rooted self-concept.

The findings provide empirical support for the applicability of the integrated motivation framework in the domain of postgraduate education. While outcome-based motivations dominate among those with work experience and career-oriented goals, a subset of participants also articulated process-oriented and identity-driven motives. This multiplicity reinforces the view that educational decisions are not solely rational or utilitarian but are influenced by affective, cognitive, and social identity processes (Gnoth, 1997; Wong and Wang, 2021).

3.2. Contextual factors influencing motivations to pursue higher education

Details of contextual factors affecting motivation were explored from the qualitative study are shown in Table 3.

Table 3. Findings about contextual factors from the in-depth interview

Theme/relevant constructs	Core ideas	Frequency		
		Undergrad	Grad 1 year	Grad 3 years
Perceived subjective norms	Popularity of Master degree/peer comparison	7	2	5
	Others accept/value a Master degree	7	5	8
	High competence from labor market	7	1	6
Perceived financial well being	Financial stress (anxiety about expenses)		2	10
	Desire to sustain and anticipate desired living standards and financial freedom	6	7	8
Perceived wellness	Optimistic belief in positive outcome of studying Master degree (better position, work-life balance)	10	5	10
	Secure self-identity and positive sense of self-regard	7	8	8
	Experience fear of failure/unacceptance	7	4	10
Job satisfaction	Opportunities for advancement		5	13
	Working overtime		5	7
Educational service satisfaction	Interpersonal bonds with faculty, peers, alumni	2	7	3
	Miss student time		7	3

Source: Created by author

The qualitative findings of this study suggest that the intention to pursue a master's degree is significantly formed by a range of contextual factors. Drawing on theories of motivation including social cognitive theory (Bandura, 1986), self-determination theory (Deci and Ryan, 1985), ecological systems theory (Bronfenbrenner, 1979), and sociocultural theory (Vygotsky, 1978), these findings reinforce the argument that academic motivation is a contextually embedded

construct. In details, five important contextual factors urging students' motivational orientations are discovered: perceived subjective norms, perceived financial well-being, perceived wellness, job satisfaction, and educational service satisfaction.

First, perceived subjective norms posited as a significant contextual impact. A substantial of participants indicated popularity of Master degree, "high competence from labor market" and "others accept/value a master degree" as main motivations for pursuing postgraduate education. This illustrates the impact of social influence on educational choices. According to social cognitive theory, individuals cultivate self-efficacy and result expectations via social modeling and verbal persuasion (Bandura, 1986). Particularly in collectivist cultural environments, where social responsibilities and interpersonal obligations are central, the motivation to fulfill others' expectations may not be sorely extrinsic. According to sociocultural theory, these social influences are frequently internalized and assimilated into an individual's identity (Vygotsky, 1978; Markus and Kitayama, 1991). Consequently, the motivation to seek advanced education is partly influenced by perceived social responsibilities and aspiration to conform to culturally endorsed academic pathways. Perceived social norms may influence self-identity based motivations in which pursuing higher education may help build an identity that fit to both the learners and their reference group's expectations.

Second, perceived financial well-being refers to instrumental value of postgraduate education as a means to improve future economic conditions. Emerging themes such as "financial stress (anxiety about expenses)" and "desire to sustain and anticipate desired living standards and financial freedom" imply that students' motivation is driven by financial outcomes. Following the ecological systems framework, these perceptions reflect macrosystem-level influences, where broader socioeconomic structures condition how individuals perceive the utility of education (Bronfenbrenner, 1979). Moreover, from an expectancy-value perspective, students who feel financially constrained or insecure may be more extrinsically driven, perceiving higher education as a strategic investment rather than a self-fulfilling effort (Eccles and Wigfield, 2002). Consequently, financial well-being is considered as a dynamic contextual factor that shapes the perceived cost–benefit ratio of educational engagement.

Third, perceived wellness is evident in environmental factors related to personal renewal and emotional satisfaction. Numerous respondents expressed a need to "secure self-identity and positive sense of self-regard" or "optimistic belief in positive outcome of studying master degree" or "experience fear of failure/ unacceptance" as components of psychological and emotional wellness. This aligns with self-determination theory's notion that optimal motivation arises when basic psychological needs—such as competence, autonomy, and relatedness—are met (Deci and Ryan, 2000). In this case, perceived wellness acts as both a prerequisite and outcome of intrinsic motivation. Individuals who feel psychologically and emotionally well are more likely to seek behavior supporting their well-being, such as viewing higher education as meaningful goal and focusing on long-term educational commitment. In contrast, low perceived wellness (e.g., dissatisfaction with current situation or emotional recession) may push individuals toward postgraduate study as a means of personal revised.

Fourth, the role of job satisfaction emerged in participants' references to "opportunities for advancement" and avoid "working overtime". Participants who dissatisfaction with their jobs often considered higher education as an attractive pathway to new challenges, advancement or to escape from stress at work. According to social cognitive theory, dissatisfaction may lower perceived self-efficacy in one's current setting, leading to a transition toward environments (e.g studying master degree) where self-efficacy can be restored or enhanced (Bandura, 1986). Similarly, from the perspective of self-determination theory, individuals seek contexts that support their psychological needs (Deci and Ryan, 2000). When the workplace lacks sufficient autonomy or growth chances, the academic setting may act as an alternative space to restore self-determined drive.

Finally, educational service satisfaction, while more relevant for current undergraduates, also influenced participants' motivation. Students who perceived engagement and support in their undergraduate programs were more inclined to pursue advanced education. This result strongly corresponds with ecological systems theory, which addresses that microsystem-level interactions such as individuals with teachers, curricula, and institutional support can either promote or hinder long-term motivation (Bronfenbrenner, 1979). When educational institutions establish an autonomy-supportive environment, they fulfill students' immediate psychological demands while fostering intellectual aspirations. This finding further corroborates self-determination theory, which associates happiness in current educational experiences with ongoing academic involvement (Deci and Ryan, 2000).

4. Practical implications

This qualitative study presents several practical implications for higher education institutions, policymakers, and academic support services aiming

to enhance postgraduate enrolment and strengthen student motivation in Vietnam. First, the identification of outcome-based, process-based, and identity-based motivations emphasizes the need for differentiated communication strategies. Universities should adapt their promotional message to align with these distinct motivational orientations. Second, the role of educational service satisfaction in shaping motivational pathways highlights the importance of enhancing the undergraduate experience. Hence, institutions should invest in integrated academic pathways and promote supportive services. Third, the strong influence of perceived subjective norms (i.e peer and family expectations) suggests that universities can benefit from leveraging social modelling and interpersonal networks in recruitment efforts. Peer recommendation, community-based information events and shared platforms may all contribute to strengthening identity-based motivations. Fourth, financial wellness remain a significant barrier for many students and are closely linked to outcome-based motivation. Institutions and policymakers should proactively address concerns related to financial well-being by improving transparency around tuition fees, scholarship opportunities, and long-term returns on educational investment. Finally, findings related to job satisfaction particularly among working professionals suggest that postgraduate education is viewed as a potential career pathway, increased autonomy, and escape from job dissatisfaction. Universities should design a program that target to mid-career learners seeking personal and professional transformation.

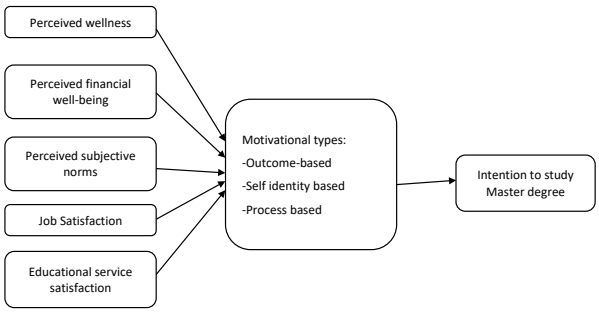
5. Conclusions and future research directions

This qualitative study offers an integrated understanding of how contextual factors shape motivational orientations and, in turn, influence students' intentions to pursue postgraduate education. Grounded in the theoretical frameworks of self-determination theory (Deci and Ryan, 1985, 2000), social cognitive theory (Bandura, 1986), and ecological systems theory (Bronfenbrenner, 1979), we propose the following conceptual model:

Contextual factors

This model hypothesizes that contextual factors directly shape three types of motivation, which in turn influence the intention to pursue a master's degree. The model also allows for potential moderation or mediation analysis to examine how certain contextual factors (e.g., subjective norms or wellness) might strengthen or weaken specific motivational pathways. Future research should operationalize this model using quantitative methodologies, particularly Structural Equation Modeling (SEM), to assess the strength, direction, and mediation pathways among contextual variables, motivational types, and intention. Validated measurement scales from SDT, expectancy-value theory, and TPB should be adapted to measure constructs such as motivation type, perceived financial well-being, and intention.

Figure 1. Conceptual model



Source: Created by author

While this study suggests motivation as a mediator between contextual factors and intention, alternative models could explore moderation effects. Moderated mediation analysis could thus uncover conditional effects across subgroups. Motivational orientation may evolve as students transition from undergraduate to postgraduate stages. A longitudinal design could track changes in context, motivation, and intention over time, providing a dynamic perspective on the decision-making process. Future studies may implement and evaluate policy interventions targeting key contextual influences. These could complement the motivational lens by adding narrative and developmental dimensions to the understanding of educational choices.

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DEVELOPING CONSUMER FINANCE IN VIET NAM

MA. Phan Tu Lan*

Abstract: ***Consumer finance is a field with great potential thanks to its flexible lending model, which does not require collateral or complicated procedures. In Viet Nam, consumer finance plays an important role in socio-economic development and is also an effective solution to limit the situation of "black credit". However, the consumer finance market in Viet Nam is still relatively young, with significant growth potential. In that context, the development of the consumer finance market becomes an urgent requirement.***

• Keywords: *consumer finance, socio-economic development, loan options.*

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1. Introduction

Consumer finance is a financial arrangement that allows customers to purchase goods and services at the point of sale through different types of loan options. In developed countries, consumer lending is a fairly large capital supply channel, contributing a high proportion to GDP growth.

Consumer finance plays a crucial role in stimulating consumer demand and the economic growth of a country (Vietdata, 2023). As human financial needs go beyond trends of borrowing for buying houses or cars, they encompass various stages of life with diverse products ranging from purchasing assets, and homes, to expenses for education, healthcare, travel, etc. Especially, when income is not sufficient to cover expenses, the emergence of borrowing needs becomes unavoidable.

In Viet Nam, consumer finance plays an important role in socio-economic development and is also an effective solution to limit the situation of "black credit". However, this proportion of consuming consumer finance is still modest, not commensurate with expectations. Meanwhile, Viet Nam's population is large, people's income is increasing, creating a need to diversify capital supply channels in the market. The potential for market share development of Vietnamese consumer finance companies is huge thanks to the simple and fast nature of the products. In this context, developing consumer finance in Viet Nam play the important role.

2. Overview of Consumer Finance

2.1. Definitions

According to Congressional Research Service (2021), consumer finance refers to the saving, borrowing, and investment choices that households make over time. These financial decisions can be complex and can affect households' financial wellbeing both now and in the future. Understanding why and how consumers make financial decisions is important when considering policy issues in consumer financial market.

Consumer finance is the provision of direct loans by credit institutions to individuals/households for the purpose of purchasing goods and services for consumption (Vietdata, 2023).

Consumer finance is the provision of direct loans by credit institutions to individuals/households for the purpose of purchasing goods and services for consumption purposes. Consumer finance include all products such as: Credit cards, home improvement loans, car purchases, study abroad, health care... Consumer credit providers can be banks or credit institutions (Dang Van Sang, 2024).

Consumer finance refers to the borrowing, saving, and investment choices that consumers and households make over time. Understanding why and how consumers make financial decisions is important when considering policy issues in consumer finance (Schneider, Karl E., 2025).

2.2. Benefits of Consumer Finance

Consumer finance meets the consumption needs of individuals when their financial capacity is not enough to cover their needs, allowing them to consume first - pay later in many forms.

The development of the consumer finance market also brings positive impacts to the whole society. Consumer finance brings many benefits such as: Helping the poor and low-income people to accumulate assets, improve their lives, and unblock the flow of goods in society; Bringing more benefits

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to borrowers is more beneficial; Helping reduce cost and the evil of black credit (Do Hoai Linh, 2023).

In practice, the growth of consumer finance will bring many positive effects to the economy. With the development of the consumer finance market, financial companies have been creating many jobs for society; helping to promote the implementation of comprehensive finance; Helping borrowers increase their financial capacity and meet personal and family needs; Increasing financial literacy for new customer groups, the population with little access to banking services, thereby helping them better manage personal financial transactions and creating a foundation for them to be ready to use other financial services; Reducing black credit thanks to quick and simple procedures... (Dang Van Sang, 2024).

Table 1: Benefits of Consumer Finance

Benefits	Meanings
Knowing the Importance of Financial Literacy	Financial literacy will help you attain your goal and make informed decisions. Developing and knowing how to use financial skills like investing and budgeting will help you achieve financial stability and reduce expenses.
Knowng the Strategies for Financial Empowerment	You should know the strategies to make the most of a credit option. If you manage many credit card payments and have other loan liabilities, it is better to consolidate all the debts and go ahead with a consumer finance option. You must know the hidden charges associated with a consumer finance option, like processing fees, late payment fees, etc.
Being Aware of Consumer Finance Tools and Resources	When you are availing of consumer finance, prepare to make an informed financial decision with the help of the available consumer finance tools and resources. It will help you make a budget and borrow the exact amount. You can access loan companions tools, an eligibility calculator, etc., and make your borrowing productive.

Source: Poonawalla Fincorp Team (2024)

2.3. The role of Consumer Finance

The fact shows that consumer finance has the following important roles:

- *Meeting consumer needs*: Consumer finance allows individuals to access loans to purchase goods and services to meet essential needs such as buying a house, buying a car, traveling, studying, repairing a house, medical treatment, etc.

- *Improving the quality of life*: Through the use of consumer finance, individuals can improve their living conditions, access better products and services, thereby improving the quality of life and personal experience.

- *Stimulating consumption and boosting the economy:* When individuals have access to finance to make purchases, consumer demand increases, thereby stimulating production and business, contributing to promoting economic growth.

- *Supporting business activities:* Consumer loans can also be used to support small business activities, helping individuals generate income and grow their economies.

- *Helping manage personal finances effectively:* Using consumer finance responsibly can help individuals learn to better manage personal finances, plan spending and save effectively.

- *Promoting the development of the financial system:* The development of consumer finance also contributes to the diversification of financial products and services, while promoting competition and transparency in the financial system.

Table 2: Importance of consumer finance

Importance	Meanings
Increasing revenue with more sales	Customers are often forced to choose between affordability and convenience. Especially, when they must pay a large amount of money upfront while making their purchase. You will be able to increase your revenue by offering customers the opportunity to finance their purchases over time. Providing this option could make the difference between making a sale and having your customer walk away.
Customer satisfaction is the key to success	Offering a financing option will give your customers the flexibility to work within a budget they are comfortable with. It will also allow them the benefit of opting for a larger purchase, which may help reassure them that they are not compromising on quality and are making the right investment at the right price point.
Creating and retaining a loyal customer base	When you offer customer service that adds value and benefits your customers, they are more likely to stay loyal to you. Once your customers have made a purchase using the financing option you provided, they will appreciate the flexibility that comes with it. Customers already familiar with the option to finance are more likely to make use of it again for any additional services they might need in the future.
Maintaining steady cash flow management	While providing financing options will benefit your customers and increase flexibility by allowing them to pay overtime, it also benefits you. Customer financing helps to make your cash flow more predictable. Knowing how much income you can expect in a given month makes it much easier to avoid debt.
Enhancing the profitability of business	Consumer financing offers your customers the flexibility of paying over time instead of being burdened by a lump sum transaction. Customers who take advantage of financing don't have to feel anxious about their ability to pay feeling in control is important, and provides customers with the confidence they need, not only to make the current purchase but also to return to you in the future as a loyal customer.

Source: Shane D'Rozario (2023)

3. The current situation of Viet Nam's consumer finance market

Currently, Viet Nam has 16 financial companies licensed to operate by the State Bank of Viet Nam. Among them, some big names such as FE Credit, HD Saison and Mcredit are leading the market, in addition to: VietCredit, Home Credit, Lotte Finance, TNEX, Mirae Asset Finance Company... (Anh Tuyet, 2025). Consumer finance products in Viet Nam include the following segments: First, consumer loans from banks. Second, loans from financial companies. Third, credit card loans. Fourth, lending through Buy Now Pay Later (BNPL - fintech model). Fifth, pawnshop business (Vietdata, 2023).

Over the past years, consumer credit has grown nearly twice as fast as the entire banking system, thanks to its focus on low-to middle-income customers

of VND5-10 million/month, accounting for 47% of the working-age population, along with an informal workforce of about 33 million people who mainly use cash or informal credit. High GDP growth rates in the coming years will also maintain the growth momentum of consumer credit (Anh Tuyet, 2025).

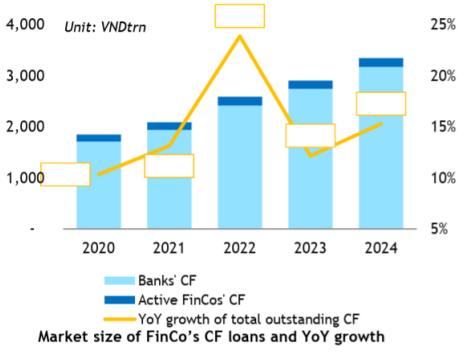
Figure 1: Segments in Viet Nam consumer finance



Source: Vietdata (2023)

According to the report of the State Bank of Viet Nam, consumer credit is growing strongly in terms of outstanding loan size, number of participating credit institutions and diversity of products and services. Up to now, the total outstanding loan balance for living and consumption in Viet Nam has reached about 2.8 million billion VND, accounting for 20% of the total outstanding credit balance of the whole economy (Techcombank, 2024).

Figure 2: The consumer finance market saw remarkable recovery after a prolonged adjustment period



Source: FiinGroup (2025)

Viet Nam's consumer finance market is expected to flourish in the coming time as the economy is forecast to continue to grow positively and new policies promote stronger participation from commercial banks. In the long term, the growth potential of Viet Nam's consumer finance market also comes from the low penetration rate compared to other countries in the region, the increasing income of people, especially the change in perception of the new generation of borrowers, mainly Gen Z, when viewing consumer finance products as a payment option instead of debt.

In addition, these expectations of consumer finance market growth are largely driven by recent policy changes and improvements, such as the State Bank of Viet Nam recently issued Circular No. 12/2024/TT-NHNN, which amends and supplements certain provisions of Circular No. 39/2016/TT-NHNN, regulating the lending activities of credit institutions and foreign bank branches to customers. In which, thí policy promote stronger participation from commercial banks in consumer lending activities, thereby promptly and fully meeting the legitimate borrowing needs of the population. The circular also allows credit institutions to lend amounts under 100 million VND without requiring customers to provide a viable plan for using the funds (Dang Van Sang, 2024).

According to Viet Nam Consumer Finance Report 2025 (FiinGroup, 2025), Viet Nam's consumer finance market is entering a new phase of recovery and transformation. After a period of economic slowdown and heightened credit risks, 2024 has marked a turning point, as both banks and finance companies have regained growth momentum. This rebound is driven by internal restructuring, digital innovation, and a resurgence in credit demand, fueled by rising domestic consumption and a new generation of young, tech-savvy consumers.

4. Challenges

Despite many recovery signals, the consumer finance market faces numerous challenges, especially as bad debt trends increase in credit institutions (Anh Tuyet, 2025). The bad debt situation in the consumer lending sector remains a concern. Recently, groups have emerged on social media, encouraging and teaching others how to evade debt and delay payments. Although lenders and regulatory agencies have implemented measures, debt recovery for this customer segment faces many difficulties and challenges. Therefore, significant changes are needed for the consumer finance market to truly recover and achieve sustainable growth, particularly in improving the legal environment, especially regulations guiding debt recovery.

However, the use of consumer finance also requires consideration and responsibility. Individuals should carefully understand the terms, interest rates and related fees before borrowing, and ensure the ability to repay the loan to avoid falling into debt.

According to VIS Rating, although there is still a lot of room for growth, risks and profits of consumer finance companies will tend to be clearly differentiated. Accordingly, units focusing on low-

risk segments such as Home Credit or HD Saison are able to maintain stable operations. Meanwhile, companies promoting cash loans and credit cards such as Mcredit, FE Credit... face higher asset risks. The reason is that loans are often unsecured and are easily affected if the borrower encounters financial difficulties. The risk increases in the context of many economic fluctuations, including the US's increased tariffs, which can affect economic growth and people's income (Anh Tuyet, 2025).

At the same time, the market continues to face both domestic and global challenges. On the external front, renewed U.S. tariffs and escalating trade tensions under the "Trump-era 2.0" protectionist agenda could pressure Vietnam's export-driven economy particularly labour-intensive sectors like textiles and garments, aquatic products, leather and footwear, and electronics. These disruptions are expected to affect household income, employment, and ultimately, debt repayment capacity of borrowers and funding from corporates customers to banks and finance companies (FiinGroup, 2025).

5. Solutions

5.1. For state management agencies

- Continue to review and improve the legal framework for lending activities to serve living needs and consumer lending to meet practical requirements, create a transparent and favorable legal environment for the operation of credit institutions and protect the rights of consumers.

- Strengthen communication about consumer finance to people. Consumer finance is a commonly used term in modern life. However, in order to provide a comprehensive understanding of consumer finance and how to effectively utilize consumer financial products, state management agencies and finance companies should strengthen dissemination and communication about consumer finance to people.

- Strengthen policies, solutions and the role of relevant organizations to protect the interests of consumer loan customers; Strengthen management, inspection and supervision of consumer lending and lending for living purposes.

- Support credit institutions in sharing consumer borrower data and guide the development of consumer loan credit scoring technology based on artificial intelligence and big data technology.

5.2. For banks and finance companies

- Diversifying product portfolio associated with refining loan portfolio. Commercial banks and consumer credit lending companies need to design each type of consumer finance product to suit each type of need and each customer segment.

- In addition to being transparent in debt collection activities and lending costs, lending institutions also need to implement measures to check and monitor the use of borrowed funds according to the purposes committed and the repayment capacity of customers. This will help credit institutions limit bad debt, ensuring full and timely recovery of principal and interest as agreed. Moreover, borrowers must be aware of responsible consumption and timely debt repayment.

- Providing reasonable interest rate policy to attract customers and simplifying loan procedures.

- Increasing investment in technology to prevent risks. Focusing on developing technology platforms for consumer lending, reducing costs, increasing labor productivity, and coordinating the development of new business models (Fintech, peer-to-peer lending, Mobile money, etc.) to increase customer satisfaction.

- Focusing on training staff, especially consumer credit analysis skills, customer care skills, debt collection skills, consulting skills, information technology application skills in operations...

6. Conclusion

Consumer finance has developed significantly worldwide, especially in developed economies, where a large portion of the population carries consumer debt. However, the consumer finance market in Viet Nam is still relatively young, with significant growth potential (Vietdata, 2023). With the new legal frameworks, the consumer finance market is expected to be more vibrant in the coming time with stronger participation from commercial banks. The development of the consumer finance market becomes an urgent requirement, contributing a high proportion to GDP growth of Viet Nam economy.

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IMPACT OF EXTERNAL STIMULI ON CONSUMERS' IMPULSIVE BUYING BEHAVIOR IN VIETNAM

Assoc.Prof.PhD. Pham Hung Cuong*

Abstract: ***This study explores the significant impact of various external stimuli on consumers' impulsive buying behavior in Vietnam by employing a quantitative research method and a cross-sectional survey design. It examines how store environments, merchandise displays, advertising, and sales communications influence impulsive purchasing. Convenience sampling was employed, and 930 consumers in Vietnam, male and female with equal numbers, were asked to fill out a questionnaire on impulsive buying behavior and the effects of external stimuli. Quantitative data were analyzed by the use of descriptive statistics and inferential statistics through the Statistical Package for Social Sciences (SPSS). The findings indicate that younger (older) and male (female) consumers exhibit higher (lower) impulsive buying tendencies. Additionally, those with less education and lower monthly household income are more prone to impulsive buying. Social media, peer pressure, environmental cues, and emotional states had marginally greater effects on impulsive buyers, but the differences were not statistically significant.***

• Keywords: *impulsive buying behavior, external stimuli, store environments, emotional states, social media influence, consumer behavior, Vietnam.*

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1. Introduction

Impulsive buying behavior is an interesting concept that has attracted considerable research interest in recent decades. It is often argued to be one of the most influential buying behaviors; research suggests that as many as 30 to 80 percent of all purchase episodes occur on an impulse for all the product classes (Rook and Fisher, 1995). On the other hand, Impulsive buying involves buying a product on a whim because of the stimulation that one receives from making the purchase. Literature has established that impulsive buying is not a single process and is affected by several internal psychological factors and external stimuli (Beatty and Ferrell, 1998a). Although factors such as self-control, emotion, and mood have been identified as pivotal personal influences, much emphasis cannot be placed on the stimuli driving them (Badgaiyan and Verma, 2015). This implies that external stimuli facilitate impulsive behaviors and may predict when and how consumers engage in impulsive buying.

Extant external stimuli work through several channels: capturing attention, eliciting emotions, stimulating desire and signaling worth. Several authors have attempted to explore the role of atmospheric, marketing, social, and situational factors, among others, as possible stimuli for impulsive buying (Zhang and Shi, 2022; Floh and Madlberger, 2013). Variables related to store atmospherics, such as music, lighting, scent, and color schemes, have been shown to increase stimulation and positive mood levels, which facilitate impulsive buying (Tinne, 2010). This is a way of prompting the consumer through window or point-of-purchase displays, where products are placed at the checkout counters to grab the attention and interest of the consumer (Inman et al., 2009). Promotional techniques such as sales, "buy more for a limited time only," "gifts/with/for free," and coupons also elicit positive effects in the context of pleasure, arousal, and perceived value, causing impulsive buying (Abratt and Goodey, 1990). The sales staff also play a significant role through their friendly attitudes, positive vocal expressions, and active attempts at persuasion (Dawson and Kim, 2009). Cue factors, such as payment methods, the amount of time consumers spend shopping, and the use of companion shoppers, also influence impulsive buying behaviors (Lu and Fang, 2016). However, given the volume of evidence in the existing research concerning how these external environmental stimuli elicit impulsive buying motivation and action, some significant research gaps must be pointed out.

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2. Literature review and hypotheses

Consumers tend to indulge in several impulsive buying situations, which is currently a growing trend. Research suggests that impulsive buying accounts for anywhere between 27% and 62% of all purchases (Abratt and Goody, 1990; Rook, 1987). It occurs when an individual suddenly decides that they need to purchase a certain product without engaging in rational thinking regarding whether they need the product (Rook, 1987). This literature review focuses on studies that seek to explain how factors such as store environment, sales promotion, and credit card usage can act as stimuli that encourage impulsive buying behavior.

Studies that have observed the impact of store environment on impulsive purchasing have revealed that store layout and design influence consumers' tendency to make impulsive purchases (Rodrigues et al., 2021). Observational measures of store quality, such as the use of attention-grabbing displays, ease of access to merchandised layouts, and appeal stimuli, such as lighting, scents, and music, can elicit impulsive buying behavior (Mohan et al., 2013). Mattila and Wirtz (2008) also showed that participants' buying choices were more influenced by congruently aroused ambient scents and lighting than incongruently non-aroused ambient scents and lighting. Similarly, by playing familiar music, consumers' impulsive buying increased, particularly for those who tended to indulge in the shopping act (Yalch and Spangenberg, 1990). Stores that encourage exploration by consumers, have widened aisles, and use display tables, for instance, enable consumers to easily gain insights into their products and help promote impulsive buying (Beatty and Ferrell, 1998b). Further, promotional strategies such as discounts, coupons, and gifts have been found to make consumers use the access and provision mode of decision-making because they want to seize the opportunities that are available for a limited time (Abratt and Goodey, 1990; Mohan et al., 2013). In a survey conducted among supermarket shoppers, those who claimed to have noticed many in-store promotions and displays exhibited greater levels of indulgence buying (Inman et al., 2009). Sales promotions may be most effective on impulsive buying when promotions induce consumers' perception of "value" and when the overall total cost of the product is perceived to be cheaper due to the promotions (Mohan et al., 2013). Furthermore, credit cards encourage impulsive spending since their use separates the buying and paying processes, hence eliminating feelings of guilt over spending, as pointed out by Roberts and Jones (2001). Thomas et al. (2011) showed that when customers pay through credit cards, they are more likely to spend more as compared to when they pay through cash, showing that credit leads to impulsive buying. Consumers make more expensive impulsive purchases with credit cards rather than cash. This is known as the "credit card effect" as credit cards reduce the "pain of paying" (Prelec and Simester, 2021; Roberts and Jones, 2001).

From the consumer's perspective, factors within the retail settings, such as atmospherics and promotions, as well as personal factors such as payment modes, have the potential to evoke impulsive urges leading to purchases that were not initially intended. The knowledge of these external cues and the psychological effects they create might aid in efforts to mitigate excessive impulsive buying, which wastes money, without diminishing moderate impulsive buying, which plays a big role in boosting retail sales.

Hypothesis 1: There is a significant relationship between external stimuli and impulsive buying behavior among consumers.

Hypothesis 2: Based on the analysis of external stimuli, this research offers recommendations to retailers and policymakers to encourage appropriate consumption and support the relevant disadvantaged population.

Hypothesis 3: Younger consumers exhibit higher impulsive buying tendencies than older consumers.

Hypothesis 4: Male consumers exhibit higher impulsive buying tendencies than female consumers.

Hypothesis 5: Consumers with lower education and monthly household income exhibit higher buying tendencies than those with higher education and income levels.

3. Data and research methods

This study employs a quantitative research method suitable for determining the relationship between external stimuli and impulsive buying propensity. A cross-sectional survey research design was adopted to administer questionnaires to the target consumer population.

A non-probability sampling technique, specifically convenience sampling, was used in this study. This method makes it possible to

identify participants who are willing to participate and are easily accessible; thus, it is convenient for collecting data. A sample size of 930 participants was considered appropriate. The participants were recruited from Vietnam. The sample comprised 450 male and 480 female participants. This gender distribution is consistently maintained across Vietnam. This sampling strategy was implemented to ensure a balanced representation of both sexes within the study population, thereby enhancing the generalizability of the findings to the broader population of Vietnam.

Data were collected using a structured questionnaire constructed to assess various aspects of impulsive buying behavior and the impact of environmental stimuli.

4. Results

Taken together, these data are informative and reveal interesting trends. Concerning age, impulsive buying tendencies were the highest among 20−30-year-olds (85 out of 215 = 40%) in Table 1. This is expected as younger consumers are less likely to have financial responsibilities. One of the characteristic tendencies of consumers is that impulsive buying diminishes with age. In terms of sex, a marginally higher percentage of male respondents (55%) were identified as impulsive buyers compared with female respondents (38%), supporting earlier findings claiming that men exhibit more consumption impulsiveness than women (Dittmar et al., 1995).

Table 1. Participants' demographics

Demographic variables	Impulsive buyers (Freq/%)	Non-impulsive buyers (Freq/%)	Total
Age			
< 20	5	4	0
20 to 30	130	85	215
31 to 40	95	116	220
> 40	200	295	495
Sex			
Male	250	200	450
Female	180	300	480
Non-binary/Third gender	20	6	0
Prefer not to say	0	0	0
Education Level			
Up to Secondary	40	100	140
Senior Secondary	80	120	200
Bachelor's degree	150	150	300
Master's degree	100	90	190
Doctoral degree	60	40	100
Employment Status			
Self-employed	0	0	0
Unemployed	50	60	110
Employed	300	220	520
Student	100	80	180
Retired	70	50	120
Monthly Household Income (million dongs)			
< 15	180	220	400
15 to 30	100	130	230
> 30	150	150	300

Source: Extracted from SPSS.

Impulsive buying is most likely to occur among bachelor's degree holders (150 out of 300) and is least likely to occur at postgraduate degree levels, perhaps because of increased cognitive capability. To further support Hypothesis 2, the age group that contributes most significantly to employment will be analyzed. Students and the unemployed have a significantly higher impulsive buying tendency than those belonging to other employed age groups because they have lower disposable income and are more likely to make unplanned purchases.

Lastly, a monthly household income below 15,000,000 million dongs was associated with higher impulsive buying (180 out of 400). This is consistent with the literature, in which the absence of financial capital was found to increase impulsive buying behavior (Mowen and Spears, 1999). Altogether, the data provide an interesting picture of the general tendencies of impulsiveness as expressed by many key demographic indicators. These aspects make it easier for marketers to identify the factors that can help them create an environment to control impulsive buying.

Table 2 illustrates the similarities and differences between impulsive and non-impulsive buying behaviors in terms of four factors: social media, peer pressure, environmental influence, and emotional state (i.e., mood). There were no statistically significant differences between impulsive and non-impulsive buyers for any of the four factors. This supports Hypothesis 1. The overall results show that impulsive buyers have slightly higher means for all four factors; thus, they appear to be slightly more influenced by these factors compared to non-impulsive buyers. The Mann-Whitney U test analysis revealed that these differences were statistically insignificant ($p>0.05$ for all comparisons). This indicates that although impulsive buyers tend to act slightly more impulsively than other buyers because of social, situational, and psychological factors, the differences are not very noticeable. It is likely that the factors affecting impulsive buying impact all consumers equally, including those who are susceptible to engaging in this behavior (Abratt and Goodey, 1990). Marketers should therefore avoid classifying consumers as "impulsive" and "non-

impulsive" and should instead direct their attention to how environmental and emotional antecedents affect consumers.

Table 2. Influence of external stimuli on impulsive buying behavior

Variables	Impulsive buying behavior (Mean ± SD)	Non-impulsive buying behavior (Mean ± SD)	Z value	P value
Influence of Social Media	2.7 ± 0.7	2.6 ± 0.6	1.12	0.261
Influence of Peer Pressure	3.0 ± 0.8	2.9 ± 0.7	1.48	0.140
Influence of Environmental Cues	3.2 ± 0.9	3.1 ± 0.8	1.33	0.183
Influence of Emotional State	3.5 ± 1.0	3.4 ± 0.9	0.89	0.372

Source: Extracted from SPSS.

In general, this information in Table 2 suggests that various impulsive-buying factors work on a continuum for customers, whereas buyers themselves merely vary in terms of their susceptibility and reaction to such stimuli (Rook and Fisher, 1995). Hence, promotional techniques designed to create a sense of urgency that pushes customers to make purchases can work for all groups of consumers.

Table 3 provides the correlations for several factors that may affect behavior and decisions. Specifically, it provides the frequency of the association between social media use, perceived pressure from peers, environmental stimuli, and emotional state. The highest correlation coefficient noted between the variables is 0.72 between perceived peer pressure and emotional state. This shows that higher peer pressure is related to a higher positive emotional state. The coefficients between the other variables are moderate positive values ranging between 0.56 and 0.72 (Cohen, 1988). The correlation between social media and peer pressure raises the question of whether different aspects of individuals and the communities in which they live influence their actions and choices (Rimal and Lapinski, 2015).

In summary, this table provides empirical evidence to support this paradigm by showing how factors such as social media, peer pressure, environmental cues, and emotions co-conspire to determine human thoughts and actions. It is also important to note that any intervention targeted at changing one of these factors is likely to affect other factors.

Table 3. Correlation between external stimuli and impulsive buying behavior factors

Variables	Influence of Social Media	Influence of Peer Pressure	Influence of Environmental Cues	Influence of Emotional State
Influence of Social Media	1.00	-	-	-
Influence of Peer Pressure	0.65	1.00	-	-
Influence of Environmental Cues	0.72	0.56	1.00	-
Influence of Emotional State	0.58	0.72	0.65	1.00

Source: Extracted from SPSS.

Table 4 presents the results of some factors that may be used to predict instances of overeating based on a multiple linear regression analysis. The intercept term indicates the impulsive buying in the amount of overeating when all predictor variables are zero. Self-reported mood, Facebook activity, and pressure from friends are also significantly positively associated with binge eating habits (all $p < 0.01$). Notably, the emotional state has the highest correlation with overeating behavior, with a coefficient of 0.25 and a p-value less than 0.001. This means that overeating rises by 0.25 standard deviations when a negative emotional state rises by one standard deviation, consistent with previous research on stress- and emotion-triggered eating (Groesz et al., 2012). These findings are consistent with those of earlier studies, such as Miller and Healy (2011), who suggested that social norms and comparisons could predict unhealthy eating behaviors. In conclusion, exposure to environmental food cues exhibited the weakest but still notable correlation with the risk of overeating ($b = 0.15$, $p = 0.003$). This finding supports those of other studies showing how unhealthy environments make it easy to indulge in unhealthy foods (Stark et al., 2017).

Table 4. Regression analysis results of the impact of external stimuli on impulsive buying behavior

Variable	Coefficient	Std. Error	T-value	P-value
Constant	0.50	0.30	1.67	0.096
Influence of Emotional State	0.25	0.05	5.00	0.000
Influence of Social Media	0.30	0.06	5.00	0.000
Influence of Peer Pressure	0.20	0.04	5.00	0.000
Influence of Environmental Cues	0.15	0.05	3.00	0.003

Source: Extracted from SPSS.

Table 5 presents Cronbach's alpha coefficients for various scales related to influences on impulsive buying behavior. It details the number of items and internal consistency reliability for each of the four scales. Cronbach's alpha is a generalizability coefficient that ranges from 0 to 1, with higher values reflecting greater internal consistency and reliability, whereby all items in the scale measure the same construct (Tavakol and Dennick, 2011). It is commonly expected that Cronbach's alpha be > 0.7, as Nunnally and Bernstein (1994) recommend. As presented in Table 5, all scales surpass this criterion, with alphas ranging from 0.76 to 0.85, indicating the scales' credibility. The Impulsive Shopping Assessment Scale (ISAS) demonstrated good reliability in this study, recording the highest value of 0.85 for the Emotional State scale comprising five items. Specifically, the Impulsive Purchasing

Questionnaire (IPQ) has 12 items, while the Peer Pressure scale has four items but has good internal consistency at 0.78. The 53-item scale has a lower alpha than the 5-item scale, although more scale items mean more consistency; therefore, Cronbach's alpha for the 5-item scale was slightly higher.

Table 5. Analysis of external stimuli impacts on impulsive buying behavior

Factors	Number of items	Cronbach's Alpha
Influence of Emotional State	5	0.85
Influence of Social Media	4	0.82
Influence of Peer Pressure	4	0.78
Influence of Environmental Cues	3	0.76

Source: Extracted from SPSS.

In general, it can be seen from this table that researchers have developed scales for assessing the impact on personal behavior that have satisfactory levels of internal consistency. Therefore, one can be confident in the use of these scales in the assessment of the intended constructs in research. High values of alpha also suggest that the scales used in this study are likely to tap into a single set of constructs that may shed light on what influences people.

5. Implications

The implications and suggestions for strategies based on the results are presented below.

Marketing: This study reveals that external factors play a crucial role in impulsive buying; therefore, the store environment can be made more attractive by using good music, effective lighting, good smells, and attractive colors to encourage people to make impulsive purchases. Merchandise displays and proper positioning of products, especially at the point of purchase, can influence consumers' decisions to buy the products. In addition, promotional strategies such as discounts, time-bound offers, and coupons are effective stimulants of impulsive buying, which give a sense of urgency and perceived worth.

Social media and peer influence: Since social media has the greatest influence on impulsive buying, brands must have a strong social media strategy that includes quality content and influencer marketing. Building on peer pressure using word-of-mouth, customer reviews, and recommendations also enhances impulsive buying because customers tend to emulate the decisions of their fellow consumers.

Emotional and cognitive engagement: Emotional appeal that makes consumers feel happy, excited, and sexually attracted can lead to impulsive buying. Marketers should develop communication strategies that appeal to the emotional aspects of their target customers. This study argues that stressing the utility of a product, its functions, and the limited stock available for sale can increase its perceived value and influence customers to buy it immediately.

Policy and consumer protection: These findings can be useful for policymakers to control promotional strategies that rely on consumer impulsiveness tendencies to protect consumers from misleading advertisements. Informing consumers about how external factors affect their buying behavior is useful in avoiding instances where they make unhealthy, impulsive buying decisions. Thus, retailers, marketers, and policymakers must comprehend and apply these findings to control and promote impulsive buying, thereby increasing customer satisfaction and safeguarding consumer interest.

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DEVELOPING THE NIGHT-TIME ECONOMY IN VIETNAM

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Abstract: ***The night-time economy (NTE) refers to legitimate economic activities officially recognized, documented, and protected by the State. NTE brings numerous economic benefits, such as increasing state and local budget revenues, promoting tourism development, stimulating domestic consumption, and generating employment. However, it also presents potential risks. Therefore, appropriate policies and measures are required to maximize its benefits and mitigate the associated challenges in Vietnam.***

• Keywords: *night-time economy; benefits of the night-time economy; policy recommendations.*

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1. Theoretical Framework of the Night-Time Economy

There are two main approaches to understanding the NTE: a broad and a narrow perspective. Broadly defined, NTE includes all social, cultural, and productive activities taking place during nighttime, generally from 6 PM to 6 AM. Narrowly defined, NTE focuses primarily on economic and cultural activities that are entertainment-oriented, such as bars, nightclubs, karaoke lounges, restaurants, live music performances, fashion shows, artistic events, and other nighttime entertainment forms (night markets, night shopping areas, etc.).

Experiences from developed countries reveal the existence of various NTE models classified by different criteria. Based on social stratification, NTE may consist of upscale models or more community-oriented, mass-accessible models. From a business perspective, NTE models may be either fully or partially state-funded, or primarily market-driven with commercial services used to offset operational costs. Professionally, NTE models are often sector-specific, e.g., food and beverage services, musical and artistic performances, shopping, or public recreational activities within a defined space.

The NTE can be examined through several lenses:

First, by sectoral classification, five major categories can be identified:

- Arts services (museums, art exhibitions, film screenings, theaters, live performances).

- Beverage services (nightclubs, alcohol-serving venues, bars).

- Food services (restaurants, cafes, fast food outlets, food trucks, food courts).

- Sports and entertainment (stadiums, public sports facilities, bowling, billiards, etc.).

- Entertainment venues (music spaces and independent creative zones).

Second, based on component structure, the NTE includes:

- Core sectors: food services (restaurants, cafes, takeaway), beverage retail (alcohol sales), and entertainment (night tours, horse racing, gambling, nightclubs, performances, sports).

- Non-core sectors: traditionally daytime industries with added nighttime services, including retail (excluding alcohol), hospitality, cultural, educational, healthcare, urban planning, transport, infrastructure (waste treatment, electricity supply, night-time governance).

- Supply sectors: production and provision of goods/services for nighttime consumption (food, beverages, tobacco, entertainment products, etc.).

Third, based on operational nature, NTE consists of:

- Social activities emphasizing public services and entertainment, often supported by the state (retail, theaters, cinemas, public areas, education, transport).

- Commercial activities centered on service industries including restaurants, hotels, cafes, bars, supermarkets, live music, concerts, festivals, and events run by either state or private actors.

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Major Benefits of Developing the Night-Time Economy:

Firstly, NTE can boost economic output and enhance national and local revenues by attracting residents, workers, and tourists to consume a variety of nighttime goods and services. Its role in the economy becomes evident when the nighttime economy develops vigorously and vibrantly, as it can bring numerous benefits by increasing local and national revenues through attracting more residents, workers, and tourists who come to consume and enjoy the wide variety of goods and services that the nighttime economy offers.

Secondly, NTE contributes to enhancing understanding of daytime economic trends and to improving local infrastructure. It also provides an opportunity to promote more seamless development between daytime and nighttime activities through continuous or overlapping operations that connect the two periods.

Thirdly, NTE facilitates economic restructuring. The development of NTE models can attract the tourism sector, thereby increasing the proportion of tourism in total GDP and accelerating economic structural transformation. Furthermore, it serves as a catalyst for the growth of various economic sectors, including agriculture, industry, commerce, and services.

Fourthly, NTE contributes to enhancing the value of creative industries, thereby helping to generate overall cultural value for the locality.

Fifthly, NTE contributes to the creation of additional employment opportunities for workers, thereby increasing incomes and improving living standards.

Sixthly, the development of NTE also helps ensure the welfare and well-being of residents, as its activities provide spaces where people can meet, interact, experience, and relax after long and stressful working hours. The development of a safe and well-regulated NTE brings significant benefits to both citizens and businesses, while contributing to the improvement of cultural and social life. Moreover, fostering NTE plays a role in poverty reduction and in enhancing the living standards of local communities.

Seventhly, NTE provides enterprises with additional opportunities for development and increased profitability by enabling their participation in the provision of nighttime economic activities.

2. Current Status of the Night-Time Economy in Vietnam

Recognizing NTE's potential, the Prime Minister's Decision No. 1129/QĐ-TTg (dated July 27, 2020) approved the national NTE development strategy, aiming to unlock nighttime economic potential from 6 PM to 6 AM to enhance incomes and social welfare while maintaining public order and safety.

The primary objective of the proposed program is to capitalize on new economic development opportunities through NTE activities; to enhance income levels and quality of life for residents; and to ensure political security and social order and safety during the development of the nighttime economy. Several localities have issued specific plans to promote nighttime economic development, such as Hoan Kiem District (Hanoi) and Da Nang City. Nighttime economic activities have already been implemented in various regions, contributing to the promotion of tourism and consumer spending.

This program marks an important step in expanding the economic space, making the most of time-related resources, and meeting the diverse consumption needs of both residents and visitors.

Based on the Government's strategic orientation, localities have actively implemented plans to develop NTE. Various forms of NTE activities have been vigorously promoted in major cities such as Hanoi, Ho Chi Minh City, Da Nang, and Da Lat. These are reflected in the development of night markets, night-time food streets, 24-hour convenience store chains, pedestrian streets, and specialized entertainment streets such as Ta Hien Street (Hanoi), Bui Vien Street (Ho Chi Minh City), and Ba Na Hills (Da Nang). Across the country, there are currently about 20 night markets serving tourism purposes, and approximately 1,000 out of a total of 2,300 convenience stores operate 24 hours a day, mainly concentrated in Hanoi and Ho Chi Minh City. Notably, the Circle K chain entered Vietnam in 2008 and has operated under the 24/7 model since 2013. Ho Chi Minh City has also developed a range of night-time urban community

cultural tourism products, including: (i) night-time pedestrian streets such as Bui Vien, Nguyen Hue, and Quang Trung Flagpole; (ii) night markets and pedestrian streets within Dam Sen Cultural Park and Hoa Binh Square Gò Vấp musical fountain plaza; (iii) specialized commercial streets such as food streets, traditional medicine streets, jewelry and gemstone streets, and lantern streets; (iv) a system of bars, clubs, and cafés; (v) night-time river and canal tours along the Saigon River and the Nhieu Loc Canal; and (vi) various artistic performances beyond the spaces of Nguyen Hue and Bui Vien pedestrian streets.

In Hanoi, since 2016, the city has hosted more than 300 large-scale cultural events, primarily held along pedestrian streets. These events have attracted the participation of eight provinces and cities across Vietnam, as well as representatives from 17 countries around the world. The nighttime economy has made an increasing contribution to the city's budget, particularly through steadily rising revenues from accommodation and food services VND 1,571 billion in 2021, VND 3,122 billion in 2022, and VND 6,012 billion in 2023. Tourism revenue also witnessed substantial growth, from VND 189 billion in 2021 to VND 3,975 billion during the period of 2022–2023. By early 2024, Hanoi had introduced 15 nighttime tourism products, all of which are high-quality, innovative offerings designed to attract and engage visitors.

Along with the rapid development of the economy, society, and international integration, NTE activities in Vietnam have become increasingly diverse and vibrant. Based on the current state of NTE activities in Hanoi and Ho Chi Minh City - two major representative urban centers - Vietnam's nighttime economy has achieved several notable outcomes as follows:

Firstly, Vietnam has initially achieved success with supportive policies that have contributed to the development of the nighttime economy, enhancing both its scale and quality in urban areas. The government has been implementing various measures to foster nighttime economic activities, including infrastructure development, business support, and the creation of favorable conditions for expanding nighttime operations.

Secondly, the growth of the nighttime economy has positively contributed to Vietnam's GDP, particularly through the tourism sector. In Ho Chi Minh City, it is estimated that an additional four hours of nighttime activity can contribute between 5–8% to the city's GDP. Revenue from nighttime businesses on Nguyen Hue pedestrian street averages approximately VND 2.3 billion on weekdays and quadruples on weekends (Saturday and Sunday). Meanwhile, businesses on Bui Vien street can earn even higher revenues, ranging from nearly VND 3 billion to about VND 8 billion per day.

Thirdly, major urban centers are gradually establishing distinctive nighttime destinations, such as pedestrian streets, night markets, night-time food courts, street performances, fireworks festivals, carnivals, and night-time amusement zones. These areas have significantly enhanced the diversity and quality of Vietnam's tourism offerings, creating a foundation for cities to pilot larger-scale, more diverse nighttime economy zones.

Fourthly, NTE development has attracted participation from a wide range of stakeholders. Notably, during weekends, pedestrian street zones become vibrant hubs of economic and recreational activity. The main business types include food and beverages, clothing, convenience stores, hotels, spas, bars, karaoke venues, along with ancillary services such as taxis, cyclos, and street music and dance performances.

Fifthly, the nighttime economy has also generated new employment opportunities while contributing to social stability. The diverse array of nighttime services requires a large labor force. Demand is not limited to waitstaff, chefs, and restaurant workers, but also includes significant numbers of transport workers, drivers, engineers, security personnel, managers, cleaning staff, technicians, IT support specialists, performing artists, event organizers, and professionals from various other industries.

Overall, despite several favorable conditions for the development of the nighttime economy-such as a stable political system, public safety, and continuously improving human security indices-there remain numerous limitations that need to be

addressed in order to better harness and optimize the potential benefits of the nighttime economy in the future. Specifically, the following challenges have been identified in the current development of Vietnam's nighttime economy:

First, the overall quality of nighttime economic activities remains low. While the number of enterprises and business households has increased rapidly, their quality has not improved significantly. Revenue generated by these entities remains modest, and their contribution to GDP growth is still limited. Moreover, many of the most active participants in the nighttime economy operate within the informal sector.

Second, nighttime services and products lack diversity. Recreational, entertainment, and festival activities available to both residents and tourists remain limited in scope and scale.

Third, business practices in the nighttime economy are often opportunistic. In various tourist destinations across the country, certain individuals and establishments-particularly those offering food, beverage, and transport services-continue to operate unprofessionally. In many cases, overcharging tourists ("rip-offs") has been reported, leaving negative impressions and potentially damaging the reputation of both localities and the country as a whole. Additionally, standards related to service quality, food safety and hygiene, and urban sanitation are not consistently enforced. The general service attitude toward tourists also lacks professionalism.

Fourth, due to the small scale and fragmented nature of many nighttime activities, the overall offerings remain underwhelming and economically inefficient. This leads to a perception among certain groups of international tourists that Vietnam's nighttime economy is monotonous and uninspiring.

3. Policy Recommendations for Promoting the NTE in Vietnam

Based on the current situation, in order to maximize the benefits of the nighttime economy, the following key solutions should be prioritized:

First, complete the legal and policy framework: It is necessary to establish specific regulations for nighttime economic activities, including provisions on operating hours, licensing, taxation, and public order. These legal instruments will help create favorable conditions for businesses while protecting the rights of consumers.

Second, develop infrastructure and supporting services: Investments should focus on improving transportation and logistics systems, enhancing technical infrastructure, and developing designated nighttime economic zones. Financial support mechanisms for infrastructure development should also be introduced to foster a conducive environment for nighttime economic activities.

Third, cultivate a high-quality workforce for the nighttime economy: Human capital plays a vital role in promoting the nighttime economy. Priority should be given to education and training, encouraging innovation and entrepreneurship, fostering inclusive work environments, and mobilizing support from social organizations.

Fourth, encourage innovation and creativity: Support should be provided to businesses in developing new products and services that blend traditional culture with modern elements, thereby attracting both residents and tourists to participate in nighttime economic activities.

Fifth, strengthen public–private partnerships: The active involvement of the private sector in the investment and management of nighttime economic initiatives should be promoted. Enhanced coordination between government agencies and businesses is crucial for ensuring the sustainable development of this economic model.

With the results achieved and these strategic policy directions, the nighttime economy in Vietnam is gradually progressing, contributing to economic growth, job creation, and improvements in the overall quality of life for the population.

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THE IMPACT OF SOCIAL SUPPORT ON CUSTOMER ENGAGEMENT IN ONLINE NONPROFIT COMMUNITIES

MA. Do Minh Diep*

Abstract: ***While several studies have explored marketing implications in virtual environments, there has been limited focus on the factors influencing customer engagement in nonprofit organizations. Therefore, this paper aims to investigate the effect of social support on customer engagement within online nonprofit communities. The author conducted an online survey targeting individuals who follow nonprofit organizations' Facebook pages. The results indicate that emotional support plays a significant role in predicting customer engagement. This research adds to the existing literature on customer engagement in the context of online nonprofit communities and offers valuable insights for marketing practices.***

• Keywords: *social support, customer engagement, nonprofit community.*

JEL codes: L31, M10, M31

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1. Introduction

Nonprofit organizations often focus on addressing social, environmental, or cultural issues that are overlooked by government and for-profit sectors, thereby filling service gaps and advocating for marginalized or underrepresented groups. They unite people around common goals and causes, fostering a sense of community and collective action. Pope et al. (2009) categorize nonprofit customers into three main groups: donors, clients, and volunteers. Nonprofit clients receive services, volunteers seek experience and the opportunity to contribute, while donors focus on the efficient distribution of resources. With the rise of digital platforms that enable interaction, collaboration, and resource sharing, online nonprofit communities have become key tools for connecting with and engaging customers. Customer engagement (CE) in these online communities plays an essential role in relationship-building, creating a sense of community, and encouraging participation and actions like volunteering, word-of-mouth promotion, or donations (Algharabat, 2018).

Despite the advantages of CE in online nonprofit communities, research on factors that stimulate CE in this context remains limited and warrants further exploration. Existing literature often examines CE as a unidimensional construct (Sprott et al., 2009). However, when considering CE as a multidimensional construct including cognitive processing, affection, and activation factors (Hollebeek et al., 2014) it remains unclear whether these elements can stimulate CE in online nonprofit communities. Thus, this study seeks to address the gap by exploring how CE is fostered within the specific context of online nonprofit communities.

2. Literature review

2.1. Customer engagement in online nonprofit community

Customer Engagement (CE) was developed as a sub-unit of engagement that focuses on interactions or participation with specific brands or services (Vivek et al., 2014). It is defined as a customer's positive cognitive, emotional, and behavioral activity related to brand interactions (Hollebeek, 2014). Although some studies have explored CE from a unidimensional perspective, a multidimensional approach is more commonly favored (e.g., Romero, 2017). The key dimensions of CE are cognitive processing, affection, and activation (Romero, 2017). First, cognitive processing refers to the level of thought and elaboration a customer applies to brand-related interactions. Second, affection reflects the customer's positive emotional response during a brand interaction. Third, activation involves the energy, effort, and time a customer invests

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in a brand during an interaction. Consistent with previous studies, online CE encompasses customers' online behaviors related to brand engagement, extending beyond mere purchases.

In the nonprofit sector, Akingbola (2019) identifies value congruence, along with rewards and recognition, as key antecedents of CE. Drawing from Social Exchange Theory, these scholars suggest that the cognitive, emotional, and physical energy customers invest is influenced by the resources and support provided by nonprofit organizations (NPOs). Shared values, which are central to NPOs, promote engagement and involvement in problem-solving activities. NPO missions and goals reflect values that customers perceive as worth their resources. However, while several NPOs incorporate values as organizational resources linked to performance, Helmig et al. (2015) found no significant difference in value prioritization or performance across different value groups. Another important antecedent of CE in nonprofits is rewards and recognition. Since nonprofit customers are motivated by the opportunity to contribute to social causes and align with the organization's values, extrinsic rewards are less important. Instead, nonprofit customers are typically motivated by intrinsic rewards, such as recognition and the chance to contribute to a greater social purpose (Akingbola, 2013). This suggests that non-monetary rewards, equal policies, and environments that reflect their values are more significant. However, nonprofit customers' engagement with rewards and recognition varies, as individuals perceive the benefits of their contributions and the rewards they receive differently (Akingbola, 2019).

2.2. Social support in online nonprofit community

Social support refers to the resources individuals perceive as available to them from non-professionals within both formal support groups and informal helping relationships (Gottlieb & Bergen, 2010). Offer (2012) suggests that social support is not just a result of connections but also emerges from one's efforts to collaborate and utilize their personal networks. When supported, individuals may feel warmth and satisfaction in their social interactions, gradually fulfilling their social needs (Liang et al., 2011). Researchers have explored various dimensions of social support, such as informational, emotional, instrumental, and appraisal support (Barrera, 1986; House, 1981; Van Den Akker-Scheek et al., 2004). However, since online social support is often intangible, informational and emotional support are the most commonly discussed dimensions in existing literature (Coulson, 2005; Huang et al., 2010; Madjar, 2008). Informational support involves providing advice, suggestions, or knowledge to help others navigate their challenges (Lee, 2018). This type of support is seen when online community members share their experiences and offer guidance about services (Bagizzi & Dholakia, 2002). Emotional support, on the other hand, involves offering empathy, listening, and building trust. Through this, members not only gain support but also form relationships with friends in online communities. These two forms of support informational and emotional are the primary aspects in online communities (Liang et al., 2011). Therefore, this study will focus on informational and emotional support as separate constructs rather than as two dimensions of a broader social support construct.

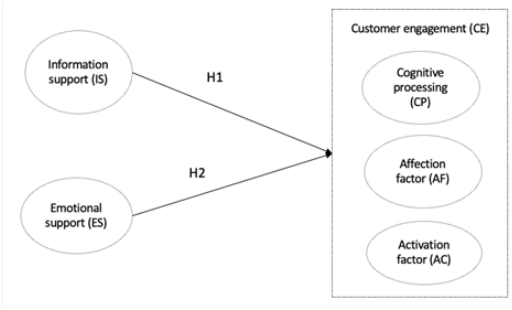
3. Hypothesis development and research model

Existing research on online communities suggests that members who receive strong support from others are more likely to reciprocate (Zhang et al., 2014). Specifically, online communities serve as effective platforms for providing comfort and solutions related to products, fostering trust and motivating members to contribute. Furthermore, as members' interpersonal trust grows through communication, they are more inclined to respond positively by offering advice, sharing experiences (informational support), and providing emotional comfort (emotional support). These actions are typical indicators of cognitive processes, affection, and activation in customer engagement (CE) (Van Doorn et al., 2010). Park et al. (2009) also emphasize that receiving social support in online communities is crucial for motivating social support. The sharing and reception of information or emotions significantly influence customers' intentions to engage with services (Liang et al., 2011). Based on this, this study proposes that:

H1. Informational support is positively related to CE in online nonprofit communities.

H2. Emotional support is positively related to CE in online nonprofit communities.

Figure 1. The research framework



4. Research method

A quantitative survey was conducted in May 2024 to gather data for empirically testing the research framework within online nonprofit communities. All survey items were rated on a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). A total of 504 valid responses were collected from Vietnamese individuals who follow the Facebook pages of nonprofit organizations (NPOs) related to charity foundations that share information about their activities and solicit donations. Respondents were filtered by asking if they frequently follow the news feed of their preferred NPO's Facebook page. Those who answered yes were asked to think about their most favorite NPO's Facebook page, with the nonprofit's name automatically populated for all related questions in the survey. Of the 504 respondents, 42.5% were male (214 individuals) and 55.8% were female (281 individuals). Regarding age, 62.3% were between 18 and 30 years old, and 29.4% were aged 31 to 50 years. The largest proportion of the sample consisted of students, making up 48%, while officers and business people accounted for 8.1% and 11.1%, respectively. Geographically, the sample included 58.9% from Hanoi, 5.8% from Da Nang, 20.6% from Ho Chi Minh City, and 14.7% from other provinces.

Table 1. Measurement scales

Construct	Authors
Informational support (IS1-IS3)	Zhang, M., Hu, M., Guo, L., & Liu, W. (2017)
IS1: On this community, some people would offer suggestions when I need help.	
IS2: When I encounter a problem, some people on this community would give me information to help me overcome the problem.	
IS3: When faced with difficulties, some people on this community would help me discover the cause and provide me with suggestions.	
Emotional support (ES1-ES3)	Zhang, M., Hu, M., Guo, L., & Liu, W. (2017)
ES1: When faced with difficulties, some people on this community comfort and encourage me.	
ES2: When faced with difficulties, some people on this community listen to me talk about my private feelings.	
ES3: When faced with difficulties, some people on this community express interest and concern in my well-being.	
CE "cognitive processing" (CP1-CP3)	Hollebeek, Glynn and Brodie (2014)
CP1: Following its Facebook page gets me to think about [Non-profit organization X].	
CP2: I think about [Non-profit organization X] a lot when I'm following its Facebook page.	
CP3: Following its Facebook page stimulates my interest in learning more about [Non-profit organization X].	
CE "affection" factor (AF1-AF4)	Hollebeek, Glynn and Brodie (2014)
AF1: I feel very positive when I follow [Non-profit organization X].	
AF2: Following [Non-profit organization X] makes me happy.	
AF3: I feel good when I follow [Non-profit organization X].	
AF4: I'm proud to follow [Non-profit organization X].	
CE "activation" factor (AC1-AC3)	Hollebeek, Glynn and Brodie (2014)
AC1: I spend a lot of time following [Non-profit organization X] compared to other non-profit organizations.	
AC2: Whenever I'm following my non-profit social networking sites, I usually follow [Non-profit organization X].	
AC3: I follow [Non-profit organization X] the most.	

5. Findings

The authors utilized SPSS and AMOS software to analyze both the measurement model (via confirmatory factor analysis) and the structural model (including the proposed conceptual model and hypotheses). The Cronbach's alpha values for Informational support, Emotional support, Cognitive processing, Affection, and Activation were 0.865, 0.885, 0.801, 0.858, and 0.8818, respectively, indicating high reliability for the measures.

Customer Engagement (CE) was treated as a second-order construct, and the model fit was assessed. The results demonstrated a satisfactory model fit, as all indices fell within the acceptable threshold ranges ($\chi 2 = 58.712$, df = 31; $\chi 2/df = 1.894$), CFI = 0.987, GFI = 0.977, TLI = 0.982, and RMSEA = 0.042 (Figure 2 and Table 2). The first-order constructs Cognitive processing (CP), Affection (AF), and Activation (AC) all showed significant coefficient values with CE as a second-order construct. Table 3 presents the discriminant validity, which was confirmed through Pearson correlations between constructs compared to the square roots of the average variance extracted along the diagonal, all of which were found to be acceptable.

Table 2. Discriminant validity of CE

Construct	AF	AC	CP
AF	**0.786**		
AC	0.547***	**0.777**	
CP	0.461***	0.549***	**0.758**

In the next phase of the structural equation modeling analysis, a confirmatory factor analysis (CFA) was performed for all constructs. The coefficient alpha values for all constructs were found to be greater than 0.70. Additionally, all items were found to load significantly on their respective constructs, with standardized values exceeding 0.89 (Hair et al., 2009). The fit indices for the measurement model were all within the recommended ranges (i.e., $\chi2 = 414.213$, df = 254, and $\chi2/df = 1.631$, CFI = 0.976, GFI = 0.938, TLI = 0.972, and RMSEA = 0.035) (Hu & Bentler, 1999), indicating that the measurement model fit the observed data well.

To test the proposed hypotheses, structural equation modeling was applied to the research model. The results showed that all constructs had coefficient alpha values greater than 0.70. Observed items significantly loaded onto their respective constructs with standardized values above 0.89 (Hair et al., 2009). The fit indices for the measurement model again fell within the recommended levels (i.e., $\chi2 = 491.452$, df = 262, and $\chi2/df = 1.876$, CFI = 0.966, GFI = 0.927, TLI = 0.961, and RMSEA = 0.042) (Hu & Bentler, 1999), suggesting that the measurement model was a good fit for the observed data.

Table 3. Results of structural equation model

Hypothesis	Direction			Estimate	t-value	P	Result
H1	CE	<---	IS	0.085	1.952	0.051	Rejected
H2	CE	<---	ES	0.386	6.597	***	Supported

The result of hypotheses testing support postulated path for H2. Emotional support has an impact with $\gamma_{CE<-ES} = 0.386$; t-value = 6.597. Unexpectedly, the hypothesis for Informational support is not supported in this case ($\gamma_{CE<-IS} = 0.085$; t-value = 1.952). Hypothesis H1 is rejected; however, with p-value = 0.051, it can be said that Informational support may positively affect CE for 90% confidence limit

6. Discussion, conclusion and recommendation

Based on the data analysis and findings, this research offers several contributions. The author empirically tested the antecedents of Customer Engagement (CE) as a multidimensional construct, including cognition, affection, and activation, within online nonprofit communities. The results reveal that only emotional support positively impacts CE in online nonprofit communities in Vietnam. This finding aligns with previous research conducted in different contexts (Algharabat et al., 2018). Informational support, however, was found not to influence CE in this case. This may be because Facebook, a widely used social media platform in Vietnam, has made information search relatively easy for users, who can access the information they need without difficulty. Furthermore, according to Resource Dependency Theory, nonprofit organizations actively post information and knowledge that encourage customers to take action, providing transparency and fostering engagement (Lovejoy & Saxton, 2012). A limitation of this study is the use of the snowball sampling method. Future research could utilize alternative sampling techniques to improve the generalizability of findings across different NPO customer groups. For example, systematic random sampling of NPO customers, including donors, volunteers, and clients (from the NPO database), could generate a more representative sample. Additionally, since this study focused on NPO Facebook pages, we recommend that future research test our model across different social media platforms used by NPOs.

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EXTENDING THE LIFECYCLE OF TRANSPORT VEHICLES IN A CIRCULAR ECONOMY FRAMEWORK: EVALUATING THE ECONOMIC EFFICIENCY OF MAINTENANCE ACTIVITIES USING THE TOPSIS METHOD

PhD. Nguyen Thi Thuy Dung*

Abstract: ***Maintenance plays a vital role in extending the lifespan of transport vehicles, thereby supporting the development of a circular economy in the transportation sector. In Vietnam, however, the potential of maintenance activities has yet to be comprehensively harnessed. This study explores how vehicle lifespans can be prolonged within a circular economy framework by evaluating four maintenance strategies - preventive maintenance (PM), predictive maintenance (PdM), reactive maintenance (RM), and total productive maintenance (TPM) - using the TOPSIS method and five circular economy-oriented criteria. Research indicates that while reactive maintenance is currently the predominant approach in Vietnam due to its lower initial costs, other strategies hold significant potential for facilitating a shift towards more proactive maintenance systems. In particular, Predictive Maintenance (PdM) offers substantial promise by leveraging real-time data analytics to anticipate equipment failures, thereby reducing downtime and maintenance expenses. Such a transition can enhance operational efficiency, extend asset lifespans, and contribute to more sustainable practices in the sector. The study offers practical recommendations for improving maintenance models, reducing resource waste, and advancing circular economy goals. It also acknowledges the current reliance on reactive methods, while emphasizing the long-term benefits and cost-efficiency of proactive alternatives for both businesses and policymakers.***

• Keywords: *circular economy, transportation vehicles, TOPSIS, lifespan extension, vehicle maintenance.*

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Introduction

In the competitive and sustainability-driven transportation industry, optimizing vehicle maintenance is crucial for cost reduction and the promotion of a circular economy. Extending vehicle lifespans, while simultaneously reducing fuel consumption and emissions, generates significant economic and environmental benefits. However, Vietnam's transportation sector faces unique challenges, including an aging vehicle fleet, complex infrastructure, and the increasing impacts of climate change. These factors have prompted governmental initiatives aimed at fostering sustainable transport solutions.

To address these challenges and maximize the benefits of efficient maintenance, various strategies are employed, each with distinct advantages and limitations. Reactive Maintenance (RM), while widely used due to its low initial costs, can lead to higher long-term expenses and operational disruptions if over-relied upon. Preventive Maintenance (PM) helps reduce breakdown risks but may result in unnecessary interventions and resource consumption. Predictive Maintenance (PdM) optimizes costs through failure forecasting but requires significant technological investment and data accuracy. Total Productive Maintenance (TPM) integrates multiple approaches and emphasizes proactive employee involvement, yet demands strong organizational commitment and substantial resources. No single strategy is optimal in all cases; its effectiveness depends on vehicle types, operational conditions, and available infrastructure.

The impact of maintenance practices extends beyond operational efficiency, playing a crucial role in advancing the circular economy. By extending the operational life of vehicles and their components, effective maintenance directly reduces demand for new manufacturing, thereby conserving valuable natural resources and energy.

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Additionally, optimized maintenance protocols facilitate the reuse and recycling of vehicle parts and materials at the end of their service life, fostering a closed-loop system within the transportation sector. These advancements generate tangible economic benefits, including job creation, reduced operational expenditures, and enhanced transportation reliability and service quality.

Building on this context, the present study evaluates maintenance models commonly employed by Vietnamese transport businesses using the TOPSIS (Technique for Order of Preference by Similarity to Ideal Solution) method. This approach enables a comprehensive assessment of different maintenance strategies and suggests improvements tailored to the specific conditions of Vietnam's transportation sector, aligning with the nation's ongoing transition toward a circular economy. The TOPSIS methodology, a robust multi-criteria decision-making tool, is particularly well-suited for this complex evaluation as it allows for the simultaneous consideration of diverse economic, operational, and sustainability-related factors that influence maintenance strategy selection.

The structure of this study is as follows: Section 2 reviews the relevant literature, followed by Section 3, which outlines the research methodology and data. Section 4 presents and discusses the findings in detail, and Section 5 provides the concluding remarks.

2. Literature Review

Several studies have emphasized the critical role of maintenance in enhancing the operational efficiency of transport vehicles, especially as companies strive to optimize costs and improve reliability.

Mitchell et al. (2002) demonstrated that a well-structured maintenance strategy (preventive maintenance) helps minimize breakdowns and maximize asset utilization. Meanwhile, predictive maintenance (PdM) is gaining popularity due to technological advancements. Simion et al. (2024) analyzed the application of artificial intelligence in predictive maintenance, highlighting its ability to improve vehicle availability and reduce operational disruptions. Mobley (2002) outlined predictive maintenance techniques within the context of total productive maintenance management. Coanda et al. (2020) and Waeyenbergh & Pintelon (2002) emphasized the role of real-time data in developing accurate and efficient maintenance models like Reactive maintenance.

Total Productive Maintenance (TPM) is a comprehensive approach that integrates various maintenance strategies with active employee participation to enhance operational efficiency. Ahuja & Khamba (2007) assessed TPM implementation initiatives in Indian manufacturing enterprises, highlighting the benefits and challenges of adopting this method. Nakajima (1988), a pioneer in TPM, provided in-depth insights into the theory and application of this methodology in modern maintenance systems.

Numerous studies have employed ranking-based approaches to support decision-making processes. Multi-Criteria Decision-Making (MCDM) methods such as TOPSIS and AHP are commonly applied to optimize the selection of maintenance strategies. For instance, Esfandiari and Rizvandi (2014) used TOPSIS to rank corporate strategies based on multiple evaluation criteria. Similarly, Rivero-Gutiérrez et al. (2021) utilized AHP to facilitate decision-making in transport system management, contributing to the development of more reliable maintenance models. Zhang et al. (2018) also applied TOPSIS to assess the performance of urban public transport priority initiatives.

However, research on vehicle maintenance in the transportation industry, particularly in developing countries like Vietnam, remains limited. Vietnamese transport enterprises face major challenges such as inconsistent infrastructure, limited financial resources, and a lack of comprehensive data on the effectiveness of different maintenance models. Notably, as Vietnam increasingly focuses on sustainable development and the circular economy, existing MCDM approaches have yet to fully integrate key environmental and recycling considerations into maintenance strategy evaluations. This presents a crucial gap in understanding how different maintenance methods contribute to circular economy goals in the transport sector.

This study aims to address that gap by evaluating maintenance models in Vietnamese transport enterprises using the TOPSIS method, thereby proposing adjustments tailored to the country's specific conditions and industry trends. The TOPSIS method, a multi-criteria decision-making technique, is particularly suitable for this research as it allows simultaneous consideration of economic,

operational, and sustainability factors affecting the selection of an optimal maintenance strategy for Vietnamese transport enterprises.

3. Data and research Methodology

Data collection method: The research data for this study were collected through interviews with 12 technical staff from transportation enterprises.

The author conducted direct interviews with technical staff who have expertise and experience in the technical field at transportation companies. Initially, they sought consensus on evaluation and scoring from a group of 10 experts. Subsequently, the author expanded the interviews in two rounds, adding 1 expert in each round, culminating in a total of 12 experts and reaching the highest agreement.

Interview content: The interviews focused on evaluating the current state of vehicle maintenance in Vietnam according to the criteria given by the experts, as well as assessing the weight of these criteria in promoting the circular economy in Vietnam's transportation sectors

Research Method: The TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) method was employed to evaluate and rank maintenance strategies.

TOPSIS Scoring Matrix

During the analysis, experts assessed maintenance strategies not only based on cost-effectiveness and maintenance efficiency but also on their contributions to the circular economy in the context of Vietnam's transportation industry.

Maintenance Cost (C1): A low-cost maintenance approach helps businesses conserve resources and minimize waste. Strategies with low costs receive high scores (8-10). Conversely, high-cost maintenance approaches requiring expensive spare parts or services are rated lower (1-3) due to their financial burden and resource inefficiency.

Downtime (C2): Maintenance strategies that minimize downtime allow vehicles to resume operation quickly, optimizing resource utilization. Short downtime durations are highly rated (8-10), whereas longer downtimes, which disrupt operations and waste resources, receive lower scores.

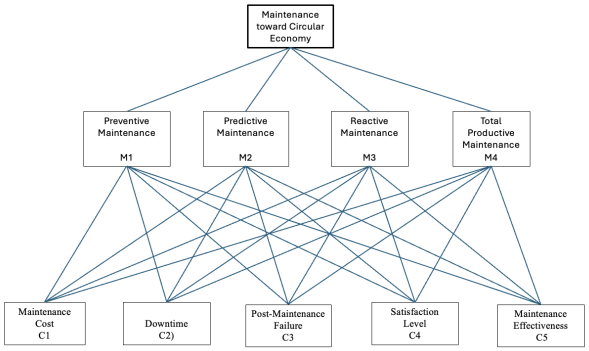
Post-Maintenance Failure (C3): This reflects vehicle stability after maintenance. Effective maintenance approaches reduce failures, enhancing vehicle durability and minimizing the need for replacements or additional repairs. Strategies with low failure rates receive high scores (8-10), as they ensure long-term operational stability and prevent resource wastage. In contrast, high failure rates lead to additional costs and inefficiencies, earning lower scores (1-3).

Satisfaction Level (C4): This factor evaluates how well a maintenance strategy enhances vehicle performance and service quality. Effective maintenance improves reliability, increases satisfaction levels, and is rated highly (8-10).

Maintenance Effectiveness (C5): This criterion assesses how well a maintenance strategy sustains vehicle stability and durability over time. Highly effective maintenance minimizes the need for frequent repairs or early replacements. Strategies that support long-term performance sustainability receive high scores (8-10), as they contribute to resource conservation and circular economy development.

This study provides insights into optimizing maintenance strategies in Vietnam's transportation sector, offering practical recommendations for enhancing maintenance efficiency, reducing resource waste, and promoting sustainable circular economy practices.

Figure 1. Research's structure



Steps of the TOPSIS Method

+ Constructing the Normalized Matrix

Normalization is applied to the values using the following formula to transform them onto a common scale for comparability:

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{n} x_{ij}^2}} \quad (1)$$

r_{ij}: is the normalized value of element x_{ij}

x_{ij}: is the original value of criterion j in dataset i.

+ Calculating the Weighted Normalized Matrix

Each criterion is weighted based on its assigned

level of importance, and the weighted normalized values are then calculated using the specified formula:

$$v_{ij} = w_j \cdot r_{ij}$$

v_{ij}: is the weighted normalized value for criterion j of option i.

w_j: is the weight assigned to criterion j, reflecting its importance in the final decision

r_{ij} : is the normalized value of element j in dataset i.

+ Determining the Ideal and Non-Ideal Solutions

Ideal solution (A+): The best value for each criterion.

$$A^+ = \{v_1^+, v_2^+, \dots, v_n^+\}$$

Non-ideal solution (A-): The worst value for each criterion

$$A^- = \{v_1^-, v_2^-, \dots, v_n^-\}$$

+ Calculating the Distance to the Ideal and Non-Ideal Solutions

$$D_i^+ = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_j^+\right)^2} \quad (2)$$

$$D_i^- = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_j^-\right)^2} \quad (3)$$

+ The closeness coefficient (Ci)

C*i* is calculated to determine the relative closeness of each alternative to the ideal solution.

The preference score is obtained using the following formula:

$$C_i = \frac{D_i^-}{D_i^+ + D_i^-} \quad (4)$$

A higher Ci value indicates a more preferred alternative.

+ Analyzing results and drawing conclusions

Based on the computed values, the best maintenance strategy can be determined, leading to a well-informed decision

4. Research Results

The values in the matrix are derived from ratings provided by experts in the Vietnamese transportation sector, who evaluated the maintenance options based on real-world operational considerations. These experts assessed each maintenance strategy in terms of its effectiveness and alignment with the operational challenges and economic realities within Vietnam.

Table 1: Initial TOPSIS Matrix

Option	Maintenance Cost (C1)	Downtime (C2)	Failure Rate (C3)	Business Satisfaction (C4)	Maintenance Effectiveness (C5)
Preventive Maintenance (M1)	7	6	5	7	6
Predictive Maintenance (M2)	5	3	4	9	8
Reactive Maintenance (M3)	8	7	7	5	4
Total Productive Maintenance (M4)	6	4	3	8	7

Source: Compiled from the survey

Preventive Maintenance (M1): This maintenance strategy is characterized by its reasonable maintenance costs. However, it faces challenges such as longer vehicle downtime and higher failure rates, which negatively impact the long-term operational efficiency of the vehicles.

Predictive Maintenance (M2): This option stands out for its superior maintenance effectiveness and high business satisfaction levels, which promote the long-term operational viability of vehicles, aligning with the goals of a circular economy. Predictive Maintenance, despite requiring substantial initial investment in advanced technology and data infrastructure, demonstrates significantly reduced vehicle downtime and lower failure rates.

Reactive Maintenance (M3): Reactive Maintenance scores well in terms of low maintenance costs and moderate downtime; however, it suffers from lower maintenance effectiveness and requires more frequent interventions.

Total Productive Maintenance (M4): While M4 scores high on business satisfaction, it is associated with considerable failure rates and extended vehicle downtime, which adversely affect its economic efficiency.

Based on the comprehensive evaluation provided by the Vietnamese experts, the Initial Decision Matrix is as follows:

+ Initial Decision Matrix

$$D = \begin{bmatrix} 7 & 6 & 5 & 7 & 6 \\ 5 & 3 & 4 & 9 & 8 \\ 8 & 7 & 7 & 5 & 4 \\ 6 & 4 & 3 & 8 & 7 \end{bmatrix}$$

+ Normalized Matrix Using Eq (1)

$$R = \begin{bmatrix} 0.5307 & 0.5721 & 0.5025 & 0.4730 & 0.4671 \\ 0.3790 & 0.2860 & 0.4020 & 0.6082 & 0.6228 \\ 0.6065 & 0.6674 & 0.7035 & 0.3379 & 0.3114 \\ 0.4549 & 0.3814 & 0.3015 & 0.5406 & 0.5449 \end{bmatrix}$$

+ Weighted Normalized Matrix

Table 1. Weighted criteria

Criteria	Symbol	Weight (W)	Rationale
Maintenance Efficiency	C5	0.4	Most important due to its impact on vehicle durability, reducing resource waste in the Circular Economy (CE).
Failure Rate	C3	0.3	Helps reduce indirect costs and increases vehicle sustainability.
Downtime	C2	0.15	Affects vehicle utilization efficiency, but not the most critical factor in CE.
Enterprise Satisfaction	C4	0.1	Important for ensuring the feasibility of implementing circular maintenance.
Maintenance Cost	C1	0.05	Lower weight because CE focuses more on resource optimization than short-term cost savings.

Source: Expert Survey

Therefore, the expert-weighted vector W = [0.01, 0.15, 0.3, 0.1, 0.4], and the weighted normalized matrix is:

$$V = \begin{bmatrix} 0.0265 & 0.0572 & 0.1508 & 0.0710 & 0.1868 \\ 0.0190 & 0.0286 & 0.1206 & 0.0912 & 0.2491 \\ 0.0303 & 0.0667 & 0.2111 & 0.0507 & 0.1246 \\ 0.0227 & 0.0381 & 0.0905 & 0.1811 & 0.2180 \end{bmatrix}$$

+ Ideal and Non-Ideal Solutions

$$A^+ = [0.0303, 0.0667, 0.2111, 0.0912, 0.2491]$$
$$A^- = [0.0190, 0.0286, 0.0905, 0.0507, 0.1246]$$

+ Euclidean Distance to Ideal and Non-Ideal Solutions Using Eq(2), Eq(3)

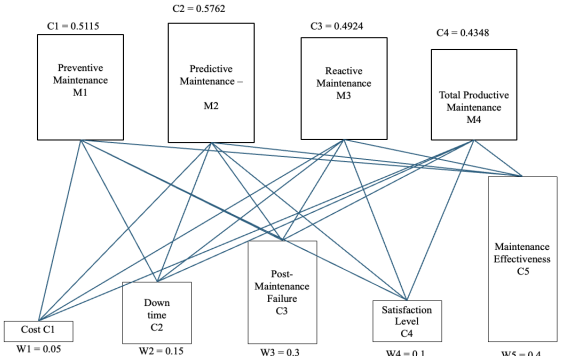
$$D^+ = [0.0896, 0.0988, 0.1309, 0.1284]$$
$$D^- = [0.0938, 0.1343, 0.1270, 0.0988]$$

+ Preference Value C_i using Eq (4)

$$C = [0.5115, 0.5762, 0.4924, 0.4348]$$

+ Ranking of Maintenance Options

Figure 1. Research's results



Source: Designed by the author

C2 ≈ 0.5762: M 2 (Predictive Maintenance) is the most optimal.

C1 ≈ 0.5115: M 1 (Preventive Maintenance) ranks second.

C3 ≈ 0.4924: M 3 (Reactive Maintenance) ranks third.

C4 ≈ 0.4348: M 4 (Total Productive Maintenance) has the lowest score.

The evaluation results indicate that **Predictive Ma**intenance (C2) is the most optimal approach, receiving the highest priority score of approximately 0.5762. This reflects its strong potential in addressing the operational challenges of Vietnam's aging and overused vehicle fleet.

Predictive Maintenance (M2) and potential in the context of aging and over-exploited vehicles:

Despite the higher technological and skill requirements of Predictive Maintenance, its top ranking indicates an anticipation of its potential to address the inherent challenges of Vietnam's aging vehicle fleet:

Maximizing the useful lifespan of older vehicles: For vehicles that have been in service for many years and potentially subjected to over-exploitation, Predictive Maintenance can facilitate the early detection of latent degradation, enabling timely interventions to extend their operational lifespan, rather than premature disposal. This directly contributes to the more efficient use of resources, a core tenet of the circular economy.

Mitigating unexpected failures from over-exploitation: Continuous monitoring of operational conditions through Predictive Maintenance can provide early warnings of failure risks arising from overloading or improper operation, thereby reducing sudden breakdowns that cause costly disruptions and optimizing the utilization of existing vehicles.

Optimizing spare part utilization for older models: Accurately determining the timing and type of spare parts needed through Predictive Maintenance can help avoid "just-in-case" replacements or the use of unsuitable parts for older vehicles, ensuring performance and safety while promoting the repair and reuse of components whenever feasible, aligning with circular economy principles.

Preventive Maintenance (M1) and its foundational role in a developing maintenance system:

The second-place ranking of Preventive Maintenance underscores the importance of basic procedures, especially within a maintenance system that is still developing:

Establishing minimum standards: Preventive Maintenance provides a fundamental framework for vehicle care, helping to ensure essential maintenance

activities are performed, even with limited technical expertise and equipment. This helps maintain a minimum level of safety and operational efficiency for the aging fleet.

Preventing common failures: Even with a less professional maintenance system, adherence to preventive maintenance schedules can help prevent common failures due to normal wear and tear, reducing the burden on reactive repair efforts.

Reactive Maintenance (M3) and its clear limitations in the Vietnamese context:

The lower ranking of Reactive Maintenance, despite its current prevalence, highlights its inadequacies in addressing the challenges of an older, over-exploited fleet:

Increased risk of severe damage in older vehicles: Relying solely on fixing breakdowns as they occur can lead to the accumulation of minor issues, causing more significant and costly failures in vehicles that are in a state of structural aging and operational degradation.

Frequent operational disruptions due to lack of prediction: Dependence on reactive repairs results in unpredictable downtime, impacting transportation efficiency and increasing opportunity costs, especially in a context of continuous transport demands.

Hindrance to optimizing the lifecycle of older vehicles: Reactive maintenance does not encourage proactively extending vehicle lifespans or planning for efficient parts replacement, contradicting the principles of the circular economy.

Total Productive Maintenance (M4) and implementation challenges with limited resources:

The lowest ranking of Total Productive Maintenance reflects the difficulties in implementing such a complex and resource-intensive system in the current Vietnamese context:

Significant investment required in training and technology: Effective TPM implementation demands a highly skilled workforce and the support of advanced management technologies, which can be a major barrier for many small and medium-sized transport enterprises with limited resources.

Difficulty in changing maintenance culture: TPM requires the participation and responsibility of all departments, which can take considerable time to build and sustain in an environment where a proactive maintenance culture is not yet strongly established.

5. Conclusions and recommendations

This study applied the TOPSIS multi-criteria decision-making method to evaluate the economic efficiency and other aspects of four vehicle maintenance strategies in the context of Vietnam's aging transportation fleet and growing emphasis on circular economy principles. The findings clearly indicate that Predictive Maintenance (M2), with the highest score of 0.5762, is considered the most optimal approach. This result reflects a growing recognition among experts of the long-term economic and operational advantages of proactive, data-driven maintenance methods.

In alignment with the goals of a circular economy, Predictive Maintenance demonstrates superior potential to extend the operational lifecycle of vehicles, reduce waste, and optimize resource use through early detection of faults and condition-based interventions. While Preventive Maintenance (M1) (score: 0.5115) remains foundational in settings with limited technical capacity, and Reactive Maintenance (M3) (score: 0.4924) may still serve short-term needs, both are less effective in achieving lifecycle optimization. Total productive maintenance (M4), despite its holistic nature, ranks lowest (0.4348), reflecting practical limitations such as high implementation costs and required technical infrastructure.

Key recommendations for Circular Economy integration:

First, investing in enabling technologies forms the foundation for modernizing maintenance practices in Vietnam's transport sector. Developing digital infrastructure, such as sensors, telematics, and real-time data analytics, is particularly critical for aging fleets that are prone to mechanical failures due to overuse. In the short term, implementing low-cost retrofit kits and mobile diagnostics allows operators to improve vehicle performance and reduce unexpected downtimes. In the long term, the integration of smart, interconnected systems will facilitate lifecycle optimization and predictive asset management. Such technological advancement directly contributes to circular economy objectives by extending vehicle lifespan, reducing material consumption, and minimizing maintenance-related waste.

Second, enhancing human capital and management capacity is essential to operationalize

advanced maintenance systems. In the context of Vietnam, where technical personnel in transport operations often lack specialized diagnostic skills, targeted upskilling through practical workshops provides immediate benefits. Over the longer term, the establishment of formal education programs and professional certifications in predictive maintenance will ensure a skilled and sustainable workforce. This not only increases operational efficiency but also supports circular practices by enabling more effective resource use and reducing the frequency of vehicle retirement due to avoidable failures.

Third, a strategic shift from reactive to predictive maintenance models must be pursued. While reactive approaches remain necessary for unforeseen breakdowns, they often result in excessive costs and wasted resources. In the short term, hybrid strategies that combine basic predictive checks with traditional repairs can help mitigate risks for overutilized fleets. Over time, predictive maintenance should become the dominant model, allowing for proactive interventions that prevent major failures. This transition enhances resource efficiency by optimizing asset utilization and aligns with circular economy principles through reduced material input and extended service life of transport assets.

Fourth, supportive policy frameworks and incentive mechanisms are crucial, particularly for small and medium-sized operators managing older vehicles. In the short run, governments should provide financial incentives such as tax relief and subsidies for installing monitoring technologies. In the long term, integrating predictive maintenance standards into national transport regulations will encourage widespread adoption. Such policy interventions are vital in embedding circular economy thinking across the sector by promoting resource efficiency, reducing emissions from poorly maintained fleets, and discouraging premature scrapping.

Fifth, fostering cross-sector collaboration and knowledge exchange enhances solution relevance and scalability. Collaboration between transport operators, technology providers, and research institutions facilitates the development of context-appropriate, cost-effective predictive maintenance solutions. Short-term pilot projects can demonstrate the tangible benefits of these practices, building stakeholder confidence. In the long run, sustained partnerships in research and development will drive innovation and enable systematic circular transformation through the sharing of best practices, technological refinement, and continuous feedback loops.

Finally, integrating predictive maintenance into lifecycle strategies is key to maximizing asset value and minimizing waste. In the short term, data derived from predictive diagnostics can inform decisions on whether to refurbish, repurpose, or retire vehicles based on actual condition rather than estimated timelines. Over the long term, fully integrated lifecycle management systems will allow for dynamic and data-driven decisions that optimize resource use across each phase of a vehicle's life. This strategic alignment strengthens the transport sector's contribution to a circular economy by ensuring that assets are maintained, upgraded, and recycled systematically rather than discarded prematurely.

By adopting these six strategies - tailored to the Vietnamese transport context - the sector can transition from a resource-intensive model to one that is resource-efficient and circular.

While this study provides a structured evaluation of maintenance strategies within Vietnam's transport sector, several limitations should be acknowledged. The reliance on expert-based scoring and weighting introduces a degree of subjectivity, which may affect the robustness of the final rankings. Furthermore, the analysis is context-specific and may not be generalizable beyond Vietnam's fragmented and aging transport systems.

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THE BUSINESS PERFORMANCE OF THE BANK FOR AGRICULTURE AND RURAL DEVELOPMENT BASED ON FINANCIAL INDICATORS FROM 2018 TO 2023

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Abstract: ***Despite facing numerous difficulties and challenges from both the global and domestic economies, Agribank has achieved remarkable accomplishments, reaffirming its pioneering role as a major state-owned commercial bank. Agribank has made significant contributions to the implementation of monetary policy, supporting individuals, businesses, and the country's economic recovery and development programs. Notably, the bank plays a key role in investing in the development of agriculture, farmers, and rural areas, with over 65% of its outstanding loans dedicated to this sector, making up the largest share of agricultural credit in Vietnam. This article will analyze Agribank's business performance through key financial indicators.***

• Keywords: *business performance, ROA, ROE, NIM, CAR, Agribank.*

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1. Introduction

Throughout its development, under various names, Agribank has consistently affirmed its position and role as one of Vietnam's leading commercial banks. It has been a key player in promoting investment in the "Three Rural" sectors (agriculture, rural areas, and farmers), spearheading monetary policy implementation, contributing to macroeconomic stability, curbing inflation, supporting economic growth, and ensuring social welfare.

Agribank has had a significant influence on providing credit to key economic sectors such as agriculture, forestry, fisheries, and rural economic development. As of now, Agribank is the only commercial bank in Vietnam entirely owned by the State, with the largest scale and operational network among the country's credit institutions. It operates 2,300 branches and transaction offices nationwide, including remote areas and islands, and employs nearly 40,000 staff.

Agribank continues to lead by example, strictly and effectively implementing national monetary policies as well as the directives and policies of the Party and State regarding the "Three Rural" sectors, monetary systems, and banking. It has particularly excelled in credit policies for agricultural and rural development. These efforts have significantly contributed to macroeconomic stability, inflation control, growth promotion, social welfare assurance, and the sustainable modernization of agriculture, a vital pillar of the economy.

2. Body of the manuscript

2.1. Theoretical Basis

Financial performance metrics in the banking sector play a crucial role in assessing the health and operational efficiency of financial institutions. Key indicators include Return on Assets (ROA), Return on Equity (ROE), Net Interest Margin (NIM), and Capital Adequacy Ratio (CAR). These metrics not only provide insights into operational performance but also reflect the level of risk and financial sustainability of a bank.

Return on Equity (ROE): This is a measure of the profitability generated from shareholders' equity. The formula is as follows:

$$ROE = \frac{\text{Profit After Tax (PAT)}}{\text{Equity}}$$

- *Return on Assets (ROA):* Measures the efficiency of a bank's use of its assets in generating profit. The formula is as follows:

$$ROA = \frac{\text{Profit After Tax (PAT)}}{\text{Asset}}$$

Both ROA and ROE are widely used to compare the financial performance between banks.

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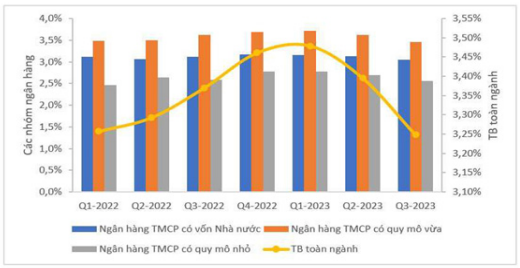
Net Interest Margin (NIM): This is an important measure that reflects a bank's profitability. NIM is calculated by subtracting interest expenses from interest income and then dividing by the total interest-bearing assets, thereby reflecting the bank's ability to generate profits from its core operations.

$$NIM = \frac{\text{Net Interest Income}}{\text{Average Earning Assets}} \times 100$$

In which, net interest income includes: Deposits at the State Bank of Vietnam + Deposits with other financial institutions (excluding provisions for risks) + Investment securities (excluding provisions for devaluation) + Loans to customers (excluding provisions for risks).

A positive Net Interest Margin (NIM) indicates effective investment by the bank, while a low or negative NIM suggests poor business performance. When comparing NIM, it is necessary to assess it against other companies in the industry and observe trends over time. For example, the 2023 Vietnam banking sector report provides statistics on the NIM of various banks as follows:

Figure 1. Classification of NIM by Group from Q1/2022 to Q3/2023



Source: Banking Academy, Vietnam Banking Report 2023, Q3

- *Capital Adequacy Ratio (CAR):* Measures a bank's ability to meet its financial obligations and absorb losses, while also complying with the capital requirements set by regulatory authorities. CAR is an indicator that reflects the relationship between a bank's equity and its risk-weighted assets. According to the regulations of the State Bank of Vietnam in Circular 41/2026/TT-NHNN, the formula is as follows:

$$CAR = \frac{C}{RWA + 12.5\,(K_{OR} + K_{MR})} \times 100$$

In which, C: Equity capital; RWA: Total risk-weighted assets; K_{OR}: Capital required for operational risk; K_{MR}: Capital required for market risk.

A high CAR indicates financial stability, but it may also suggest that the bank is pursuing a conservative strategy, limiting profit growth. The capital adequacy ratio is a fundamental measure for central banks (CB) to assess the financial health of commercial banks. If a CB determines that a commercial bank does not meet the required capital adequacy, that bank is considered unable to operate normally and is forced to close. The capital adequacy ratio helps determine the ability to meet long-term debt obligations and absorb other risks. Therefore, central banks in various countries always set and monitor the minimum CAR that commercial banks must maintain. According to the Basel II standards, commonly applied in banking systems worldwide, the CAR is 8%. In Vietnam, Circular 36/2014/TT-NHNN sets the CAR at 9%. At the end of 2016, Circular 41/2016/TT-NHNN reduced the minimum ratio to 8%, in line with Basel II regulations.

Other indicators: In addition to the basic metrics, measures such as the Efficiency Ratio, Loan-to-Assets Ratio, and Risk-Adjusted Return on Capital (RAROC) also provide detailed insights into a bank's operational efficiency and the level of risk it faces. For example, the efficiency ratio assesses the level of effectiveness in controlling operating costs, while RAROC considers the profitability of investment portfolios based on risk levels.

Evaluating a bank's financial performance cannot be separated from the overall economic context and risk management strategy. This is especially true as banks increasingly apply advanced technologies such as big data and artificial intelligence to improve their risk management capabilities and optimize performance.

2.2. Business Performance of Agribank Based on Financial Indicators

The business performance of Agribank in recent times is presented in Table 1.

Table 1. The financial business performance of Agribank

Years	Net profit/loss from service activities	Net profit/loss from foreign exchange and gold trading activities	Net profit/loss from trading securities	Net profit/loss from the purchase and sale of investment securities	Net profit/ loss from other activities	Total profit before tax	Profit after tax
2018	3,763,116,000,000	704,649,000,000	6,255,000,000	52,965,000,000	8,023,823,000,000	7,345,482,000,000	5,769,524,000,000
2019	4,591,035,000,000	1,030,125,000,000	9,332,000,000	(24,754,000,000)	11,006,030,000,000	14,116,530,000,000	11,247,778,000,000
2020	4,386,825,000,000	939,732,000,000	-	113,760,000,000	8,108,077,000,000	12,965,931,000,000	2,583,084,000,000
2021	4,311,810,000,000	1,515,021,000,000	-	62,844,000,000	8,091,458,000,000	14,502,469,000,000	2,891,350,000,000
2022	4,383,232,000,000	4,383,232,000,000	4,383,232,000,000	4,383,232,000,000	4,383,232,000,000	22,538,625,000,000	18,043,000,000,000
2023	4,901,464,000,000	4,901,464,000,000	4,901,464,000,000	4,901,464,000,000	4,901,464,000,000	25,859,182,000,000	20,695,801,000,000

Source: Compiled from Agribank's Financial Statements

From the statistical results in Table 1, there are

several observations regarding Agribank's business performance as follows:

Net profit/loss from service activities: The net profit/loss from Agribank's service activities increased significantly in 2019 (22%), then slightly decreased in 2020 and 2021. By 2023, this figure continued to rise (11.82%), indicating a recovery trend after previous fluctuations.

Net profit/loss from foreign exchange trading: The results show that this indicator experienced strong growth in 2019 (46.19%) and reached an extraordinary increase in 2021 (61.22%). However, since 2022, foreign exchange activities have undergone changes, leading to greater stability in this indicator, with a slight increase of 11.82% in 2023.

Net profit/loss from trading securities: The results in Table 2.1 show a dramatic increase in profit/loss from trading securities in 2022 (46,869.91%) due to significant changes in securities trading activities. In 2023, this indicator maintained a growth rate of 11.82%.

Net profit/loss from investment securities trading: This indicator at Agribank has experienced significant fluctuations, with a growth rate of -146.74% in 2019, a sharp decline in the following years, and then an extraordinary increase in 2022 (6,874.78%).

Net profit/loss from other activities at Agribank from 2018-2023: There was a growth in profit/loss from other activities in 2019 (37.17%), but it gradually decreased in the following years and stabilized at 11.82% in 2023.

Total profit before tax of Agribank in the period from 2018-2023: There were significant changes. The profit before tax grew substantially by 92.18% in 2019 but decreased in 2020 (-8.15%) and rebounded strongly in 2022-2023 (14.73%).

Profit after tax: The growth was extraordinary in 2019 (94.95%) but dropped sharply in 2020 (-77.03%) due to market factors. After that, the profit showed a tendency to stabilize, reaching 14.7% in 2023.

These growth rates demonstrate the clear fluctuations of each indicator over the years, reflecting market impacts and strategic adjustments made by the bank in the post-pandemic period.

Analysis of Some Profitability Indicators of Agribank:

The business performance analyzed includes the indicators ROA, ROE, credit growth rate, and the loan portfolio/total assets ratio of the bank. The results of the business performance from 2018 to 2023 are summarized in Table 2.

Table 2. Some indicators of profitability

Years	Return on Assets (ROA)	Return on Equity (ROE)
2018	0.45%	9.92%
2019	0.77%	16.24%
2020	0.16%	3.62%
2021	0.17%	3915.51%
2022	0.96%	20.74%
2023	1.01%	20.59%

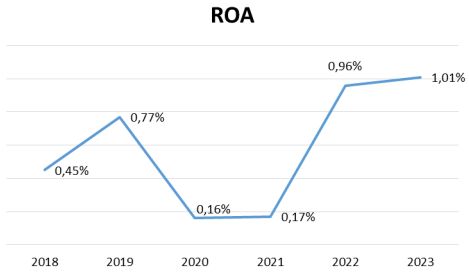
Source: Compiled by the author from Agribank's Financial Statements/ Annual Reports

The data above reflects some important financial indicators of Agribank over the years from 2018 to 2023, including Return on Assets (ROA) and Return on Equity (ROE). Below are some detailed observations:

Return on Assets (ROA)

Figure 2.2 reflects the trend of Agribank's Return on Assets (ROA) over the years.

Figure 2. The trend of fluctuations in ROA from 2018 to 2023



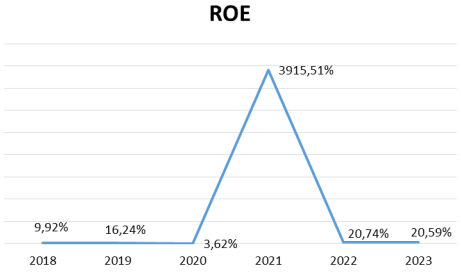
The results in Table 2 and Figure 2 show that the ROA indicator has shown a slight increase from 0.45% in 2018 to 1.01% in 2023. This indicates an improvement in Agribank's asset utilization efficiency over time, especially after the pandemic period.

Return on Equity (ROE)

The trend of fluctuations in Return on Equity (ROE).

The Return on Equity (ROE) in 2021 showed a significant growth, reaching 3915.51%, an exceptionally high figure compared to other years. This could be attributed to a special event that led to a large fluctuation in profit relative to equity. Excluding 2021, Agribank's ROE has remained relatively high, particularly in 2019 (16.24%) and 2022 (20.74%).

Figure 3. The trend of fluctuations in ROE from 2018 to 2023



In general, the analysis of the data reflects notable changes in Agribank's financial performance over the years, with a trend of slowing credit growth and improving asset utilization efficiency. However, the ROE figure for 2021 should be carefully examined to clarify the cause of this anomaly.

Current Status of Credit Management Efficiency at Agribank

Credit management efficiency reflects the bank's ability to manage and allocate credit effectively to optimize profits, minimize risks, and ensure the quality of its loan portfolio. Credit management efficiency is demonstrated through objectives such as minimizing bad debts, which requires Agribank to manage loans effectively in order to reduce the bad debt ratio and, in turn, minimize potential losses due to uncollected loans. Another objective is to ensure that credit contributes to profit stability, making it predictable and contributing to the bank's overall profitability. Furthermore, credit management efficiency involves evaluating and selecting loans for the right clients, meeting the right needs, and ensuring the clients' ability to repay. Lastly, it aims to ensure that the bank's credit is managed in accordance with legal regulations and internal policies, thereby minimizing illegal actions and legal risks.

However, the efficiency of credit management also depends on factors such as customer evaluation processes, risk assessment methods, debt collection and monitoring systems, as well as the expertise and experience of the credit management team in the bank.

Some indicators of credit management efficiency are presented in Table 3, including: Capital Adequacy Ratio (CAR), Liquidity Ratio, the proportion of short-term capital used for medium- and long-term loans, credit growth, and credit outstanding/Total assets.

Table 3. Some Indicators of Credit Management Efficiency at Agribank

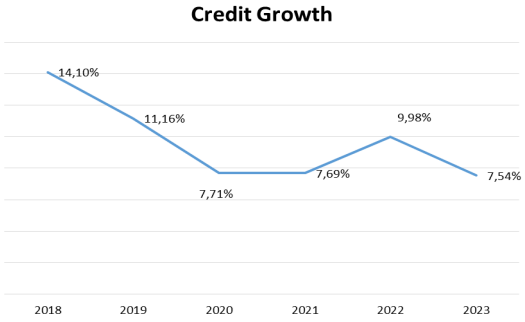
Years	Capital Adequacy Ratio (CAR) Min – 8%	Liquidity Ratio Min = 10%	Short-term Funding to Long-term Loan Ratio Max = 30%	Credit Growth	Credit Portfolio to Total Assets Ratio
2018	9.54%	14%	30.3%	14.10%	77.41%
2019	9.2%	15.8%	26.9%	11.16%	75.99%
2020	10.3%		-	7.71%	75.86%
2021	10.2%	15.6%	-	7.69%	75.56%
2022	10.6%	16.6%	25.18%	9.98%	75.10%
2023	>9%	--	23.11%	7.54%	74.04%

Source: Calculations and compilation by the author

Credit Growth Rate

Credit growth reflects the change in the total outstanding loans of a bank over a certain period of time. It is an important indicator that shows the bank's readiness to provide capital to the economy and the borrowing needs of businesses and individuals. The trend of credit growth at Agribank is shown in Figure 4.

Figure 4. The credit growth trend from 2018 to 2023



The credit growth trend has been gradually decreasing from 14.10% in 2018 to 7.54% in 2023. This decrease may reflect the challenging economic environment or more cautious lending practices by financial institutions, particularly following the impact of the COVID-19 pandemic.

Loan-to-Asset Ratio

The Loan-to-Asset Ratio reflects the degree of focus a bank has on its lending activities in comparison to other investments and assets. This is an important indicator for assessing the risk level and business strategy of the bank.

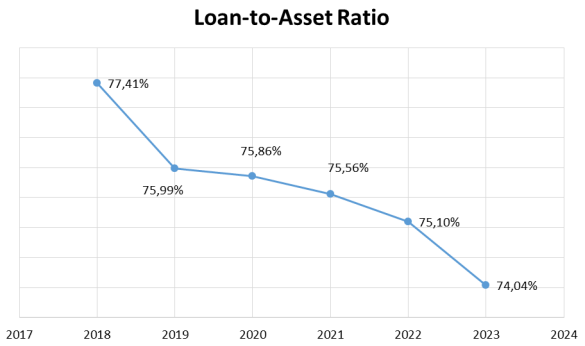
A high Loan-to-Asset Ratio suggests that the bank is concentrating most of its assets into loans, which can lead to higher profits but also increases the risk if clients fail to repay on time. Furthermore, this ratio also indicates liquidity risks. If the ratio is too high, the bank may struggle to maintain liquidity, especially when faced with overdue loans

or bad debts. Loans are typically harder to liquidate than other assets like securities or cash.

On the other hand, a lower ratio may indicate that the bank is prioritizing stability, taking fewer risks, and investing in more liquid assets. This ratio also reflects how effectively the bank is using its assets. A balanced Loan-to-Asset Ratio demonstrates that the bank is successfully managing the trade-off between generating profit from its lending activities and managing risk. If the ratio is too low, the bank may not be utilizing its assets effectively, particularly by not optimizing profits from lending.

The detailed analysis of the Loan-to-Asset Ratio at Agribank is presented in Figure 5.

Figure 5. The trend of fluctuations in the Loan-to-Asset Ratio from 2018 to 2023



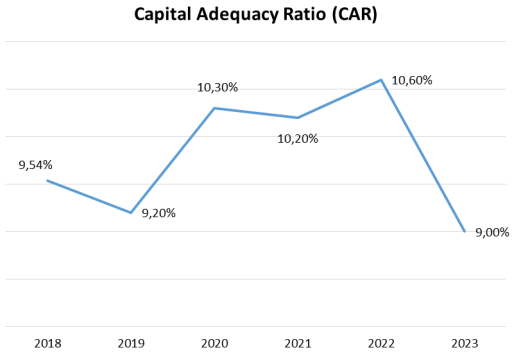
The results in Table 2 show that the Loan-to-Asset Ratio has slightly decreased over the years, from 77.41% in 2018 to 74.04% in 2023. This may indicate that Agribank is reducing its reliance on credit to finance its assets, possibly by raising more equity capital or optimizing its debt levels.

Capital Adequacy Ratio (CAR)

The Capital Adequacy Ratio (CAR) is an important financial indicator used by financial institutions and banks to measure capital safety. CAR represents the ratio between a bank's own capital and its total risk-weighted assets, reflecting whether the bank has enough capital to absorb potential losses and protect depositors. According to the Basel II and Basel III regulations, banks are typically required to maintain a minimum CAR of 8% or higher (depending on the country). Compliance with the CAR helps banks reduce financial risks and strengthen the confidence of customers and investors.

The results reflecting the trend of fluctuations in Agribank's Capital Adequacy Ratio are shown in Figure 6.

Figure 6. The trend of fluctuations in the Capital Adequacy Ratio (CAR) from 2018 to 2023



Hệ số an toàn vốn cho thấy các năm từ 2020-2022 kết quả trên 10%, trong khi các năm còn lại có hệ số là khoảng 9%. Các kết quả này đều cho thấy hệ số CAR đều đạt qua ngưỡng đảm bảo 8%.

3. Solutions

- The application of information technology and digital transformation will help Agribank enhance management efficiency, minimize risks, and improve security, thus improving ROA and ROE, as well as overall business performance.

- Diversifying financial products and services will help Agribank increase revenue and profit, while reducing reliance on traditional income sources. Agribank should develop additional high-value-added financial products to meet the diverse needs of customers. This includes green credit products, digital banking services, and financial products for high-tech agriculture.

- Strengthening risk management and cost control will help Agribank maintain stability and sustainability in its business operations, thereby enhancing profitability.

4. Conclusion

Agribank has made significant progress in credit management, maintaining good safety and liquidity ratios, while also improving capital efficiency. However, the gradual decline in credit growth needs to be closely examined to ensure sustainable development in the future.

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PROMOTING TRADE PROMOTION ACTIVITIES IN THE NEW CONTEXT

MA. Hoang Thi Thuy*

Abstract: ***Trade promotion is identified as an important solution to help open and diversify markets, stabilize exports in the context of unstable world trade. In Vietnam, in order to export, trade promotion activities are one of the tasks that state management agencies pay great attention to. The article discusses the overview of trade promotion, the current status of trade promotion activities in Vietnam in recent years, and from there proposes solutions to promote this activity in the coming time.***

• Keywords: *trade promotion, export markets, FTAs.*

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1. Introduction

Promoting trade promotion activities means enhancing efforts to boost the buying and selling, and exchange of goods and services, while also improving the image and reputation of products, businesses, and localities in the market. This includes activities such as promotions, advertising, fairs, exhibitions, and other initiatives aimed at connecting sellers and buyers, expanding the market, and increasing revenue.

In Vietnam, trade promotion activities are one of the tasks that state management agencies pay great attention to. With various innovative solutions, trade promotion activities have achieved many positive results, expanding domestic and export markets. Especially in the early months of the year 2025, Vietnam's socio-economic development still faced many difficulties and challenges. Meanwhile, the global and regional situation continues to evolve rapidly, complexly, and unpredictably; geopolitical tensions and competition between major countries are increasing; the US announcement of high tariffs on its partners poses a risk of global economic recession. This is a major challenge, posing an urgent need to adjust and supplement trade promotion solutions and tasks to improve the economy's adaptability, protect domestic production, develop the domestic market and promote exports, maintain the momentum of recovery and sustainable economic development in 2025 and the following years.

In that context, the Prime Minister has just issued Directive No. 18/CT-TTg dated June 18, 2025, on implementing tasks and solutions to promote domestic and foreign trade to boost trade activities in 2025. Many tasks have been assigned to ministries, branches, and localities to promote trade promotion activities for export, increase the market share of Vietnamese goods in traditional markets and markets with FTA/CEPA with Vietnam, while expanding and diversifying export markets, and reducing dependence on some high-risk markets.

2. Overview of trade promotion

Definition

Figure 1: State management function of the Ministry of Industry and Trade on trade promotion

	State management function
1	Hosting and coordinating with ministries, ministerial-level agencies, relevant agencies, and local authorities to develop and implement the National Trade Promotion Program and the National Brand Program in accordance with the law; develop and organize the implementation of trade promotion activities in accordance with the law
2	Guiding and inspecting the content and conditions of commercial advertising, branding, fairs, trade exhibitions, promotions, displays, and introductions of goods and services domestically and internationally in accordance with the provisions of law
3	Managing and monitoring state budget sources for annual trade promotion activities in accordance with the law
4	Managing and directing the activities of Vietnamese trade promotion offices abroad; managing representative offices of foreign trade promotion organizations in Vietnam according to the provisions of law
5	Establishing, operating, and developing a trade promotion infrastructure system and digital infrastructure serving trade promotion.

Source: Article 2, Decree 96/2022/ND-CP

A trade promotion is a marketing activity that business - to - business companies engage in to attract more customers. These activities can include promotional discounts, financial rebates, and competitions (Indeed, 2025).

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In Viet Nam, trade promotion means activities of promoting and seeking opportunities for the purchase or sale of goods and provision of services, including sale promotion, commercial advertisement, display and exhibition of goods and services, and trade fairs and exhibitions (Article 3, the Commercial Law 2005). The Ministry of Industry and Trade is the agency performing the tasks and powers of state management of trade promotion as prescribed in Clause 21, Article 2 of Decree 96/2022/ND-CP of the Government.

Benefits of trade promotion

In trade activities, trade promotion activities are extremely important. Trade promotion encourages customers to buy products, promotes faster and more purchases. In addition, trade promotion is also used to attract customers to see the difference between the products of the business and those of other competitors. Trade promotion is also a tool used to persuade customers. Trade promotion plays an intermediary role, helping businesses find partners, expand markets, and reach target customers. Trade promotion activities such as participating in international fairs and exhibitions, or surveying foreign markets, can help businesses expand export markets and attract foreign investors. Trade promotion can influence customers' consumption behavior, helping them recognize and choose products/services that suit their needs.

Trade promotion also brings many benefits: Building the image of the company and the product; Finding large and stable customers and markets for the company; Informing about the characteristics of the product; Building awareness of new products; Promoting existing products; Repositioning the image or uses of slow-selling or saturated products; Creating enthusiasm for distribution members; Persuading customers to change products; Promoting customers to buy; Building close relationships with customers; Providing after-sales service to customers; Maintaining brand loyalty; Creating advantages for the company compared to competitors (Le Minh Truong, 2022).

Form of trade promotion

Normally, there are many forms of trade promotion as follows:

- *Advertising:* Advertising is a trade promotion activity of a trader to introduce to customers its business activities of goods and services. Advertising is a form of indirect communication, carried out through paid media and clearly identifying the source of funding.

- *Promotion*: Promotion is a trade promotion ***activity*** by merchants aimed at encouraging the purchase and sale of goods and the provision of services by offering customers certain benefits.

- *Trade Fair and Exhibition*: A trade fair and exhibition is a trade promotion activity conducted within a specific time frame and at a designated location where businesses display and introduce goods and services with the aim of boosting sales and seeking opportunities to conclude purchase contracts for goods and service contracts.

- *Display and Introduction of Goods and Services:* The display and introduction of goods and services is a trade promotion activity by traders using goods, services, and related materials to introduce these goods and services to customers.

- *Public Relations*: Public relations is the proactive management by an agency, organization, or business of community communication relationships to build and maintain a positive image of itself.

In Viet Nam, according to the Commercial Law No. 36/2005/QH11, there are many forms of trade promotion activities, as in Figure 2.

Figure 2: Forms of trade promotion activities

Forms	Content
Sale promotion	Sale promotion is an activity of trade promotion conducted by traders to promote the purchase and sale of goods or the provision of services by offering certain benefits to customers
Commercial advertising	Commercial advertising means trade promotion activities of traders aimed at introducing to customers their goods and services
Display and introduction of goods and services	Display and introduction of goods and services means trade promotion activities of traders that use goods and/or services and documents thereon to introduce such goods and/or services to customers.
Trade fairs and exhibitions	Trade fairs and exhibitions mean trade promotion activities conducted in a concentrated manner at particular locations and for given periods of time for traders to display and introduce their goods and/or services for the purpose of promoting them and seeking opportunities for entering into contracts for the sale and purchase of goods or service contracts.

Source: The Commercial Law No. 36/2005/QH11

Methods of Trade Promotion

The methods of trade promotion include: Regular, continuous trade promotion; Periodic trade promotion; Occasional trade promotion; Campaign-based trade promotion.

3. Current status of trade promotion in Vietnam

3.1. Results achieved

Over the past years, with many innovative solutions, Viet Nam's trade promotion activities

have achieved many positive results, expanding domestic and export markets.

- In recent years, the system of legal documents in trade promotion activities has basically ensured state management, created a stable and suitable legal environment and facilitated trade promotion organizations and industry associations to carry out trade promotion activities; thereby, trade promotion activities have developed and contributed significantly to export growth and export market expansion. Through the implementation of trade promotion policies and mechanisms in practice, the Vietnamese Government's supporting role in export activities has been affirmed, improving the capacity of trade promotion organizations, industry associations, enterprises, and cooperatives effectively, contributing positively to building and promoting quality goods in the domestic and international markets. However, the practical application of trade promotion policies and mechanisms in implementing trade promotion activities in recent times has caused problems (Vu Ba Phu, 2025).

- Decentralization, delegation of authority, and simplification of administrative procedures in the field of trade promotion to facilitate organizations and businesses have been implemented synchronously and effectively. Decree No. 128/2024/ND-CP of the Government has simplified 10 administrative procedures on promotional activities and trade fairs, and exhibitions, and is expected to reduce more than 100,000 administrative procedures on promotion each year and cut over 90% of administrative procedure compliance costs for businesses.

- Many new trade promotion activities have been implemented for the first time, effectively supporting businesses to increase exports in Viet Nam's strong industries. At the same time, contributing to diversifying trade promotion channels to support businesses in promoting, introducing products, and connecting with foreign partners and businesses.

- Promoting brand development, especially national brands. Vietnamese enterprises are increasingly interested in brand development and increasingly improving the quality of Vietnamese products to participate more deeply in the global value chain. At the 9th national brand product selection period in 2024, 359 products of 190 enterprises were recognized as national brand products, an increase of 10.5% in the number of products and 10.5% in the number of enterprises compared to the 8th selection period (Department of Trade Promotion).

- Trade promotion to promote green economic development has been focused on and implemented through many activities such as: Green Economic Forum and Exhibition 2024 (GEFE 2024) with the theme "Creating a Green Future", Export Promotion Forum 2024 with the theme "Promoting green exports", Ceremony to announce products achieving national brands in 2024 with the theme "Strengthening towards the Green Era"... to raise awareness and contribute to promoting green economic development, green transformation as well as contributing to promoting economic restructuring associated with growth model innovation, in order to achieve economic prosperity, environmental sustainability and social equity towards the successful implementation of the Net Zero target by 2050.

- Market diversification is a strategy that has always been directed by the Ministry of Industry and Trade, and the Trade Promotion Agency has actively coordinated with relevant units to achieve good results, recognized by the business community. In recent times, the Trade Promotion Agency has focused on implementing activities in new and potential markets, such as Latin America, the Halal market, India, Russia, and Middle Eastern countries. This helps reduce dependence on some traditional markets.

- Organizing seminars and training programs to support businesses in understanding the standards and regulations of each market to meet export requirements, especially with markets where Vietnam has free trade agreements (FTAs) to reduce tariff barriers and increase the ability to penetrate international markets.

- The Ministry of Industry and Trade has also actively digitized trade promotion activities. It encourages businesses to apply information technology and participate in cross-border e-commerce platforms (such as Amazon, Alibaba, Shopee) to reach international customers. Organize training programs on e-commerce, digital marketing, and the use of artificial intelligence to improve business competitiveness.

- Promoting green products by supporting businesses in developing products that meet

circular economy and sustainable development standards, especially for markets such as the EU and Northern Europe, which have strict environmental requirements.

- Strengthening international fairs, exhibitions, and trade. In 2024, nearly 6,000 businesses were supported to participate in these activities, and many contracts were signed with values up to tens of millions of USD. The Department also provided more than 500 consultations on markets and industries, helping businesses seize opportunities in new and large markets.

3.2. Difficulties and challenges

Besides the advantages, there are still difficulties that affect trade promotion activities, such as:

- Policies on improving the trade promotion capacity of local trade promotion organizations, associations, and enterprises have not yet met the rapid changes in trade promotion methods in the new situation.

- Limited resources (human resources, finance), lack of funding compared to the required investment level to ensure competitiveness in export promotion activities; lack of infrastructure to organize large-scale trade promotion activities to organize regional, national, and international trade promotion events (Vu Ba Phu, 2025).

- State budget resources allocated for trade promotion activities are still limited, and financial support mechanisms for trade promotion activities have not been adjusted promptly by competent authorities, leading to certain difficulties in implementation.

- The organizational model of trade promotion agencies in localities in Viet Nam is not unified, causing difficulties for trade promotion agencies at both central and local levels in coordinating and linking to implement trade promotion activities, supporting businesses, associations, industries, etc.

- Limited resources of enterprises. Most Vietnamese enterprises are small and medium-sized, lacking the capital and experience to participate in large-scale trade promotion programs or quickly adjust business strategies in the face of tariff barriers.

- Many businesses have not been fully updated on new tariff policies or related regulations (such as the origin of goods, anti-tax evasion). Trade promotion programs sometimes do not provide in-depth or timely information to help businesses adapt.

- Competition in trade promotion activities in the international market. Countries such as India, Thailand, and Indonesia are also stepping up trade promotion to take advantage of opportunities from the shift of supply chains away from China. This makes it difficult for Vietnamese businesses to retain partners, even with support from trade promotion programs.

- Trade promotion activities are currently scattered, unfocused, lacking inter-sectoral connections, and not long-term. The forms and methods of trade promotion are not diverse and rich, and there are no modern and innovative forms of trade promotion. The scale of export promotion activities is still small, not commensurate with the export potential of Viet Nam's key industries (Vu Ba Phu, 2025).

4. Proposed solutions

4.1. For authorities

- Strengthen export promotion, effectively exploit free trade agreements to diversify markets and supply chains; consolidate and expand market share in traditional markets; create breakthroughs in expanding new potential export markets.

- Diversifying export markets should target a number of "destination" markets. Specifically, for the Asian region, increase exports to India, Korea, ASEAN (such as Indonesia, Malaysia); for the Middle East market (Saudi Arabia, UAE) - markets with high demand for agricultural products, processed foods, and textiles. For the Latin American market, exploit markets such as Mexico, Brazil, and Argentina, where there is great potential but has not been fully exploited. For the Halal market, promote exports to Muslim countries (Indonesia, Pakistan, Bangladesh) with products that meet standards.

- Changing direction to take advantage of FTAs, including using FTAs to help businesses access markets in Canada, Australia, Japan, the EU, China, and ASEAN to reduce tariff costs and access markets with competitive advantages.

- Focusing on promoting imports, diversifying import markets to ensure input supply to serve domestic production development and export.

- Strengthening to consult, provide updated information on the market, changes in trade

policies, standards, regulations, and consumer tastes of import markets. Thereby, contributing to creating a proactive position and improving the competitiveness of Vietnamese enterprises when approaching international markets.

- Continuing to improve business capacity through training activities on trade promotion skills, application of information technology in trade promotion, green transformation, digital transformation, ecological design, circular economy; supporting businesses to develop green economic products, and circular economy to effectively participate in the global value chain.

- Continuing to improve business capacity through training activities on trade promotion skills, application of information technology in trade promotion, green transformation, digital transformation, ecological design, circular economy; supporting businesses to develop green economic products, and circular economy to effectively participate in the global value chain.

- Continuing to support businesses to participate in major fairs such as Anuga (Germany), Sial (France); Canton Fair (China), World Food Moscow, or Trade Expo Indonesia... to find new partners; Organize Vietnamese booths at international events with support in terms of costs and logistics.

- Promoting cross-border e-commerce, developing digital data infrastructure, and expanding the scope of trade promotion support, regardless of the type of enterprise or intermediary organization. No distinction between Vietnamese enterprises or FDI enterprises, as long as they contribute to export, investment, and the national brand.

- Considering policies to directly support businesses participating in specialized fairs and exhibitions in potential markets, helping to approach customers, distributors, and international strategic partners more effectively. Promote and have financial mechanisms and professional coordination for overseas Vietnamese to participate in organizing events, trade promotion programs, and investment and business connections in the host country.

- Supporting businesses in finding partners to move part of their production lines to ASEAN countries (such as Indonesia and Thailand) to take advantage of tariff incentives in FTAs; supporting businesses in finding alternative sources of raw materials from markets that are not subject to high tariffs.

- Coordinating to review, arrange, and increase financial resources for trade promotion activities, brand promotion for Vietnamese enterprises, and export products.

4.2. For industry associations

- Supporting businesses in responding to tariffs through continuous updates on new tax policies; advising businesses on trade defense measures and how to respond to anti-tax evasion investigation requirements.

- Closely coordinating with the Ministry of Industry and Trade and other ministries, branches, and localities in implementing domestic and foreign trade promotion programs; proactively proposing trade promotion contents according to industry characteristics to integrate into national programs.

- Promoting the organization of market survey delegations, trade exchanges, and connections between domestic and foreign enterprises; preside over or coordinate the organization of domestic and international specialized fairs and exhibitions.

- Actively participating in and promoting digital transformation in industry trade promotion activities, including applying e-commerce platforms, logistics, digital marketing, and data analysis tools to support businesses in effectively reaching customers.

5. Conclusion

Trade promotion is one of the important solutions to boost Vietnam's export activities in the context of international economic integration. Based on the implementation of the above-mentioned solutions, trade promotion activities will certainly continue to be effective, contributing to high growth for Vietnam's economy in the coming years.

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THE ROLES OF MORAL NORM AND NEED FOR STATUS IN PREDICTING GREEN PURCHASE INTENTION: EMPIRICAL EVIDENCE FROM VIETNAMESE GEN Z CONSUMERS

MA. Hoang Tuan Dung - PhD. Nguyen Hoang Linh - Prof.PhD. Nguyen Thi Tuyet Mai

Abstract: ***Based on the Value-Attitude-Behavior (VAB) framework, this study investigates the roles of moral norm and need for status as two important antecedents of green purchase intention among Gen Z consumers in Vietnam. Data were collected from a quantitative survey of 426 urban Gen Z consumers conducted in Hanoi, Vietnam. PLS-SEM was employed to test the proposed model and hypotheses. The results show that all five hypotheses received support from the data, confirming the roles of moral norm and need for status in predicting attitude and purchase intention. Moral norm was found to be a stronger predictor compared need for status. This study contributes to the extant literature by enriching our knowledge of the interesting and important relationships between moral norm and need for status, and their influence toward green purchase intention of Gen Z consumers in Vietnam. Further implications for fostering green purchase among younger Vietnamese consumers are subsequently discussed.***

• Keywords: *green purchase intention, moral norm, need for status, gen Z, Vietnam.*

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1. Introduction

As the world grapples with increasingly severe environmental disasters and pollution that profoundly impact communities, markets, consumers, and ecosystems, environmental concern has consequently captured significant attention from both academicians and practitioners worldwide However, past research on pro-environmental consumption has primarily focused on developed countries, leaving developing countries largely underrepresented, especially in Asian contexts (Nguyen 2019; Nguyen et al., 2019). Therefore, there is a clear need for further study to gain a better understanding of this important consumption behavior, specifically in emerging economies like Vietnam, which is currently experiencing significant economic growth accompanied by environmental degradation.

In these countries, Gen Z (born between 1997-2012) is a pivotal demographic in global environmental protection. Recognized for their heightened awareness and responsibility toward environmental issues, these young, well-educated consumers are more open to embracing innovative concepts like sustainable or eco-friendly consumption practices and (Joshi and Rahman, 2017). In Vietnam, Gen Z consumers are increasingly informed about sustainable and responsible consumption practices, thanks to greater access to environmental education, social media, and international sustainability trends. Given Gen Z's role as a growing key consumer segment in Vietnam, they are expected to play a leading role in the adoption of green purchase behavior.

While prior research has explored various aspects of green purchase intention and behavior among Gen Z consumers, there are several phenomena remain underexplored or show inconsistent findings. For example, green purchase behavior is often considered to be strongly influenced by a sense of normative moral obligation, typically framed in terms of social responsibility and the avoidance of negative consequences (Barbarossa & De Pelsmacker, 2016; Liu et al., 2020). However, Arvola et al. (2008) empirically demonstrated that behavior guided by moral norms can also be motivated by positive experience. This highlights the need to re-examine moral motivations not only as obligations but also as potential sources of personal fulfillment. Secondly, the role of status motivation in green purchase is controversy and inconsistent in literature. While some consumers purchase green products under concern for the environment or driven by personal values such as altruism or biospheric concern, other consumers engage in green purchase primarily to signal their status without any regard to the environment (Nguyen, 2019) or view trendy green products as a means to display

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success (Nguyen et al., 2019). This suggests that status should not only be viewed as a behavioral motive or external driver but also as an underlying personal value that can shape green purchase behavior. Furthermore, this relationship appears to be context-dependent, particularly concerning a region's developmental level (Nguyen, 2019). Since prior research on green consumption often focuses on developed contexts or general populations (Fatema, 2024) there should be further investigation into how socio-symbolic motivations influence green purchase intentions among Gen Z consumers in emerging markets. To address these identified gaps, this study will use the Value-Attitude-Behavior (VAB) framework to empirically investigates the influence of moral norm (from the perspective of a positive experience) and status need on the behavioral intention to purchase green products among Gen Z consumers in Vietnam.

2. Theoretical framework and hypotheses development

Theoretical framework

Green consumption refers to purchasing decisions and consumption behaviors that aim to minimize negative environmental impact and support sustainable production and consumption patterns. This includes opting for products that are biodegradable, recyclable, energy-efficient, ethically sourced, or manufactured with minimal environmental harm. Different theoretical frameworks, such as the Value-Belief-Norm (VBN) theory, Theory of Planned Behavior (TPB), and Self-Determination Theory (SDT), have been employed to explore this behavior. While these models have significantly advanced our understanding of pro-environmental actions, they often prioritize cognitive and rational drivers and overlooking the symbolic or personally motivated factors increasingly shaping consumer decisions (Fatema, 2024). With green consumption becoming more tied to identity and lifestyle, scholars have highlighted the importance of examining its value and status signaling functions (Elliott, 2013; Huh and Kim 2024).

In order to examine green behavior under the perspective of value-oriented behavior, this study chose the Value-Attitude-Behavior (VAB), another prominent theoretical model used to understand pro-environmental behavior, as the theoretical framework. The VAB framework was proposed by Homer and Kahle (1988) to describe the cognitive hierarchy between value, attitude, and behavior. In this framework, values represent beliefs about what is important in life, such as altruism, biospheric concern, or egoistic interests. Attitudes reflect a person's positive or negative evaluation of specific behaviors, such as purchasing green products. Finally, behavior is the actual action taken, such as buying eco-friendly goods or engaging in recycling. This model has been widely applied to explain why consumers engage in green consumption, highlighting the importance of underlying value orientations such as environmental concern or social responsibility (Schwartz, 1992; Segev and Liu, 2022).

With its root in social psychology, VAB framework suggests that personal values (e.g., altruistic, biospheric, egoistic) guide the formation of attitudes toward green products or sustainable practices. which in turn influence behavior. For example, consumers with strong biospheric values tend to develop positive attitudes toward sustainable products, which increase their likelihood of green purchasing. In this study, we argue that moral norm and need for status are also personal value that not only directly affect green purchase intention but also can both guide attitude toward such behavior. Specifically, green consumption in Vietnam is influenced by deeply held personal moral norms, which function as a core value guiding their beliefs and behaviors. These moral norms represent an internalized sense of duty, responsibility, and what is inherently "right" regarding environmental stewardship. Drawing upon theories of human values (Schwartz, 1992), these moral considerations can be rooted in universalism or benevolent values, emphasizing concern for the welfare of all people and nature. For Gen Z, who often exhibit heightened awareness of social and environmental justice, acting in an environmentally responsible manner is not just a cognitive decision but also stems from a fundamental conviction about their ethical obligation to protect the planet and contribute positively to society. This value, therefore, directly shapes their attitudes towards green products (e.g., "it is good to buy eco-friendly items") and, in turn, influences their green purchase intention. With regards to need for status, in contemporary society, particularly among younger generations, consumption choices often serve as powerful signals of identity, affiliation, and aspiration (Elliott, 2013). The desire to be perceived as modern, progressive, socially conscious, or even economically discerning can also be an ingrained personal value, aligning with self-enhancement values such as achievement and power in value frameworks (Schwartz, 1992). For Gen Z, who are highly connected and often express themselves through their consumption, acquiring green products can fulfill this intrinsic need for status by conferring social prestige, demonstrating ethical alignment, or indicating a desirable lifestyle (Huh & Kim, 2024). This value, therefore, forms the basis for positive attitudes towards green products (e.g., "buying this makes me look good/responsible") and subsequently

drives their green purchase intention. Thus, in our study, the construct of moral norm and need for status are integrated into VAB framework as the factor driving Gen z's green purchase intention.

Hypothesis development

Attitude is defined as a person's positive or negative assessment of carrying out a specific action (Ajzen, 1991). When applied to green purchase, this refers to how favorably or unfavorably an individual views purchasing environmentally friendly products, often influenced by perceived advantages like improved health, safety, and reduced ecological footprint. Numerous studies have consistently confirmed that a positive attitude toward environment friendly purchase significantly predicts green purchase intention, including those studies in Asia (Joshi and Rahman, 2015; Nguyen et al., 2019). The impact of attitude on intention to purchase has been established through extant literature, but the impact magnitudes of attitude have been inconsistent and dependent on the specific research context In this study, we re-test the relationship between attitude and purchase intention toward green products among Gen Z consumers in the context of Vietnam, an emerging economy in Southeast Asia. We expect to see similar findings pertaining to the significantly positive impact on purchase intention. Therefore, the following hypothesis is presented:

H1: Attitude toward green purchase is positively related to green purchase intention among Vietnamese Gen Z consumers.

Moral norm is defined as an individual's conviction that acting in a certain way is inherently right or wrong regardless of their personal or social consequences. It refers to internalized norms and values of important others, representing each person's own views about right and wrong learned during life (Schwartz, 1992). Moral norms are often operationalized as perceived moral obligation and have been used interchangeably with personal norms and moral obligation in literature (Arvola et al., 2008). What distinguishes moral norms is that the consequences of violating or upholding them are tied to one's self-concept. Schwartz (1992) said that moral norm expresses individual values and refers to internalized feelings of personal obligation to act in a certain way, often to avoid guilt. In the area of environmental research, moral norm has been considered an important antecedent of environment-friendly purchase behavior, with several previous studies integrated moral norm into their research models (Arvola et al., 2008; Thøgersen and Ölander, 2006). In other studies, moral norm was also found to have an indirect impact on intention through attitude (Liu et al., 2020). While the extant literature acknowledges the significant impact of moral norm on environmentally friendly purchases, research has not sufficiently investigated its positive aspect. Past studies predominantly conceptualized moral norm as a moral obligation, focusing on anticipated negative feelings arising from non-adherence to one's moral principles or ethical duties (Thøgersen and Ölander, 2006). On the other hand, a study by Arvola et al. (2008) is one of the very few that have examined the positive aspect of the moral norm rather than as negative feelings of obligation or guilt, focused on the positive self-enhancing feelings of doing the right thing. We argue that in the context of young Vietnamese consumers, examining the role of moral norm (i.e., consumers' positive and self-rewarding feelings associated with purchasing green products) is appropriate since the moral aspects related to green purchases are more likely to evoke positive than negative feelings.

Beyond shaping attitudes, moral norms are also recognized as direct drivers of pro-environmental and ethical behaviors. Previous research suggested that moral norm plays the role of a driving factor in explaining pro-environmental behaviors (Barbarossa and De Pelsmacker, 2016; Liu et al., 2020) or highlight their role as a direct predictor of purchase intention (Chen, 2016). Moral norms often mediate the relationship between social norms (which are stronger in collectivist cultures) and behavioral intentions (Arvola et al 2008, Liu et al., 2019), which means it can be a predictor of pro-environmental and ethical behaviors. Le et al. (2019) in a research on consumers in urban Vietnam market shows that collectivistic consumers strongly emphasized the environmental consequence of their purchase decisions. Thus, it is expected that moral norm has both direct and indirect impact (through attitude) on purchase intention. Therefore, the following hypothesis is presented:

H2: Moral norm is positively related to a) attitude toward green purchase and b) green purchase intention for Vietnamese Gen Z consumers.

Eastman et al. (1999) defined need for status as the motivational process through which individuals strive to elevate their social standing by acquiring consumer products that symbolize status, both for themselves and for those in their social circles. Studies by Griskevicius et al. (2010) suggest that green products, especially when priced higher and purchased in public settings, can serve as symbols of distinction, allowing individuals to simultaneously demonstrate pro-environmental commitment and elevate their social standing. Thus, activating status motives can lead individuals to favor green products over more luxurious, non-green alternatives. This aligns with the idea that attitudes toward green products may be positively shaped when such products carry symbolic and reputational value.

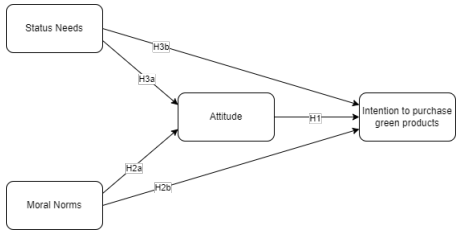
In Vietnam, a study by Nguyen and Tambyah (2017) reveal that factors such as material success orientation, materialism (particularly its success component), and individualism among urban consumers contribute to the prevalence of status consumption, providing them a sense of satisfaction. Despite the collectivist nature of Vietnamese society, the research reveals a high degree of individualism among urban consumers, who often perceive material possessions as indicators of success and achievement. Thus, it is expected that status-oriented individuals, especially among Gen Z, will develop more favorable attitudes toward green purchases when they perceive such products as both environmentally responsible and socially distinctive.

Besides affecting attitudes, the need for status also plays a direct role in influencing purchase intentions. Individuals with a strong desire for social recognition and admiration are more inclined to engage in status consumption, including the acquisition of products that signal prestige and social standing. In emerging markets such as Vietnam, status consumption is particularly salient, as consumers often use material goods to project success, sophistication, and alignment with global, modern lifestyles (Nguyen and Tambyah, 2011). Here, green products are often limited in availability, relatively high in price, and primarily distributed in urban areas, and thus can be seen as status product. Therefore, we argue that Gen Z individuals with strong status needs are more likely to intend to purchase green products, as doing so enhances both their social image and self-concept. While need for status is a universal human motive, individual differences in terms of motivation can lead to varied status-seeking behaviors, including materialistic consumption. Therefore, the following hypothesis is presented:

H3: Status need is positively related to a) attitude toward green purchase and b) green purchase intention for Vietnamese Gen Z consumers.

The proposed hypotheses are summarized in the conceptual framework in Figure 1.

Figure 1. Proposed Research Framework



3. Methodology

Measurement

For this study, data from Gen Z consumers in Hanoi and the surrounding urban areas were collected because their conditions (such as high living conditions and green product availability) are favorable for green consumption (Nguyen et al., 2019). To serve the purpose of data collection, our questionnaire was developed including all the scale items measuring the four constructs in the research model. Specifically, the three-item scale measuring attitude was developed based on Ajzen (1991) (e.g., 'purchase of green products is a smart choice'), and the three-item scale measuring purchase intention was adapted from Chan (2001) (e.g., 'I will consider buying less polluted products'). The scale measuring moral norm was adopted from Arvola et al. (2008) and included three items (e.g., 'buying green products instead of conventional products would feel like making a personal contribution to something better'). To measure need for status, we adopted a 5-item status consumption scale developed by Eastman et al. (1999). All the scale items are scored on a 7-point Likert-type format ranging from strongly disagree (1) to strongly agree (7).

To ensure a common understanding among respondents, the definition of green products was provided at the beginning of the questionnaire. The original English items underwent a back-translation process to ensure semantic consistency in Vietnamese. A pilot study was then carried out with a small sample of Gen Z consumers, and their feedback was used to refine the questionnaire for clarity and relevance.

Data collection and analysis

Participants were approached via online survey and supermarket intercepts. Research assistants were instructed to distribute the paper version of the questionnaire in the major supermarkets in Hanoi, Hung Yen, and Ninh Binh. The online survey was posted on Gen Z-related Facebook groups for maximum exposure. The collected paper questionnaires were then screened for missing data and validity to filter out non-valid responses before being merged with the online data.

After screening, we collected 426 valid responses. All respondents belong to Gen Z, from 18 to 27 years old (Nguyen and Nguyen, 2020). The average age is 20.7. The sample covers a wide range of income levels, with nearly half of the respondents earn more than 10 million per month, and a small percentage earning above the 18-million level. The data was analyzed via conducting partial least squares-structural equation modelling (PLS-SEM). PLS-SEM was chosen due to its superior ability to handle data without normal distribution and small sample sizes. We followed Hair et al. (2019)'s suggested procedure, which include reliability and validity of the measurement assessment and structural model assessment, followed by a bootstrapping to examine the path coefficients. The analysis was run on SmartPLS3 software.

4. Results and discussion

Measurement model assessment

For the validity and reliability of the measurement model, we first examine the outer loadings of the observed variables. One item (att4) was removed due to low loading, under the suggested minimum value of 0.7. After restarting, all latent constructs score above 0.5 for AVE, establishing convergence validity. Cronbach's alpha, rho_A and Composite reliability were all above the required values of 0.7, 0.7, and 0.5. Table 1 illustrates the results of validity and reliability check.

Table 1. Reliability of measurement

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
attitude	0.855	0.859	0.912	0.775
int	0.766	0.774	0.866	0.683
moral norm	0.886	0.887	0.929	0.814
status need	0.84	0.846	0.893	0.676

To assess the discriminant validity, we looked at the values of the Heterotrait-monotrait (HTMT) ratio between the latent constructs. All HTMT values are below the 0.9 threshold, establishing discriminant validity issues. Table 2 illustrates the detailed ratios between constructs.

Table 2. Discriminant validity

	attitude	int	moral norm	status need
attitude				
int	0.675			
moral norm	0.688	0.688		
status need	0.372	0.441	0.463	

Structural model assessment

After establishing the validity of the measurement model, we assessed the structural model. First, we looked for collinearity issues. Inner VIF values were all below the threshold value of 3.3, eliminating the threat of collinearity. In-sample explanatory was evaluated with R Square and Q Square. The results indicate moderate predictive relevance of the endogenous constructs, with R square at 0.367 and 0.404, and Q Square at 0.279 and 0.270 for Attitude and Intention, respectively. The results are shown in Table 3.

Table 3. Structural model assessment

	R^2	Q^2
attitude	0.367	0.279
intention	0.404	0.270

Hypothesis testing

To assess the path coefficients, we performed the bootstrapping with 5000 sub-samples at 0.05 significant level. Detailed hypotheses test results are presented in Table 4.

Table 4. Hypothesis Test

Structural relationship	Path Coefficients	f^2	P-value	Hypothesis	Results
Attitude > Intention	0.306	0.1	0.000	H1	Supported
Moral norm > Attitude	0.564	0.423	0.000	H2a	Supported
Moral norm > Intention	0.335	0.112	0.002	H2b	Supported
Status needs > Attitude	0.091	0.011	0.034	H3a	Supported
Status needs > Intention	0.126	0.022	0.012	H3b	Supported

In this study, five hypotheses were tested. The obtained path coefficients confirmed all proposed hypotheses. The direct effect of Attitude on Intention (H1) was supported with p-value <0.05 and coeff. =0.306. Moral norm significantly influenced both Attitude and Intention, with p-value <0.05 and coeff. =0.564 and 0.335, respectively. H2a and H2b, therefore, were supported. Moral norm' effect size, as indicated by f square, was surprisingly large, at 0.423 for Attitude. However, its direct impact on intention was quite small, with f square =0.112. Finally, status needs were found to exert a significant positive influence on Attitude and Intention, with p-values =0.034 and 0.012, coeff. =0.091 and 0.126, respectively. H3a and H3b were supported. While being statistically significant, the effect size of Status needs on Attitude and Intention was small, especially on the former, at f^2 =0.011.

Discussion

From the results, all five hypotheses are supported. Similar to previous studies, Attitude is a significant predictor of intention to purchase green products (Nguyen et al., 2019; Nguyen, 2019). However, its moderate effect formed an interesting reversed situation compared to a previous cross-cultural study (Nguyen, 2019), whereas Attitude was the most salient in previous studies on Vietnamese consumers but relatively weak for the Taiwanese, a more developed country. It provided support for Nguyen (2019)'s assertion that attitude lost its importance as the economy developed.

As expected, the findings provided empirical evidence to support the significant positive impact of Moral norm on Attitude and Intention to purchase green products. This means that the positive feelings related to the moral aspect of green purchases are likely to lead to a similarly positive attitude, and a favorable intention to purchase. While previous studies addressed moral norm from a dominantly negative aspect, such as guilt or bad consequences (Barbarossa and De Pelsmacker, 2016; Thøgersen and O¨lander, 2006), the results of this study contributed to the literature by investigating moral norm from the positive aspect, extending the findings of Arvola et al. (2008) in an emerging economy.

Interestingly, the significant positive impact of Status needs on Attitude and Intention to purchase green products contradicts Nguyen (2019)'s findings on the insignificant effect of materialism on green consumption in Taiwan, while mirroring the Attitude's effect. More specifically, green products were suggested to be unrelated to success and luxury in developed markets (Nguyen, 2019). However, in less developed markets, green products are expensive and associated with materialistic values (Nguyen et al., 2019). Considering that the temporal gap between these

studies is more than 5 years, the results indicate a slow but certain progression of consumers' values from the emerging economic stage to a more developed stage.

From a theoretical perspective, the current study's findings enrich our understanding of green consumption in an emerging economy. They provide empirical evidence that consumers in developing countries are different to their counterparts in more developed countries because of the local socioeconomic conditions. As the economy develops, their values tend to move closer to those in a further development stage. This process is slow and follows incremental progression, like how the current study found a similarity in Attitude and moral norm, but a contradiction in Status needs.

From a managerial perspective, building a favorable attitude toward green products is still very relevant for organizations doing business in this area. However, the main focus should be on moral norm, as to relocate their marketing activities of green products to consumers with a high moral norm standing. More specifically, these activities are suggested to feature and induce positive feelings associated with the consumption or usage of green products. Green products therefore should be designed in a way that brings the consumers a sense of comfort or pleasure when purchasing and using. Organizations wanting to improve their performance can also tackle the intention and attitude by providing a sense of superior status related. The needs for status, as their desire to be seen as better, are statistically significant in predicting Intention and Attitude. Thus, organizations can provide green products but be promoted as a higher, more status-induce consumption to attract Gen Z's customers. However, since their effect was small, their efficiency was very low. So, investing too much in this aspect will not bring the desired outcome, or it will be too costly. On the other hand, the observed trend of development in Vietnam, as highlighted in the previous section, indicates that any substantial investment would be very likely to be outdated.

There are still limitations in this study that can be improved in subsequent studies. Firstly, due to due to the limitation of resources, convenience sampling was the chosen approach, which limits the generality of the results. Therefore, future studies can address representativeness by conducting a probabilistic sampling method, including more rural areas and non-Gen Z consumers. Secondly, since previous studies on Taiwanese consumers provide a nice context to highlight the findings, more attempts should be made to compare the two countries directly. The difference in development, combined with the previous data on green consumption, should provide very interesting insights as to how consumers' values and behaviors change over time and amidst economic development.

5. Conclusion

This study advances our understanding of green purchase intention among Vietnamese Gen Z consumers by applying the Value-Attitude-Behavior (VAB) framework and incorporating two contextually relevant predictors: moral norm and need for status. The results highlight that moral norm is a strong driver of both attitude and intention, emphasizing the positive, self-fulfilling role of ethical conviction in green consumption. While the need for status also influences green purchase, its effect is smaller, suggesting that symbolic aspirations play a role but are secondary to moral motivations. These findings offer both theoretical and practical insights, encouraging marketers to frame green products as ethically rewarding and socially meaningful choices for younger consumers in emerging markets.

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MAPPING THE EFFECTIVE RATE OF PROTECTION IN MANUFACTURING INDUSTRIES: EVIDENCE FROM VIETNAM

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Abstract: ***This paper presents the first study to map the industry-level effective rate of protection (ERP) to provinces in a developing country such as Vietnam. By exploiting firm-level data and national input-output tables, our main findings are as follows. First, at the industry level, the ERP exhibited a decreasing trend from 2011 to 2015. This trend aligns with movements in the nominal rate of protection (NRP) on outputs and the input tariff rate (ITR). Notably, some high-technology-intensive industries consistently recorded negative ERP values (indicating negative net protection, which is harmful to the domestic industry). This was particularly evident in the manufacture of chemical products and computers, electronic, and optical equipment throughout the 2011-2015 period. Conversely, the highest positive ERP values (signifying the most protected industries) were consistently observed in certain final goods manufacturing sectors: textiles, leather, and footwear; motor vehicles, trailers, and semi-trailers; and manufacturing n.e.c. (not elsewhere classified), including recycling. Second, at the provincial level, several provinces within the Northern Key Economic Zone exhibited higher ERP values in 2011; however, these values declined significantly by 2015. By 2015, some provinces in the Central region demonstrated the highest provincial ERP values. The mapping methodology developed in this study and its findings may provide valuable insights of the regional effective rate of protection for trade policymakers when negotiating bilateral and multilateral trade agreements.***

• Keywords: *Vietnam, mapping, trade policies, ERP.*

JEL code: F00, F10, F69

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1. Introduction and Literature Review

Liberalization in trade induces two pro-competitive forces driving the productivity of firms (Topalova and Khaldewald, 2011). The first force is the competition, which is caused by lowering tariffs that are imposed on imported final goods (output tariff) (Melitz, 2003 and Melitz et al.,2008). The second force is an increase in firms' access to better imported inputs due to a reduction in tariffs on imported intermediates (e.g., Goldberg, 2009). To evaluate the net effect of trade protection in an industry needs a measurement of the effective rate of protection (ERP) that is calculated from both output tariffs and input tariffs. Topalova and Khalderwald (2011) recommend using ERP to capture the net effects of tariff policies on firm-level total factor productivity.

This study adds to the existing literature fresh evidence of provincial net effects of tariff protection (ERP) of a developing country, such as Vietnam, for sixteen 2-digit manufacturing industries, and proposes an updated measurement to map ERP into 63 provinces in Vietnam. Vietnam is an interesting case study to analyze the ERP in light of trade liberalization, especially for the period between 2011 and 2015. Importantly, the period between 2011 and 2015 witnessed the substantial trade reforms of the country when several bilateral trade agreements (BTAs) and free trade agreements (FTAs) were signed and negotiated, for example: the ASEAN-India FTA and the ASEAN-New Zealand FTA in 2010, the Vietnam-EFTA in 2012 (in negotiation),[1] the Regional Economic Comprehensive Partnership - RECP in 2013 (in negotiation), the Vietnam-Chile BTA in 2014, the Vietnam-Korea BTA in 2015, and the Vietnam-Israel BTA in 2015 (in negotiation). Figure 1 plots the weighted average effectively applied tariffs for goods imported to Vietnam in the timeline of some key BTAs and FTAs.

For the case study of the Vietnam manufacturing during the period of important trade reforms (2001 to 2009), Ha (2015) finds that a reduction in output tariffs is harmful to firm-level total productivity, but a cut in input tariffs stimulates productivity. Vu et al. (2017) state that workers in processing exporting firms were paid less than in non-exporting firms in Vietnam. For the case study of Chinese manufacturing firms, Brandt et al (2017) show that a cut in output tariff reduces

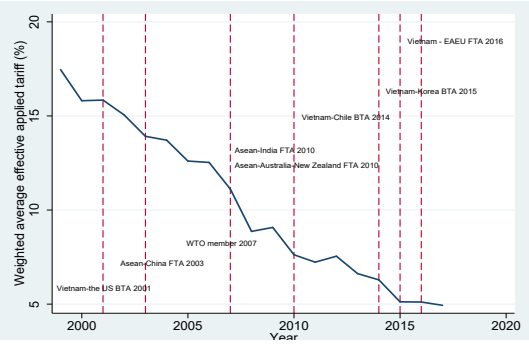
[1] *the EFTA (European Free Trade Association) includes members: Switzerland, Norway, Iceland, and Liechtenstein.*

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markup and raises TFP, but a reduction in input tariffs pushes both markup and TFP of firms. In a more complete investigation of tariff structures, Athukorala (2006) estimates ERP of industries in Vietnam during the period between 1997 and 2003. Our analysis is built closely from the existing literature, particularly the theoretical framework of trade liberalization and wages of Amiti and Davis (2011), and other empirical studies of Athukorala (2006), McCaig (2011), Topalova and Khaldewald (2011), and Fukase (2013).

This paper reviews the tariff policies of Vietnam between 2011 and 2015 by analyzing the tariff structure (ERP, ITR, and NRP) at the 2-digit industry level following the studies of Athukorala (2006), Topalova and Khalderwald (2011), and Corden (1969). We go one step further from the literature (Topalova and Khaldewald, 2011; Mc Caig, 2011; Fukase, 2013; and Brant et al, 2017) to map the industrial-level ERP for sixty-three provinces in Vietnam in the two years 2011 and 2015.

Figure 1: Weighted Average Effectively Applied Tariff on Imported Goods to Vietnam - Nominal rate of protection (1999-2017)



Source: Weighted average effectively applied tariffs are downloaded from http://wits.worldbank.org. The timeline of selected BTAs/FTAs signed and in effect is downloaded from www.wtocenter.vn. Note: Weighted average effectively applied tariffs include preferential tariffs when applicable in case of new FTAs or BTAs are in effect.

We use a novel data set compiled from firm-level data in manufacturing (2006, 2011, and 2015) provided by the General Statistics Office of Vietnam (GSO), inter-country input-output table in year 2011 (OECD, version 2016), and weighted average applied effective tariff data of Vietnam for the respective years (WITS).[2]

The paper is organized as follows. The next section discusses the methodology applied in our research. The fourth section describes the data used in this research. The fifth section presents empirical results, and the last section gives conclusions.

2. Methodology for the measurement of ERP

First, we follow Topalova and Khandewald (2011) and Amiti and Davis (2011) to calculate the input tariff rate ITR_{JT} of industry *j* in year t in equation 1.

$$ITR_{jt} = \sum_{s} (\delta_{js,2011} \times NRP_{jt}) \quad \text{(Equation 1)}$$

Where:

NRP_{jt} (Nominal rate of protection of industry j at time t) is the tariff imposed on imported goods in industry j at year t. $\delta_{js,2011}$ is the value share of imported inputs used in the value of output in industry j. Intuitively, ITR_{jt} is the weighted average of the Nominal rate of protection applied in industry j at year t, using a fixed share of input s imported into industry j in year 2011.

Adding to the existing literature,[3] we take a further step to calculate the NRP and ITR, which are mapped at the provincial level: They are constructed respectively using the share of labor in industry j in province p in the year 2006, which is:

$$\frac{L_{jp},2006}{L_{p},2006}$$

$$NRP_{pt} = \sum_{j} \frac{L_{jp},2006}{L_{p},2006} NRP_{jt} \quad \text{(Equation 2)}$$

$$ITR_{pt} = \sum_{j} \frac{L_{jp},2006}{L_{p},2006} ITR_{jt} \quad \text{(Equation 3)}$$

At industry-level, we measure ERP_{jt} for industry j at year t using NRPjt (tariff on import goods of industry j at year t) and ITRjt (input tariff of industry j at year t), δ_{js} is the coefficient calculated from the OECD-WTO inter-country input-output table (year 2011) to show the share of input s in the value of output j. δ_{js} is assumed to be unchanged between 2011 and 2015, and Cobb-Douglas technology is assumed (this assumption is in line with Amiti and Davis, 2011).

$$ERP_{jt} = \frac{NRP_{jt} - ITR_{jt}}{1 - \sum_{s} \delta_{js,2011}} \quad \text{(Equation 4)}$$

Then, we propose an index to measure the net effects of trade protection in industry *j* experienced by the province *p* as follows:

$$ERP_{pt} = \sum_{j} \frac{L_{jp},2006}{L_{p},2006} ERP_{jt} \quad \text{(Equation 5)}$$

In equation 2, 3 and 5, we choose the year 2006 as the pre-WTO time-invariant labor data because Vietnam joined the WTO in 2007. The analogous consideration for time-invariant labor data can be found similarly in McCaig (2011) and Topalova (2010). By applying this method, equations 2,3, and 5 only consider the variation of NPR and ITR and ERP, but not the variation of labor at the provincial level.

3. Data description

We use firm-level data in the Vietnamese enterprise survey (VES) in the years 2006, 2011, and 2015 for our analysis. In addition, the OECD-WTO input-output

table in the year 2011 is also merged with the firm data. The tariff data imposed on imported goods to Vietnam is a weighted, effectively applied tariff downloaded from data base of the World Bank (http://wits.worldbank.org). The tariffs are applied MFN, which includes a lower rate of preferential tariff when it is applicable in case of FTAs or BTAs. The 2-digit VSIC 2007 (the 2007 Vietnamese Standardized Industry Classification) in the firm-level data (VES data) is equivalent to ISIC Rev.4 (International Standardized Industry Classification). To link the VES data with the IO table of the year 2011 (2016 edition, OECD), the classification of industries in the VES data is converted from ISIC Rev.4 to ISIC Rev.3 using the concordance of the GSO. Some of the industries in the VES are also combined consistently in line with the 2-digit industry classification of the IO table.[4] When calculating NRP for the industries that are combined from other industries, we use trade weights to calculate the weighted average tariff. The weight of trade is also downloaded from the World Bank (http://wits.worldbank.org). See more details about the measurement of variables used in this study in Table 2.

Table 2. Measurement of Variables

Variable	Measurement	Data	Source
$NRP_{j,t}$(%)	Weighted effective applied tariffs on goods imported to industry j at year t	2-digit ISIC.Rev 3 converted to industry classification of the input-output table (OECD version 2016)	http://wits.worldbank.org
$ITR_{j,t}$(%)	Weighted average of Nominal rate of protection applied in industry *j* at year *t* using a fixed share of input *s* imported into industry *j* in year 2011 (%)	2-digit ISIC.Rev 3 converted to industry classification of the input-output table (OECD version 2016)	Authors 'calculation using NRPj,t downloaded from http://wits.worldbank.org
$ERP_{j,t}$(%)	Equation 4 Closely follows Topalova and Khandewal (2011)	Weighted Applied Tariff years 2010 and 2014	http://wits.worldbank.org
$ERP_{p,t}$	Equation 5	Weighted Applied Tariff years 2010 and 2014 Labor weight of the province by industry year 2006	
Input-output coefficient		Inter-country input-output table, year 2011	OECD (edition 2016)
Real output	Log values of output deflated by base year 2010.	VES 2011 and 2015, and WB GDP deflator	General Statistics Office of Vietnam And the World Bank.

4. Results and discussion

4.1. Industry-level ERP

Table 3 indicates the nominal rate of protection (NRP, weighted effectively applied tariffs imposed on final goods imports to Vietnam), input tariffs (ITR, tariffs on intermediate goods), and effective rate of protection (ERP) for manufacturing industries in Vietnam for the two years 2011 and 2015. Remarkably, being highly protected from imported competition is revealed in industries imposing high NRP, such as Motor vehicles and Textiles. Highly subsidized industries with high ITR are Textiles, Chemicals, Rubbers and Plastics products, and Fabricated metal products.

The decrease in ITR and ERP is because of the reduction in NRP since the country enjoys MFN tariffs (committed in the WTO) and lower preferential tariffs (committed in new FTAs/BTAs which came into force during the period). We find a high correlation between ITR and NRP (about 0.95) for both years 2011 and 2015.

Table 3. Nominal Rate of Protection (NRP), Input Tariffs (ITR), and Effective Rate of Protection (ERP) in 2011 and 2015 by Industry (%)

Industry	NRP2011	NRP2015	ITR2011	ITR2015	ERP2011	ERP2015
Chemicals and chemical products	1.650	1.310	3.835	2.522	-6.034	-3.346
Computer, electronic, and optical equipment	1.044	1.099	2.751	1.897	-5.528	-2.583
Wood and products of wood and cork	1.170	0.740	0.703	0.490	0.628	0.336
Basic metals	1.610	1.080	1.258	0.880	0.823	0.466
Electrical machinery and apparatus, nec	4.880	1.690	2.165	1.150	4.968	0.988
Machinery and equipment, nec	2.270	1.430	0.925	0.545	1.854	1.219
Other transport equipment	11.730	3.210	3.789	1.678	18.423	3.555
Food products, beverages, and tobacco	5.115	4.208	2.442	1.777	4.594	4.177
Pulp, paper, paper products, printing, and publishing	7.430	5.220	2.570	1.805	7.935	5.577
Coke, refined petroleum products, and nuclear fuel	9.030	5.650	2.223	1.426	10.244	6.356
Fabricated metal products	8.230	5.210	3.745	2.444	13.059	8.054
Rubber and plastic products	9.920	6.590	3.536	2.411	14.004	9.168
Other non-metallic mineral products	9.960	9.650	2.725	2.030	11.017	11.603
Manufacturing NEC; recycling	15.800	10.240	1.641	1.066	21.147	13.703
Motor vehicles, trailers, and semi-trailers	18.640	11.140	2.662	1.676	24.463	14.489
Textiles, textile products, leather, and footwear	10.374	8.969	5.707	4.538	15.667	14.877

Source: Nominal rate of protection is downloaded from http://wits.worldbank.org. Inter-country Input-output (ICIO) table in the year 2011 is provided by OECD (2016 edition).

Note: NRP of merged industries is calculated using weights of trade values. ITR and ERP are measured based on the method in Toppalova and Khandewald (2011). Industry classification follows the classification of ICIO.

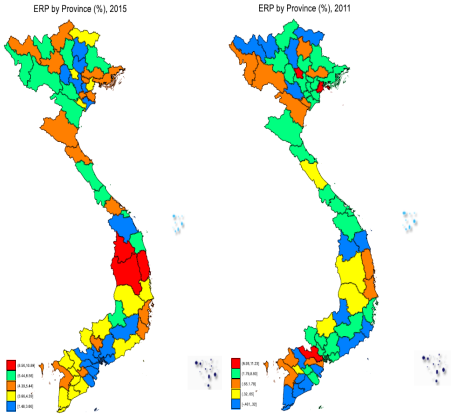
The results of ERP in Table 3 demonstrate the proportionate change in per unit value added of domestic industries induced by the structure of the tariff protection during 2011-2015 in Vietnam. The sharp drop of ERP in 2015 compared to 2011 was recorded for the manufacture of electrical machinery and apparatus, n.e.c., motor vehicles, trailers and semi-trailers, and other transport and manufacture of equipment. The negative values of ERP are presented in the manufacture of chemical products and computer, electronic, and optical equipment, which are industries of intermediate products. In opposite, the highest positive net effects of protection in positive values are shown in the manufacture of final goods, such as textiles, leather and footwear, motor vehicles, trailers and semi-trailers, and manufacturing n.e.c., recycling. These results of ERP at the industry level of manufacturing in Vietnam from 2011 to 2015 are in line with the tariff structures of the country in 2003

[4] *Source : ICIO Table version 2016 in website of OECD http://oe.cd/icio*

analyzed by Athukorala (2002). However, highly protected industries in trade in 2011 and 2015, such as the manufacture of textiles and the manufacture of fabricated metal, account for substantial shares in total output and total labor of the manufacturing sector in Vietnam. For example, the output share of the textiles industry was 8.80% and 10.72% respectively in 2011 and 2015. The textile industry created 27.22% and 30.89% of total jobs, respectively, in 2011 and 2015. This finding is not similar to the results found by Athukorala (2002) that highly protected industries do not substantially contribute to the total output and labor force of the manufacturing.

4.2. Mapping ERP to Provinces

Figure 3. Effective Rate of Protection (ERP) in 2011 and 2015 by Province (%)



Source: Nominal rate of protection is downloaded from WITS for lagged years in 2010 and 2014. Inter-country Input-output (ICIO) table in the year 2011 is provided by OECD (2016 edition). The weight is the labor data from the enterprise survey of Vietnam in 2006 (before the country's WTO accession).

Note: NRP of merged industries is calculated using the weight of trade values. ITR and ERP are measured based on the method in Toppalova and Khandewald (2011). Industry classification follows the classification of ICIO. Due to the limitations of the administrative data, these maps only show the ERP by provinces of Vietnam, but do not show the ERP in all islands of the country, such as Hoang Sa and Truong Sa islands.

In this section, we measure the provincial NRP, ITR, and ERP to investigate and visualize the net effective rate of protection for 63 provinces in Vietnam in 2011 and 2015. In this calculation, the tariffs are lagged one year. This means the indices for the studied period in 2011 and 2015 are calculated, respectively, for the years 2010 and 2014. The lagged years reflect the fact that the economy needs time to react to the effects of tariffs on input and output markets. The labor share of industries in one province, which reflects the industry structure of the province, is fixed for the year 2006 in calculating weighted NRP, ITR, and ERP (one year before Vietnam officially became a WTO member in 2007). Hence, comparing the provincial ERP in two years accounts for the variation of ERP during the research period. Figure 3 presents patterns of the ERP in 2011 and 2015 of 63 provinces of Vietnam. Generally, negative values of ERP are recorded in some provinces in 2011, but the ERP is only in positive values in 2015. Figure 3 indicates that in 2011, higher values of ERP, which imply a higher proportional rise in per-unit provincial value-added due to exposure of the province to the net effective rate of protection, were shown in municipalities and large provinces which are belong to the Northern key economic zone of the country (except for Namdinh). However, the ERP of these provinces dropped in 2015. The high values of the provincial ERP in 2015 were shown in other provinces in the Central region.

5. Conclusion

This study gives a complete review of ERP at the industry and provincial levels in Vietnam from 2011 to 2015. Our results at the industry level indicate that, together with the decreasing trend of NRP and ITR, ERP has reduced; however, ERP remains at high values in some industries of final goods such as textiles, rubber and plastics products, motor vehicles, trailers, and semi-trailers. Negative values of ERP are found in the high-technology intensive industries, such as the manufacture of chemicals and computers, electronics, and optical products. At the provincial level, we find that ERP was higher in the northern municipalities in 2011 but dropped and remained at high values in some provinces in the central regions in 2015. The mapping methodology and findings presented in this study could offer trade policymakers valuable insights into regional effective rates of protection (ERPs) during negotiations for bilateral and multilateral trade agreements.

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THE MEDIATING ROLE OF CUSTOMER SATISFACTION ON THE IMPACT OF LAST MILE DELIVERY QUALITY ON E-COMMERCE CUSTOMER LOYALTY IN VIETNAM

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Abstract: ***This study assesses the impact of last-mile delivery quality on e-commerce customer loyalty, examining the mediating role of customer satisfaction. The authors develop and distribute a questionnaire survey to investigate the extent of the effect of last-mile delivery on e-commerce customer loyalty through e-commerce customer satisfaction in Vietnam. Relying on Logistics Service Quality (LSQ) and Service Quality (SERVQUAL) models, the Partial Least Squares Structural Equation Modeling method (PLS-SEM) is employed to identify the positive direct impacts of five last mile delivery quality dimensions (timeliness, information quality, assurance, responsiveness, and reliability) on e-commerce customer satisfaction. Customer satisfaction, in turn, demonstrates a positive direct relationship with customer loyalty. Importantly, the study identifies e-commerce customer satisfaction as a mediating factor through which the five last-mile delivery quality dimensions indirectly influence customer loyalty. These findings provide evidence and insights for relevant parties, including Vietnam's government and last-mile couriers, to effectively enhance the e-commerce business in Vietnam with a greater focus on last-mile delivery dimensions.***

• Keywords: *e-commerce, customer satisfaction, customer loyalty, last mile delivery, partial least squares structural equation modeling.*

JEL codes: M31, M30

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1. Introduction

The rapid expansion of Vietnam's business-to-consumer (B2C) e-commerce sector in recent years has fueled the growth of several related industries, particularly e-commerce logistics. Among these, the quality of last-mile delivery (LMD) has emerged as a critical consideration for online shoppers (Vaast, 2017), given its implications for supply chain infrastructure, operational efficiency, and overall business performance (Hoang, 2019).

Customer loyalty plays a vital role in the profitability and long-term growth of e-retailers, with repeat buyers accounting for approximately 40% of sales revenue (Rosen, 2001). Simultaneously, customer satisfaction is widely acknowledged as a key driver of loyalty (Luarn and Lin, 2003). As a result, e-retailers are increasingly leveraging logistics strategies to enhance fulfillment and delivery services, aiming to improve consumer experiences (Xiao, Wang, and Liu, 2018). Importantly, LMD constitutes the only phase in the e-commerce supply chain involving direct customer interaction, making it a pivotal determinant of how both the logistics service and the retailer's fulfillment capabilities are perceived (Boyer, Prud'homme, and Chung, 2009).

The connection between LMD quality and both e-customer satisfaction (CSAT) and e-customer loyalty (CLOY) has garnered substantial interest from scholars and practitioners across marketing, logistics, and online business disciplines. Prior research confirms that LMD quality positively affects CSAT in the context of e-commerce (Tran et al., 2022; Vakulenko et al., 2019), while also establishing a significant link between LMD and customer loyalty (Hafez, Elakkad, and Gamil, 2021).

This study investigates the impact of LMD quality on e-commerce customer loyalty, mediated by customer satisfaction, within the Vietnamese B2C market. A mixed-methods approach was adopted, including qualitative analysis of prior studies to construct the research model, followed by

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quantitative validation using PLS-SEM to analyze survey data in the final research phase.

2. Research model hypotheses

Mentzer et al. (1999) introduced the Logistics Service Quality (LSQ) model using an integrated logistics approach, identifying nine dimensions. These were later grouped into *technical quality* (timeliness, order quality, order condition, order accuracy, and order release quantities) and *functional quality* (personnel contact, information quality, ordering procedure, and discrepancy handling) (Rafiq and Jaafar, 2007). In parallel, Parasuraman et al. (1988) developed the SERVQUAL model, a foundational framework in service quality assessment, comprising five dimensions: tangibles, reliability, responsiveness, assurance, and empathy.

Drawing on these two models, this study develops an integrated framework to assess the relationships among last-mile delivery (LMD) service quality, e-commerce customer satisfaction (CSAT), and e-commerce customer loyalty (CLOY). LMD quality is measured by five key dimensions - timeliness, information quality, assurance, responsiveness, and reliability - derived from the literature. These are hypothesized to influence CSAT, which in turn affects CLOY (Authors, 2025).

Among LSQ dimensions, *timeliness* is one of the most frequently cited and reliable indicators of service performance (Zailini et al., 2018; Saura et al., 2008). In online B2C contexts, timeliness has a direct effect on satisfaction as customers expect immediate service after payment, unlike offline retail, where purchases are instant (Rao et al., 2011). Given that online customers must wait through fulfillment and delivery processes, the efficiency of last-mile transportation becomes critical in shaping satisfaction and loyalty (Tran et al., 2022).

H1: Timeliness has a positive direct impact on e-commerce CSAT.

Information quality - defined as the clarity and completeness of service/product-related data - affects how customers assess risk and track delivery progress (Park and Kim, 2003; Khan, Liang, and Shahzad, 2015). Seamless information flow between customers, sellers, and delivery providers enhances transparency and customer experience, leading to increased CSAT and CLOY (Tran et al., 2022).

H2: Quality of information has a positive direct impact on e-commerce CSAT.

Assurance, originally linked to the courtesy and competence of service staff (Parasuraman et al., 1988), has been extended in the LMD context to include the professionalism of delivery personnel, data security, and respectful behavior (Yang et al., 2021). Previous research found assurance to be a significant factor influencing trust, satisfaction, and loyalty in delivery services (Pantouvakis and Dimas, 2013; Cho et al., 2021).

H3: Assurance has a positive direct impact on e-commerce CSAT.

Responsiveness relates to timely and helpful communication, issue resolution, and flexibility in delivery arrangements (Gulc, 2020). It plays a crucial role in customer satisfaction, especially in logistics contexts where service recovery and adaptability are essential (Ugboma et al., 2004; Rahim, Voon, and Mahdi, 2015).

H4: Responsiveness has a positive direct impact on e-commerce CSAT.

Reliability, encompassing order accuracy, parcel condition, and timely delivery, is fundamental to LMD quality (Gulc, 2020). E-commerce consumers emphasize both information security and product integrity (Lin et al., 2011), and parcel locker service studies have confirmed the strong influence of reliability on CSAT (Lai et al., 2022). Pantouvakis and Dimas (2013) also argue that reliability and responsiveness together predict customer satisfaction in logistics services.

H5: Reliability has a positive direct impact on e-commerce CSAT.

Finally, *customer satisfaction* is a key driver of *customer loyalty*, defined as repeat purchasing behavior and advocacy (Oliver, 1999). In e-commerce, CSAT is shaped by service quality and plays a decisive role in long-term customer retention (Saura et al., 2008). Positive experiences lead to repurchase intentions and referrals (Waari, 2018; Zhang et al., 2012).

H6: E-commerce CSAT has a positive impact on e-commerce CLOY.

3. Research methodology

3.1. Measure of Constructs

This study developed 31 items across 6 constructs based on prior literature and qualitative research (Tran et al., 2022; Dam and Dam, 2021;

Cho et al., 2021; Gulc, 2020; Zailini et al., 2018; Alemu, 2016; Bouzaabia et al., 2013; Rose et al., 2011; Walsh and Beatty, 2007). A pilot test with 68 Vietnamese B2C e-commerce customers was conducted to refine the questionnaire. Feedback on clarity, wording, and relevance led to revisions, and final calibration was done using Exploratory Factor Analysis (EFA), resulting in 31 finalized items across 6 scales. These aim to measure the mediating role of CSAT in the relationship between LMD quality and CLOY.

3.2. Sampling Method and Data Collection

Convenience sampling was used to gather responses from B2C e-commerce customers in Vietnam. Based on Hair et al. (2006), the minimum sample size required was met. Of 494 collected responses, 462 valid ones remained after filtering out 32 invalid entries, satisfying EFA reliability criteria.

3.3. Data Analysis

PLS-SEM was conducted using SmartPLS 4.0, following Hair et al.'s (2011) two-step approach: first assessing the measurement model, then the structural model. Prior to this, data were screened for quality via normality (skewness, kurtosis), reliability (Cronbach's Alpha), and EFA. Since reflective scales were used, measurement validity was tested for reliability, convergent validity, and discriminant validity (Hair et al., 2014). Finally, bootstrapping was applied to examine the mediating effect of CSAT between LMD quality and CLOY, as this method offers robust and accurate estimates in PLS-SEM (Zhao et al., 2010).

4. Result analysis

In the event of VIF lower than 3, it can be inferred that the model does not experience collinearity (Hair et al., 2019). Table 1 displays the outcomes of assessing the collinearity phenomenon in the model. It can be seen that the VIF values studied do not surpass 3, ensuring the significance of a non-collinearity model.

Table 1. Result of collinearity statistics (VIF)

	VIF
T -> CSAT	1.623
QI -> CSAT	1.486
A -> CSAT	1.692
RP -> CSAT	1.400
RL -> CSAT	1.519
CSAT -> CLOY	1.000

Source: Authors, 2025

Table 2 illustrates the result of hypothesis testing for the structural model, including estimated coefficients, standard deviation, T statistics, and p-value. A hypothesis is statistically significant given that the corresponding p value is less than 0.1 at the 10% significance level, 0.05 at the 5% significance level, and 0.01 at the 1% significance level. (Hair et al., 2014)

H1: Timeliness has a positive direct impact on e-commerce CSAT

The correlation between timeliness and CSAT experiences a β coefficient of 0.231, proving a positive direct impact of such factors. The p-value of the H1a is 0.000 < 0.01, signifying that this hypothesis is statistically significant at the 1% significance level.

H2: Quality of information has a positive direct impact on e-commerce CSAT

The positive relation of quality of information and CSAT experience is statistically significant (β = 0.251, p value = 0.000). Given that other factors remain unchanged, the increase in one unit of quality of information leads to CSAT rising by 0,251 units.

H3: Assurance has a positive direct impact on e-commerce CSAT

It is found that assurance exerts a positive and significant influence on CSAT. Keeping other factors constant, when assurance is increased by one unit, CSAT is directly raised by 0.139 units. Since the p-value of assurance is 0.002 < 0.01, which secures statistical significance, H3 is accepted.

H4: Responsiveness has a positive direct impact on e-commerce CSAT

The hypothesis H4 is accepted due to its statistical significance at the significance level of 1%. The results present the β coefficient equal to 0.203, which surpasses 0, indicating the positive direct effect of responsiveness on e-commerce CSAT.

H5: Reliability has a positive direct impact on e-commerce CSAT

Provided that the p-value of reliability is less than 0.01, the direct correlation between reliability and CSAT is proven to be significant. With a unit increment of reliability, CSAT shall increase by 0.093 units with other variables staying the same.

H6: E-commerce CSAT has a positive impact on e-commerce CLOY

CSAT is the sole variable to have a direct effect on CLOY, owing to the satisfactory p-value of 0.000. CSAT is demonstrated to be a significant antecedent of CLOY with a β of 0.681. Assuming other factors remain constant, CSAT escalating by one unit shall result in a 0.681 unit increment of CLOY.

Table 2. Result of hypothesis testing for the structural model

Hypothesis	Relationship	Estimated coefficient	T statistics	P values	Result
H1	T -> CSAT	0.231	5.279	0.000***	Accepted
H2	QI -> CSAT	0.251	6.122	0.000***	Accepted
H3	A -> CSAT	0.139	3.093	0.002***	Accepted
H4	RP -> CSAT	0.203	4.940	0.000***	Accepted
H5	RL -> CSAT	0.093	2.310	0.001***	Accepted
H6	CSAT -> CLOY	0.681	23.952	0.000***	Accepted

, **, * represents significance level 10%, 5%, 1%, ns: not significant*

Source: Authors, 2025

The coefficient of determination (R^2) represents the explanatory ability of independent variables for a dependent variable (Hair et al., 2014). The R^2 of CLOY and CSAT are, respectively, 0.463 and 0.479. Independent variables can explain 46.3% of the variance of CLOY. Additionally, 47.9% of CSAT's variance shall be explained by independent variables in the model.

Table 3. Result of the coefficient of determination (Adjusted R^2)

	R^2	Adjusted R^2
CLOY	0.463	0.462
CSAT	0.479	0.473

Source: Authors, 2025

The effect size (f^2) is formulated by Chin (1998) to consider the importance of an independent variable on the dependent variable. The majority of LMD quality scales exhibit a minor influence on CSAT, including timeliness, quality of information, assurance, and responsiveness. f^2 coefficient, worth 0,011 for responsiveness, turns it into the sole factor to have a very small impact on CSAT. Besides, e-commerce CSAT (f^2 = 0,863) is the single factor to exert a strong influence on CLOY.

Table 4. Result of the effect size (f^2)

Dependent variable	Independent variable	f^2	Effect size
E-commerce customer satisfaction	Timeliness	0.063	Small
	Quality of information	0.082	Small
	Assurance	0.022	Small
	Responsiveness	0.057	Small
	Reliability	0.011	Very small
E-commerce customer loyalty	E-commerce customer satisfaction	0.863	Large

Source: Authors, 2025

The authors adopted a 5.000-resample PLS Bootstrapping approach to examine the indirect effects of timeliness, information quality, assurance, responsiveness, and reliability on e-commerce customer loyalty (CLOY) through the mediating role of customer satisfaction (CSAT).

E-commerce CSAT mediates the relationship between timeliness and e-commerce CLOY. Timeliness demonstrates a positive indirect effect on CLOY via CSAT, with a path coefficient (β) of 0.157. The corresponding p-value is 0.000, indicating that the mediating relationship is statistically significant at the 1% level.

E-commerce CSAT mediates the relationship between the quality of information and e-commerce CLOY.

CSAT has the most substantial mediating effect in the relationship between information quality and CLOY, with a β coefficient of 0.171. As the p-value equals 0.000, the result confirms a significant positive indirect relationship at the 1% level.

E-commerce CSAT mediates the relationship between assurance and e-commerce CLOY.

The relationship between assurance and CLOY through CSAT is also significant, with a p-value of 0.004. The β coefficient is 0.095, indicating a positive mediating effect of CSAT between assurance and customer loyalty.

E-commerce CSAT mediates the relationship between responsiveness and e-commerce CLOY.

Responsiveness exhibits a statistically significant indirect effect on CLOY through CSAT (β = 0.138, p < 0.01). This suggests that improvements in responsiveness positively contribute to customer loyalty when mediated by CSAT.

E-commerce CSAT mediates the relationship between reliability and e-commerce CLOY.

Although the weakest among the five dimensions, reliability still shows a significant indirect effect on CLOY through CSAT, with β = 0.064 and p = 0.007. This confirms the mediating role of CSAT in the relationship between reliability and customer loyalty.

Table 5. Evaluation result of the indirect impact of the structural model

Relationship	Estimated coefficient	T statistics	P values	Result
T -> CSAT -> CLOY	0.157	5.149	0.000***	Accepted
QI -> CSAT -> CLOY	0.171	5.992	0.000***	Accepted
A -> CSAT -> CLOY	0.095	2.850	0.004***	Accepted
RP -> CSAT -> CLOY	0.138	4.722	0.000***	Accepted
RL -> CSAT -> CLOY	0.064	2.279	0.007***	Accepted

, **, * represents significance level 10%, 5%, 1%, ns: not significant*

Source: Authors, 2025

5. Research findings and discussion

The research findings provide empirical support for the proposed model (see Figure 1.3) and contribute to the literature on e-commerce and last-mile delivery (LMD). The study successfully identifies five LMD quality dimensions - timeliness, information quality, assurance, responsiveness, and reliability - within the context of Vietnam's B2C e-commerce sector. All five dimensions demonstrate a statistically significant positive indirect effect on customer loyalty (CLOY) through the mediating role of customer satisfaction (CSAT), thereby confirming the proposed hypotheses.

Among the examined constructs, information quality emerged as the most influential factor impacting CLOY via CSAT. This aligns with the conclusion of Hafez, Elakkad, and Gamil (2021), but contrasts with Alemu (2016), who emphasized timeliness as the most critical factor. In the current study, timeliness ranks second in indirect influence on CLOY, suggesting that Vietnamese B2C shoppers prioritize the quality of information over delivery speed when forming loyalty perceptions.

Assurance also plays a significant indirect role in driving CLOY, consistent with findings from Tran et al. (2022), particularly in the electronics segment of B2C e-commerce. Responsiveness was similarly found to positively affect CLOY via CSAT, reinforcing earlier conclusions by Gulc (2020). Lastly, while reliability shows a statistically significant indirect influence on CLOY, it ranks lowest among the five LMD dimensions in terms of impact strength, in agreement with research by Lai et al. (2022) and Gulc (2020).

In addition to indirect effects, the study reveals a direct positive relationship between LMD quality and CSAT. This supports the findings of Vakulenko et al. (2019) and Alkhalifah, Alorini, and Alturki (2022), who affirm that high LMD quality is essential not only for customer satisfaction but also for the profitability of B2C e-commerce businesses. These results highlight that for Vietnamese shoppers, final-mile delivery is a core component of overall satisfaction with online shopping platforms.

Moreover, the direct positive relationship between CSAT and CLOY is confirmed, consistent with a wide body of prior research (Hafez, Elakkad, and Gamil, 2021; Murfield et al., 2017). The data analysis further reinforces Eid's (2011) assertion that CSAT is a strong antecedent of CLOY in B2C contexts. Thus, enhancing CSAT is likely to significantly increase loyalty among Vietnam's e-commerce consumers.

6. Limitations and suggestions for further research

Despite having met the requirement as suggested by Hair et al. (2006), the sample size of this study may not fully represent Vietnam's B2C e-commerce customer base, as the sample size is not considered large enough and includes respondents from certain cities and provinces. Future studies shall approach a larger, more diverse sample across more locations to improve generalizability.

Additionally, the demographic information and shopping habits of B2C e-commerce end users are not taken into consideration, which might remarkably influence perceptions of LMD quality, CSAT, and CLOY. Future research is suggested to explore the degree to which demographics and shopping habits affect these evaluations.

Finally, the authors focus on 5 scales for the LMD quality based on LSQ and SERVQUAL, whereas other studies have examined a broader range of dimensions. Future studies stand in need of more variables to comprehensively assess the drivers of B2C e-commerce clients' perception towards LMD quality, CSAT, and CLOY.

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VOLUNTARY ADOPTION OF IFRS IN VIETNAM: EVIDENCE FROM LISTED ENTERPRISES

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Abstract: ***Currently, International Financial Reporting Standards (IFRS) have been applied in most countries in the world. The benefits of applying IFRS such as: improving the quality of information on financial statements, increasing competitiveness, comparing information on reports between countries, attracting foreign investment, and increasing opportunities for business cooperation and international integration... Therefore, applying IFRS is necessary to proactively integrate deeper into the regional and world economy. The research objective of this article is to examine the factors affecting the voluntary application of IFRS by listed enterprises on the stock market in Vietnam. The research method of this article is a mix of methods, combining qualitative research and quantitative research methods. Data were collected from 200 audited financial statements in 2023. The results show that ownership structure, internationality, profitability, and Big4 auditing firms have an impact on enterprises' voluntary adoption of IFRS.***

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

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1. Introduction

In the trend of international globalization, international accounting convergence is becoming one of the issues receiving great attention from countries around the world. The process of international accounting convergence means that information is provided quickly, and promptingly meets the requirements of equivalence between countries. Therefore, accounting information is no longer an internal issue of each country but is applied and presented in financial statements in a common language accepted globally (Rezaee et al., 2010). The application of IFRS brings numerous of benefits to companies and countries (De George et al., 2016): helping to improve the quality of financial reporting information, increase transparency and comparability, provide users of financial statements with useful information related to management and investment decisions. According to statistics from IFRS.org, as of April 2020, 166 countries and territories worldwide have or are on the way to applying to International Financial Reporting Standards (IFRS). Currently, Vietnam is one of the few countries that have not applied IFRS for the preparation and presentation of financial statements but still applies 26 VAS accounting standards. However, the application of VAS is increasingly limited, and some contents are not suitable for transactions of the market economy in the new period, especially in the context of strong capital market development, with the emergence of many types of complex financial instruments. To keep up with the trend of international integration, globalization of economic cooperation, and development, on March 16, 2020, the Ministry of Finance officially issued Decision No. 345/QD-BTC approving the project of applying international financial reporting standards in Vietnam. On November 29, 2024, at the 8th Session of the 15th National Assembly, the National Assembly passed Law No. 59/2024/QH15 amending and supplementing Clause 3, Article 7 of the 2015 Law on Accounting on accounting standards as follows: "The Ministry of Finance shall prescribe accounting standards and professional ethics standards of Vietnamese accountants based on international accounting standards following the specific conditions of Vietnam; guide on the subjects, scope, format, roadmap and other contents related to the application of international accounting standards." As a developing country and an emerging economy in Asia, the need to apply IFRS in Vietnam is becoming increasingly urgent. However, enterprises applying international accounting standards face high conversion costs (Soderstrom & Sun, 2007). Conversion costs to IFRS will increase in the first years, reducing the profits of enterprises. However, the voluntary

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adoption of IFRS has improved accounting quality (Barth et al., 2012). Companies that switch to IFRS have better access to financial markets, thus attracting potential outside investors or international growth opportunities.

This study examines the relationship between voluntary adoption of IFRS and influencing factors to answer the question: What factors influence voluntary adoption of IFRS in listed companies in Vietnam? How much influence does each influencing factor have on the voluntary adoption of IFRS in listed companies in Vietnam?

2. Literature review

In the trend of integration, research results in recent years show that the national accounting systems in countries have changed towards convergence with international accounting standards (Chiang, 2013; Shigufta Hena Uzma, 2016). The application of IFRS has been accepted by many countries, helping to improve the efficiency of the capital market, attract foreign investment, and develop the stock market (Phan, 2014). However, there are also studies showing that the conversion of financial reporting from national accounting standards to IFRS in enterprises faces many barriers both within and outside the enterprise (Alsaqqa & Sawan, 2013; (Bui et al., 2020).

Based on the benefits of IFRS adoption, many studies on IFRS have been conducted in countries around the world, in which the issue of voluntary adoption of IFRS has also received much attention from researchers. In the United Kingdom, André et al., (2012) showed that internationality, leverage, company size, and auditor reputation have a significant positive impact on the voluntary adoption of IFRS by unlisted companies in the UK. Other company characteristics such as profitability, capital intensity, manufacturing industry, financial industry, growth, ownership structure, and employee productivity do not affect the decision to adopt IFRS. (Samaha et al., 2016) based on a meta-analysis of 17 empirical papers related to the determinants of IFRS compliance in emerging markets. The results show that firm size, audit type, internationality, profitability, and ownership dispersion have positive effects on IFRS compliance.

Pichler et al., (2018) examined the factors influencing voluntary adoption of IFRS in private companies in Italy. The results showed that companies with ownership, Big4 audit, and high profitability are more likely to adopt IFRS. Capital intensity, high or low leverage, company size, or foreign sales do not affect the voluntary adoption of IFRS.

Giner Inchausti et al., (2020) analyzed the factors affecting the voluntary adoption of IFRS by 167 listed companies in Japan during the period (2010-2019). The research results showed that internationalization and strong governance systems were the main factors influencing the voluntary adoption of IFRS.

The author's study (Gu, 2021) examined from a motivational perspective whether voluntary adoption of IFRS improves accounting quality using a sample of listed companies in Japan from 2010 to 2014. The results showed that voluntary adoption of IFRS can lead to higher accounting quality because it results in higher returns, increases comparability of financial statements by reducing income smoothing, and increases conditional conservatism.

3. Theoretical framework

This study applies positive accounting theory as a framework to study the factors affecting the voluntary adoption of IFRS in Vietnam. Positive accounting theory, originally proposed by (Watts & Zimmerman, 1990), provides insights into the underlying reasons for the choice of specific accounting policies. Positive accounting theory seeks to explain a process, using accounting ability, understanding, and knowledge, and using the most appropriate policy to address certain conditions in the future. This theory helps explain and predict accounting activities that occur in practice, helping us answer the question "What are the motivations for accountants to choose accounting policies?". Therefore, positive accounting theory can help policymakers introduce new accounting policies for newly arising economic transactions. Applying positive accounting theory to research to explain the factors affecting the choice of accounting policies of enterprises is based on the information provision requirements including the need for accounting information from shareholders, boards of directors, tax authorities, the need for information published on financial statements for external parties such as potential investors, creditors, etc. Positive accounting theory has been used in various studies to study

the voluntary application of IFRS (Emmanuel Iatridis, 2012; Pichler et al., 2018). Positive accounting theory has also been developed in the direction of expanding the scope of information such as in the fields of human resource accounting and social accounting.

4. Research hypothesis

4.1. Ownership structure

In previous studies, ownership structure is an influential factor in the choice of accounting framework (Johansson, A., and Karlsson, 2013), and the separation of managers and owners has been shown to influence accounting choice (Dhaliwal et al., 1982). Information asymmetry occurs when managers and owners are separated (Deegan, 2013) and the asymmetry can be reduced through information provision (Watts & Zimmerman, 1978); (Watts, R. L., Zimmerman, 1990). Bova and Pereira (2012) argue that foreign investors are expected to promote greater IFRS compliance in the companies in which they invest for two reasons: improving corporate monitoring and reducing information asymmetry, both of which are more important to foreign investors than domestic investors. Their findings provide evidence that foreign ownership is positively and significantly correlated with IFRS compliance. Therefore, the authors propose the research hypothesis:

H1: Foreign ownership is positively related to voluntary adoption of IFRS by listed enterprises.

4.2. Internationalization

Previous studies (Dumontier & Raffournier, 1998) show that Swiss companies listed on foreign markets adopt IFRS more voluntarily than domestic companies. Murphy (1999), and Tarca (2004) also pointed out that international activities have an influence and play an important role in the choice of accounting standards. Internationality is another determinant of voluntary IFRS adoption (Young & Guenther, 2003). The study by (Zéghal & Mnif Sellami, 2010) found a positive influence of foreign financial markets of listed companies on the decision to voluntarily adopt IFRS. Brown (2011) suggested that companies aiming to expand international relations will tend to voluntarily adopt IFRS more. Therefore, the author proposes the following research hypothesis:

H2: Internationality in business operations positively affects the voluntary adoption of IFRS by listed enterprises.

4.3. Profitability

One of the factors that many financial managers, investors, and credit institutions are interested in is the profitability of the enterprise. Because this factor directly affects the interests of the above subjects both in the present and the future, it is the basic factor for reference from which to make investment or lending decisions or other financial decisions. (Affes & Callimaci, 2007) Found a significant impact between IFRS compliance and profitability. Kim et al. (2011) also obtained similar results. Meanwhile, the study of André et al. (2012) found that profitability has no relationship with voluntary application of IFRS. Therefore, the author proposes the following research hypothesis:

H3: Profitability has a positive impact on voluntary application of IFRS by listed enterprises.

4.4. Leverage

Some studies confirm the impact of leverage on IFRS adoption by enterprises: Murphy (1999), (El-Gazzar et al., 1999) found that European companies with lower debt-to-equity ratios tend to adopt IFRS. On the other hand, IFRS adoption may be beneficial for leveraged companies because they often need to raise capital to finance growth (Magli et al., 2018). Therefore, the author proposes the following research hypothesis:

H4: Leverage factor has a positive impact on voluntary adoption of IFRS by listed companies

4.5. Audit quality

Previous studies have shown that firms may prefer to hire highly reputable audit firms to demonstrate higher financial reporting quality (Chaney et al., 2004; Van Tendeloo and Vanstraelen, 2008). Furthermore, since large audit firms have more experience and strong specialization in the IFRS transition process, it is hypothesized that the likelihood of voluntary IFRS adoption will increase when a firm is audited by one of the large audit firms (Matonti & Iuliano, 2012). The study by (Hallberg, A., and Persson, 2011), also found that firms voluntarily adopt IFRS when they use Big-4 audit firms, and this result was studied in Swedish listed firms. In line with the view (Uyar et al., 2016) (Uyar, Ali, Merve Kılıç, 2016) in emerging enterprises, the audit quality factor has a positive influence on the voluntary adoption of IFRS. Therefore, the author proposes the following research hypothesis:

H5: Auditing firm of Big4 enterprises has a positive influence on the voluntary adoption of IFRS of listed enterprises

5. Research method

5.1. Research data

The data in this article is taken from the websites: finance.vietstock.vn, cafef.com, and on the websites of the companies, and is based on the audited financial statements of 2023 of listed enterprises. The author surveyed chief accountants, general accountants, directors, and managers to collect information on whether or not listed enterprises in Vietnam voluntarily apply IFRS. For the convenience of the survey, the author chose the investigation method, surveying in the form of direct interviews or sending questionnaires via email to the survey subjects at the selected enterprises. The sample was selected using the convenience sampling method, which is convenient for data collection, to ensure objectivity in the data collection process of the non-probability sampling method. The research sample of the thesis was randomly selected from enterprises with diverse fields, industries, business types, etc. listed on the Ho Chi Minh City Stock Exchange. Ho Chi Minh City and Hanoi in 2023. This is consistent with the roadmap for IFRS application according to Decision 345/QD-BTC dated March 16, 2020. These enterprises have been developing and integrating into the global economy, opening up an important medium- and long-term capital mobilization channel in the Vietnamese economy.

Finally, the author uses SPSS 20 software to analyze regression and descriptive statistics of factors affecting the voluntary application of IFRS in large-scale listed enterprises in Vietnam.

5.2. Research model

This study uses Binary Logistic regression to estimate the relationship between specific characteristics of selected listed companies and the willingness to voluntarily adopt IFRS. This model has been widely applied in previous studies (André et al., 2012; Yang, 2014; Pichler et al., 2018). Based on the theoretical foundation and results from previous studies, the author builds the expected research model with the following general form:

$$IFRS_i = b_0 + b_1*CCSH_i + b_2*TQTH_i + b_3*KNSL_i + b_4*DOBA_i + b_5*CTKT_i + \varepsilon$$

In which: $IFRS_i$ is the dependent variable denoting the willingness to voluntarily apply IFRS of listed enterprises i. The independent variables $CCSH_i$, $TQTH_i$, $KNSL_i$, $DOBA_i$, $CTKT_i$ respectively are Ownership structure, Internationalization, profitability, leverage, foreign investors, and the type of auditor of the listed company i. The definitions of the variables in this study are presented in Table 5.1.

Parameters: β_0, β_1, β_2, β_3, β_4,β_5; Error: ε

Table 5.1: Variables and descriptions

Variable	Description
IFRS	A dummy variable with a value of 1 if the listed company is willing to voluntarily apply IFRS and 0 otherwise.
Ownership structure	A dummy variable with a value of 1 if the listed company is foreign-owned and 0 otherwise.
Internationalization	A dummy variable with a value of 1 if the listed company has foreign operations and 0 otherwise.
Profitability (ROE)	The ratio of profit after taxes to the equity of the listed company.
Leverage	The ratio of liabilities to total assets of the listed company.
Audit quality	A dummy variable with a value of 1 if the listed company is audited by Big-4 and 0 otherwise.

Source: Compiled by the author

6. Research results and discussion

6.1. Descriptive statistics

Table 6.1: Descriptive statistics of qualitative variables

Variables	N	Frequency		Percentage (%)	
		0	1	0	1
CCSH	Voluntarily apply IFRS (N=147)	24	123	16,3	83,7
	Do not Voluntarily apply IFRS (N=53)	49	4	92,5	7,5
TQTH	Voluntarily apply IFRS (N=147)	71	76	48,3	51,7
	Do not Voluntarily apply IFRS (N=53)	36	17	67,	32,1
CTKT	Voluntarily apply IFRS (N=147)	79	68	53,7	46,3
	Do not Voluntarily apply IFRS (N=53)	45	8	84,9	15,1

Source: Research results

The research results in Table 6.1 for qualitative variables show that the descriptive statistics for the group of companies voluntarily applying IFRS with foreign ownership are 83.7% higher than the group of companies that do not voluntarily apply IFRS, respectively 7.5%. Similarly, the group of companies voluntarily applying IFRS with foreign operations is 51.7% higher than the group of companies that do not voluntarily apply IFRS is 32.1%. Also, the companies audited by Big4 auditing firms of the group of companies voluntarily applying IFRS is 46.3% higher than the group of companies that do not voluntarily apply IFRS is 15.1%. This shows that enterprises that voluntarily apply IFRS will attract foreign investment, and international operations and these enterprises have a higher audit by Big4 to increase the quality and transparency of published information than enterprises that do not voluntarily apply IFRS.

Table 6.2: Descriptive statistics of quantitative variables

Variables	N	Minimum	Maximum	Mean	Std.Deviation
KNSL	Voluntarily apply IFRS (N=147)	0,397%	284,37%	35,30%	46,16%
	Do not Voluntarily apply IFRS (N=53)	0.015%	108%	10,76%	16,14%
DOBA	Voluntarily apply IFRS (N=147)	5,57%	777,57%	53,43%	63,51%
	Do not Voluntarily apply IFRS (N=53)	4,80%	90,30%	47,82%	21,06%

Source: Research results

The results of Table 6.2 are descriptive statistics of the quantitative variables of profitability (KNSL) and leverage (DOBA). The average value of profitability (KNSL) of the group of companies voluntarily applying IFRS (equivalent to 35.30%) is significantly higher than that of the group of companies that do not voluntarily apply IFRS (equivalent to 10.76%). Meanwhile, for the group of companies that voluntarily apply IFRS, the average value of leverage is 53.43%, while for the group of companies that do not voluntarily apply IFRS, it is 47.82%.

6.2. Correlation coefficients matrix

Table 6.3. Displays the correlation coefficient matrix for the variables in the model

Variables	IFRS	CCSH	TQTH	KNSL	DOBA	CTKT
IFRS	1					
CCSH	0,698**	1				
TQTH	0,174*	-0,084	1			
KNSL	0,259**	0,058	0,052	1		
DOBA	0,045	0,094	-0,073	0,017	1	
CTKT	0,283**	0,037	0,282**	0,135	0,054	1

***. Correlation is significant at the 0,01 level (2-tailed).*

**. Correlation is significant at the 0,05 level (2-tailed).*

Source: Research results

The test results in Table 6.3 show that the variables CCSH, TQTH, KNSL, and CTKT have a close correlation with the dependent variable (all have Sig. values < 0.05), therefore, these independent variables are included in the model to explain the dependent variable. However, the variable DOBA has a Sig. Value> 0.05, which means that the variable DOBA has no correlation with the dependent variable IFRS and will be eliminated from the empirical research model. On the other hand, the research results also show that the Pearson correlation coefficients of the independent variables all show a positive correlation with the dependent variable IFRS.

6.3. Logistics regression analysis

The results of Binary Logistic regression analysis of 4 independent variables with the dependent variable of voluntary application of IFRS in the model are presented in Table 6.4.

Table 6.4: Logistic regression analysis

		B	S.E	Wald	df	Sig.	Exp(B)	95% C,I,for EXP(B)	
								Lower	Upper
Step 1[a]	CCSH	5,526	0,816	45,918	1	0,000	251,163	50,792	1241,990
	TQTH	1,942	0,729	7,091	1	0,008	6,970	1,670	29,102
	KNSL	0,024	0,010	0,010	1	0,021	1,024	1,004	1,046
	CTKT	1,885	0,675	0,675	1	0,005	6,587	1,753	24,753
	Constant	-3,395	0,721	0,721	1	0,000	0,034		

a. Variable(s) entered on step 1: CCSH, TQTH, KNSL, CTKT.

Source: Research results

The results of Logistic regression analysis in Table 6.4 show that, of the 4 independent variables included in the research model, there are 4 variables that affect the dependent variable IFRS (all have Sig. values = 0.000 < 0.05, so they are statistically significant), including: Ownership structure (CCSH), Auditing company (CTKT), Internationality (TQTH), Profitability (KNSL).

6.4. Discussion

In the context of Vietnam's integration into the global economy, these enterprises need to improve transparency, compare information, and have a common language when preparing financial statements. The voluntary application of IFRS helps these enterprises access international capital easily, expand business abroad, and optimize profits for the enterprise.

+ Ownership structure (CCSH) has a positive impact on the voluntary adoption of IFRS in large-scale listed enterprises in Vietnam. This result is consistent with the study of (Indrawati, 2014). Because foreign shareholders are not familiar with accounting regulations in the host country, it creates an information gap between shareholders and the company. The implementation of international financial reporting standards allows foreign investors to better monitor the company's operations and finances (Khanna et al., 2004).

+ Internationality (TQTH): the research results show that foreign-operated enterprises will affect the voluntary adoption of IFRS. Foreign-operated companies must provide information on financial statements of higher quality and be a common language for communicating with other companies (Tarca, 2004).

+ Profitability (KNSL): The results show that there is a positive impact on the voluntary adoption of IFRS by large-scale listed enterprises in Vietnam. Companies with high profitability will have an easier time raising external capital (Bassemir, 2018). The higher the profitability of enterprises, the greater the possibility of voluntary adoption of IFRS (Pichler et al., 2018).

+ Auditing company (CTKT), the research results show that auditing companies have an impact on voluntary adoption of IFRS. This result is consistent with previous studies by André et al. (2012), Halberg and Persson (2011). Companies that voluntarily adopt IFRS will increase the reliability of financial information thanks to reports audited by large, reputable auditing companies.

+ The DOBA variable has no impact on the voluntary adoption of IFRS by large-scale listed enterprises in Vietnam. This result is also consistent with previous studies by André et al. (2012). If companies have more creditors, they will feel less need to adopt IFRS.

7. Conclusion

This study investigates the factors influencing the voluntary adoption of IFRS. Analyzing data from 200 listed companies on the Ho Chi Minh City Stock Exchange and the Hanoi Stock Exchange in 2023, the study examines the positive relationship between ownership structure, leverage, internationalization, profitability, and audit firms on voluntary adoption of IFRS. The study finds that enterprises with large foreign investment capital, foreign operations, high profitability, and audited by Big4 are more likely to voluntarily adopt IFRS.

Although this study provides detailed information on the specific characteristics of the company that determine voluntary adoption of IFRS, the study still has some limitations and needs to be considered and expanded for further research to improve as follows: (1) The data used in the study was collected from listed enterprises in different business lines, so it is not representative of each type of enterprise; (2) In fact, there are still some other company characteristics that may affect the ability to voluntarily adopt IFRS, such as industry characteristics, growth, accountants' competence, etc., which have not been considered in this study; (3) Finally, the sample size of this study is small, so it cannot be generalized, which may affect the quality of the study.

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STOCK LIQUIDITY DETERMINANT AND LIQUIDITY PREMIUM IN THE VIETNAMESE MARKET

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Abstract: ***This study examines the determinants of stock liquidity and the existence of a liquidity premium in the Vietnamese stock market. Using panel data of non-financial listed firms, we analyze the impact of internal corporate and macroeconomic factors on liquidity. Results show that variables such as asset turnover, profitability, and GDP growth significantly influence liquidity. We then assess whether liquidity is priced in stock returns. The findings reveal a positive and significant relationship between liquidity and annual stock returns, confirming the presence of a liquidity premium. Liquidity explains return variation better than traditional firm-specific factors. These results have implications for asset pricing, investment strategies, and market policy in emerging economies.***

• Keywords: *stock liquidity, liquidity premium, Vietnam, asset pricing, emerging markets, firm characteristics, macroeconomic factors.*

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1. introduction

Liquidity is a fundamental attribute of well-functioning financial markets, referring to the ease with which assets can be traded without causing significant changes in their prices. In equity markets, stock liquidity is essential for efficient price discovery, effective capital allocation, and overall financial stability. Liquid stocks allow investors to enter and exit positions at low cost, thereby facilitating investment and reducing market frictions.

While early studies on liquidity focused primarily on firm-specific characteristics such as size, trading volume, and corporate disclosure recent research highlights the importance of broader macroeconomic factors in influencing market-wide liquidity conditions. Variables such as interest rates, inflation, monetary policy stance, GDP growth, and economic uncertainty have been shown to affect investors' trading behavior, risk appetite, and the willingness of market makers to provide liquidity. For example, loose monetary policy can reduce funding costs and promote liquidity provision, whereas periods of macroeconomic instability can lead to market-wide liquidity dry-ups and elevated transaction costs.

The implications of stock liquidity extend beyond market functioning and directly affect asset pricing. A growing body of empirical evidence supports the existence of a liquidity premium an additional return required by investors to hold less liquid assets. The seminal work of Amihud and Mendelson (1986) demonstrates that investors demand compensation for bearing liquidity risk, especially when transaction costs are high or market conditions are volatile. This liquidity premium is not static; it varies over time in response to both micro-level and macro-level influences, becoming particularly pronounced during periods of heightened uncertainty or financial stress.

Understanding the interaction between macroeconomic factors, stock liquidity, and the liquidity premium is crucial for multiple stakeholders. Policymakers benefit from insights into how monetary and fiscal policies influence financial market stability. Institutional investors and asset managers can improve portfolio construction by accounting for liquidity-related risks and expected returns. Moreover, the pricing of financial instruments particularly in emerging and less-developed markets requires an understanding of how liquidity conditions evolve with macroeconomic dynamics.

This paper seeks to examine the role of macroeconomic variables in shaping stock market liquidity and the resulting effects on liquidity premiums. By synthesizing theoretical perspectives and reviewing empirical evidence, it aims to provide a comprehensive understanding of how macro-financial linkages influence both trading activity and asset pricing in modern capital markets.

2. Data sources

The study utilizes macroeconomic data, corporate financial data, and stock market transaction data. Therefore, the data is retreived from various sources. The most crucial data for this research is stock market transaction data, which is used to calculate liquidity indicators. This data is retrieved from the website

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investing.com. Investing.com is a global platform for economic and financial market information. The information compiled from the website includes macroeconomic data, financial information of listed companies, and transaction data of these companies. Regarding market transaction data, investing.com provides data on average price, opening price, closing price, high price, low price, and trading volume for both individual stocks and market indices. The market data is available with daily, weekly, or monthly frequency.

Corporate financial data is sourced from the website Stockplus. Stockplus provides financial data for companies, including balance sheet figures, income statements, and cash flow statements. This financial data is available on a quarterly and annual basis, adhering to financial reporting standards.

Finally, macroeconomic data is collected from sources such as the World Bank open data platform and the General Statistics Office (GSO). Macroeconomic data is reported on a quarterly basis. The study focuses on data from the period 2015 to 2022 because, prior to 2015, many variables used in the research lacked sufficient data points.

Quarterly frequency was chosen due to limitations in the frequency of corporate financial data. Additionally, studies on microstructure market dynamics suggest that quarterly frequency ensures that fundamental information is reflected in stock prices and other market variables (Lesmond, 2005).

We exclude from our sample the financial firms because they follow the strict regulations, and their financial statements are structured differently. We also exclude firm-year observations with missing data.

Figure 1: Distribution of firms in our sample

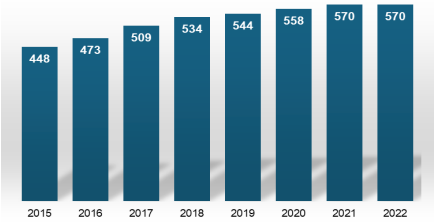
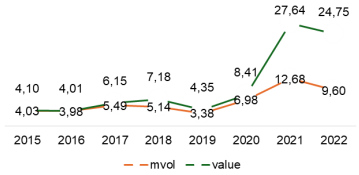


Figure 1 presents the distribution of the number of firms in our sample. The rich of the data increases through time with the lowest number of firms is in 2015 (448 firms) and highest is in 2022 (570 firms). The coverage of our sample does not cover all firms listed in the Vietnamese stock market because we exclude financial firms and firm-year with missing value.

Figure 2 presents the rough measures of market liquidity which are market volume (mvol) and market trading value (value). The two indicators move consistantly in the same pattent when they started low in the beginning of the sample and rich highest level in 2021.

Figure 2: Trading volume and value during the research period



3. Empirical results

3.1. Macro factors

We estimate the following regression function.

$$TV_t = \beta_0 + \beta_1.GDP_t + \beta_2.EXRATE_t + \beta_3.MG_t + \varepsilon_t \quad (1)$$

Where TV_t is Logarithm of trading volume (a proxy for stock market liquidity) at time t; GDP_t is GDP growth rate at time t; $EXRATE_t$ is Exchange rate at time t; MG_t : Money supply growth at time t; ε_t is the error term at time t; β_0 is intercept term;β_1, β_2, β_3 are Coefficients of the independent variables.

Table 1: Regression results of macro factors effect on the market liquidity

The dependent variable is the trading volume				
Variable	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
GDP	-0.459**	-0.344*		
	(0.191)	(0.178)		
EXRATE	0.0157		0.0222	
	(0.0539)		(0.0575)	
MG	-0.137			-0.0596
	(0.0864)			(0.0848)
Constant	9.391***	8.527***	6.044***	6.612***
	(1.707)	(1.215)	(1.140)	(0.626)
Observation	32	32	32	32
R-squared	0.188	0.110	0.005	0.016

The regression results in Table 1 examine the influence of key macroeconomic variables real GDP growth (gdp), exchange rate (exrate), and money supply growth (moneygrowth) on stock market liquidity, proxied by trading volume.

GDP growth is negatively and significantly associated with trading volume in both Model 1 and Model 2. The coefficients (-0.459 and -0.344) suggest that higher GDP growth is associated with a decline in market liquidity, which may reflect substitution effects (e.g., investment shifting to real sectors) or structural frictions in the market. The significance at the 5% and 10% levels indicates moderate robustness of this relationship.

Exchange rate changes show a positive but statistically insignificant relationship with trading volume in Models 1 and 3, implying that exchange rate movements have limited explanatory power for liquidity in this context.

Money growth also exhibits a negative but statistically insignificant relationship with trading volume (Models 1 and 4). While the coefficients are negative, the lack of

significance suggests no clear evidence of a consistent effect.

Across models, *R-squared values* are relatively low, ranging from 0.005 to 0.188, indicating that macroeconomic variables explain only a small portion of the variation in trading volume. This highlights the need to consider other structural, institutional, or firm-level factors in explaining stock market liquidity.

3.2. Firm-level factors and stock liquidity

Table 2: The Impact of Internal Corporate Factors on Liquidity Dependent Variables

Model (1) - Trading Value, Model (2) - Amihud (2002), Model (3) - Trading Volume			
VARIABLES	(1)	(2)	(3)
	Model 1	Model 2	Model 3
AT	3.127***	0.247***	2.640***
	(0.110)	(0.0386)	(0.101)
ROA	4.486*	4.445***	-3.394
	(2.647)	(0.932)	(2.434)
AGROWTH	0.00274	6.83e-05	0.00646***
	(0.00184)	(0.000649)	(0.00169)
Constant	-81.63***	-8.047***	-68.31***
	(3.022)	(1.064)	(2.779)
Observations	2,186	2,187	2,186
R-squared	0.278	0.024	0.258
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1			

Table 2 presents regression results examining the relationship between internal corporate factors and three commonly used proxies for stock liquidity: trading value, the Amihud (2002) illiquidity ratio, and trading volume. The independent variables include asset turnover (AT), return on assets (ROA), and asset growth (AGROWTH). The findings are interpreted in light of existing empirical literature.

The results show that *asset turnover (AT)* is positively and significantly associated with all three liquidity measures, including trading value, Amihud illiquidity (with a negative sign reflecting better liquidity), and trading volume. This suggests that firms with higher operational efficiency tend to exhibit higher levels of market liquidity. These findings are consistent with Fang, Noe, and Tice (2009), who argue that efficient internal operations reduce information asymmetry and enhance investor confidence. Similarly, Chordia et al. (2001) find that firm fundamentals such as turnover and profitability influence trading activity and liquidity provision. The robustness of asset turnover across all models reinforces the notion that internal operational quality is a key determinant of liquidity.

In contrast, the effect of *return on assets (ROA)* on liquidity is more nuanced. ROA has a positive and statistically significant impact on trading value and Amihud illiquidity but is negatively associated with trading volume, albeit insignificantly. This suggests that higher profitability may contribute to greater valuation-based liquidity (higher trading value and lower price impact) but does not necessarily increase trading frequency. This finding aligns with Bali et al. (2014), who show that more profitable firms tend to exhibit higher liquidity due to reduced valuation uncertainty. However, the lack of a significant relationship between ROA and trading volume could be due to offsetting effects of investor types or the influence of external macro factors, as noted by Pastor and Veronesi (2003).

The influence of *asset growth (AGROWTH)* is significant only in the trading volume model, indicating that firms experiencing rapid expansion may attract higher trading frequency, possibly due to speculative interest or investor attention. This finding supports the attention-driven trading hypothesis proposed by Chen, Hong, and Stein (2002), where high-growth firms especially those in emerging markets are more likely to attract retail and momentum investors. However, the lack of significance in trading value and Amihud suggests that such trading activity may be less impactful in terms of valuation or price efficiency. Indeed, Cooper, Gulen, and Schill (2008) warn that high asset growth can lead to overvaluation and subsequent liquidity deterioration, particularly if growth is not matched by earnings or efficiency.

The explanatory power of the models, as measured by the R-squared values, varies considerably. The models for trading value ($R^2 = 0.278$) and trading volume ($R^2 = 0.258$) explain a moderate share of the variation, suggesting that internal factors contribute meaningfully to observable liquidity dynamics. However, the model for Amihud illiquidity ($R^2 = 0.024$) has very limited explanatory power. This finding reinforces the view in the literature such as Amihud (2002) and Acharya and Pedersen (2005) that price-impact-based liquidity measures are more sensitive to market-wide or macroeconomic conditions than to firm-specific fundamentals. These include factors like investor sentiment, monetary policy, or aggregate risk premia, which are outside the control of individual firms.

In summary, the empirical evidence supports much of the existing literature on the determinants of liquidity. Internal corporate characteristics particularly asset turnover are significant predictors of liquidity across multiple dimensions. However, the strength and nature of these relationships vary depending on how liquidity is measured. The findings highlight the importance of differentiating between trading activity, transaction costs, and price responsiveness when assessing firm-level liquidity and underscore the need to complement internal firm analysis with broader market-level variables for a more comprehensive understanding of liquidity dynamics.

3.3. Liquitidy and liquidity premium

In this section, we test the value of liquidity. We estimate the following model:

$$Return_{i,t} = \alpha + \beta_1.LIQAL_{i,t} + \beta_2.VALUE_{i,t} + \beta_3.MVOL_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where: $Return_{i,t}$ is yearly stock return for firm i in year t (dependent variable); $LIQAL_{i,t}$ is Liquidity variable (e.g., inverse Amihud measure); $VALUE_{i,t}$ is firm value indicator (market-to-book or size); $MVOL_{i,t}$ is market volatility of the stock; α is Constant (intercept); β_1, β_2, β_3 are coefficients for explanatory variables; $\varepsilon_{i,t}$ is the error term.

Table 3: Liquidity Premium

The dependent variable is yearly stock return.			
VARIABLES	(1)	(2)	(3)
	Model 1	Model 2	Model 3
LIQAL	0.177***		
	(0.0140)		
VALUE		0.00476	
		(0.00440)	
MVOL			0.00539
			(0.00485)
Constant	0.882***	1.051***	1.050***
	(0.0452)	(0.0473)	(0.0472)
Observations	2,187	2,186	2,186
R-squared	0.068	0.001	0.001
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1			

The regression results presented in the table examine the relationship between various liquidity-related factors and the annual average stock returns, which serve as the dependent variable in all three models. The key explanatory variables tested include adjusted illiquidity (LIQAL), the value ratio (value), and liquidity volatility (mvol), across Models 1 to 3, respectively.

In Model 1, the coefficient of LIQAL is positive and statistically significant at the 1% level (β = 0.177; SE = 0.014), indicating that stocks with lower liquidity (i.e., higher LIQAL values) tend to have higher average returns. This finding is consistent with the liquidity premium hypothesis, which states that investors demand higher expected returns as compensation for holding less liquid assets. The result aligns with the seminal work of Amihud and Mendelson (1986), who argue that higher transaction costs lead to a higher required rate of return, hence forming a liquidity premium. It also echoes the broader theoretical foundation that illiquidity is priced in the market, particularly in less efficient or emerging markets.

In contrast, Models 2 and 3, which test the explanatory power of the value ratio and liquidity volatility (mvol), yield statistically insignificant coefficients (0.00476 and 0.00539, respectively), suggesting that neither factor plays a significant role in explaining the cross-section of stock returns in this sample. These findings imply that, while investors may consider liquidity levels in their pricing decisions, they are less responsive to fluctuations in liquidity or valuation ratios in this context.

Moreover, the R-squared value of Model 1 is 0.068, substantially higher than the R-squared values of Models 2 and 3 (both just 0.001). This indicates that LIQAL accounts for a much larger proportion of the variation in annual returns, confirming its greater explanatory power relative to the other internal characteristics. This supports the findings of Pastor and Stambaugh (2003), who demonstrate that liquidity risk is a priced factor in asset markets, particularly under conditions of changing market-wide liquidity.

The empirical results strongly support the existence of a liquidity premium: stocks with lower liquidity command higher returns, reflecting investor compensation for bearing illiquidity risk. In contrast, value ratios and liquidity volatility appear to have limited influence on return variation within the dataset. These findings are consistent with major theoretical and empirical studies in the field and highlight the role of liquidity especially systematic illiquidity as a critical factor in asset pricing.

4. Conclusion

This study provides empirical evidence on the key drivers of stock liquidity and the existence of a liquidity premium in the Vietnamese market. The analysis highlights that both firm-specific factors such as asset turnover and profitability and macroeconomic variables such as GDP growth and exchange rate fluctuations play significant roles in determining stock liquidity. More importantly, the findings confirm that liquidity is not only a determinant of trading behavior but also a priced factor in the cross-section of stock returns. Stocks with higher liquidity are associated with significantly higher annual returns, validating the presence of a liquidity premium in Vietnam. Compared to other variables, liquidity exhibits superior explanatory power, underscoring its central role in emerging market asset pricing. These insights have meaningful implications for investors, who must account for liquidity in portfolio construction, and for policymakers, who should focus on improving market infrastructure and transparency to enhance overall market efficiency. Future research could extend this analysis by exploring liquidity spillovers, sector-specific effects, or time-varying liquidity dynamics in the region.

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ASSESSMENT OF THE POTENTIAL FOR GREEN FINANCE DEVELOPMENT IN VIETNAM'S ELECTRICITY INDUSTRY: CASE OF ELECTRICITY OF VIETNAM (EVN)

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Abstract: ***Green finance refers to financial activities that support projects and operations aimed at minimizing negative environmental impacts and promoting sustainable development. Green financial products include green bonds, green loans, and other financial instruments dedicated to renewable energy projects, clean energy, and environmental protection. This study focuses on assessing the potential for green finance development in the electricity sector, with particular attention to the current state of green capital mobilization at Vietnam Electricity (EVN), as well as the barriers and opportunities in the transition to sustainable energy. EVN has accessed several international funding sources with green components but has not yet issued green bonds. The main barriers include the lack of a legal framework for green finance, limited transparency in ESG reporting, and constraints on the financial capacity of state-owned enterprises in accessing these financial tools. To promote green finance, EVN needs to develop a clear green finance strategy and expand sustainable financial products such as green bonds. Government support is also necessary to improve the regulatory framework, including issuing a taxonomy of green activities and facilitating the issuance of green bonds by state-owned enterprises. Additionally, enhanced cooperation with international financial institutions is needed to leverage technical and financial assistance from global energy transition initiatives.***

• Keywords: *green finance, reducing CO2 emissions, green bonds, energy transition.*

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1. Introduction

1.1. Background of the study

In the context that the world is facing increasingly serious impacts of climate change, the energy transition towards sustainability is not only an inevitable trend, but also an urgent requirement. Countries around the world, especially developing countries like Vietnam, are under great pressure to balance the need for economic growth and their commitment to reducing greenhouse gas emissions. With the commitment to achieve net zero emissions by 2050 made at COP26, Vietnam is accelerating the transformation of the energy system, in which the electricity sector plays a key role.

Green finance has emerged as an important tool for mobilizing resources for the energy transition. This is a form of financing aimed at financing projects that benefit the environment, including renewable energy, energy efficiency, green transportation, and climate-resilient infrastructure. In the electricity industry, green finance not only contributes to reducing pressure on the state budget but also creates conditions for businesses to access preferential capital sources, promote technological innovation and improve operational efficiency.

Electricity of Vietnam (EVN) - a state-owned enterprise playing a key role in electricity production, transmission and distribution - is facing an urgent requirement to transform its development model towards green and sustainable development. With a large scale of assets and investment, EVN has the potential to become a leader in implementing green finance in the electricity industry. However, practice shows that access to and mobilization of green finance sources at EVN is still limited, and at the same time faces many barriers in terms of institutions, internal capacity and market conditions.

1.2. Research Objectives

This study aims to comprehensively assess the potential for green finance development in Vietnam's electricity sector through an in-depth case analysis of Vietnam Electricity (EVN).

The research focuses on addressing the following key questions:

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• What forms of green finance has EVN implemented or is currently implementing?

What is the scale and effectiveness of these initiatives?

• What are the main barriers that hinder EVN from effectively mobilizing green capital?

• What opportunities do the current policy and market contexts offer EVN for developing green finance?

• What actions should EVN take to effectively seize these opportunities and overcome challenges, while contributing to the national goal of achieving net-zero emissions?

2. Rationale and research overview

2.1. Rationale for green finance

Definition of green finance

According to the OECD, Green Finance is understood as financial flows that serve the goals of environmental sustainability, including investment in projects to mitigate climate change, renewable energy, efficient use of resources, protect ecosystems, etc and infrastructure to adapt to climate change.

In the energy sector, green finance is particularly focused on:

• Renewable energy development projects (solar power, wind power, small hydropower...)

• Energy Saving, Grid Modernization, and Rural Electrification Projects

• Initiatives to reduce emissions and achieve a sustainable energy transition

Popular green finance tools

• *Green Bonds:* Debt securities used to raise capital for environmental projects, subject to certain standards such as the ICMA Green Bond Principles, ASEAN Green Bond Standards, or the EU Taxonomy.

• *Green Loans: A* form of preferential or conditional loans associated with environmental objectives, usually provided by development financial institutions.

• *Green Credit:* Credit products from banks aimed at customers implementing environmentally friendly projects.

• *Climate Fund or Green Fund:* Non-refundable funding or technical assistance from organizations such as the Green Climate Fund (GCF), World Bank (WB), Asian Development Bank (ADB)...

• *Carbon credit mechanism:* Businesses can sell reduced emissions according to international standards, creating more sources of income for reinvestment.

These tools are considered the foundation for businesses in the electricity industry to mobilize capital for energy transition.

Standards and legal framework for green finance

Currently, green finance is governed by international standards such as *the ICMA Green Bond Principles* (a set of voluntary principles for the issuance of green bonds), *ASEAN Green Bond Standards* (standards applied in Southeast Asia), and *the EU Taxonomy* (a classification system for sustainable economic activities). In Vietnam, green finance is governed by the *Green Growth Strategy for the period 2021-2030, the orientation for the development of the green finance market of the State Bank and the Ministry of Finance, the Law on Environmental Protection 2020* refers to environmental criteria in financial activities, Pilot guidelines on green bond issuance from the Ministry of Finance. However, a complete, synchronous and mandatory legal framework for green finance in Vietnam is still in the process of being built.

2.2. Research overview

The WB's report (2022) has analyzed the possibility of developing the green bond market in Vietnam, in which the energy sector is considered one of the most potential sectors. The report states that renewable energy is the leading sector in green bond investment in Vietnam in the next 3 years; Other sectors such as water management, sustainable agriculture, and clean transportation are also highly appreciated, but renewable energy remains a top priority in the green portfolio. However, the report also points to a major hurdle now being limited awareness of green bonds among the business community and other stakeholders. The World Bank has supported BIDV in issuing green bonds worth US$104 million in 2023, marking an important step forward in the development of the domestic green bond market. International organizations such as the Global Green Growth Institute (GGGI) have also conducted surveys and research to promote the development of the green bond market in Vietnam

Samar S et all, (2023) provides evidence that green finance (green bonds) significantly fosters renewable energy production. Their results are robust to addressing cross-sectional dependence concerns, allowing structural breaks, and using several alternative specifications and estimation methods.

Compared to their baseline findings, the effect is higher for green bonds issued to finance alternative energy. The existing stock of technological capacity significantly fosters the impact of green finance on renewable energy production, particularly in the long run. The long-run impact of green finance is significant in countries with higher emissions per dollar GDP, higher levels of climate change exposure to the economy and human life, and better-developed credit markets. The effect is more pronounced in countries with low or net zero emission targets and following the post-Paris 2015 agreements.

Dongyang Zhang et all, (2023) measured the effects of green financing and energy transition on COP26 targets for 40 countries, namely, 14 economies with market-based financial systems and 26 countries with bank-based financial systems, from 2010 to 2020. The findings confirmed that, in the market-based financial system, GDP per capita has a positive coefficient, while for countries with a bank-based financial system, GDP per capita has a negative coefficient on greenhouse gas emissions. With a 1% improvement in the energy transition of countries under a market-based financial structure, greenhouse gas emissions will decrease by 0.08%. The central practical policies recommended by this research are enhancing green loans, bank financing, and green bank guarantees.

Ramla Khalidi (2022) makes specific recommendations on integrating green finance into national energy development strategies. This report highlights the role of green finance in promoting sustainable growth and supporting a just energy transition. Recommendations include building green finance tools, improving the regulatory framework, and strengthening the capacity of relevant agencies. The report also recommends the establishment of a National Energy Bank to invest in renewable energy projects such as solar and wind power, as well as support domestic businesses in manufacturing equipment and providing maintenance services for renewable energy systems. In addition, the report emphasizes the importance of modernizing agriculture, building climate-resilient housing, developing green transportation and green industry. Large-scale investment in renewable energy is expected to create a large domestic market for domestic businesses, promoting growth and creating jobs. The government is also recommended to provide additional support to domestic enterprises to develop production and service capacity in the renewable energy sector.

Le Mai Trang et all, (2024) analyzes the current situation of green finance in Vietnam, clarifies the barriers; from there, proposes several solutions to promote the development of this field. In Vietnam, green finance plays an essential role in mobilizing capital for environmentally friendly projects, such as renewable energy, green transportation, sustainable agriculture and green buildings. However, the development of green finance in Vietnam still faces many challenges, including an incomplete legal framework, limited awareness of businesses and a lack of diverse green financial products.

Nguyen Phan Yen Phuong (2025) mentioned that the green finance also is considered an important approach to promote green and sustainable growth. Encouraging green capital flows is one of the crucial factors that support businesses to focus on building and implementing sustainable development strategies, thereby creating a sustainable ecosystem and realizing The National Strategy for Green Growth in Vietnam

Although there have been many studies related to green finance and energy transition, there is still a gap in analyzing the specific case of the Electricity of Vietnam (EVN) - a key player in the national power system. An in-depth study of EVN will not only help to properly assess the potential and challenges in green finance mobilization, but also provide a basis for designing appropriate support policies at the macro level.

3. Research Methodology

The study employs a qualitative approach combined with a case study analysis to comprehensively assess the potential for green finance development in the electricity sector, using the specific case of Vietnam Electricity (EVN). This approach enables an in-depth examination of institutional context, corporate capacity, and financial trends influencing the energy transition process.

The researcher collected secondary data and conducted in-depth interviews with managers responsible for green finance and renewable energy at EVN.

Secondary data was drawn from the following sources:

• Financial statements, sustainability reports, and annual reports of EVN from 2017 to the present

• Legal documents and policies related to green finance and energy transition issued by the Government, Ministry of Industry and Trade, Ministry of Finance, and the State Bank of Vietnam

• Reports from international organizations such as the World Bank (WB), ADB, GIZ, UNDP, IEA, Climate Bonds Initiative, etc., related to green finance, electricity sector development, and energy transition

• Scientific studies and academic articles on green finance, ESG, and energy transition.

After data collection, the researcher conducted a preliminary comparison between EVN and other state-owned energy enterprises in the region, such as PLN in Indonesia and EGAT in Thailand, to highlight similarities and differences in their approaches to green finance.

4. The current situation of green finance mobilization at EVN

4.1. Overview of EVN's financial situation and investment orientation

Electricity of Vietnam (EVN) is a state-owned enterprise that plays a central role in the national power system, dominating about 60-70% of the power generation capacity and almost the entire power transmission grid. With a total asset scale of over VND 700,000 billion (as of 2023), EVN invests heavily annually in the development of power infrastructure, including: power plants, transmission grids, rural electrification, and recently operation system digitization projects.

However, according to the financial report and assessment of the Ministry of Industry and Trade, EVN is facing significant financial pressure such as a financial deficit for many years due to the electricity price policy not fully reflecting input costs, limited loan limits due to large outstanding loans and low credit index. highly dependent on ODA concessional loans and support from development finance institutions (DFIs).

Although EVN has declared its orientation for sustainable development, shifting to renewable energy, and actively investing in the digitalization of the power grid, the linking of investment strategy with green finance is still unclear and systematic.

4.2. Forms of green finance implemented or approached

EVN and its subsidiaries have approached a number of loans from international organizations with the goal of supporting the energy transition, although they are not always clearly identified as "green finance". Examples include: (i) Loans from the World Bank and ADB for projects to improve power grids, electrify rural areas, and improve electricity efficiency; (ii) The project "Smart Grid for Renewable Energy Development" using capital from GIZ (Germany) and the German Bank for Reconstruction (KfW); (iii) Components on small-scale hydropower development and reduction of power losses with environmental factors within the framework of the power sector support program.

As of 2024, EVN has never issued green bonds domestically or internationally, despite the potential for implementation. The reasons can be mentioned such as the lack of an assessment, classification and reporting process in accordance with international standards, the lack of an internal mechanism to identify "green" projects or environmental benefits, the new Vietnamese green bond market, the lack of a reliable ESG credit rating system, etc state-owned enterprises such as EVN are subject to many legal constraints in debt issuance, especially in the form of international debt.

Although EVN has issued *the Sustainable Development Report* since 2021, the level of integration of *ESG* (Environment - Society - Governance) factors in the financial strategy is still in its infancy. The system of environmental indicators is incomplete; there is no independent report on carbon emissions or the environmental impact of investment projects.

4.3. Comparison with some regional businesses

Criteria	EVN (Vietnam)	PLN (Indonesia)	EGAT (Thailand)
Green Bonds	Unreleased	2023 Sustainable Bond Issued	Issued green bonds for renewable projects
ESG Disclosure	There is a sustainable report, lacking international standards	Have a specific ESG plan, cooperate with the World Bank	Integrated ESG, GRI compliant
Green finance loans	Some projects from WB, ADB, GIZ	Many projects from JICA, ADB	Funded by the ADB Climate Fund
Main Barriers	Incomplete legality, low project identification capacity	Lack of financial transparency	The green capital market is not deep

Through comparison, it can be seen that EVN has not fully exploited the potential of green finance mobilization compared to partners in the region, partly due to the incomplete legal system and limited internal capacity.

4.4. Assessment of barriers and opportunities for EVN's green finance development

EVN is facing barriers in mobilizing and implementing green finance such as institutional and legal barriers, barriers to Vietnam's financial market as well as barriers within EVN itself.

Currently, Vietnam does not have a uniform classification system for "green" activities (taxonomy) and binding regulations on the issuance of green bonds or green loans at the level of state-owned enterprises.

This makes it difficult for EVN to identify suitable projects and build a capital mobilization roadmap. EVN also faces a complicated approval process for international loans or bond issuance, which reduces flexibility and delays in accessing international financial opportunities. In addition, the lack of quantitative reporting requirements on environmental, social and governance makes it difficult for EVN to approach investors or international financial institutions that require transparent and comparable information.

The green bond market in Vietnam is still in its infancy, lacking independent ESG rating standards and specialized investors. The issuance of green bonds requires third-party assessments, environmental audits and continuous monitoring - creating an additional cost and human burden for EVN if there is no appropriate technical support.

On EVN's side, there are also specific barriers. Firstly, EVN has not yet developed or announced a green capital mobilization strategy or a strategy to integrate sustainable finance into medium and long-term investment. Secondly, EVN lacks a dedicated team in charge of green finance, the capacity for quantitative environmental impact assessment is still weak, and there is no process for selecting, screening and supervising projects according to international green criteria. Thirdly, the accumulated losses in recent years (due to the electricity price regulation mechanism) make it difficult for EVN to achieve high credit - a necessary factor when issuing bonds in the international market.

Besides the barriers, EVN still sees some opportunities to promote green finance at EVN. The first opportunity comes from the national energy transition policy. The Prime Minister of Vietnam pledged that Vietnam will achieve net zero emissions by 2050. This is a great motivation for state-owned energy enterprises such as EVN to shift to clean energy development and modernize the power system. Power Plan VIII (2023) has strongly prioritized renewable energy (solar, wind, biomass) and smart transmission systems - suitable areas for green finance mobilization. The National Green Growth Strategy and guidance from the Ministry of Finance have begun to shape the system, criteria and mechanisms to encourage green finance.

The second opportunity comes from abundant international finance. Many international financial institutions are prioritizing investment in the energy transition in Vietnam such as ADB, WB, JICA, GIZ, GCF, Climate Investment Funds, etc. These organizations often provide concessional loans with long terms, technical support for the construction of green projects, co-financing or risk guarantees when issuing bonds. *In addition,* Vietnam is negotiating with development partners in the Just Energy Transition Partnership project and will have financial opportunities of up to tens of billions of USD if EVN and businesses are able to absorb it.

The third opportunity comes from the capital market and requests from investors. International investors are increasingly prioritizing "ESG-compliant" capital flows - that is, financing businesses with sustainable development strategies, environmental transparency and the ability to create positive impacts. EVN, as a leading enterprise in the electricity industry, if it soon improves the ESG framework and makes the strategy transparent, can attract a large amount of capital from development investment funds and the private capital market.

5. Recommendations

On the basis of the analysis of the current situation, barriers and opportunities above, the group of solutions is proposed at 3 levels: (1) EVN level, (2) national policy level, and (3) support level from international organizations.

5.1. Enterprise-level solution group (EVN)

EVN needs to *build a green finance strategy and integrate ESG*. Specific activities include: (i) promulgating a Green Finance Mobilization Strategy to 2030, which clearly defines green capital targets, a list of priority projects, a green bond issuance plan, and monitoring mechanisms; (ii) Integrate environmental-social-governance (ESG) indicators into the investment planning, project appraisal, and financial reporting process; (iii) Forming a specialized department on sustainable finance, with sufficient technical capacity to work with international organizations and financial institutions with high requirements for environmental transparency.

EVN should *choose one to two green infrastructure investment projects* (e.g. smart grid renovation, wind or solar power plants) to pilot the issuance of domestic or international green bonds. However, EVN needs to build a *Green Bond Framework* in accordance with international standards (ICMA, ASEAN Green Bond Standards), and at the same time invite third-party consulting and assessment organizations to participate in verification.

EVN needs to complete *EVN's annual Sustainable Development Report* in accordance with international

standards such as *the Global Reporting Initiative,* and at the same time integrate climate risk analysis (TCFD) and carbon emission reduction strategies. EVN also needs to publish quantitative data on greenhouse gas emissions, energy consumption, and the percentage of capital invested in green projects.

5.2. National policy-level solution group

To support EVN in particular and enterprises in the electricity industry in general, the Vietnamese Government needs to urgently promulgate a set of criteria for classifying green activities (Green Taxonomy), applied in the fields of energy, transport and construction, in order to create a legal basis for state-owned enterprises to issue green bonds. The Ministry of Finance needs to complete mechanisms to encourage the issuance of green bonds such as income tax exemption and reduction for individual investors, develop a co-guaranteed mechanism or support for green assessment costs for state-owned enterprises.

The Government needs to build a flexible financial mechanism for SOEs such as EVN when investing in green projects: concessional loans, risk-sharing mechanisms, or public-private partnership (PPP) models, or prioritize the allocation of ODA and non-refundable financing from international organizations for high-performance green projects in the power sector.

5.3. Cooperation with international organizations and mobilization of technical resources

EVN needs to actively cooperate with partners such as ADB, WB, GIZ, JICA in building a green finance framework, ESG reporting, and developing emission measurement/emission reduction mechanisms. At the same time, EVN should participate in networks such as *Green Finance Network Asia, Initiative for Climate Action Transparency (ICAT)* to update international practices.

EVN needs to actively play a core role in programs such as *JETP,* where international capital and technical sources will be prioritized for enterprises with the ability to absorb and deploy effectively.

5.4. Recommendations on the implementation roadmap

The author also recommends to EVN the roadmap for implementing the above solutions as follows:

Stage	Main objectives	Recommended Activities
2025-2026	Build the foundation	Develop a green finance strategy; Establishment of ESG department; Standardize reports
2026-2028	Pilot deployment	The first green bond issuance; Choose a smart infrastructure project to raise capital
2028-2030	Expansion and integration	Large-scale international capital mobilization; Active participation in the JETP and global initiatives

6. Conclusion

Promoting green finance in the electricity sector particularly within Vietnam Electricity (EVN) is a key factor in supporting the national energy transition toward sustainability, modernization, and low emissions. The study reveals that EVN has significant potential to mobilize green finance due to its operational scale, long-term investment orientation, and central role in the national power grid. However, its access to and implementation of green financial instruments remain limited, with no clear strategy, a lack of financial products such as green bonds, and numerous barriers stemming from institutional constraints, internal capacity, and the underdeveloped domestic green capital market.

Nevertheless, both the international and domestic contexts are creating favorable conditions, including the Just Energy Transition Partnership (JETP), funding opportunities from international financial institutions, and growing investor interest in ESG factors. Therefore, EVN must take strategic and systematic action and closely coordinate with regulatory agencies and international partners to build a supportive legal framework, enhance institutional capacity, and innovate its approach to finance.

In conclusion, for EVN to play a leading role in Vietnam's sustainable energy transition, developing green finance is not merely a strategic option it is a necessary condition. Coordinated efforts from the enterprise, government, and development partners will be key to realizing the goal of net-zero emissions by 2050.

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SUSTAINABLE TOURISM DEVELOPMENT IN VIETNAM: OPPORTUNITIES AND CHALLENGES

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Abstract: ***Sustainable tourism development is currently an inevitable and effective direction for the tourism industry of Vietnam in particular and countries in the world in general. Vietnam has great potential for sustainable tourism development, from geographical location to natural and cultural resources. However, we also face many difficulties in developing sustainable tourism. This study points out the theoretical basis for sustainable tourism development and analyzes the opportunities and challenges for sustainable tourism development in Vietnam. As a result, it proposes some solutions for sustainable tourism development in Vietnam, making tourism a key industry, and contributing to the socio-economic development of Vietnam.***

• Keywords: *sustainable tourism, tourism, Vietnam.*

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1. Problem statement

Tourism is a smokeless industry, contributing greatly to the economic development of the country. Tourism has created many jobs, helped increase GDP, and contributed to the State budget. It is also an effective tool to carry out the work of hunger eradication and poverty reduction in remote areas. However, rapid and uncontrolled development has greatly impacted the environment, society, and the economy.

In Vietnam, the tourism industry has always received attention from the State and functional agencies, constantly developing, contributing positively to the economy, and helping the country to develop more and more. Every year, the tourism industry creates about 4.5 million workers, including 1.5 million direct workers. In 2015, the contribution to the GDP of the tourism industry was 6.3 percent and in 2019, it was 9.2 percent. Besides economic promotion, tourism also has a strong impact on trade, agriculture, industry, and transportation, stimulates domestic demand, promotes regional development, etc.

However, the COVID-19 pandemic that has occurred since the end of 2019 has caused severe impacts on Vietnam's tourism, causing a sharp decline in the number of visitors, and many business activities have had to stop completely for a long time. Many businesses, travel agencies, hotels, and restaurants have announced their closure. Approximately 800,000 people have lost their jobs and the average income of workers in the tourism industry has decreased by about 40 percent compared to before the pandemic.

After the pandemic, looking back at the activities of the tourism industry, we can see that in Vietnam, tourism activities still have many limitations, tourism development is not commensurate with its potential and advantages. The rapid development of the tourism industry while the environmental infrastructure has not kept up has also caused negative impacts on tourism resources. Many tourism resources have been overexploited, leading to a decline and difficulty in recovery. The amount of waste causing pollution and environmental degradation in tourist areas is quite large, especially in key areas prioritizing investment in tourism development. Many unhealthy cultural phenomena have had negative impacts, affecting local customs and culture. These are signs of unsustainable development.

Therefore, it is necessary and urgent to assess the opportunities and challenges of sustainable tourism development in Vietnam, and then look for solutions to develop sustainable tourism, making tourism truly a spearhead economic sector of Vietnam.

2. Theoretical basis

2.1. Tourism

Nowadays, tourism has become a popular economic and social phenomenon in countries around the world, including Vietnam. The concept of tourism has long been widely used by scholars in books, newspapers, and mass media. However, in each period of development, the concept of tourism

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also has different characteristics and is increasingly supplemented and perfected.

The International Union of Official Travel Organizations (IUOTO) has defined tourism as follows: "Tourism is the act of traveling to a place other than one's usual residence for purposes that are not related to business, meaning not to engage in a profession or work for income".

At the United Nations Conference on Tourism held in Rome - Italy (August 21 - September 5, 1963), experts defined tourism as follows: "Tourism is the sum of relationships, phenomena, and economic activities originating from the journeys and stays of individuals or groups outside their usual place of residence or country for peaceful purposes. The places where they stay are not their workplaces".

According to Article 3, Chapter I, Vietnam's Law on Tourism 2017: "Tourism is activities related to human trips outside of their usual place of residence for a duration not exceeding one continuous year, aimed at fulfilling the needs of sightseeing, relaxation, entertainment, studying, exploring tourism resources or in combination with other legitimate purposes".

From the various definitions of tourism mentioned above, we can observe a shift in the perception of the content of the term tourism. Some people view tourism as a social phenomenon, while others consider it an economic activity. Therefore, to have the most multi-dimensional view, tourism can be understood as a socio-economic phenomenon. Tourism is defined as: "The movement and temporary overnight stay during the free time of individuals or groups outside the place of residence to restore health, raising awareness of the surrounding world, with or without the consumption of some natural, economic, cultural values and services provided by professional establishments".

2.2. Sustainable tourism development

In 1992, the World Tourism Organization (UNWTO) defined: "Sustainable tourism is the development of tourism activities to meet the current needs of tourists and local residents while still paying attention to the conservation and enhancement of resources for future tourism development. Sustainable tourism will have a plan to manage resources to satisfy the economic, social, and aesthetic needs of people while maintaining cultural integrity, biodiversity, the development of ecosystems and systems supporting human life". This definition is quite long but fully contains the contents, activities, and factors related to sustainable tourism.

According to the World Travel and Tourism Council (WTTC), 1996: "Sustainable tourism is about meeting the needs of present tourists and destination while ensuring the ability to fulfill the demand for future generations of tourists". This is a fairly concise definition of sustainable tourism when referring to intergenerational issues. However, according to this definition, it only focuses on the needs of tourists and destinations, not mentioning the ecological environment and biodiversity.

According to Hens L, 1998: "Sustainable tourism requires managing all forms of resources in a way that we can meet economic, social and aesthetic needs while maintaining cultural identity, essential ecological processes, biodiversity, and life support systems". It can be seen that this definition of sustainable tourism focuses mainly on the issue of managing tourism resources to achieve sustainable development.

According to Machado (2003), Sustainable tourism is defined as: "forms of tourism that meet the current needs of tourists, the tourism industry, and local communities without compromising the ability of future generations to meet their own needs. Tourism is economically viable without destroying the resources on which the future of tourism depends, especially the natural environment and the social fabric of the local community". This definition mentions the sustainability of tourism as it meets both the needs of the present generation while considering the demands of future generations. However, this definition focuses on the sustainability of tourism forms and tourism products rather than the sustainability of the entire tourism industry.

Article 3, Chapter I, Vietnam Tourism Law 2017 also clearly states: "Sustainable tourism development is tourism development that simultaneously meets socio-economic and environmental requirements, ensuring harmony of interests of subjects participating in tourism activities, without compromising the ability to meet future tourism needs".

From the above understanding, we can view that "Sustainable tourism development" has the following three basic characteristics:

- Economic sustainability: Tourism must actively contribute to the country's economic growth in a stable manner, creating jobs and stable income, fairness for the community as well as businesses, localities, and the interests of tourists.

- Cultural and social sustainability: Tourism activities require participants in tourism activities to preserve cultural traditions and national identity in all stages of the tourism process while ensuring healthy and civilized social development.

- Environmental sustainability: environmental sustainability in tourism activities means carrying out tourism activities that use resources that do not exceed their self-recovery capacity to meet current development needs without weakening the ability to regenerate in the future, in order to satisfy the needs of future generations. This also means that tourism must minimize negative impacts on the environment, and preserve and protect the environment to facilitate better tourism development.

3. Opportunities for sustainable tourism development in Vietnam today

Vietnam is a country with many favorable conditions for developing the tourism industry, especially sustainable tourism.

Firstly, it has diverse natural conditions with many beautiful and unique destinations. Vietnam has a coastline of 3,260 kilometers, with 125 beaches, most of which are very beautiful and convenient for tourism exploitation, such as Tra Co, Ha Long, Sam Son, Lang Co, Da Nang, Nha Trang, Phu Quoc, etc. Vietnam ranks 27th among 156 coastal countries in the world and is one of the 12 countries with the most beautiful bays in the world (Halong Bay and Nha Trang Bay).

Many famous landscapes and scenic spots have been voted in the list of the most beautiful places in the world, such as My Khe (Da Nang), Nha Trang, An Bang (Quang Nam), Bai Dai (Con Dao), Ha Long Bay, Lang Co (Hue), etc. In 2021, Touropia voted Ha Long Bay (Quang Ninh) of Vietnam as the most beautiful bay on the planet, above Guanabara Bay (Southeast Brazil) and San Francisco Bay (California, USA). Meanwhile, the World Bays Club honored Lang Co as one of the most beautiful bays in the world in 2009.

Secondly, there are many historical and cultural sites, as well as famous landmarks and scenic spots, both domestically and internationally. Vietnam has 85 sites ranked as special national relics, 3,329 sites recognized as national relics, and 9,857 provincial relics. In particular, there are 8 tangible heritages and landscapes classified as World Heritage (Trang An Scenic Landscape Complex, Ho Dynasty Citadel, Thang Long Imperial Citadel, Hue Monuments Complex, Ha Long Bay, Hoi An Ancient Town, My Son Sanctuary, and Phong Nha - Ke Bang National Park). These landscapes, combined with climate and weather conditions, are important factors for Vietnam to attract millions of domestic and international tourists every year.

Thirdly, intangible cultural values are imbued with traditional and unique features. With a treasure of 191 heritages belonging to all 7 types of intangible cultural heritage of ethnic groups living in all regions of the country included in the National Intangible Cultural Heritage List, Vietnam has 11 heritage items recognized as masterpieces of the intangible cultural heritage of humanity (Hue Royal Court Music, Central Highlands Gong Cultural Space; Bac Ninh Quan Ho Folk Songs, Ca Tru, Giong Temple Festival, Xoan Singing, Hung King Worship, Southern Amateur Music, Nghe Tinh Vi Dam Folk Songs, Tug of War, Three Palaces Worship).

Fourthly, the stable political regime, and the State's policy of innovation, openness, and integration also create favorable conditions for sustainable tourism development. The Party and State pay special attention to tourism development, especially sustainable tourism development. On January 22, 2020, the Prime Minister issued Decision No. 147/QD-TTg approving the "Vietnam Tourism Development Strategy to 2030", which clearly states the goal by 2030: "Tourism is truly a spearhead economic sector and develops sustainably. Vietnam becomes a particularly attractive destination, among the top 30 countries with the world's leading tourism competitiveness, fully meeting the requirements and goals of sustainable development"

Fifthly, young and abundant human resources are also an advantage for the sustainable development of Vietnam's tourism. According to the United Nations, by September 2024, Vietnam will have a population of nearly 100 million, ranking 15th in the world and 3rd in Southeast Asia. The workforce aged 15 and older in Vietnam reached 52.4 million in 2023, an increase of 666,500 compared to 2022 (According to data from the General Statistics Office - 2023). An abundant labor force and a young labor force structure - considered the "golden structure" in labor, will be a great advantage for the sustainable development of Vietnam's tourism in particular and the country's economic development in general.

Sixthly, tourists' awareness of sustainable development is increasingly enhanced. Tourists today have also changed in terms of lifestyle, consumption, and enjoyment, especially among the younger generation, Gen Z who are not only interested in experiencing, exploring, and enjoying, being green but also want to contribute to sustainable development, environmental protection for the community even during their travels.

4. Challenges in developing sustainable tourism in Vietnam today

In addition to the opportunities for sustainable tourism development, the Vietnamese tourism

industry still faces several difficulties and challenges that have led to the failure to exploit these opportunities, and at the same time, threaten to affect the sustainability of the industry. Specifically:

First, the legal system is still incomplete, specific policies for tourism types such as community tourism are still unclear; tax, land, and immigration policies are sometimes difficult to access and involve complex procedures; the ability to access policies and investment support policies for tourism businesses is not high, due to barriers in processes and procedures.

Second, professionalism in developing tourism products and promoting marketing is still lacking. Vietnam's tourism products are slow to innovate, monotonous, lack distinctiveness, and show little creativity. There is a lot of overlap between regions, the added value embedded in tourism products is low, and there is a lack of coherence and connection in product development. Products are slow to innovate while tourist demand changes dramatically. New tourism products mainly exploit the values of existing resources, there are not many complementary products to attract tourists, stimulate their spending needs, and increase local revenue. The absence of complementary products also reduces the demand for visits as well as the ability to return.

In addition, promotion work is still limited, unprofessional, unsystematic, and ineffective; it only stops at promoting the general image, failing to create a resonance and specific appeal for each tourism product and brand. The government's investment funds are still limited and have not yet created a stimulating effect. Some internationally known tourist destinations such as Ha Long, Sapa, Hanoi, Hue, Hoi An, Da Lat, and Saigon (Ho Chi Minh City) but the images are still not very prominent.

Third, factors of security, safety, and hygiene have not been ensured. In fact, in recent times, issues of unsanitary conditions, security, and order at tourist sites have frequently occurred. Illegal taxis, soliciting, street vendors, scams, and forcing tourists still occur frequently in many localities, especially during peak seasons.

Fourth, the management and exploitation of tourism resources have not been effectively implemented. There has not been a comprehensive assessment of tourism resources, and the evaluation, classification, and ranking for sustainable and effective management of these resources have not been proceeded. As a result, while many tourism resources exist, their full potential has not yet been exploited.

The limitations in management and decentralization have led to conflicts of economic interests among various stakeholders and sectors. Short-term perspectives and technological constraints have resulted in some tourism resources being damaged and misused, negatively impacting the sustainable development of tourism.

Fifth, the quality of human resources in the tourism industry is still limited. Although the tourism workforce is large, the proportion of those who are professionally trained is low; the quality of tourism training has many limitations and has not adapted quickly to global integration and competition. The team of professional tour guides with many types of tourism and responding to the languages of the target market is still not fully prepared. Statistics on trained labor in the tourism sector show that only 10 percent of the workforce holds a university degree, while those with college, vocational, or elementary training make up over 50 percent, and the remainder consists of workers who have completed only short-term courses.

Sixth, the infrastructure to access destinations is not yet modern and lacks uniformity. The system of technical facilities, accommodation, and tourism services is developing rapidly but is still small in scale, unprofessional in operation, and has not yet formed a system of national tourist areas with outstanding brands.

Seventh, the awareness of the community in developing tourism is still limited. Due to their inherent characteristics, many locals do not allow tourists to visit their living areas or feel uncomfortable with changes in their lives brought about by strangers. In many places, local residents are hesitant to borrow money for investing in community tourism when transitioning their economic model and are only willing to do so with complete support from the local authorities.

Eighth, the negative impact of tourism on the ecological environment is also a huge challenge for sustainable tourism development. Pollution of soil, water, and air environments due to waste, emissions from tourism activities, and noise pollution from vehicles and tourists causes inconvenience to residents and wildlife. Tourism development means increasing the number of visitors to tourist attractions, strengthening the development of infrastructure, and services, and increasing the demand for resources, thereby leading to increased pressure from tourism development on the environment.

In addition, Vietnam's tourism industry is also facing numerous challenges from fierce competition

from countries in the region such as Thailand, Malaysia, and Cambodia when these countries have had very large investment and promotion strategies to increase their attractiveness to international tourist markets.

5. Some solutions for sustainable development of Vietnam tourism

5.1. Disarmament of the State

First, it improves the system of legal documents, planning, and policies to create a legal corridor for sustainable tourism development. In particular, it is necessary to develop policies and regulations on payment for environmental services and build a penalty regime for tourism activities that cause environmental pollution. This is an economic tool to help those who benefit from ecosystem services pay those who participate in maintaining, protecting, and developing the functions of that ecosystem.

Second, the Government needs to focus on investing from the State budget for tourism activities in basic tasks such as renovating historical relics, training human resources, and promoting and developing tourism activities; especially investing in infrastructure for sustainable tourism development. It prioritizes investment in tourism projects that have specific solutions to solve environmental pollution and bring direct socio-economic and environmental benefits to the community both in the present and the future. Besides, we need to focus on investing in building some attractive, world-famous destinations to create unique brands and attract tourists around the world.

Third, it is important to strengthen the organization of the State management apparatus in conjunction with specifying the functions and tasks of State management of tourism and promoting reform of related administrative procedures to meet the requirements of sustainable tourism development. It builds a team of State management officials on tourism from the central to local levels, with capacity and responsibility. It improves the effectiveness of State management of the tourism environment and raises environmental awareness for officials working in the tourism industry, thereby contributing to sustainable tourism development.

Fourth, it strengthens the training and development of high-quality human resources to serve the goal of sustainable tourism development. It is necessary to improve the training quality of tourism educational institutions in terms of both teachers and facilities. It plays a leading role in training tourism human resources with extensive knowledge of the profession and passion for the profession.

Fifth, it enhances communication, and tourism promotion activities and applies information technology to promote sustainable tourism. It focuses on developing nature-friendly tourism products, including eco-tourism, community-based tourism, and cultural tourism, as well as implementing meaningful cooperation programs to promote activities and enhance the influence of Vietnamese tourism.

Sixth, it promotes the development of tourism linkages. The tourism linkages between provinces and regions are expanded across the country to create unique tourism products and connect tourism tours most effectively. It coordinates to build unique, distinctive tourism programs and products that are distinct to each locality.

Seventh, it pays attention to preserving and protecting the natural environment, culture, community tourism, hunger eradication, and poverty reduction, ensuring security and safety in tourism development to ensure sustainable tourism development. It is necessary to integrate sociocultural development planning and environmental protection with tourism business development planning; incorporate sustainable development requirements into state management of tourism; conduct environmental impact assessments for tourism development investment projects that affect the environment to ensure minimizing negative impacts and risks of tourism on the environment, cultural traditions, and living conditions of residents.

5.2. Solutions for tourism businesses

First, it takes advantage of technology and digital customer experience. The improvement of customer experience through mobile applications, online booking websites, and customer care services via social networks will help businesses increase customer attraction and retention.

Second, it develops unique and diverse products and services. Developing new tour packages, special holidays, or enhancing travel experiences will attract customers' attention and create competitive advantages. In addition, the current development of diverse tourism products such as eco-tourism, experiential and exploratory tourism, community tourism, agricultural tourism, adventure tourism, business travel, resort tourism, and MICE (Meetings, Incentives, Conferences, and Exhibitions) will be a sustainable direction for businesses in the future, as well as tapping into high-paying customer sources.

Third, environmental protection and sustainable development. The growth of the tourism industry also goes hand in hand with issues of environmental

protection and sustainable development. Businesses need to actively participate in environmental conservation activities, minimizing negative impacts on the environment and local communities. Tourism businesses need to strictly implement regulations on environmental protection. The restaurants and hotels use green technology, and environmentally friendly materials, save fuel, and limit direct discharge into the environment, especially homestays near tourist areas. The construction of accommodation facilities must comply with regulations and not destroy the surrounding landscape. In addition, businesses should actively participate in organizing environmentally friendly tours such as tree planting tours, garbage collection, distribution of self-destructing plastic bags, etc. Such tours will attract many young people and foreigners, enhancing the image of Vietnamese tourism businesses and serving as an effective means of communication regarding environmental protection.

Fourth, cooperation and connection with local areas. Collaborating with local partners, non-governmental organizations, and other businesses in the industry is also an important factor in developing sustainable tourism. Through building a strong network of connections, businesses can effectively take advantage of new resources and opportunities.

Fifth, training and developing human resources. Employees are the most important resource in every business. Training and developing personnel not only helps improve service quality but also motivates them to generate new ideas and enhance work processes. It is important to train and retrain through organizing short-term training courses (sending staff to study or inviting leading experts in the tourism sector) to continuously improve the quality of high-quality human resources in the business.

5.3. Solutions for the community

For tourism activities to develop sustainably, one of the important factors is to ensure social welfare and income for local communities, so that residents can see the benefits that tourism brings. As a result, it raises awareness of tourism activities such as environmental issues, attracting visitors through preserving and promoting the beauty of local culture to tourists.

It enhances the role of local communities in educating the tradition of hospitality and cultural exchange between regions and countries, both domestically and internationally.

It builds trust and pride within the community through campaigns, propaganda, and lectures on the values of natural and cultural resources as well as the importance of people in preserving and promoting these values.

It propagates laws related to tourism business activities to local communities. Residents involved in tourism activities need to be organized and aware, avoiding spontaneous tourism, protecting the tourism environment, and ensuring the rights of tourists.

It is necessary to develop specific plans to promote the role of residents in sustainable tourism development, including preserving and conserving local traditional culture and safeguarding the landscape of the living environment. It enhances the role of residents in awareness of sustainable tourism development such as not automatically raising prices during the tourist season, not soliciting tourists, not having activities that pollute the environment, and destroying tourism resources, etc.

5.4. Solutions for tourists

Tourists are an important component of tourism activities, consume tourism products, and are also a direct factor affecting the environment in tourist areas. Therefore, raising the responsibility of environmental protection for tourists is an important task for sustainable tourism development.

Tourists are aware of becoming Green tourists by choosing types of tourism that both satisfy their own travel needs and bring benefits to the local community where they travel by participating in rural tours, eco-tourism, community tourism, etc.

There should be specific instructions for visitors to raise awareness of environmental protection, energy saving, willingness to participate in environmental activities in tourist areas, willingness to support environmental tourism activities, and local socio-economic development.

6. Conclusion

Identifying opportunities and challenges will contribute significantly to finding appropriate and satisfactory solutions to build and develop sustainable tourism in Vietnam, helping tourism truly become a key economic sector and contribute to the socio-economic development of the country.

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TOURISM DEVELOPMENT IN LAO CAI PROVINCE: OPPORTUNITIES, CHALLENGES AND SUSTAINABLE ORIENTATION

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Abstract: ***Lao Cai is one of the provinces with the greatest tourism potential in the northern mountainous region of Vietnam, thanks to its unique advantages in nature, culture, and geographic location. However, alongside its strengths and opportunities, the province is also facing numerous challenges in the tourism development process. This article employs the SWOT analysis method to assess the current state of tourism development in Lao Cai and proposes several strategic orientations for sustainable tourism management in the near future.***

• Keywords: *tourism, tourism development, visitor, strength, weakness, opportunity, threat.*

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1. Introduction

Tourism has increasingly become a driving force of socio-economic transformation in many localities across Vietnam, particularly in remote and mountainous areas. Among these, Lao Cai stands out as a prime example of a province with remarkable potential for tourism development. Strategically located in the Northwest region of Vietnam, bordering China's Yunnan province, Lao Cai is not only an important gateway for cross-border trade and tourism but also a convergence point of natural beauty, cultural diversity, and historical richness. The province is home to iconic destinations such as Sa Pa, Fansipan - "the Roof of Indochina", the poetic Muong Hoa Valley, and the colorful highland markets of Bac Ha. These places, along with pristine destinations like Y Ty and Si Ma Cai, contribute to Lao Cai's growing reputation as a top-tier tourist destination both domestically and internationally. The tourism sector in Lao Cai has experienced rapid development over the past decade, especially in the post-COVID-19 recovery period. With government support, strong investment from both the public and private sectors, and increasing tourist demand for nature-based, cultural, and experiential travel, Lao Cai has significantly improved its infrastructure, tourism services, and promotional strategies. However, this growth has also exposed several pressing challenges. Overcrowding in key destinations like Sa Pa, degradation of the natural environment, uneven service quality, and the commodification of ethnic cultural identities are among the most concerning issues. Furthermore, climate change, the lack of professional human resources, and growing regional competition present additional threats to sustainable tourism development. To ensure long-term, balanced growth, it is essential that Lao Cai's tourism strategy not only capitalizes on its inherent strengths and external opportunities but also addresses its internal weaknesses and external risks. A comprehensive and integrated approach, grounded in sustainability principles, is required - one that promotes inclusive community participation, preserves cultural and environmental assets, and enhances tourism governance and planning capacity. This paper employs the SWOT (Strengths - Weaknesses - Opportunities - Threats) analytical framework to provide a systematic assessment of tourism development in Lao Cai province. Drawing on both secondary data (from provincial reports and national statistics) and primary data (from tourist surveys and expert interviews), the study offers insights into the current landscape of tourism in Lao Cai. It identifies key issues and proposes strategic orientations for fostering sustainable tourism in the near future. By doing so, the paper aims to contribute to the ongoing policy and academic discussions on sustainable tourism in Vietnam's mountainous regions and to offer practical solutions for enhancing Lao Cai's competitiveness as a green, culturally rich, and resilient destination.

2. Research Methodology

To comprehensively assess the current status of tourism development in Lao Cai province and propose strategic orientations for sustainable growth, this study adopted a multi-method approach combining

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both secondary and primary data collection, as well as qualitative and quantitative analysis methods. The research process was conducted in three main stages:

2.1. Secondary Data Collection

Secondary data was collected from a variety of official sources, including reports, planning documents, and statistical yearbooks issued by the Lao Cai Provincial People's Committee, the Department of Culture, Sports and Tourism, the Vietnam National Administration of Tourism, and other relevant governmental agencies. The time frame of the data spans from 2022 to 2024, a period that reflects the post-pandemic recovery and resurgence of tourism activities in the province. These documents provided critical information on tourism arrivals, revenue, infrastructure development, public policies, and strategic orientations. Additionally, data from academic publications, previous research, and websites such as the provincial tourism portal and national tourism websites were utilized to supplement the analysis.

2.2. Primary Data Collection

To complement the secondary data and obtain insights into tourists' real experiences and perceptions, primary data was collected through field surveys and qualitative interviews. The research team designed a structured questionnaire to measure tourist satisfaction with various aspects of tourism services in Lao Cai, including natural landscape quality, cultural experience, accommodation, local cuisine, guiding services, service professionalism, price transparency, and environmental sanitation.

The survey was conducted at three major tourist destinations: Sa Pa, Bac Ha, and Y Ty. A total of 1,000 valid responses were collected, with the distribution as follows: 500 questionnaires from visitors in Sa Pa (representing the most developed and visited area), 300 from Bac Ha (a cultural and community tourism center), and 200 from Y Ty (a rising destination in eco and ethnic tourism). The data collection process ensured diversity in respondent demographics (age, gender, nationality, travel purpose, and duration of stay) to reflect a wide range of tourist perspectives.

In addition to the questionnaire, in-depth interviews were carried out with key stakeholders, including local tourism officials, tour operators, hotel and homestay owners, and local community representatives. These interviews helped to explore more deeply the underlying issues affecting tourism development, such as infrastructure challenges, environmental management, cultural preservation, and governance mechanisms.

2.3. SWOT Analysis

The SWOT (Strengths - Weaknesses - Opportunities - Threats) analysis framework was applied to synthesize the findings from both the secondary and primary data sources. This method facilitated a systematic evaluation of Lao Cai's tourism potential and development challenges. The strengths and weaknesses were identified based on internal factors such as tourism resources, infrastructure, and human capital, while opportunities and threats were derived from external trends, market dynamics, and policy environments. The SWOT analysis served as a foundation for developing strategic recommendations aimed at ensuring sustainable tourism development in Lao Cai in the medium and long term.

This mixed-methods approach, integrating empirical data with strategic analysis tools, enhances the validity and relevance of the study's findings and ensures that the proposed solutions are grounded in the actual conditions and needs of Lao Cai's tourism sector.

3. Results

3.1. Current State of Tourism Development in Lao Cai

Several types of tourism have been effectively exploited, such as: Leisure tourism in Sa Pa and Bac Ha; Ecotourism and adventure tourism (connected to the Chay River, Mount Fansipan, village trekking, caves, waterfalls...); Cultural and community-based tourism; Spiritual tourism and shopping tourism.

Tourism spatial orientation has gradually expanded through surveys and the development of new community tourism routes and sites. Inter-provincial tourism routes have also been formed, with a focus on Chinese tourists using travel cards along the Lao Cai - Hanoi - Hai Phong - Quang Ninh route and toward southern provinces.

The Bac Ha tourism area has undergone planning and investment in sites such as: Bac Ha Cultural Market, Hoang A Tuong Ancient Residence, Bac Ha Temple, and Ban Pho Village. The province has also worked to restore and preserve festivals and traditional games, especially the traditional horse racing festival.

Lao Cai serves as a hub connecting Vietnamese tourists to China and vice versa. It is also a destination within the "Back to Roots" tourism program among the provinces of Lao Cai and Phu Tho, helping attract diverse investment into the tourism sector.

From 2022 to 2023, the number of tourists increased significantly (by nearly 69%), reflecting post-COVID-19 recovery and the effectiveness of

tourism stimulus policies. From 2023 to 2024, the number of tourists continued to grow, though at a slower rate (22%), suggesting the tourism sector is reaching a more stable development phase.

Table 1: Tourism Activities in Lao Cai Province, 2022-2024

Year	Tourist Arrivals (million)	International Visitors (thousand)	Tourism Revenue (billion VND)
2022	3.5	175	12,000
2023	5.9	300	18,500
2024	7.2	500	24,000

Source: Lao Cai Provincial People's Committee, 2024

Tourism revenue grew in parallel with visitor numbers and international arrivals. However, the rate of revenue growth is slowing down, signaling the need to improve service quality and increase tourists' average spending instead of only focusing on volume. Lao Cai tourism showed a strong recovery and growth after the pandemic, especially in 2023.

The increase in international tourists highlights the province's growing appeal to foreign markets. However, the slowdown in revenue growth raises concerns about sustainability and the added value of tourism. Future strategies should focus on service quality, signature product development, green tourism, and community-based tourism to ensure sustainable growth.

Table 2: Tourism Infrastructure in Lao Cai Province, 2022-2024

Category	2022	2023	2024
Number of accommodation establishments	1,200	1,350	1,500
Number of hotel rooms	15,000	17,500	20,000
Hotels rated 3 stars or higher	25	30	35
Upgraded tourism roads (km)	50	70	90
New community tourism sites	5	8	10

Source: Lao Cai Provincial People's Committee, 2024

Accommodation facilities increased steadily (~150 per year), showing strong investment in infrastructure to meet rising demand. The stable growth rate reflects well-planned development aligned with real needs.

The number of hotel rooms grew faster than establishments, indicating a trend toward larger-scale hotels capable of serving more guests, particularly in key tourist hubs like Sa Pa and Bac Ha.

There was notable growth in high-quality hotels, catering to the demand for better experiences and attracting international and high-end visitors. This is a positive sign toward sustainable and quality tourism development.

Significant investment in transportation infrastructure, especially roads connecting remote areas with tourist centers, helped improve access and distribute visitor flows more evenly, rather than concentrating only on hotspots.

Lao Cai focused on community-based tourism development, associated with ethnic culture, ecology, and agriculture. While growth is steady, attention must be paid to maintaining quality and avoiding unregulated expansion. Tourism infrastructure from 2022 to 2024 developed comprehensively, balancing quantity and quality, especially in the mid- to high-end segments. Expanding community tourism and transport investment lays the foundation for sustainable tourism and effective visitor dispersion.

Table 3: Tourist Satisfaction with Services in Lao Cai Province

Based on a survey of 1,000 tourists in Sa Pa, Bac Ha, and Y Ty

Evaluation Criteria	% of Satisfied Tourists
Landscape, climate, environment	91%
Local cultural experiences	85%
Accommodation quality (hotels, homestays)	77%
Local cuisine	73%
Tour guides and interpretation	60%
Communication and professional service	59%
Price transparency and posting	52%
Environmental sanitation and waste treatment	48%

Source: Tourism Development Research Institute, 2024

Highly rated criteria: Landscape, climate, and environment (91%) ranked highest, reflecting Lao Cai's exceptional natural appeal. This is a key advantage to be preserved and sustainably developed. Local cultural experiences (85%) were also highly rated, showing the strong attraction of ethnic villages, traditional festivals, and cultural diversity. These are core values for unique tourism products. Accommodation quality (77%) and local cuisine (73%) received fairly high satisfaction, indicating basic services meet tourists' needs well, especially in central areas like Sa Pa.

Moderately rated criteria: Tour guides and interpretation (60%) and communication and professional service (59%) scored relatively low. This indicates shortcomings in soft skills, foreign language proficiency, and tourism professionalism, especially in remote or non-central areas.

Lowest rated (red flags): Price transparency and posting (52%) was a major concern. Practices like overcharging and unclear pricing remain common, reducing trust and visitor satisfaction. Environmental sanitation and waste treatment (48%) was the lowest-rated criterion, pointing to weaknesses in environmental management, which could harm the province's tourism image and long-term sustainability.

3.2. SWOT Analysis in Tourism Development of Lao Cai Province

3.2.1. Strengths

Lao Cai possesses a unique and diverse tourism potential, positioning itself as a leading tourism hub in Vietnam's Northwestern mountainous region. One of its most iconic landmarks is Fansipan Peak - known as "the Roof of Indochina" at 3,143 meters - attracting both adventurous trekkers and casual tourists through its state-of-the-art cable car system. The breathtaking Muong Hoa Valley, home to some of the world's most beautiful terraced rice fields, as recognized by CNN, adds to the province's natural charm. Meanwhile, off-the-beaten-path destinations such as Y Ty and Bac Ha offer unspoiled landscapes ideal for ecotourism and nature-based exploration, making Lao Cai a perfect destination for travelers seeking authenticity and tranquility.

Beyond natural beauty, Lao Cai is also a melting pot of rich ethnic cultures, with over 25 minority groups residing across the province. These communities bring unique festivals, customs, and traditional handicrafts to life. Vibrant cultural events such as the H'mong Gau Tao Festival and the Dao Say San Festival, along with colorful highland markets like the Bac Ha Market, offer immersive cultural experiences. Traditional crafts, including brocade weaving, blacksmithing, and Do paper making, not only preserve cultural heritage but also serve as foundations for the development of community-based tourism.

Strategically located along the Vietnam-China border, Lao Cai benefits from its proximity to Yunnan province and its position within the Kunming-Lao Cai-Hanoi-Hai Phong economic corridor. This location facilitates both trade and cross-border tourism, creating valuable opportunities for regional integration and international connectivity.

Tourism infrastructure in Lao Cai has also undergone significant development, particularly in key destinations such as Sa Pa. The area is now equipped with luxury resorts, modern hotels, and the renowned Fansipan Legend cable car, attracting high-end tourists. The Noi Bai-Lao Cai expressway and improved transport services have greatly enhanced accessibility to the region. In addition, major investors such as Sun Group and Vingroup have contributed to elevating service standards and boosting Lao Cai's global tourism appeal.

3.2.2. Weaknesses

Despite its many advantages, Lao Cai's tourism sector still faces several notable weaknesses that hinder its sustainable development. One of the most pressing issues is the lack of coordinated tourism planning. In areas like Sa Pa, uncontrolled and spontaneous construction has led to overcrowding, environmental degradation, and a loss of landscape value. The absence of inter-district planning and coordination results in fragmented investments, making it difficult to implement a unified, sustainable tourism strategy across the province.

Another significant challenge is the weakness in human resources. Many tourism service providers, especially in remote and community-based tourism areas, lack professional training and foreign language skills. This affects service quality and the overall visitor experience. Additionally, there is a shortage of qualified tour guides with in-depth knowledge of the local culture and history, which limits the ability to deliver meaningful and engaging interpretations of Lao Cai's cultural heritage.

Cultural preservation efforts also remain inadequate. Many traditional festivals are becoming overly commercialized, losing their original meanings and authenticity. Traditional craft villages, once vibrant and culturally rich, are now in decline due to a lack of strategic support, investment, and innovation. This erosion of cultural identity threatens the very foundation of Lao Cai's appeal to cultural and experiential tourists.

Moreover, the province's international tourism marketing and promotional efforts are underdeveloped. Promotional content often lacks creativity and professional quality, making it difficult to compete in global markets. There is limited utilization of digital platforms, social media, and online marketing tools, and Lao Cai has yet to establish strong partnerships with international travel agencies and tour operators. This significantly restricts its ability to reach potential international visitors and position itself effectively on the global tourism map.

3.2.3. Opportunities

Government prioritization of tourism: Tourism is identified as a key economic sector in national and provincial strategies, with numerous infrastructure projects underway and investment incentives in place.

Global trend towards experiential, green, and community-based tourism: These trends align well with Lao Cai's natural and cultural strengths. Visitors are increasingly seeking authentic, nature-connected experiences, which Lao Cai can offer through sustainable tourism models.

Digital technology advancement: Enables the development of smart tourism systems, including digital marketing, VR experiences, online bookings, and interactive maps. These tools improve efficiency and enhance the visitor experience.

Expanded regional and international linkages: Cross-border tourism with China and inter-provincial tours (e.g., Lai Chau, Dien Bien) enrich product offerings. Economic corridors (Kunming - Lao Cai - Hanoi - Hai Phong - Quang Ninh) bring in more international tourists and investment opportunities.

3.2.4. Threats

Climate change and natural disasters: Frequent floods, landslides, and heavy fog in highland districts (e.g., Sa Pa, Bat Xat) disrupt tourism and pose safety risks. Harsh weather conditions challenge long-term tourism investment.

Regional competition: Provinces are emerging with similar tourism products. This puts pressure on Lao Cai to innovate and differentiate its brand.

Cultural value loss: Over-commercialization of ethnic culture can lead to loss of authenticity, affecting tourists seeking genuine experiences. Heavy tourism dependence may distort local values and traditions.

Global uncertainties: Events like pandemics (e.g., COVID-19), economic downturns, regional conflicts, or visa policy changes can severely affect international tourism. Diversifying markets and strengthening domestic tourism are essential.

3.3. Sustainable Tourism Development Orientation and Solutions

To achieve sustainable and effective tourism development in Lao Cai province, a comprehensive and integrated approach is essential. This requires active coordination among key stakeholders, including local government authorities, tourism businesses, community organizations, and tourists themselves. Sustainable tourism must be grounded not only in economic growth but also in the preservation of natural and cultural resources, social inclusiveness, and long-term resilience. The following development orientations and corresponding solutions are proposed as a strategic roadmap for guiding Lao Cai's tourism sector toward a green and responsible future.

First, it is imperative to strengthen tourism planning and spatial zoning.

Tourism planning should be based on scientific principles, community participation, and a long-term vision. The provincial master plan for 2025-2030, with a vision to 2045, must clearly define functional tourism zones to avoid overcrowding and environmental degradation while ensuring a balanced distribution of tourism activities. Core zones such as Sa Pa should focus on high-end tourism development with international-standard infrastructure, controlled construction, and environmental protection. Buffer zones like Bac Ha are ideal for developing cultural tourism, agricultural experiences, and moderately scaled accommodations. Conservation zones, including remote areas like Y Ty, should prioritize ecosystem protection, cultural preservation, and small-scale, community-based tourism models. These spatial arrangements must be supported by environmental impact assessments, visitor carrying capacity evaluations, and continuous monitoring systems to ensure alignment with sustainable development goals.

Second, enhancing the quality of human resources in tourism is essential.

Human resources serve as a cornerstone for the competitiveness and professionalism of the tourism industry. Lao Cai needs to invest in vocational training programs covering hotel management, tour guiding, event organization, and the operation of community-based tourism. Emphasis should be placed on improving foreign language proficiency and intercultural communication skills, especially among local service providers and ethnic minorities working in tourism-related roles. Inclusive training programs that empower local communities to participate directly in tourism, such as through homestays, local guiding, and traditional handicraft production, are crucial. In addition, cooperation with tourism schools, universities, and international partners should be expanded to provide practical courses, internships, and skill-building opportunities tailored to local needs.

Third, digital transformation should be accelerated to build a smart tourism ecosystem.

The application of digital technologies is vital for modernizing tourism services and enhancing the visitor experience. Lao Cai should focus on developing a smart tourism infrastructure that includes tools such as interactive digital maps, mobile applications, online booking platforms, QR code systems, and virtual reality (VR) experiences. These technologies will not only improve the efficiency of tourism management but also expand global reach through digital marketing and data-driven decision-making. Tourism businesses and community-based service providers should be encouraged to engage in e-commerce and promote their offerings on social media and other digital platforms. At the same time,

data analytics should be used to monitor tourist behavior, assess satisfaction levels, and continuously improve service quality.

Fourth, promoting regional and international cooperation is key to expanding market access.

Lao Cai's strategic location offers great potential for regional linkages and cross-border tourism development. The province should continue to develop inter-provincial tourism routes in coordination with neighboring provinces, forming thematic circuits centered on nature, culture, and adventure. Cross-border tourism with China, particularly Yunnan province, should be further explored by leveraging the Kunming - Lao Cai - Hanoi - Hai Phong economic corridor and enhancing border infrastructure. Participation in national and international tourism expos, cultural festivals, and trade forums can significantly enhance Lao Cai's visibility, attract foreign investment, and foster partnerships with global travel agencies and media outlets.

Finally, the promotion of green, inclusive, and responsible tourism must be a guiding principle.

Environmental sustainability and cultural integrity are critical to Lao Cai's long-term appeal as a tourist destination. The province should support the development of eco-friendly tourism models that integrate forest conservation, biodiversity protection, and organic agricultural practices. Local communities should be actively involved in conserving traditional crafts, festivals, music, and rituals, transforming cultural heritage into both an economic asset and a source of identity. Efforts must be made to reduce the ecological footprint of tourism by encouraging the adoption of green technologies in accommodations, waste management systems, and transport services. Public awareness campaigns should also be launched to educate tourists and businesses on sustainable practices and environmental responsibility.

4. Conclusion

Lao Cai province holds significant potential to emerge as a leading tourism hub in Northern Vietnam, thanks to its unique combination of natural beauty, cultural diversity, and strategic geographic location. With iconic destinations such as Sa Pa, the Fansipan mountain range, and culturally rich areas like Bac Ha and Y Ty, the province is well-positioned to attract both domestic and international tourists. The substantial increase in visitor numbers and tourism revenue in recent years clearly demonstrates Lao Cai's growing appeal and the positive impact of tourism stimulus policies and infrastructure investment. However, the path toward becoming a sustainable and competitive tourism destination is not without challenges. To fully realize its tourism potential, Lao Cai must adopt a modern, strategic governance mindset that places sustainability at the core of its development model. This requires moving beyond short-term gains and mass tourism approaches toward long-term planning that balances economic growth with environmental stewardship and cultural preservation. Effective tourism governance must be accompanied by the consistent implementation of policies and regulatory frameworks that prevent unplanned construction, environmental degradation, and the over-commercialization of ethnic cultures. Strengthening policy coordination across departments and districts is also essential to avoid fragmented development and ensure that tourism brings inclusive benefits to all communities. Equally important is the active participation of local communities in tourism development. Sustainable tourism cannot be achieved without empowering local residents - particularly ethnic minority groups - to engage in tourism as both contributors and beneficiaries. Community involvement not only helps preserve intangible cultural heritage but also fosters a sense of ownership and responsibility for protecting the natural environment. Supporting community-based tourism models, enhancing vocational training, and investing in public awareness programs are necessary steps toward building a tourism sector that is both inclusive and resilient. Ultimately, the future of tourism in Lao Cai must be built on three foundational pillars: cultural preservation, environmental protection, and service quality enhancement. These elements are essential for maintaining the province's competitive advantage in an increasingly crowded tourism market. Cultural preservation ensures authenticity and differentiation; environmental protection safeguards the very landscapes that draw visitors; and service quality is key to visitor satisfaction, repeat tourism, and positive word-of-mouth. Together, these pillars form the backbone of a green, inclusive, and sustainable tourism development strategy that can secure Lao Cai's place as a model destination in Vietnam and the wider Southeast Asian region.

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EFFICIENT MANAGEMENT OF THE SUPPLY CHAIN THROUGH DIGITAL TECHNOLOGY AND THE MEDIATED ROLE OF SUPPLY CHAIN FINANCE FOR THE RETAIL INDUSTRY

PhD. Nhan Cam Tri*

Abstract: ***The purpose of this paper is to understand the impact of digitization on supply chain efficiency under the mediation of supply chain finance. 344 employees and managers at small and medium-sized businesses in Vietnam's retail sector were interviewed for the article. The research model is a partial least squares structural model (PLS-SEM), processed by SmartPLS 4.0 software through two steps. Research results show that supply chain finance has a positive and significant impact on supply chain effectiveness. The external environment, negotiation, digitizing technologies, information sharing, and financial institutions have a positive influence on supply chain finance. The outcomes also confirmed the intermediary role of supply chain finance. The study's findings have helped demonstrate the research topic empirically in Vietnam, a developing nation with a rapidly evolving retail sector influenced by digitalization. In practice, research results are the basis for helping managers establish sustainable business strategies.***

• Keywords: *Digitizing technologies, external environment, information sharing, financial institutions, negotiation, supply chain.*

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1. Introduction

Effective supply chain management plays a significant role in expanding business reach, establishing market dominance, and building customer trust (Nguema et al., 2020). By optimizing supply chain activities, businesses can gain a competitive edge in their industry and achieve substantial profits (Ali et al., 2020). Therefore, developing a robust supply chain management system is a critical priority.

Adequate financial resources are crucial for ensuring the efficient functioning of supply chains, especially for small and medium-sized enterprises (Gornall & Strebulaev, 2018). Financial support supplies the working capital needed for operations (Lamoureux & Evans, 2012). To access funding from organizations, businesses must demonstrate effective operations and risk management (Pfohl & Gomm, 2009). This highlights the role of supply chain finance in enhancing supply chain efficiency.

Research has identified various factors influencing supply chain efficiency, including financial institution support, interest rates, inflation, government policies, and industry regulations (Nguema et al., 2020; Ali et al., 2020). Additionally, collaboration and negotiation are proven to play a critical role (Nguema et al., 2020; Ali et al., 2020; Carnevale & Isen, 1986; Lamoureux & Evans, 2012). The impact of digitization on supply chain finance has also been attributed to advancements in Industry 4.0 technology (Nguema et al., 2020; Bui & Nguyen, 2023).

A review of studies reveals that research on factors affecting supply chain efficiency within the context of digitization and supply chain finance remains limited, with existing findings primarily based in China (Nguema et al., 2020; Ali et al., 2020). In Vietnam, following the containment of the COVID-19 pandemic, retail supply chain operations have undergone significant changes. Many businesses have enhanced the digitization of supply activities to meet customer demands and boost competitiveness (Thi Ngoc Bich et al., 2022). While initial retail stores - ranging from groceries, fashion, and pharmaceuticals to food and beverage outlets - often perform well, subsequent stores tend to experience reduced sales and operational inefficiencies. Despite these developments, no studies in Vietnam have explored the impact of supply chain finance on supply chain efficiency in the context of digitization, highlighting a research gap.

This study aimed to examine how digitization

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influences supply chain effectiveness in Vietnam's retail industry, with supply chain finance as a mediating factor. Theoretically, it provides empirical evidence on factors affecting retail supply chain performance in a developing country where supply chain activities are widespread. Recent technological advancements have driven noticeable changes in operations. Practically, the findings can guide small and medium-sized enterprises to adopt supply chain finance, enhancing efficiency in the retail sector within a technological context.

2. Literature review

2.1. Supply chain finance and supply chain effectiveness

Supply chain finance plays a vital role in sustaining business operations, particularly for small and medium-sized enterprises (SMEs). It is approached from two perspectives: one focuses on financial activities aimed at generating monetary benefits (Basu & Preetam, 2013), while the other emphasizes its role in fostering relationships among supply chain participants (Gelsomino et al., 2014).

Managing finances effectively remains a significant challenge for SMEs (Pfohl & Gomm, 2009). To support these businesses, financial institutions actively participate in creating an ecosystem that provides the necessary working capital promptly (Lamoureux & Evans, 2012). Supply chain finance benefits buyers, sellers, and financial institutions by enhancing financial efficiency.

Supply chain efficiency is often measured across four dimensions: (1) reducing transaction costs, (2) lowering warehousing costs, (3) cutting inventory costs, and (4) minimizing distribution costs (Fugate et al., 2009). Supply chain finance is recognized as an effective method for cost reduction and improving business agility, particularly in areas such as transportation, storage, and distribution (Nguema et al., 2020).

Moreover, the value of supply chain finance is assessed by financial institutions based on the relationships among supply chain participants, reflecting their level of trust, commitment, and profitability (Ali et al., 2020). This dynamic demonstrates how supply chain finance fosters efficiency, enabling businesses to secure loans from financial institutions. These findings have been supported by previous studies (Gelsomino et al., 2014; Nguema et al., 2020; Mulchandani et al., 2023). Based on this, the following research hypothesis is proposed:

Hypothesis H1. Supply chain finance has a positive impact on supply chain effectiveness

2.2. Collaboration and supply chain finance

Supply chain operations inherently involve various risks (Ali et al., 2020). To address these, collaboration among supply chain participants is essential, as it reflects trust and commitment, trust being the most critical element (Capaldo & Giannoccaro, 2015). Such collaboration enhances cohesion and enables real-time information sharing and joint planning, both of which are crucial for mitigating the adverse effects of disruptions (Dubey et al., 2018).

Collaboration also improves supply chain performance and, consequently, overall business performance (Nguema et al., 2020). Furthermore, cooperative efforts reduce transaction costs, as Industry 4.0 requires all supply chain participants to adapt to technological advancements (Kamble et al., 2020). Engagement with external stakeholders not only strengthens internal value but also boosts competitive advantages (Powell et al., 1996).

To measure collaboration, Simatupang & Sridharan (2005) identified four key factors: sharing demand forecasts, inventory policies, price changes, and supply disruptions with suppliers. Previous studies have highlighted the advantages of collaboration, particularly in facilitating access to supply chain finance (Mulchandani et al., 2023; Nguema et al., 2020). Based on this, the following research hypothesis is proposed:

Hypothesis H2. Collaboration has a positive impact on supply chain finance

2.3. Negotiation and supply chain finance

Negotiation is defined as reaching a joint decision between two parties on a specific issue (Carnevale & Isen, 1986). In supply chain operations, it helps buyers and sellers resolve disputes and balance mutual interests. Negotiation plays a crucial role in supply chain finance, as it reflects both parties' commitment to the supply chain (Liebl et al., 2016).

To measure supply chain finance, Ali et al. (2020) identified five factors: hedging system, coordinated capital flow, supply chain efficiency, hedging capacity, and technology capacity. Negotiation is evaluated using Janda & Seshadri's (2001) scale, focusing on win-win opportunities, negotiation time, and consensus. Previous studies have shown that effective negotiation improves access to supply chain finance (Ali et al., 2020; Mulchandani et al., 2023). Based on this, the following research hypothesis is proposed:

Hypothesis H3. Negotiation has a positive impact on supply chain finance

2.4. Financial institutions and supply chain finance

Financial institutions are vital to supply chain operations, handling payment collection and risk assessment for manufacturing companies (Nguema et al., 2020). They also enhance supply chain efficiency by reducing negative cost shifts and improving visibility, availability, delivery, and cash flow for all participants (Lamoureux & Evans, 2012).

According to Zhang (2015), the role of financial intermediaries is captured in three factors: supportive attitude, organizational structure, and hedging. Empirical studies show that factoring services provided by financial institutions have improved SME efficiency (Hofmann, 2021). These institutions effectively assess credit risks using a six-step approach (Zhao et al., 2018). Additionally, Gornall & Strebulaev (2018) proposed a capital structure suited to supply chain operations. Based on this, the following hypothesis is proposed:

Hypothesis H4. The role of financial institutions has a positive impact on supply chain finance

2.5. Digitizing technologies and supply chain finance

Supply chain operations benefit significantly from advancements in science and technology (Nguema et al., 2020). Digital technology provides businesses with a competitive edge as their operations and distribution expand geographically (Ali et al., 2020). It also supports forecasting, planning, sales invoicing, and data synchronization within supply chain systems (Kamble et al., 2020).

The ability to digitize is evaluated through three factors: applying digitalization to attract buyers, staff training, and fostering relationships within the supply chain (Nguema et al., 2020). Technologies like Big Data and the Internet of Things enable accurate decision-making, minimize errors, and reduce risks (Kamble et al., 2020). Additionally, digital tools improve order tracking, reduce paperwork costs, and enhance transparency (Fairchild, 2005). However, the high cost of digitization poses challenges for SMEs. Based on this, the following research hypothesis is proposed:

Hypothesis H5. Digitizing technologies have a positive impact on supply chain finance

2.6. External environment and supply chain finance

The operations of economic organizations are influenced by macroeconomic factors (Kamble et al., 2020). During the appraisal of supply chain enterprises, macro variables are key considerations (Gornall & Strebulaev, 2018), significantly affecting investment, financing, and trade promotion (Ali et al., 2020).

Zhang's (2015) research highlights the role of governing body regulations in shaping enterprise operations. The COVID-19 pandemic, for instance, had a profound impact on retail supply activities (Li et al., 2023). To assess the external environment, Zhang (2015) identified three factors: the impact of macroeconomic conditions, regulatory influence, and advancements in financial technology.

Hypothesis H6. The external environment has a positive impact on supply chain finance

2.7. Information sharing and supply chain finance

Information sharing enhances mutual understanding among businesses. According to the theory of information asymmetry, it helps supply chain actors make informed decisions, reducing issues like adverse selection and moral hazard (Auronen, 2003). Information sharing is evaluated using three factors: the extent of sharing with stakeholders, the benefits gained, and its overall effectiveness.

Research shows that effective information sharing has improved access to finance for SMEs in China (Nguema et al., 2020), as it contributes to better business performance. Based on this, the following research hypothesis is proposed:

Hypothesis H7. Information sharing has a positive impact on supply chain finance

2.8. The intermediary role of supply chain finance

Enhancing supply chain efficiency is a significant challenge for businesses. Positive internal factors like collaboration, negotiation, information sharing, and digitization increase access to finance, thereby improving supply chain performance (Liebl et al., 2016). Favorable macroeconomic conditions also support business growth, capital expansion, and better debt repayment (Zhang, 2015; Li et al., 2023).

Financial institutions are a key source of capital for businesses (Gornall & Strebulaev, 2018), improving access to funding and boosting supply

chain efficiency (Gelsomino et al., 2014; Nguema et al., 2020; Mulchandani et al., 2023). Empirical studies in China confirm the critical and intermediary role of supply chain finance (Ali et al., 2020; Mulchandani et al., 2023). Based on this, the following research hypothesis is proposed:

Hypothesis H8. Supply chain finance plays an intermediary role in the impact of the external environment on supply chain effectiveness

Hypothesis H9. Supply chain finance plays an intermediary role in the impact of collaboration on supply chain effectiveness

Hypothesis H10. Supply chain finance plays an intermediary role in the impact of negotiation on supply chain effectiveness

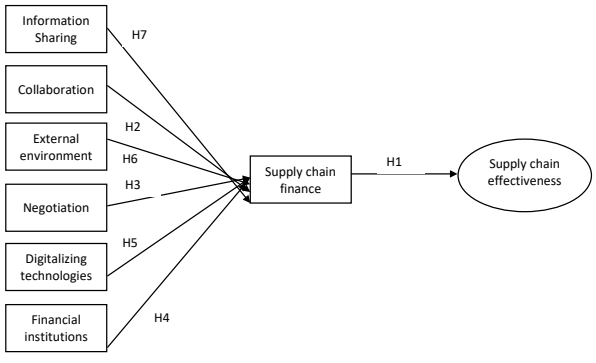
Hypothesis H11. supply chain finance plays an intermediary role in the impact of digitalizing technologies on supply chain effectiveness

Hypothesis H12. supply chain finance has a mediating role in the impact of financial institutions on supply chain effectiveness

Hypothesis H13. supply chain finance has a mediating role in the impact of information sharing on supply chain effectiveness

Based on the study of Ali et al. (2020) and Mulchandani et al. (2023), the author proposes a research model as Figure 1.

Figure 1. Proposed research model



3. Methodology

3.1. Research methods

The research process was carried out in two steps. First, the article reviews related previous studies to propose a model of the impact of digitization on supply chain effectiveness under the mediated influence of supply chain finance. Then, six factors have an impact on supply chain finance, including the External Environment, collaboration, negotiation, information sharing, financial institutions, and Digitizing technologies. Finally, the article used quantitative research methods and conducted a direct survey using Google Forms to get data.

3.2. Research data

The article uses Google Forms to collect answers from employees and managers who are working at retail businesses in Ho Chi Minh City. The survey was collected during 5 days from 05/05/2023 to 05/06/2023. The data was then filtered, and 344 valid responses were retained. In the questionnaire, a 5-point Likert scale was used, with the lowest level being disagreed, and the highest level being completely agreed. This scale is used due to its user-friendliness, time-saving, and suitability as a research model.

3.3. Data analysis

Model using partial least squares structural equation (PLS-SEM) and bootstrapping, processed by SmartPLS 4.0 software. The analysis process goes through two stages, including measurement model evaluation and structural model evaluation.

4. Research results

4.1. Statistical description

The responses collected from 344 people showed that men accounted for 52%, while women accounted for 48%. Furthermore, nearly 50% of respondents are between the ages of 25 and 45. The number of people between the ages of 16 and 25 accounts for 31%. In addition, the results of the data description also show that the proportion of respondents in the sample is 45% professionals and 55% leaders. More than half of the businesses surveyed are small businesses.

4.2. Evaluation of the measurement model

The results of the model evaluation are shown in Table 1, showing that all the model evaluation criteria give positive results. This indicates that all the resulting measurement models have satisfactory stability and accuracy.

Table 1. Results of measurement model evaluation

Latent variable	Items	Convergent validity			Internal consistency reliability	
		Outer Loadings	Composite Reliability - rho_a	AVE	Composite Reliability - CR	Cronbach's Alpha
		>0.70	>0.50	>0.50	0.60 - 0.90	0.60 - 0.90
SCFN	SCFN1	0.803	0.870	0.584	0.875	0.822
	SCFN2	0.710				
	SCFN3	0.717				
	SCFN4	0.783				
	SCFN5	0.801				
SCEN	SCEN1	0.819	0.831	0.704	0.905	0.861
	SCEN2	0.892				
	SCEN3	0.805				
	SCEN4	0.838				
NEGO	NEGO1	0.875	0.830	0.741	0.896	0.826
	NEGO2	0.861				
	NEGO3	0.847				

Latent variable	Items	Convergent validity			Internal consistency reliability	
		Outer Loadings	Composite Reliability - rho_a	AVE	Composite Reliability - CR	Cronbach's Alpha
		>0.70	>0.50	>0.50	0.60 - 0.90	0.60 - 0.90
COLA	COLA1	0.784	0.786	0.590	0.852	0.771
	COLA2	0.723				
	COLA3	0.820				
	COLA4	0.743				
DIGI	DIGI1	0.879	0.760	0.701	0.875	0.788
	DIGI2	0.860				
	DIGI3	0.769				
FINA	FINA1	0.810	0.772	0.694	0.872	0.781
	FINA2	0.850				
	FINA3	0.839				
ENVI	ENVI1	0.830	0.788	0.683	0.866	0.768
	ENVI2	0.794				
	ENVI3	0.827				
INFO	INFO1	0.838	0.788	0.668	0.858	0.753
	INFO2	0.792				
	INFO3	0.849				

Source: SmartPLS 4.0 analysis results

According to Sarstedt et al. (2022), the reliability and value of each item must be evaluated, as well as the outer loading coefficient; the threshold value must be at least 0.7. In addition, Cronbach's Alpha value must be between 0.6 and 0.9. Thus, the results in Table 1 all meet the requirements. The AVE values are all greater than 0.5, giving the structural detail that explains more than half of its item variation (Table 1). Therefore, the converging value of the structure is established. To evaluate the discriminant validity of the model, the heterotrait-monotrait ratio of correlations (HTMT) was calculated, with all items meeting the required threshold (Table 2).

Table 2. The results of the heterotrait-monotrait ratio of correlations

	COLA	DIGI	ENVI	FINA	INFO	NEGO	SCEF
COLA							
DIGI	0.636						
ENVI	0.744	0.734					
FINA	0.646	0.724	0.795				
INFO	0.674	0.675	0.781	0.707			
NEGO	0.726	0.675	0.840	0.679	0.755		
SCEF	0.444	0.477	0.642	0.512	0.630	0.737	
SCFN	0.769	0.762	0.729	0.841	0.761	0.814	0.580

Source: SmartPLS 4.0 analysis results

4.3. Structural model evaluation

The structural model is evaluated by calculating the degree of difference between the dependent variables. In which, the path coefficient and the coefficient of determination R^2 are used. The path coefficient shows how well the independent variable explains the dependent variable. The coefficient R^2 represents the variation of the independent variable for the variance of the other variable.

The evaluation results show that the R^2 of supply chain effectiveness is 0.525. This shows that the explanatory level of the model is moderate (Hair et al., 2017). The highest VIF coefficient of the variables in the research model is 2.79, the model has insignificant multicollinearity (Hair et al., 2012).

Table 3. Hypothesis test results

Hypothesis		Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Indirect effects						
H9	COLA -> SCEF	0.160	0.160	0.024	6.739	0.000
H11	DIGI -> SCEF	0.141	0.142	0.025	1.617	0.006
H8	ENVI -> SCEF	0.106	0.106	0.029	3.607	0.000
H12	FINA -> SCEF	0.090	0.092	0.023	3.897	0.000
H7	INFO -> SCEF	0.087	0.087	0.024	3.660	0.000
H10	NEGO -> SCEF	0.048	0.050	0.029	1.686	0.092
Total effects						
H2	COLA -> SCFN	0.318	0.319	0.047	6.791	0.000
H5	DIGI -> SCFN	0.181	0.182	0.049	1.657	0.008
H6	ENVI -> SCFN	0.212	0.209	0.054	3.899	0.000
H4	FINA -> SCFN	0.180	0.182	0.042	4.249	0.000
H7	INFO -> SCFN	0.174	0.172	0.046	3.805	0.000
H3	NEGO -> SCFN	0.096	0.098	0.054	1.782	0.075
H1	SCFN -> SCEF	0.502	0.504	0.045	11.269	0.000

Source: SmartPLS 4.0 analysis results

The results of the path analysis show that H3 and H10 are rejected. All other hypotheses are accepted, these paths between the independent and dependent variables are statistically significant. As for the direct effect, hypothesis H2 shows that the impact of cooperation on supply chain finance is positive and significant ($\beta = 0.318$ and $p = 0.000$). Hypothesis H6 shows that the impact of the External Environment on supply chain finance is positive and significant ($\beta = 0.212$ and $p = 0.000$). Hypothesis H4 shows that the impact of financial institutions on supply chain finance is positive and significant ($\beta = 0.180$ and $p = 0.000$). Hypothesis H7 shows that the effect of information sharing on supply chain finance is positive and significant ($\beta = 0.174$ and $p = 0.000$). Hypothesis H1 shows that the influence of supply chain finance on supply chain effectiveness is significant and positive ($\beta = 0.502$ and $p = 0.0000$). Hypothesis H5 implies that the impact of digitalization on supply chain finance is positive and significant ($\beta = 0.181$ and $p = 0.008$) (Table 3).

According to the findings, hypothesis H9 describes the mediating effect of supply chain finance on the relationship between cooperation and supply chain effectiveness. The results showed a strong and positive mediating role ($\beta = 0.160$ and $p = 0.0000$). Hypothesis H8 suggests a mediating effect of supply chain finance on the relationship between the External Environment and supply chain effectiveness. The results showed a strong and positive mediating role ($\beta = 0.106$ and $p = 0.0000$). Hypothesis H12 shows the mediating effect of supply chain finance on the relationship between financial institutions and supply chain effectiveness. The results confirmed this effect to be in the same direction and statistically significant ($\beta = 0.090$ and

p = 0.000). Hypothesis H7 implies a mediating effect of supply chain finance on the relationship between information sharing and supply chain effectiveness. Research results have also shown that this influence is positive and strong (β = 0.087 and p = 0.000). Hypothesis H11 is also confirmed, showing the mediating effect of supply chain finance on the relationship between Digitizing technologies and supply chain effectiveness (β = 0.141 and p = 0.006).

The results reveal four unsupported hypotheses, highlighting differences between findings in Vietnam and those in China. Among Vietnamese SMEs, collaboration does not significantly impact supply chain finance, nor is its indirect influence confirmed. The remaining factors, however, show positive and significant effects, aligning with the studies of Ali et al. (2020) and Mulchandani et al. (2023). These findings suggest that supply chain finance enhances the efficiency of SMEs in Vietnam's retail supply chain. Key factors influencing supply chain finance include the external environment, negotiation, digitization, information sharing, and financial institutions. Additionally, supply chain finance mediates supply chain effectiveness (Table 3).

The study underscores that when collaboration, a favorable external environment, negotiation, and digitization are effectively implemented, financial institutions provide robust support, improving access to finance. Consequently, businesses achieve greater supply chain effectiveness. Financial support significantly boosts outcomes, as shown by the highest impact coefficient among direct effects. Collaboration emerges as the most influential factor, as effective cooperation within the supply chain resolves issues and benefits both sides, facilitating access to finance. The external environment ranks second, as favorable macroeconomic conditions enhance business operations and debt repayment, easing the process of raising capital.

5. Conclusion

Research indicates that factors such as the external environment, negotiation, digitization, information sharing, and financial institutions positively impact supply chain finance. Among these, collaboration and the external environment are the most influential. Enhanced supply chain finance, in turn, promotes supply chain effectiveness. Based on this, governments and retail businesses should focus on implementing digitization processes.

However, the model has limitations as it evaluates from the perspective of businesses while neglecting consumer viewpoints. Additionally, it does not account for the time factor, as responses may vary over time. These limitations present opportunities for future research to address and refine the model further.

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A THEORETICAL OVERVIEW OF ELECTRONIC PAYMENT ADOPTION AND ITS IMPLICATIONS FOR RETAIL CHAINS: A CASE FOR VIETTEL STORE

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Abstract: ***This paper provides a comprehensive theoretical overview of electronic payment (e-payment) adoption, drawing on established technology acceptance models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT, including UTAUT2). It synthesizes findings from various empirical studies on factors influencing consumer intention and actual usage of e-payment services across diverse contexts and geographies. Key determinants examined include perceived usefulness, perceived ease of use, social influence, facilitating conditions, hedonic motivation, price value, habit, trust, and perceived risk. While acknowledging the general benefits and challenges of e-payment, this paper also discusses potential implications for retail chains seeking to implement effective e-payment solutions. Specifically, it considers these general findings in the hypothetical context of Viettel Store. It is important to note that the provided source materials do not contain specific information regarding Viettel Store, thus the discussion on its behalf is illustrative and based solely on the generalized insights derived from the literature on e-payment adoption.***

• Keywords: *electronic payment, technology acceptance model (TAM), unified theory of acceptance and use of technology (UTAUT), perceived usefulness, perceived ease of use, social influence, trust, perceived risk, retail chains, Viettel Store.*

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1. Introduction

The rapid advancement of technology and widespread mobile phone use have transformed financial transactions, making mobile payment a widely accepted method (Hsiao, 2019). E-payment refers to monetary transactions made via electronic communication, enabling fast, convenient, and low-risk exchanges for both consumers and sellers (Thi et al., 2024). Its adoption is growing globally, with notable progress in regions like Asia for example, Thailand's PromptPay and China's mobile payment boom. Academic research has examined consumer behavior in tech adoption using models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Escobar-Rodríguez & Carvajal-Trujillo, 2014). These frameworks help explain how users accept new ICTs, offering valuable insights for businesses, especially retail chains, aiming to implement digital payment systems. This paper provides a theoretical overview of e-payment adoption, focusing on TAM and UTAUT constructs and their relevance to retail settings, using Viettel Store as a hypothetical example. The discussion is illustrative only, as no data on Viettel Store is included in the source materials.

2. Electronic Payment: Concepts, Advantages, and Challenges

2.1. Definition and Types of Electronic Payment

Electronic payment (e-payment) refers to any monetary transaction initiated using electronic communication methods (Thi et al., 2024). This broad term encompasses various forms of digital transactions, including payments for goods, services, and bills/invoices with a mobile device via telecommunications networks or proximity technologies (Hsiao, 2019). Examples include online purchases, e-banking, mobile banking (m-banking), mobile shopping (m-shopping), online trading, and even e-toll collection. The shift towards e-payment is driven by technological advancements, such as the development of Quick Response (QR) codes and Near Field Communication (NFC) (Hsiao, 2019).

Mobile payment, a significant subset of e-payment, is defined as payments conducted through mobile devices like wireless handsets, smartphones, personal digital assistants (PDAs), and NFC-based devices. These systems utilize wireless and other communication technologies to allow users to make quick payments

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with their mobile devices (Hsiao, 2019). Different types of mobile payments include remote payment (e.g., via mobile Internet networks) and proximity payment (e.g., via RFID and NFC by holding mobile phones near a device) (Hsiao, 2019). QRIS (Quick Response Code Indonesian Standard) is an example of a digital payment system innovation aimed at facilitating transactions effectively, efficiently, and with guaranteed security.

2.2. Advantages of Electronic Payment

E-payment systems offer several advantages for both companies and users compared to traditional payment methods (Hsiao, 2019): (1) Increased Versatility, (2) Faster Transactions, (3) Greater Convenience, (4) Lower Costs, (5) Enhanced Security and Trust, (6) Broader Financial Inclusion, (7) Increased Productivity and Efficiency.

2.3. Challenges and Concerns in Electronic Payment Adoption

Despite its numerous advantages, e-payment adoption faces several challenges, primarily related to perceived uncertainty and risk (Hsiao, 2019): (1) Security Concerns, (2) Trust Issues, (3) Infrastructure and Technology Issues, (4) Consumer Habits and Inertia, (5) Cost and Pricing Structure, (6) Interoperability.

3. Theoretical Frameworks for Technology Acceptance

Understanding consumer acceptance of technology is central to successful e-payment implementation. Several theoretical models have been developed and applied in this domain, with the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) being the most prominent.

3.1. The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is one of the most powerful theories used to explain user technology adoption. Developed by Davis (1989), TAM postulates that perceived usefulness (PU) and perceived ease of use (PEU) are the primary determinants of a user's attitude towards using a technology, which in turn influences their behavioral intention to use it, and ultimately, actual usage (Wu et al., 2011).

Perceived Usefulness (PU): Defined as "the degree to which a person believes that using a particular system would enhance his or her job performance". In the context of e-payment, it refers to the belief that using the system will enhance efficiency in completing financial and daily transactions, save time, and bring greater convenience (Thi et al., 2024).

Perceived Ease of Use (PEU): Defined as "the degree to which consumers perceive that utilizing a certain technology requires less effort". This includes the perception that the system is uncomplicated, effortless, quick to navigate, and easy to learn and become skillful at using.

3.2. The Unified Theory of Acceptance and Use of Technology (UTAUT) and UTAUT2

Recognizing the limitations of earlier models like TAM and the Theory of Reasoned Action (TRA). (Venkatesh et al., 2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT integrates eight prominent models of technology acceptance into a unified framework. It posits that Performance Expectancy, Effort Expectancy, and Social Influence affect the behavioral intention to use a technology, and behavioral intention and facilitating conditions influence the actual use of the technology.

UTAUT2 integrates three new constructs and redefines the seven original constructs from a consumer perspective (Escobar-Rodríguez & Carvajal-Trujillo, 2014). The seven factors influencing a consumer's intention to use ICT in UTAUT2 are: (1) Performance Expectancy (PE), (2) Effort Expectancy (EE), (3) Social Influence (SI), (4) Facilitating Conditions (FC), (5) Hedonic Motivation (HM), (6) Price Value (PV), (7) Habit (HA).

In UTAUT2, actual use of ICT is influenced by behavioral intention, facilitating conditions, and habit (Escobar-Rodríguez & Carvajal-Trujillo, 2014). The UTAUT2 model has been confirmed to improve the percentage of variance explained in both intentions to use ICT and actual use of ICT compared to the original UTAUT model (Escobar-Rodríguez & Carvajal-Trujillo, 2014). It has been widely applied to various consumer contexts, including mobile banking, mobile phone technologies, online dispute resolution, location-based services, and online purchasing (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

3.3. Extensions and Additional Constructs

Beyond the core constructs of TAM and UTAUT/UTAUT2, several studies have incorporated additional variables to enhance predictive power and capture specific contextual nuances in e-payment adoption.

Trust: A key predictor in e-commerce and mobile payments, encompassing security and data protection (Hsiao, 2019; Thi et al., 2024).

Perceived Risk: Negatively affects e-payment adoption, often moderated by trust, linked to security and privacy concerns.

Perceived Safety (PS): Influences intention to use technologies like autonomous vehicles through perceived usefulness.

Perceived Credibility (PC): Crucial for trust in issuers, especially in digital currency adoption.

Perceived Convenience (PC): Strong positive effect on intention to use e-wallets; often a top predictor (Thi et al., 2024).

Willingness (W): Directly influences behavioral intention to use e-wallets.

Personal Innovativeness (PI): Reflects an individual's readiness to try new technologies. It has been found to influence perceived usefulness and perceived ease of use.

Digital Financial Literacy (DFL): Can have a significantly positive effect on mobile usefulness and mobile ease of use mobile fintech.

Innovation Resistance Theory (IRT): Combined with UTAUT2, IRT introduces barriers to adoption, such as tradition barrier (TB) or value barrier (VB), providing a more holistic view of adoption inhibitors.

4. Empirical Findings on Key Determinants of E-Payment Adoption

Empirical research across various e-payment contexts has provided valuable insights into the influence of different factors on user acceptance. While some findings are consistent, others show variations depending on the specific technology, cultural context, or user group.

4.1. Performance Expectancy (Perceived Usefulness)

Performance Expectancy (PE) and Perceived Usefulness (PU) are consistently found to be strong determinants of behavioral intention to use technology.

Strong Positive Effect: Using mobile shopping apps enables users to accomplish goal-oriented tasks, similar to how PU affects m-shopping intention and mobile financial services usage intention.

Enhancing Efficiency: The utilization of e-payment is argued to enhance productivity and efficiency in payment-related processes (Thi et al., 2024). For mobile payment services, utilitarian benefits (convenience, no spatial restrictions for financial transactions) are important drivers of adoption.

Influence on Trust and Satisfaction: Trust is positively influenced by perceived usefulness (Thi et al., 2024). In the TAM context for OTT services, PU positively affects user satisfaction.

4.2. Effort Expectancy (Perceived Ease of Use)

Effort Expectancy (EE) and Perceived Ease of Use (PEU) are also critical, particularly in the early stages of new technology adoption.

Positive Effect on Intention: EE/PEU often positively influences behavioral intention to use mobile apps. Learning how to use LCC e-commerce websites (air ticket purchasing sites) easily is a driver of online purchase intention (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

Influence on Perceived Usefulness: PEU frequently has a significant positive effect on PU. For cloud storage services, PEU has the strongest direct relationship towards PU, implying that easy-to-use services are perceived as more useful.

Impact on Trust and Satisfaction: Perceived ease of use also positively affects trust (Thi et al., 2024). In mobile credit card usage, PEU has a significant effect on user satisfaction.

Contextual Variations: While generally influential, EE/PEU may not always directly impact behavioral intention to adopt mobile payment across all contexts.

4.3. Social Influence

Social influence (SI) refers to the impact of important others on an individual's intention to use a technology.

Positive Effect on Intention: SI has been found to positively influence behavioral intention to use mobile payment. For QRIS payments, Social Influence has a positive effect on Perceived Usefulness and Perceived Ease of Use.

Cultural Moderation: The impact of SI can vary significantly across cultures. For example, SI had a positive, significant influence for Italian mobile payment users but a non-significant effect for Chinese users.

Influence on Trust: Social influence significantly influences customer trust (Thi et al., 2024).

4.4. Facilitating Conditions

Facilitating conditions (FCs) relate to the resources and support available to perform a behavior.

Positive Effect on Intention/Usage: FCs positively influence the behavioral intention to adopt mobile payment.

Practical Resources: This includes having the necessary resources (e.g., mobile devices, internet access), knowledge, and compatibility with other technologies.

4.5. Hedonic Motivation

Hedonic motivation (HM) refers to the fun or pleasure derived from using technology.

Positive Effect on Intention: HM has been found to have a positive effect on behavioral intention to use mobile shopping apps. In UTAUT2, HM is considered more important than performance expectancy in explaining intention to use ICT in a consumer context (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

Contextual Variations: The influence of HM can vary. Some studies found HM to positively influence mobile payment adoption while others found no significant influence in either the Italian or Chinese mobile payment samples.

4.6. Price Value

Price value (PV) represents consumers' cognitive trade-off between perceived benefits and the monetary cost of using applications.

Mixed Effects on Intention: PV can positively influence behavioral intention to adopt mobile payment, especially for Chinese respondents.

Impact on Use Behavior: Interestingly, price saving did not affect LCC online purchase usage in one study, despite its influence on intention (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

Importance of Perceived Value: Perceived value, which relates to PV, has been found to significantly influence behavioral intention towards mobile coupon applications and customer satisfaction and loyalty in mobile commerce.

4.7. Habit

Habit refers to the extent to which using a technology has become routine or natural (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

Strong Predictor of Intention and Usage: Habit is a strong predictor of online purchase intention and actual online purchase usage.

Influence on Actual Use: Actual usage behavior in respect of a new technology is affected by habit (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

Diminished Importance of Intention: As habit strengthens, the intention to use a specific form of technology could become less important (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

4.8. Trust and Perceived Risk

As habit strengthens, the intention to use a specific form of technology could become less important (Escobar-Rodríguez & Carvajal-Trujillo, 2014) Click or tap here to enter text..

Trust as a Key Predictor: Consumer trust is often the strongest predictor of online purchase intention in contexts like LCC air tickets (Escobar-Rodríguez & Carvajal-Trujillo, 2014), (Wu et al., 2011). Trust is positively influenced by information quality, perceived security, and privacy protection.

Role of Security and Privacy: Perceived security and privacy protection are important antecedents of consumer trust.

Perceived Risk as an Inhibitor: Perceived risk negatively impacts the intention to use digital payments (Thi et al., 2024). It can also negatively influence customer trust.

Conflicting Findings: In some studies, perceived risk (specifically privacy risk and security risk) did not significantly affect behavioral intention to use mobile shopping apps in the USA (Chopdar et al., 2018). Similarly, perceived risk had no impact on behavioral intention to use mobile payment systems in a study combining Valence Framework and TAM (Altes et al., 2024).

4.9. Other Relevant Factors

Perceived Convenience (PC): Demonstrated the highest impact on electronic payment adoption in Ho Chi Minh City, underscoring its critical role as the primary consideration for consumers (Thi et al., 2024). It has a positive significant effect on behavioral intention to use e-wallets.

Willingness (W): A positive significant effect on the Behavioral Intention (BI) to use an e-wallet as the mode of payment.

Personal Innovativeness (PI): Found to influence perceived usefulness positively (Shanmugavel & Micheal, 2022). In Spain, PI was a determinant of intention to use QR code payment.

Digital Financial Literacy (DFL): Positively affects mobile usefulness and mobile ease of use for mobile fintech apps.

Age and Gender: Can moderate the influence of key constructs on behavioral intention and usage behavior (Martins et al., 2014). For instance, men might play a more prominent role than women in strengthening mobile fintech use and digital financial inclusion.

National Culture: Cultural dimensions influence consumer behavior and mobile technology adoption, leading to divergent results in cross-country comparisons (e.g., Italy vs. China in mobile payment adoption).

5. Implications for Retail Chains: A Hypothetical Case for Viettel Store

Understanding the theoretical constructs and empirical findings on e-payment adoption offers valuable insights for retail chains seeking to implement or enhance their digital payment solutions. While the specific context of "Viettel Store" is not detailed in the provided sources, the generalized implications can be applied to such a retail environment. Effective e-payment solutions must address consumer perceptions and behaviors identified in the literature to drive adoption and continued use. Specific recommendations for Viettel Store would require dedicated market research and analysis.

5.1. Prioritizing Perceived Usefulness and Performance Expectancy

For a retail chain like Viettel Store, emphasizing the usefulness of e-payment is paramount (Thi et al., 2024).

Time and Efficiency Savings: Highlight how e-payment allows customers to complete transactions more quickly and efficiently, reducing checkout times and queues, especially in busy periods. This can free up customers' time for other activities.

Convenience: Promote the convenience of paying anytime, anywhere, directly from their mobile devices, without needing cash or physical cards (Hsiao, 2019). This aligns with findings that convenience is a primary consideration for consumers (Thi et al., 2024).

Enhanced Productivity: Frame e-payment as a tool that enhances the overall shopping experience

by streamlining the payment process, making it more productive for customers.

Loyalty Programs and Benefits: Integrate e-payment with loyalty programs, discounts, or exclusive offers (Chopdar et al., 2018), (Escobar-Rodríguez & Carvajal-Trujillo, 2014). Customers perceiving greater benefits compared to monetary costs (Price Value) are more likely to use mobile shopping apps (Chopdar et al., 2018). Viettel Store could offer specific discounts or reward points for e-payment usage.

5.2. Ensuring Perceived Ease of Use and Minimal Effort

Ease of use is crucial, particularly for new users and in the early stages of adoption (Chopdar et al., 2018).

User-Friendly Interface: Any e-payment solution implemented by Viettel Store (e.g., QR code scanning, NFC tap-to-pay, integrated app payments) must have a clear, simple, and intuitive interface. "It is easy for me to become skillful at using mobile shopping apps" is a key indicator.

Seamless Integration: Ensure the e-payment process is seamlessly integrated into the existing checkout system and customer journey, requiring minimal physical and mental effort.

Easy Learning: Provide clear, step-by-step instructions or visual guides (e.g., via digital displays at checkout or in-app tutorials) to ensure customers can easily learn and become skillful at using the new payment methods (Thi et al., 2024).

Overcoming Hesitations: For BOP (Bottom of Pyramid) users, easy-to-understand and operate m-fintech services can overcome hesitations (Thi et al., 2024). Viettel Store, serving a diverse customer base, should ensure its solutions are accessible across different digital literacy levels.

5.3. Building and Maintaining Trust and Addressing Perceived Risk

Trust is a paramount factor in driving e-payment adoption, and directly addressing perceived risks is essential(Thi et al., 2024).

Security Measures: Viettel Store must implement and clearly communicate advanced security technologies and strict security policies for its e-payment systems. This includes safe shopping guarantees, encryption, and authentication mechanisms to reassure customers about the safety of their personal and financial information. Visible security badges or certifications on payment screens can increase perceived security (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

Privacy Protection: Clearly explain privacy policies and guarantee the protection of confidential personal information (names, addresses, payment details) collected during transactions. Third-party certifications assuring privacy can also build trust (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

Information Quality: Provide accurate, complete, and up-to-date information regarding payment processes, terms, and conditions on their website or app. This includes clear information on fares, availability, and timetables for service-related transactions if applicable (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

Reliability and Stability: Ensure the e-payment system is reliable, minimizing errors, connection losses, or battery issues, which are common fears associated with mobile payment.

Customer Support: Offer robust customer support channels to quickly address any payment-related issues or concerns, enhancing overall trust and reassurance.

5.4. Leveraging Social Influence and Cultivating Habit

People are influenced by those important to them, and habitual use reinforces adoption (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

Peer Influence: Encourage existing satisfied customers to share their positive e-payment experiences through word-of-mouth or social media campaigns.

Influencer Marketing: Collaborate with local influencers or community figures (if appropriate for Viettel Store's target demographic) to promote the ease and benefits of their e-payment solutions.

Normalization of Behavior: Create a perception that using e-payment at Viettel Store is a widely accepted and appropriate behavior within the community (Chopdar et al., 2018).

Incentivizing Repetitive Use: Offer incentives for repeated e-payment use (e.g., small discounts for subsequent e-payment transactions) to help establish habit (Escobar-Rodríguez & Carvajal-Trujillo, 2014). This can make the use of e-payment become "natural" to customers (Chopdar et al., 2018).

Contextual Advertising: Advertise different usage contexts and occasions for e-payment (e.g., buying a new phone, paying bills, purchasing accessories) to integrate it into customers' daily routines (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

5.5. Addressing Facilitating Conditions and Other Factors

Resource Availability: Ensure that customers have the necessary resources and knowledge to use e-payment. This might involve offering free Wi-Fi in stores, ensuring staff are knowledgeable about the systems, or providing clear instructions on how to set up relevant apps (Chopdar et al., 2018).

Compatibility: Ensure the e-payment solution is compatible with various mobile devices and existing technologies customers already use (Chopdar et al., 2018).

Hedonic Motivation: While not always significant, adding an element of fun or enjoyment to the payment process can be beneficial (Escobar-Rodríguez & Carvajal-Trujillo, 2014). This could include gamified elements, pop-up discounts, or pleasant animations during transactions (Escobar-Rodríguez & Carvajal-Trujillo, 2014).

Addressing Digital Literacy: For a diverse customer base, providing educational support and ensuring solutions are accessible to varying levels of digital financial literacy is important (Ashoer et al., 2024), (An et al., 2024).

By strategically addressing these factors, Viettel Store, like any other retail chain, can increase the likelihood of widespread adoption and continued use of its e-payment solutions, leading to improved customer experience and operational efficiency.

6. Conclusion

The landscape of financial transactions is undeniably shifting towards electronic payment systems, driven by technological innovations and the inherent advantages of convenience, speed, and efficiency. This paper has provided a comprehensive theoretical overview of e-payment adoption, primarily grounded in the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT/ UTAUT2). Key determinants such as perceived usefulness, perceived ease of use, social influence, facilitating conditions, hedonic motivation, price value, and habit consistently emerge as crucial factors influencing consumers' behavioral intention and actual usage of these technologies. Furthermore, external factors like trust and perceived risk play a pivotal role, often acting as strong facilitators or significant barriers to adoption, respectively.

Empirical studies from various global contexts, including specific comparisons between countries like Italy and China, or India and the USA, highlight both universal principles and culturally specific nuances in technology acceptance. While perceived usefulness and ease of use frequently exhibit strong positive effects, the influence of social factors, hedonic motivation, and price value can vary depending on the technological maturity of a market or the specific user demographic. The critical role of trust and security, particularly in the sensitive realm of financial transactions, remains a consistent finding across the literature.

The implications for retail chains, such as the hypothetical Viettel Store, are clear: successful e-payment implementation necessitates a deep understanding of these consumer-centric factors. Prioritizing solutions that offer tangible benefits, are intuitive and easy to use, foster a sense of trust and security, align with social norms, and integrate seamlessly into daily habits will drive higher adoption rates. Investing in user-centric design, robust security protocols, clear communication, and strategic marketing that emphasizes convenience and value are essential steps.

Limitations and Future Research: This paper's primary limitation lies in the absence of specific data or studies related to "Viettel Store" within the provided sources. Consequently, the practical implications discussed for Viettel Store are illustrative applications of general academic findings, not tailored recommendations based on specific operational or market characteristics of the company. Future research could focus on conducting empirical studies within specific retail chain contexts to validate these generalized implications and identify unique factors relevant to their operations and customer base. Furthermore, exploring the long-term impact of e-payment adoption on consumer loyalty and overall business performance for retail chains, as well as the evolving role of new payment technologies (e.g., blockchain in finance) would provide valuable insights. Comparative studies across different retail sectors and emerging markets could also deepen our understanding of e-payment dynamics.

By continuing to investigate the multifaceted determinants of e-payment adoption, researchers and businesses can collaborate to foster an environment where digital transactions are not just a convenience but a universally embraced and trusted standard.

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INVESTMENT EFFICIENCY IN VIETNAM'S AGRICULTURAL SECTOR

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Abstract: ***Agriculture remains a cornerstone of Vietnam's economy, playing a vital role not only in securing the nation's food supply but also in sustaining the livelihoods of a large portion of the rural population. As the country becomes more deeply integrated into the global economy and faces mounting challenges from climate change, improving the efficiency of agricultural investment has emerged as a key priority for sustainable development. This paper takes a closer look at how effectively investment is being used in Vietnam's agricultural sector, with a particular focus on how total social investment capital contributes to agricultural value-added. By offering data-driven insights, the study aims to help shape better-informed investment policies that support the broader goals of agricultural restructuring and long-term rural development.***

• Keywords: *investment efficiency, agriculture, farmers, rural development.*

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1. Overview of investment efficiency in agriculture

Investment efficiency in the agricultural sector is reflected through its impact on economic growth, social development, and environmental protection. This concept highlights the relationship between capital investment costs and the outcomes achieved in terms of agricultural economic growth, improved social indicators, enhanced livelihoods for farmers, and positive environmental changes. In other words, investment efficiency in agriculture captures the relationship between the benefits gained and the costs incurred from investing in the sector.

To assess economic efficiency, the Incremental Capital-Output Ratio (ICOR) is commonly used. ICOR is a composite economic indicator that reflects the amount of additional investment capital required to generate an additional unit of total output. The ICOR varies depending on the socio-economic conditions of each period, as well as on the structure of investment and the effectiveness of capital utilization. A lower ICOR indicates higher investment efficiency, while a higher ICOR implies lower efficiency.

Formula:

$$ICOR = \frac{V_1}{G_1 - G_0}$$

ICOR: Incremental Capital Output Ratio (Efficiency of investment capital use);

V1: Realized investment capital in the study period;

G1: Gross Domestic Product (GDP) in the study period;

G0: Gross Domestic Product (GDP) in the period preceding the study period.

Typically, in the context of developing countries like Vietnam, an ICOR value of 3.0 or lower is considered efficient. In developed countries, this ratio tends to be higher due to the greater complexity of their economies; however, it generally does not exceed 5.0.

2. Status of Investment in Vietnam's Agricultural Sector

Investment in Vietnam's agricultural sector during the period 2009-2024 has shown a strong upward trend, reflecting the growing attention of the State and society to the role of this sector in economic development and social welfare.

Table 1: Total Social Investment Capital in Agriculture 2009-2024

Year	Value (billion VND)	Year	Value (billion VND)
2009	38.834	2017	109.907
2010	55.904	2018	115.601
2011	59.495	2019	121.219
2012	64.047	2020	128.415
2013	69.204	2021	126.142
2014	72.985	2022	138.895

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Year	Value (billion VND)	Year	Value (billion VND)
2015	82.734	2023	143.713
2016	92.483	2024*	241.754

Source: General Statistics Office

Between 2009 and 2015, investment in Vietnam's agricultural sector saw a remarkable rise from VND 38,834 billion in 2009 to VND 82,734 billion just six years later. From 2016 to 2020, the trend continued steadily, with capital increasing each year, reaching VND 128,415 billion by 2020. In 2021, however, investment dipped slightly to VND 126,142 billion, largely due to the financial strain and disruptions caused by the COVID-19 pandemic.

The momentum picked up again in 2022, with agricultural investment climbing to VND 138,895 billion, followed by a modest rise to VND 143,713 billion in 2023. What stands out most is the projected leap in 2024, with total investment expected to hit VND 241,754 billion almost double the previous year's figure. This surge likely reflects a stronger push from policymakers to channel more resources into agriculture as a response to pressing challenges like climate change, food security, and the ongoing restructuring of the sector.

Taken as a whole, these figures suggest that agriculture is gaining a more prominent place in Vietnam's broader economic strategy. Still, a crucial question remains: Is this growing investment translating into real efficiency and sustainable outcomes? That's what the following sections of this paper aim to uncover.

3. Status of Agricultural Development in Vietnam

Thanks to supportive government policies, Vietnam's agricultural sector has continued to grow in both scale and production capacity, maintaining a relatively high rate of growth. This progress has reinforced the sector's crucial role as a backbone of the national economy and a key pillar in ensuring long-term food security.

Table 2: Total Agricultural Gross Output 2009-2024

Year	Gross Output (billion VND)	Year	Gross Output (billion VND)
2009	219.887,18	2017	898.214,12
2010	232.700,00	2018	931.986,97
2011	245.900,00	2019	952.490,68
2012	254.260,60	2020	983.732,38
2013	801.200,00	2021	1.012.260,62
2014	830.000,00	2022	1.046.272,57
2015	858.400,00	2023	1.086.344,81
2016	870.700,00	2024	1.122.194,19

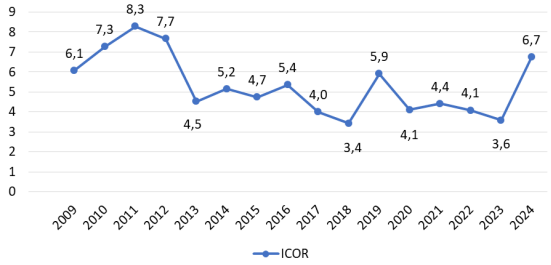
Source: Report by the Ministry of Agriculture and Rural Development (MARD)

The data presents a positive picture of the development of Vietnam's agricultural sector over the past 15 years. In 2009, the total agricultural production value stood at just over VND 219 trillion, but this figure has steadily increased year after year. Since 2013, the sector has maintained a stable growth trajectory. Notably, during the 2020-2024 period, despite challenges such as pandemics and climate change, agricultural production value continued to rise, reaching over VND 1.1 quadrillion in 2024. This steady growth highlights not only the strong inherent potential of Vietnam's agriculture but also the sector's ongoing efforts to modernize and move toward greater sustainability.

4. Investment Efficiency in Vietnam's Agricultural Sector

In Vietnam, the ICOR is calculated by the national statistical agency for the entire economy, encompassing public investment, investment by state-owned enterprises, the non-state sector, and foreign-invested enterprises. The ICOR is not disaggregated by economic sectors, largely because public investment is primarily directed toward infrastructure, which tends to generate indirect rather than immediate economic returns.

Figure 1: ICOR of the Agricultural Sector 2009-2024



Source: Reports by the Ministry of Agriculture and Rural Development (MARD) and the General Statistics Office (GSO)

In practice, the ICOR in the agricultural sector has consistently been lower than the national average. Over the observed period, the economy-wide ICOR averaged around 7.5, while the

agricultural sector's ICOR stood at a lower and more favorable 5.1. This suggests that investment in agriculture has been more stable and efficient compared to the broader economy, highlighting the sector's critical role in maintaining investment efficiency overall.

The ICOR of Vietnam's agricultural sector during the 2009-2024 period shows a gradually declining trend and remains relatively low compared to the national average, fluctuating between 3.42 and 5.50 across the years. Notably, between 2011 and 2022, agricultural investment accounted for only about 4.3% to 6.2% of total realized social investment, yet the sector contributed approximately 12% to 16% of the country's GDP. This highlights that although agriculture received a smaller share of investment, it delivered the highest returns, whereas sectors such as industry, construction, and services despite their significant contributions to economic growth required much higher levels of investment.

Specifically, during the 2009-2010 period, the ICOR of the agricultural sector ranged from 4.6 to 6.1, which was lower than the national ICOR of 6.6 to 9.2. This indicates that even with limited capital input, the agricultural sector achieved relatively efficient growth. From 2011 to 2015, the sector's ICOR continued to decline and stabilized around 4.5 to 5.0.

The 2016-2020 period marked a significant improvement in investment efficiency, with the ICOR dropping below 4.0 and reaching its lowest point of 3.42 in 2019. This decline reflects more effective capital utilization, possibly resulting from technological innovation, structural reforms, or gains in productivity.

Between 2021 and 2023, the ICOR of the agricultural sector remained relatively stable, fluctuating slightly between 3.6 and 4.1, indicating continued high efficiency. Compared to the national ICOR, agriculture has maintained greater stability, underscoring its resilience and sustainable growth potential in the face of broader economic fluctuations.

5. General assessment

In recent years, total social investment in Vietnam's agricultural sector has witnessed many positive changes, contributing to increased production, improved productivity, and higher incomes for rural populations. The ICOR of the agricultural sector has remained more stable and efficient than that of the overall economy, underscoring the sector's role in maintaining investment efficiency. However, from a broader perspective, the effectiveness of agricultural investment still falls short of fully reflecting the sector's potential and importance within the national economy.

On the one hand, investment in agriculture has helped improve production infrastructure, advance mechanization, and promote the application of science and technology in farming. Specialized farming areas and agricultural value chains have emerged, contributing to higher productivity and added value within supply chains. Nevertheless, much of the investment remains fragmented, lacking focus, and has not yet created a strong, sustainable driving force for development.

Total social investment in agriculture remains low compared to actual needs and is disproportionate to the sector's contribution. Estimates suggest that current investment levels meet only about 60% of demand, indicating a significant resource gap. This shortfall is especially concerning in the context of Vietnam's agriculture facing challenges such as climate change, market volatility, and the pressing need for structural transformation. Under such circumstances, existing investment levels are insufficient to generate meaningful improvements in quality and resilience.

Moreover, the effectiveness of capital use is hindered by several factors. In the public investment sector, inefficiencies in resource allocation, planning, and management mechanisms have resulted in fragmented, overlapping, and low-impact investments. Meanwhile, private investment is constrained by difficulties in accessing land and credit, along with a lack of long-term policy support. The absence of attractive incentive mechanisms has also discouraged private sector participation in agricultural and rural infrastructure projects, which typically involve long payback periods and high risk.

These limitations have reduced the overall efficiency of agricultural investment, hindered the sector's sustainable development, and weakened the

competitiveness of Vietnamese agricultural products in an increasingly integrated global market.

In conclusion, while total social investment in agriculture in Vietnam has achieved some positive outcomes, there remains significant room for improvement. Enhancing investment efficiency requires not only increasing the scale of capital but also improving allocation quality, strengthening institutional frameworks, and promoting public-private partnerships to mobilize diverse resources for sustainable agricultural development.

6. Recommendations and Solutions

Firstly, *strengthening institutional frameworks and investment governance:* Review and revise regulations related to public investment in agriculture to ensure greater transparency, efficiency, and alignment with actual needs. Enhance institutional capacity at the local level to enable more evidence-based planning, allocation, and monitoring of investment, thereby avoiding fragmented and overlapping projects. Develop mechanisms for inter-sectoral and inter-regional coordination, particularly in the implementation of public investment projects related to agricultural and rural infrastructure.

Secondly, *mobilizing and Diversifying Investment Resources:* Establish stronger incentive mechanisms to attract private investment, including tax incentives, credit support, risk guarantees, and streamlined administrative procedures. Promote public-private partnership (PPP) models in the development of agricultural infrastructure, logistics systems, agro-processing industries, and post-harvest technologies. Public investment should prioritize essential areas that can act as catalysts for private capital, such as irrigation systems, rural transportation networks, and digital transformation in agriculture.

Thirdly, *improving Investment Quality and Efficiency:* Enhance the use of impact assessment and post-investment evaluation tools, with a focus on result-based monitoring. Prioritize projects with strong spillover effects that are closely linked to raw material zones, value chains, and cooperatives. Expand the use of information technology and digital tools in investment planning, management, and monitoring to improve transparency and responsiveness.

Fourthly, *developing Markets and Enhancing Capital Absorption Capacity:* Support the development of farmer organizations, cooperatives, and small agricultural enterprises to improve their capacity to access and utilize investment capital effectively. Strengthen the connection between investment and domestic as well as international markets through trade promotion, traceability systems, and agricultural product quality standards. Prioritize investment in human resource development in rural areas, especially in skills related to value chain management, production planning, and market access.

Conclusion

Vietnam's agricultural sector has demonstrated steady growth and increasing investment over the past 15 years, affirming its essential role in national food security, rural livelihoods, and economic stability. Despite limited capital allocation compared to other sectors, agriculture has consistently shown higher investment efficiency, as reflected in its relatively low ICOR. However, challenges remain in fully unlocking the sector's potential, including fragmented public investment, limited private sector engagement, and institutional bottlenecks. To achieve more sustainable and impactful outcomes, it is crucial to improve the quality of investment through better planning, monitoring, and governance, while also promoting public-private partnerships and strengthening market linkages. As Vietnam faces mounting pressures from climate change, food insecurity, and global economic volatility, a more strategic and coordinated investment approach will be essential to ensuring the long-term resilience and modernization of its agricultural sector.

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INTERNATIONALIZING THE WORKFORCE OF LOGISTICS COMPANIES IN HO CHI MINH CITY BY 2030

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Abstract: ***The internationalization of the logistics workforce in Ho Chi Minh City by 2030 can be understood as increasing the international, cultural, and skill diversity of the logistics workforce, while enhancing the ability to work in an international environment. This includes attracting and retaining talent from many countries, training current employees in the skills needed for the global market, and applying international standards in management and operations. Human resources will be the deciding factor in helping Ho Chi Minh City's logistics businesses quickly catch up with other countries, enhancing competitiveness and expanding the market both domestically and internationally. Based on the issues in the workforce of Logistics companies, the paper proposes policy implications for internationalizing the workforce of logistics companies in Ho Chi Minh City by 2030.***

• Keywords: *logistics companies, workforce, Ho Chi Minh City.*

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1. Introduction

In the context of the global economy, Viet Nam's logistics industry is facing great opportunities to develop and become one of the key economic sectors, making an important contribution to the development of the national economy. However, to achieve this, improving the quality of human resources in the industry is an urgent and inevitable requirement (Ho Lan Ngoc, 2024). Currently, the Vietnamese economy in general and Ho Chi Minh City in particular are facing a shortage of high-quality human resources in the logistics industry. This problem is becoming more serious as Vietnam is aiming to become a regional and international logistics center. First and foremost is the need to strengthen collaboration between training institutions and logistics service companies to foster the development of the logistics industry.

Ho Chi Minh City issued Decision No. 4432/QD-UBND on December 2, 2020, approving the strategy for logistics industry development in Ho Chi Minh City until 2025, with orientation towards 2030. This strategy focuses on improving logistics infrastructure, enhancing service quality, increasing operational efficiency, and promoting sustainable development in the logistics sector. Additionally, the strategy proposes measures to support and encourage enterprises to invest in the logistics sector, thereby enhancing the industry's international competitiveness. Through this strategy, Ho Chi Minh City aims to elevate the position and competitive capability of the logistics sector on the global market while contributing to the sustainable development of the local economy.

However, logistics human resources in Ho Chi Minh City are facing a shortage in both quantity and quality, especially high-quality human resources. Therefore, investing in a workforce equipped with logistics knowledge and skills is a key factor in helping businesses improve service quality, increase efficiency, and enhance market competitiveness. Ho Chi Minh City fully acknowledges the requirements and characteristics of the logistics workforce within the broader economic sectors. To ensure that the workforce meets the demands of logistics companies and activities, training institutions in Ho Chi Minh City must clearly understand the specific requirements of logistics human resources to design appropriate training programs. Avoiding the common issue of training programs at some universities being designed based on their existing academic strengths, resulting in graduates struggling to find suitable jobs because their education did not fully equip them with the necessary logistics knowledge and skills, is critical.

2. The real status of the workforce of logistics companies in Ho Chi Minh City

Ho Chi Minh City currently has about 9,600 businesses registered to operate in the logistics sector, accounting for 36.7% of the total number of logistics businesses nationwide. Of these, about 2,700 businesses provide professional logistics services, accounting for 54% of the country's market share (Anh Le, 2024).

According to the Department of Industry and Trade, Ho Chi Minh City alone needs about 63,000 logistics workers per year in the 2021-2025 period, of which more than 8,400 are professional logistics workers (Dan Tri Newspaper, 2022). However, according to a survey by the Ho Chi Minh City Institute for Development

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Studies, 53.3% of businesses lack employees with logistics expertise; 30% of companies have to retrain their staff, and only 6.7% are satisfied with the expertise of their employees (Viet Nam Economic Journal, Issue 34-2023, August 21, 2023). This poses significant difficulties in their operations and growth. The shortage of qualified human resources in logistics not only impacts operational efficiency but also hinders business competitiveness and development in the market.

The internationalization of the workforce not only helps logistics companies in Ho Chi Minh City improve their competitiveness but also contributes to making Ho Chi Minh City an international logistics center. Ho Chi Minh City aims to have the logistics service industry contribute over 8.5% to GRDP by 2030, and the growth rate of logistics service revenue of enterprises reaches 15-20% per year.

Currently, the mechanisms and policies for developing the logistics workforce are a significant gap at the national, sectoral, local, and enterprise levels. It can be said that they do not yet correspond to the role and mission of logistics in a market economy. The policies of the sector and localities mainly focus on measures for specialized logistics development, but lack integration and interconnection. They still carry administrative characteristics and lack specific financial and non-financial policies for training and developing the logistics workforce. The management of logistics workforce development still has many inadequacies compared to the development requirements, especially for logistics in e-commerce.

The knowledge and skills of the logistics workforce in Ho Chi Minh City are noticeably lagging behind the needs of logistics companies and manufacturing enterprises. According to the Logistics Industry Reference Council's (LIRC) 2024–2028 skills forecast, Vietnam's logistics workforce lacks skills in information technology, foreign languages, the use of logistics software, and knowledge and skills in procurement management, transportation management, and warehouse management. In addition, logistics workers in the country also need to be trained and upgraded in creativity, adaptability, problem-solving, planning, and positive thinking in the workplace.

3. The internationalization of the workforce in logistics companies in Ho Chi Minh City

3.1. Developing training programs and curricula internationally aligned and suited to Viet Nam's logistics realities

Currently, comprehensive and modern programs that align with both international standards and the practical logistics needs of Vietnam are limited. While referencing foreign textbooks and materials is essential, language barriers pose challenges for learners in absorbing knowledge. In recent years, modern teaching methods have become increasingly common in universities worldwide. These methods often involve the use of information technology and access to online resources to enhance learning. Universities are also focusing on developing soft skills such as communication, teamwork, and time management for students.

In terms of university management in logistics, countries with over 200 years of market economy development have invested heavily in logistics and supply chain management. They typically implement modern management techniques like Six Sigma, Lean Management, and Total Quality Management to optimize processes and improve efficiency. They also regularly organize training courses and workshops to enhance the expertise of logistics professionals.

3.2. Enhancing collaboration between domestic training institutions and international logistics training organizations

One solution for improving training quality is to establish partnerships with foreign training institutions. International training partnerships are an advanced form of education being adopted by many universities, not only for undergraduate programs but also for postgraduate education. Additionally, efforts should be made to increase exchanges and learning opportunities for faculty members, especially with countries that have developed logistics systems, in order to update knowledge and cultivate a top-tier team of logistics educators and scientists in Vietnam.

Strengthening training partnerships will not only improve training quality but also help Vietnamese institutions access internationally recognized logistics programs such as Certified Supply Chain Professional (CSCP), Certified Logistics Professional (CLP), Certified in Production and Inventory Management (CPIM), Certified International Supply Chain Professional (CISCP), and Global Logistics Associate (GLA). This would allow local institutions to learn, adapt, and improve their current training programs, which still have many gaps.

3.3. Developing a system of in-depth logistics knowledge and skills

In reality, the scope and content of work in the logistics industry are highly diverse and closely related to other economic sectors since logistics encompasses a whole chain of supply services. In logistics, there are several technical and human resource quality requirements to execute specialized tasks, all interconnected within a service chain. Some of the important technical and quality personnel requirements in the logistics sector include:

- *Technical requirements:* Knowledge of supply chain and logistics management; understanding of transportation, storage, and inventory management methods; proficiency in logistics management software; and the ability to analyze data and make informed decisions.

- *Personnel quality:* Strong communication and teamwork skills; attention to detail; the ability to work under pressure and meet deadlines; effective time and resource management skills.

These technical and human resource quality requirements are essential for ensuring the smooth and efficient operation of the supply chain and logistics. They must also be interconnected to create a seamless logistics system that meets the needs of customers and businesses. As such, a full understanding of the requirements and characteristics of the logistics workforce within economic sectors is needed. To ensure a workforce that meets the demands of logistics businesses and activities, training institutions must thoroughly grasp the logistics workforce's characteristics and requirements to design suitable training frameworks.

3.4. Strengthening partnerships and collaboration between logistics companies and training institutions

Currently, most logistics companies in Ho Chi Minh City are small to medium-sized enterprises with limited collaboration in business operations and training partnerships. Therefore, strengthening collaboration between logistics companies is crucial, especially in training and developing logistics human resources.

Additionally, training institutions should collaborate with logistics companies, experimental centers, and simulation facilities, inviting experienced professionals from businesses to teach specialized courses in training programs, guide technical and professional skills, and collaborate on research topics related to logistics. These partnerships would also provide opportunities for students to visit and learn from real working environments.

3.5. Applying new achievements in information technology in training and developing logistics human resources

The Fourth Industrial Revolution, with breakthroughs in artificial intelligence (AI), integrating AI with the Internet of Things (IoT), and modernization tools, is beginning to transform the entire logistics and supply chain system globally, imposing new demands on logistics human resource training that educational institutions need to address. At the same time, combining AI with IoT and modernization tools will help optimize logistics processes, reduce costs, and enhance flexibility in supply chain management. Training human resources should focus on developing creative thinking, problem-solving, and independent work skills to meet the demands of the increasingly complex industrial environment.

With the technological transformation and digitization in the logistics industry, training human resources with new knowledge and skills will be crucial for enhancing competitiveness and sustainable development for logistics enterprises in the future. In the coming years, the rapid and deep participation of technology in the logistics sector's operations has reduced the labor force scale in enterprises. Thus, in the context of the increasing presence of smart factories, capacity (rather than capital) will become the core factor of social production. This means that the demand for high-quality digital human resources will continue to rise, requiring higher standards for logistics human resource training.

4. The training strategy of the logistics human resources in Ho Chi Minh City

The logistics human resource training strategy of Ho Chi Minh City needs to be more specific to enhance competitiveness in the global service chain. To improve the competitiveness of logistics human resources in Ho Chi Minh City in the global service chain, the training strategy should focus on the following specific aspects:

Firstly**,** promoting joint research, strengthening cooperation between member training institutions in improving facilities, enhancing faculty capabilities, and transferring technology related to digital transformation, logistics, and green supply chain management. The teaching staff is a crucial factor in the success of the digital transformation process in the logistics industry. Digital transformation in the logistics industry is a complex process that requires close coordination of many factors, in which the capacity of the teaching staff and the ability to transfer technology play important roles. Below are some specific points about the role of the teaching staff and technology transfer in this process:

- *Capacity of teaching staff:* Training and enhancing knowledge; practical skills; encouraging creative thinking.

- *Technology transfer:* Integrating new technology; Collaboration between businesses and education; Evaluating technology effectiveness:

Secondly**,** cooperating in research, propose the development of training program standards and professional standards for job positions in the industry. The logistics industry is an increasingly developing field with an important role in the global economy. To meet the demand for high-quality human resources, it is necessary to develop standardized training programs and professional standards. Below are some basic contents related to training program standards and professional standards in the logistics industry:

- *Training Program Standards:* Training programs in the logistics industry typically cover key areas such as: Supply Chain Management, Warehouse Management, Transportation Management, Information Technology in Logistics, and Legal and Policy in Logistics.

- *Professional Standards:* Professional standards for positions in the logistics industry are often determined based on the necessary skills and knowledge, including: Analytical and problem-solving skills, Communication and teamwork skills, Knowledge of information technology, Planning and organizational skills, and Market knowledge and trend forecasting.

- *Job Positions in the Logistics Industry:* Common positions may include: Supply Chain Management Specialist, Transportation Management Specialist, Warehouse Management Specialist, Logistics Planning Specialist, Logistics Consultant, Material and Inventory Management Specialist

- *Training institutions and certifications:* Universities and Colleges (Provide formal training programs in logistics and supply chain management); Professional Certifications: Certifications such as APICS (Association for Supply Chain Management), CLTD (Certified in Logistics, Transportation and Distribution), or CSCMP (Council of Supply Chain Management Professionals) can enhance skills and career opportunities for workers in the industry.

***Thirdly*,** enhancing coordination and resource sharing in terms of facilities, teaching materials, and experts. Currently, the training units providing logistics human resources at both university and vocational training levels face limitations in practical facilities and a shortage of highly qualified lecturers directly teaching. This is a real challenge in the field of logistics workforce training. To address this issue, logistics training institutions should promote the development of faculty resources by investing in specialized training, creating opportunities for them to access and apply the latest knowledge from practical experiences, and increasing collaboration with businesses so that lecturers can engage with and apply knowledge in real-world environments.

To strengthen coordination and resource sharing in the logistics sector, several measures can be implemented:

- Creating networks between universities, training centers, businesses, and research organizations in the logistics field. This helps share experience, knowledge, and resources among stakeholders.

- Organizations can coordinate the use of facilities such as warehouses, classrooms, laboratories, and equipment. This not only saves costs but also facilitates more effective research and training activities.

- Schools and training centers should build a common library of textbooks, reference books, and electronic lectures that stakeholders can access and use. This helps synchronize teaching quality and keep information up to date.

- Creating opportunities for logistics experts to come together to discuss, share knowledge, and experience. These events could be seminars, forums, webinars, or specialized conferences.

- Encouraging organizations and businesses to collaborate on research projects, thereby creating innovative solutions for the sector. Research topics could involve optimizing logistics processes, applying new technologies, or promoting sustainability in the sector.

- Logistics experts can participate in training, teaching, or consulting for other organizations, thereby enhancing workforce quality and motivating the sector's growth.

- Creating internship programs for students and new employees in the logistics industry at companies to help them access practical experiences and apply learned knowledge in real-world scenarios.

***Fourthly*,** strengthening cooperation and coordination with businesses and associations in the logistics sector is an important step to improve training quality and research efficiency. To strengthen cooperation and coordination with businesses and associations in logistics, the following measures can be implemented:

- Creating strong links with logistics businesses, industry associations, and educational institutions to jointly develop training programs that meet real-world demands.

- Organizing practical courses and internships at logistics businesses to give students the opportunity to apply theoretical knowledge to practical situations. This also helps businesses find potential talent.

- Collaborating to organize workshops and forums to share experience and update new information in logistics, creating a learning and exchange environment for both students and businesses.

- Encouraging research activities between universities and businesses to develop new technologies, improve logistics processes, and focus on new trends and challenges in logistics to enhance operational efficiency.

- Adjusting training programs based on the real needs of the labor market and development trends in the logistics industry, ensuring students are equipped with the necessary knowledge and skills.

- Through cooperation programs, creating job opportunities for students immediately after graduation, and providing high-quality human resources for the logistics industry.

- Promoting entrepreneurship activities in logistics, encouraging students and businesses to collaborate to develop new and innovative solutions, and supporting startup ideas in logistics through incubation and technical assistance programs.

- Collaborating with associations to develop specialized certification programs that meet the requirements of the logistics industry.

- Establishing an online platform that allows businesses and training institutions to share information, resources, and collaboration opportunities.

- Establishing mechanisms to periodically evaluate the results of the cooperation, thereby adjusting the activity plans accordingly.

Fifthly, strengthening international connections to exchange and learn from training experiences, access funding for facility development, scholarships, technology transfer, and scientific research collaboration... To strengthen international connections in the logistics sector, the following steps can be taken:

- Registering to participate in international organizations and associations such as the International Logistics and Transport Association (ILTA) or the International Federation of Freight Forwarders Associations (FIATA) to stay updated on the latest information and trends and expand networking.

- Organizing or participating in international logistics conferences and seminars. This is a good opportunity to exchange knowledge with top experts and introduce achievements and needs.

- Developing exchange programs for students and faculty with prestigious universities and training centers abroad, providing opportunities to learn and share experiences.

- Establishing relationships with international organizations and funding sources to seek financial support for facility development and research in logistics.

- Encouraging joint research with international universities and reputable research institutes to develop innovations and apply technology in logistics.

- Exploring and developing technology transfer programs from countries with developed logistics sectors to improve the capabilities and quality of training in this field.

- Creating pilot logistics projects with international partners to test new models and attract attention from stakeholders.

5. Policy implications

In oder to realize these target of the growth rate of logistics service revenue of enterprises reaching 15-20% per year, the paper proposes policy implications for internationalizing the workforce of logistics companies in Ho Chi Minh City by 2030 as follows:

Firstly, improving policies and working environments

To attract talent, companies need to improve policies and the working environment. This includes providing career development opportunities for employees, performance-based bonuses, and creating a positive and creative working environment. Specific policies that should be implemented include:

- Logistics companies need to establish competitive salaries and reasonable bonus policies to attract and retain talented employees.

- Logistics companies need to invest in employee training and career development, helping them to advance and grow in their careers.

- Creating a comfortable and open working environment that encourages employees to work efficiently and fosters creativity.

- Providing attractive benefits such as insurance, travel, and entertainment options, helping employees to balance their work and life.

- Building career development programs and creating promotion opportunities for employees with potential and aspirations for growth.

- Ensuring that employees are respected and evaluated fairly in all company decisions and actions.

- Supporting employees in training and skill development to improve their work performance and career growth.

- Building a positive corporate culture, allowing employees to feel satisfied and proud to work for the company.

Secondly, training and workforce development

- Strengthening collaboration with universities and research institutes to develop international logistics training programs, including subjects related to global logistics, supply chain management and international trade.

- Organizing English courses and other relevant languages for international trade and logistics to improve the international communication abilities of employees.

- Providing training courses or internships at international logistics companies to allow employees to learn and exchange experiences.

Logistics companies in Ho Chi Minh City need to invest in employee training and development to improve their skills and knowledge, as well as improve work performance and enhance the quality of the company's services. This not only helps create a high-quality workforce but also makes employees feel valued and motivated in their work. To train employees in the logistics sector, several important steps should be taken: Classify employees by role and level; Develop training programs; Utilize modern training methods, Ensure continuous learning task; Evaluate and ensure training quality; Encourage learning and development.

Thirdly, talent attraction policies

- Building programs to recruit talent from abroad, offering attractive remuneration packages to attract experienced professionals in the logistics field.

- Developing international recruitment programs involves creating attractive compensation packages and effective recruitment methods to attract experienced professionals in the logistics field.

Fourthly, applying information technology

- Investing in modern information technology and logistics management systems to improve workflows, making it easier for employees to access new technologies and global trends.

- Investing in information technology and modern logistics management systems is a key step in improving workflows within businesses.

- Establishing information-sharing systems between companies in the logistics industry to improve efficiency. The following steps can be taken: Identifying Objectives and Needs, Choosing Information Sharing Technology, Ensuring Data Security and Privacy, Training and User Support, Monitoring and Evaluating Effectiveness, Creating a Collaboration Network.

Fifthly, promoting a global corporate culture

- Encouraging employees to work in a multicultural environment, fostering creativity and innovation in the workplace.

- Encouraging logistics employees to work in a multicultural environment while fostering creativity and innovation in the workplace, consider implementing the following measures:

- Promoting the acceptance and respect of different cultures within the workforce; Organizing cultural exchange activities where employees can share their cultural backgrounds, customs, and cuisine.

- Offering training courses on cross-cultural communication and diversity management for employees. This helps them better understand how to communicate and work effectively in a diverse environment.

- Providing opportunities for all employees to contribute ideas and propose solutions for improving work processes. You can organize group meetings or online forums to share and discuss creative ideas.

- Providing the necessary tools and resources for employees to experiment with and implement new ideas. This can include creating a budget for creative projects or allowing employees to dedicate part of their work time to developing creative ideas.

- Recognizing and rewarding employees with creative ideas and positive contributions to the company's development. This recognition not only encourages employees but also motivates them to implement creative ideas in the future.

- Creating a flexible work environment where employees can freely express themselves, leading to the development of new and creative ideas.

- Organizing multicultural team projects where employees can work together, learn from each other, and exchange ideas. The combination of different cultures often leads to creative and innovative solutions.

Sixthly, establishing flexible work policies

- Implementing remote work and flexible work policies can be an effective strategy to attract and retain talent in the logistics industry, especially in the context of globalization and rapid technological development. Below are some points to consider: Remote Work Policies, Flexible Work Schedules, Create a Positive Work Environment, Optimize Recruitment Processes, and Monitoring and Evaluation.

Seventhly, promoting corporate social responsibility

To promote Corporate Social Responsibility (CSR) in the logistics sector in Ho Chi Minh City, several measures can be taken:

- Logistics companies should provide training courses on CSR for employees, emphasizing the importance of adhering to labor standards, protecting the environment, and contributing positively to the community.

- Encouraging the use of methods and technologies that minimize negative environmental impacts, such as fuel-efficient trucks, optimizing transportation routes, or applying automation technologies to reduce waste.

- Companies can engage in charitable or social activities, such as supporting schools, participating in social welfare programs, or protecting the environment.

- Logistics companies should create and implement sustainable standards in their operations. For example, setting up carbon-neutral transportation policies or using recycled materials in packaging management.

- Partner with community and non-governmental organizations to implement CSR projects, creating a positive ripple effect and enhancing the company's reputation.

- Companies should actively communicate their CSR activities to raise awareness and encourage other businesses to participate. Sharing successes and positive stories will motivate the community.

- Establishing metrics to evaluate the effectiveness of CSR programs and publishing regular reports to inform the public and stakeholders about the company's contributions.

Eighthly, encouraging research and technological innovation

- Collaborating with businesses or research institutes to develop new work methods and improve logistics processes.

- Introducing new technologies in logistics education and practice. In the logistics sector, IoT applications can improve the efficiency of goods transportation and management processes.

6. Conclusion: In summary, increasing international connections in logistics brings many benefits to organizations, businesses, and government agencies, helping promote sustainable development and improve efficiency in business operations. Internationalizing the workforce in the logistics sector not only helps Ho Chi Minh City enhance its global market competitiveness but also contributes positively to local economic development. These policies and initiatives need to be implemented synchronously, with close coordination between the City government, businesses, and educational institutions. The above solutions will help improve logistics workforce training quality, meeting the global labor market's requirements and demands, contributing to the sustainable development of the logistics sector in the era of globalization.

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EARLY CHILDHOOD CHARACTERISTICS AS PREDICTORS OF NON-COGNITIVE SKILLS OF VIETNAMESE: A MACHINE LEARNING APPROACH

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Abstract: ***Grasping how childhood experiences affect the development of non-cognitive skills allows policymakers to create supportive structures to ensure positive progression. This study explores whether or not non-cognitive skills are associated with various early childhood characteristics. This research focuses on exploring the data from The Young Lives Study and utilizes models using Artificial Neural Networks (ANNs) to predict a subject's non-cognitive skills. Shapley Values are employed to identify the best predictors. Results highlight that health indicators, especially Body Mass Index (BMI), have the strongest and most widespread impact. This highlights that physical health is imperative for socio-emotional health development. Parental/Caregiver Characteristics and Household Characteristics follow in order of significance, proving the importance of family and home background in developing these skills.***

• Keywords: *non-cognitive skills, early childhood development, artificial neural networks, shapley values, young lives study.*

JEL codes: I18, I28, I31, O15

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1. Introduction

Non-cognitive and cognitive skills are crucial for individual development. Empirical studies increasingly show that non-cognitive skills possess predictive power for life outcomes that are equal to or even surpass that of cognitive skills. For example, Heckman and Rubinstein's (2001) analysis of General Educational Development testing program recipients demonstrated that while cognitive test scores were similar to high school graduates, poorer life outcomes highlighted the critical influence of non-cognitive skills like perseverance and motivation, which cognitive tests did not capture.

Cognitive skills encompass abilities related to handling abstract problems and approaching measures in various ways, depending on their type and content. Non-cognitive skills, in contrast, have a broader definition and are defined using various terms, including generic competencies, life skills, and socio-emotional skills, and encompass a collection of traits, behaviors, mindsets, and attitudes. Studies emphasize that these skills are valuable assets for both academic outcomes and broader personal development (Anghel & Balart, 2017). These skills cover a spectrum of traits and personality characteristics that significantly influence educational attainment, occupational success, and personal development throughout the lifespan (Heckman & Rubinstein, 2001).

Through many empirical and experimental studies, a strong consensus emphasizes that early characteristics significantly influence later outcomes in several aspects, such as education, economic status, health, and behavior. Research has shown that non-cognitive skills play a vital role in educational and labor market achievements, are influenced by factors like parenting style, and can be more predictive of certain developmental outcomes than cognitive skills (Fletcher and Wolfe, 2016). Heckman et al. (2006) highlighted that there is compelling evidence that non-cognitive skills are critical contributors to success in the labor market, shaping educational paths and employment opportunities. These studies are, however, few in number since cognitive skills are often easier to measure. Building on these gaps, this study focuses on the following questions:

- What early childhood factors have the most significant effect on the development of non-cognitive skills?

- Do different non-cognitive skills share the same "important" predictors, or do these factors vary across skill types?

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2. Related work

According to O'Connell and Shaikh (2008), "Achievement-related skills" can be divided into cognitive and 'non-cognitive' abilities. Molnár, G., & Kocsis (2023) conducted a study to predict academic success in higher education by using cognitive methods, and found that the most significant predictor of later academic success relates not only to cognitive skills but also to non-cognitive skills, such as motivation to learn and the ability to apply effective strategies. Besides, Al-Sheeb et al. (2019) also used both skills to show that a combination of cognitive and non-cognitive factors contributed approximately 30-40%, while non-cognitive factors contributed 25% of the variance in students' GPA.

Several studies have used regression models to investigate the influence of family background and the home learning environment from age 11 on the development of both non-cognitive and cognitive skills, as well as later life outcomes. For instance, Carneiro et al. (2007) examined data from the National Child Development Survey. They reported that anxiety for acceptance or hostility towards adults plays a significant role in various outcomes, and that family background influences both cognitive and non-cognitive skill development. Similarly, Duckworth et al. (2019) employed regression approaches on cognitive ability, grit, and physical ability from 10,000 cadets at the US Military Academy at West Point to predict GPA and binary outcomes like successful graduation. Their study found that grit was a reliable predictor only for completing the initial summer training.

Some studies use machine learning (ML) to predict outcomes from non-cognitive and cognitive skills. Mareckova et al. (2019) used Cluster Analysis and Group Lasso to predict differences in individual unemployment. This study emphasizes the significance of self-esteem, agreeableness, and emotional stability in predicting long-term unemployment. Musso et al. (2013) also proposed using an ANN with a backpropagation multilayer perceptron neural network and predicted different levels of GPA in university students based on cognitive variables like working memory and learning strategies, and non-cognitive factors like family-social background factors and background information. The study found that oriented attention, cognitive resources, time management, and executive control were the most important for predicting. These studies explore and highlight the diverse methods being applied to demonstrate the importance of both cognitive and non-cognitive skills.

While existing research has extensively explored the impact of cognitive and non-cognitive skills on various life outcomes, and some studies have employed ML techniques in this domain (Mareckova et al., 2019), a notable limitation remains. Specifically, there is a scarcity of research that compares the predictors of different non-cognitive skills using advanced ML methodologies. Much of the current understanding relies on traditional statistical methods like regression, which may not fully capture the complex, non-linear relationships and interactions between early childhood factors and non-cognitive abilities.

3. Methodology

3.1. Data collection

This study uses data from the Young Lives Study, a longitudinal study of poverty and inequality that has followed the lives of 12,000 children in four countries (Ethiopia, India, Peru, and Vietnam) since 2001. The Young Lives Study provides data collected across five rounds, from Round 1 in 2001 to Round 5 in 2016, with two cohorts: the Younger cohort (age 1 in Round 1 to age 15 in Round 5) and the Older cohort (age 8 in Round 1 to age 22 in Round 5). The Young Lives Study is particularly well-suited for this research: its longitudinal design allows examination of how early childhood factors at age 1 influence non-cognitive skill development at age 15. The Vietnam dataset was chosen for exploration in this study using data collected from Round 1 and Round 5. Data from Round 1 was divided into 5 main categories associated with early childhood:

- *Child Demographic Characteristics* covers demographic information, with age at 1 year showing minimal variation (Variables: Gender).

- *Child Health Status* is vital since physical health affects energy levels and engagement, influencing non-cognitive skills. Stunting has been linked to deficits in motor skills and social skills. (Variables: Short height for age, Underweight status, BCG vaccination status, Measles vaccination status, BMI index,…).

- *Parental/Caregiver Characteristics* are important for understanding how early caregiving influences skill development. Berger et al. (2019) found that parental education correlates with children's mental health, a proxy for non-cognitive skills. (Variables: Caregiver's ability to read, Caregiver's education level, Gender of caregiver, Age of the father at R1,…).

- *Household Characteristics* give insight into socioeconomic status. Fletcher and Wolfe (2016) found that lower family income is associated with reduced non-cognitive skills. (Variables: Household size, Age of the household head, Education level of the household head, Access to safe drinking water, Access to electricity, Access to services index,…).

- *Perceptions and Relationships* captures parental perceptions and child-parent relationships. (Variables: Potentially life-threatening injury in early childhood, … Child's health is perceived as worse than other children's, Children see their mother every day)

Next, this study uses the Round 5 dataset as the result of the target variables (z_ refers to standardization):

• **chhealth**: Cognitive and non-cognitive skills can significantly influence socioeconomic trajectories and health.

• **z_selfefficacy**: Self-efficacy is the belief in one's ability to succeed in specific situations or accomplish tasks.

• **z_agency**: Agency refers to the capacity of individuals to act independently and make their own choices, measured as a standardized score.

• **z_selfsteem**: Self-esteem is fundamental to mental health, influencing behavior, relationships, and performance, a key non-cognitive skill.

• **z_peers**: This variable measures aspects of peer relationships or interactions, such as social skills or peer acceptance.

• **z_pride**: Pride is a positive emotion associated with self-accomplishment or group identity.

• **z_relationparents**: This measures the quality of the parent-child relationship, such as closeness or conflict.

3.2. Artificial Neural Networks and Shapley Values

This study proposes to apply Artificial Neural Networks(ANNs) and Shapley Values to explore and understand the power of early childhood factors to predict different non-cognitive skills. ANNs are a computational structure consisting of several interconnected computational elements, known as neurons, and each unit carries out a very simple operation on its inputs and transfers the output to a subsequent node or nodes in the network topology (Specht, 1991). An ANN architecture includes an input layer (representing independent variables), one or more hidden layers, weight connections between nodes, and an output layer (representing the dependent variables). ANNs are particularly effective at capturing nonlinear, high-dimensional data, such as the complex interactions between young children's traits and non-cognitive skills. The predictive capability of the ANN model as used here was improved by modifying the parameters that determine the rate of learning, the persistence, momentum, and stopping criteria, and the type of functions used for weight adjustments.

This study uses Shapley values to address key research questions regarding the influence of early childhood characteristics on non-cognitive skills. Shapley values provide a mathematically rigorous approach to fairly distribute the predictive contribution of an ANN model among its input features, offering clear insights into their relative importance. This method arises from game theory, wherein it fairly attributes the total payoff from a cooperative game to the game's players (Shapley, 1953). The use of Shapley values in machine learning for social sciences and education is gaining traction due to their interpretability.

4. Results

4.1. Descriptive Analysis, data preprocessing, and dimension reduction

The Vietnam dataset includes 1980 children's information from Round 1 and Round 5. The data was first preprocessed: null values and duplicates were removed, and the data was properly formatted. After cleaning, the final sample consists of 1192 records. Sample descriptive statistics for the dataset are reported in Table 1 below (full data are not shown here but are available upon request).

Data was split using an 80-20 split and was normalized. For each non-cognitive skill, a RandomForestRegressor was trained based on the training data due to computationally efficient and robust feature importance estimates. Then, the absolute mean Shapley Values across all training samples were calculated for each feature. Features with importance above the 40th percentile are selected for each output, which reduces the input dimensionality for each output. Seventeen features were chosen for each skill.

Table 1. Summary Statistics for select variables

Variable	Mean	Std
female	0.4823	0.499899
stunting	0.115772	0.262430
bmi	8.404910e-16	1.000420
dadedu	0.482143	0.281724
momedu	0.452661	0.282187
sees_dad_daily	0.910235	0.285965
sees_mom_daily	0.997483	0.050125
z_selfefficacy_r5	0.042852	1.003331
z_agency_r5	0.094939	0.957992
z_selfsteem_r5	-0.006257	1.009678
z_peersr5	0.009710	1.027226
z_pride_r5	0.057601	0.999476
z_relationparents_r5	0.052514	1.002729
chhealth5	0.589346	0.152944

4.2. Neural network analyses

Next, to predict all non-cognitive skills simultaneously, a multi-output neural network was designed with two hidden layers (64 and 32 neurons, ReLU activation), 30% dropout, and 7 output neurons. Besides, a single-output model following the same structure was trained for each non-cognitive skill. Models were optimized and trained for up to 200 epochs with a batch size of 32, and early stopping

(patience of 20 epochs) to prevent overfitting. With the Adam optimizer (learning rate 0.001) and MSE loss, the model provided the best result, with an average for all non-cognitive skills R2 is 72%, and a separate model for each output with selected features, which gives an average R2 is 80%. After that, feature importance was quantified as the percentage contribution of each feature to predictions, based on Shapley Values. Importance was averaged across outputs, and the top 5 features were identified in Figure 1.

Figure 1. Average importance of features (Top 5)

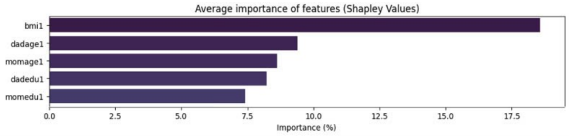


Table 2 shows that bmi has the highest average influence, highlighting the substantial impact of body mass index on later outcomes. Notably, several other features in the top 15, such as parental age (dadage and momage) and parental education (dadedu and momedu), also demonstrate considerable influence. This suggests that parental background and investment, alongside health factors like bmi, play a crucial role in shaping later life outcomes.

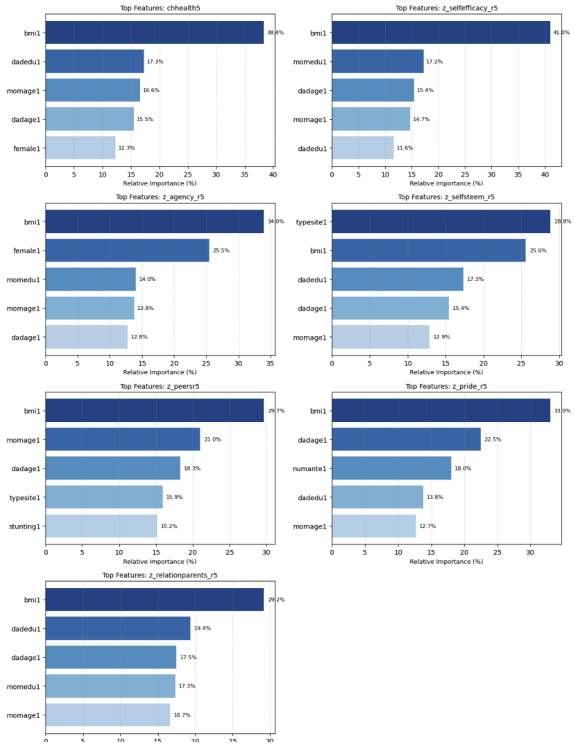
Table 2: Top 5 important features

Features	Mean importance(%)	Category
bmi	18.5595	Child Health Status
dadage	9.3820	Caregiver Characteristics
momage	8.6016	Caregiver Characteristics
dadedu	8.2219	Caregiver Characteristics
momedu	7.4014	Caregiver Characteristics

For each non-cognitive skill, the top 5 features were also identified (Figure 2). Notably, body mass index (bmi) influences all seven of the measured outcomes. BMI (bmi1) appears as the most contributing factor, affecting all outputs, with particularly strong impacts on self-efficacy (23.28%) and general health perception (22.60%). The broad influence of BMI indicates that interventions targeting physical health may have cascading benefits across multiple developmental domains. Furthermore, father's age (dadage) affects four outcomes, father's education (dadedu) impacts three, while mother's age (momage) and mother's education (momedu) each influence two outcomes.

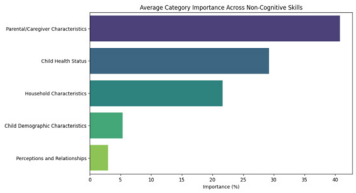
Parental characteristics show differentiated impact patterns. Father's age affects four skills, with the strongest influence on pride (13.34%), while mother's age impacts only two skills, most notably peer relationships (10.70%). This gender difference in parental influence may reflect distinct socialization roles, where fathers' characteristics relate more to internal motivational factors (self-efficacy, pride) while mothers' age shows a stronger association with social outcomes. Similarly, education levels demonstrate parent-specific effects: father's education primarily relates to health and relationship outcomes, whereas mother's education shows stronger connections with self-efficacy and agency.

Figure 2. Top 5 features for each skill



Lastly, since inputs were grouped into five categories, this study also wants to explore which groups have the most influence on each non-cognitive skill. Importance (measured by cumulative Shapley values for each category) was normalized to percentages to enable comparison across outputs, then the top category for each output was identified, and categories ranking in the top three for multiple outputs were analyzed to detect broad-impact predictors (Figure 3). The results show that Caregiver Characteristics make up the greatest level among other categories at more than 40%, and perceptions and Relationships have the least contribution to later outcomes.

Figure 3. Categories important across non-cognitive skills



5. Discussion and Conclusion

This study aimed to explore both applications of using ANN to predict factors affecting children at an early age that have the most impact on later outcomes,

and to identify and understand the contribution of each factor to each outcome. The neural networks achieved a good predictive performance, with average R^2 scores of 72% for the full model (using all features) and 80% for single-output models (using Shapley-selected features). These results indicate that child health indicators, caregiver education, and household socio-economic status can reliably predict non-cognitive skills measured later. The single-output models, which used a reduced set of features selected via Shapley Values, performed even better, suggesting that feature selection effectively reduced model complexity without sacrificing accuracy. This balance between parsimony and performance is particularly valuable in applied settings, where simpler models enhance interpretability for policymakers.

The feature importance analysis revealed that certain early-life factors play a disproportionate role in shaping non-cognitive skills. The top feature overall, BMI, with an average importance of 18.5%, underscores the critical influence of health on developmental outcomes. This agrees with previous results where higher body weight is associated with lower social and emotional skills (Guerra et al. 2022). Moreover, mom and dad's education level (with 8.2% and 7.4% respectively) shows results aligning with prior research where parental education is a key determinant of child psychological and social development (Heckman, 2006). Other high-ranking features, such as household size, stunting, and service index, point to the combined importance of health and environmental factors.

The identification of common features between pairs of non-cognitive skills, such as self-efficacy & self-esteem, which share 5 features (e.g., mom and dad's age and edu, BMI), highlights overlapping predictors. For instance, BMI contributed to all outcomes, suggesting that health fosters almost all outcomes, such as confidence, self-worth, and pride, through similar mechanisms. These cross-skill relationships suggest that non-cognitive skills are not developed in isolation but are interconnected through shared environmental and social influences.

At the category level, Caregiver Characteristics, Child Health Status, and Household Characteristics emerged as the most influential across all non-cognitive skills. While the feature importance analysis highlighted BMI within the Child Health Status category as the single most influential factor, the Caregiver Characteristics category as a whole demonstrates the greatest cumulative influence on non-cognitive skills. This category, encompassing factors like caregiver literacy and parental education, underscores the impact of the caregiving environment. The Child Health Status category was unsurprisingly dominant for chhealth5. For psychological skills, Caregiver Characteristics was the leading category alongside health factors, further emphasizing the role of nurturing relationships and parental background in fostering confidence and self-worth. Household Characteristics also contributed to later non-cognitive skills.

This study has implications for social, policy, and research domains by stressing the impact of early health and parental factors in shaping non-cognitive skills. Targeted interventions can be done towards nutrition, education, and household stability to foster a resilient future generation. Investments in early childhood nutrition programs, quality preschool education, and initiatives improving parental education and mental health are crucial, aligning with research suggesting the enduring impact of the early environment. Besides, businesses and policymakers can leverage these insights within the framework of the Sustainable Development Goals, thus providing targeted social programs and long-term community investments.

Lastly, this study, while insightful, faces limitations due to a limited dataset from Vietnam. To strengthen these results, future research should aim to confirm them using larger and more varied groups of people, such as data from other countries (Ethiopia, India, Peru) within the same study. Considerably, the potential to utilize data from other rounds (6 and 7) of The Young Lives Study could provide a longitudinal perspective on the development of these relationships over time. It would also be valuable to investigate the cause-and-effect link between factors identified and the development of non-cognitive skills.

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EXPANDING INTO ASIAN AND AFRICAN MARKETS: A STRATEGIC DIRECTION FOR VIETNAM'S EXPORTS

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Abstract: ***Amidst the continuously shifting landscape of global trade, shaped by geopolitical tensions, rising protectionism, and the restructuring of global supply chains, redefining Vietnam's export strategy has become more urgent than ever. In this context, the Asian and African markets stand out as dynamic and promising regions, characterized by large populations, rapid economic growth, increasing consumer demand, and deeper economic integration. This article focuses on evaluating the current state of Vietnam's exports to the Asian and African markets in recent times, analyzing the specific opportunities and challenges of each region. Based on this analysis, it proposes several practical strategic directions and solutions to enhance Vietnam's competitive capacity and promote sustainable export growth in these two high-potential regions.***

• Keywords: *market, Asia, Africa, strategy, export, Vietnam.*

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1. Introduction

In the context of deepening globalization and international economic integration, export activities play a pivotal role in Vietnam's economic development. However, the international trade environment is becoming increasingly complex and unpredictable, as clearly evidenced by the growing trend of trade protectionism in several major economies. A prime example is the United States' policy of raising import tariffs, which has highlighted the fragility and unpredictability of large markets. This situation requires Vietnam to proactively seek out and tap into alternative potential markets to ensure stability and sustainable growth in export activities. Given these challenges, diversifying export markets has become an urgent requirement to achieve sustainable growth, minimize the risks of overdependence on a few markets, and fully leverage the potential of the economy.

Asia and Africa are considered two highly promising regions, offering numerous favorable conditions for expanding the market share of Vietnamese goods. Geographically, Asia is close in proximity, which facilitates transportation, and it shares many cultural similarities, consumption habits, and a history of traditional trade cooperation with Vietnam. Countries in this region - particularly China, South Korea, Japan, and members of ASEAN - are experiencing rapid expansion of the middle class, leading to increased consumer demand in both quantity and quality. Notably, Vietnam is currently participating in and benefiting from various Free Trade Agreements (FTAs) with countries in this region, providing a significant competitive edge in market penetration. Meanwhile, Africa is entering a "demographic dividend" phase with rapid urbanization and industrialization. The shortage of consumer goods, processed foods, textiles, electronics, construction materials, and more represents major market gaps that Vietnamese products can fill. Additionally, policies of economic openness and integration are creating an increasingly favorable trade environment between Vietnam and African countries. Expanding exports to Asia and Africa is not only a measure to spread risk and reduce reliance on traditional markets, but also a crucial component of Vietnam's strategy to elevate its trade position on the global stage. However, to effectively tap into these markets, Vietnam must adopt a comprehensive market access strategy, take full advantage of FTAs, invest in product quality, build strong brands, and improve the supporting export ecosystem. This study is conducted with the aim of clarifying the current situation, analyzing specific opportunities and challenges of the two key market regions - Asia and Africa. From this, it proposes a number of strategic solutions to promote sustainable export growth, enhance the competitiveness of Vietnamese goods, and expand Vietnam's influence in the global value chain.

2. Current status of Vietnam's goods exports to the Asian and African markets

2.1. Achievements

In recent years, the Asian and African markets have affirmed their strategic roles in Vietnam's export activities, becoming two key regions in the country's strategy to expand markets and enhance its capacity for international economic integration. Owing to geographical proximity, longstanding cooperative relations, and certain cultural and consumer habit similarities, Asia has long occupied a central position in Vietnam's trade balance. In 2023, the total import-export turnover between Vietnam and the Asian region reached USD 436.2 billion, accounting for more than 63% of the country's total trade value. Of this, export turnover to Asia reached USD 173.2 billion, equivalent to 48.8% of Vietnam's total exports, reflecting a high level of dependence on this region as a

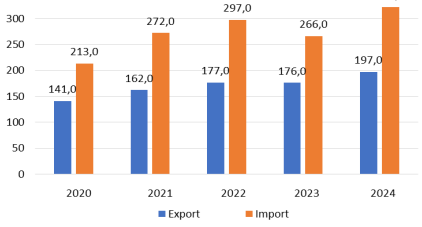
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major consumer market for Vietnamese goods (Ministry of Industry and Trade, 2024). At the same time, Asia also serves as an essential supplier of raw materials, machinery, and production inputs for Vietnam's domestic manufacturing sector, contributing to the stabilization of supply chains and the recovery of the processing and manufacturing industries after the pandemic.

Alongside Asia, the African market has also gradually emerged as a promising destination in Vietnam's export expansion strategy. Although the trade volume with Africa remains modest compared to Asia, its steady growth rate signals positive prospects for future expansion. In 2023, the total trade turnover between Vietnam and Africa reached USD 5.8 billion, an increase of 5.9% compared to 2022. Of this, export turnover was USD 3 billion, up 4.5%, accounting for 0.8% of Vietnam's total exports; imports from Africa reached USD 2.8 billion, up 7.4%. Notably, Vietnam maintained a trade surplus with Africa, although the surplus decreased to USD 167.4 million, a 28% decline from the previous year (Ministry of Industry and Trade, 2024). Despite the relatively small scale, these figures reflect the dynamism of bilateral trade and the strong potential for Vietnamese goods to expand their market share in this rapidly developing region.

Entering 2024, the total import-export turnover between Vietnam and the two regions of Asia and Africa reached USD 519.7 billion, a strong increase of 13.7% compared to 2023, accounting for 66.3% of the country's total trade value. Exports to these two markets significantly contributed to Vietnam's record-high total trade turnover of USD 786.29 billion (General Statistics Office, 2025). Of this, exports to Asia and Africa exceeded USD 197 billion (Song Linh, 2025).

Chart 1. Vietnam's import and export to the Asian and African markets in the 2020-2024 period (billion USD)



Source: Calculations by the authors based on data from the Ministry of Industry and Trade

In terms of commodity structure, Vietnam's exports to Asia and Africa are undergoing a positive transformation toward increasing processing levels and added value. The declining share of raw material exports and the growing proportion of processed industrial goods - especially electronics, textiles, footwear, wood products, and deeply processed agricultural and aquatic products - reflect a clear trend of moving up the export value chain. Among these, the agricultural and aquatic product group saw an impressive growth rate of 30.4% in 2024, driven by a strong breakthrough in fresh fruits and processed goods in demanding markets such as China, Japan, and South Korea. Thanks to better compliance with quality standards, traceability requirements, and food safety testing, Vietnamese agricultural products are gaining a stronger foothold in Asian markets while gradually expanding into African countries, where demand is high but local production capacity remains limited.

2.2. Limitations and Challenges

Despite achieving positive results and demonstrating strong potential in the Asian and African markets, Vietnam's export activities in these two regions still face numerous limitations and considerable challenges amid deeper integration and increasingly fierce competition. These limitations not only affect export efficiency but also hinder the goals of market expansion, value-added growth, and sustainable economic development.

Firstly, one of the major limitations is Vietnam's heavy reliance on a small number of key markets in Asia, particularly China, South Korea, and Japan. While these are large and stable trade partners, overdependence on them makes Vietnam's export sector vulnerable to fluctuations in trade policies, border controls, technical standards, and non-tariff barriers. Specifically, sudden changes in China's import policies - such as tightening food hygiene inspections, requiring traceability, or adjusting border trade regulations - have repeatedly caused congestion of goods, especially agricultural products, at northern border gates. This situation highlights a lack of proactivity and sustainability in Vietnam's export strategy to Asia, as businesses still mainly rely on unofficial, short-term export methods without long-term strategic planning.

Secondly, in the African region, although the market is emerging with growing import demand driven by rapid population growth and urbanization, Vietnam's export turnover to Africa remains very low, accounting for less than 1% of the country's total exports. This is largely due to Vietnamese enterprises lacking market information and a firm understanding of consumer behavior, legal systems, and business environments in the region. Moreover, weak logistics infrastructure, high transportation costs, long delivery times, and the absence of an efficient distribution system further discourage enterprises from deeply penetrating the African market. In addition, risks related to payments, political instability, and legal uncertainties in some African countries also contribute to Vietnamese businesses' reluctance to fully engage with this high-potential yet volatile region.

Thirdly, although the structure of Vietnam's export commodities has improved, it remains unbalanced and still overly concentrated on a few key sectors such as agriculture-aquaculture, textiles, and electronic components. High value-added, deeply processed products still make up a relatively small portion. Notably, the absence of strong brands, limited competitiveness in technology, design, and international standards continue to prevent many Vietnamese products from entering the mid- to high-end segments in developed Asian markets such as Japan, South Korea, and Gulf countries. In Africa, Vietnamese goods

face stiff competition from rivals like China, India, and Turkey - countries with advantages in pricing, established trade networks, and long-standing market presence. This indicates the urgent need for Vietnam to adopt a clear product strategy tied to thorough market research and technological investment to enhance its competitive capacity.

Fourthly, Vietnam's ability to leverage Free Trade Agreements (FTAs) with Asian and African countries remains limited. Although Vietnam has signed and participated in numerous bilateral and multilateral FTAs, such as RCEP, ACFTA, EVFTA, and CPTPP, most small and medium-sized enterprises (SMEs) still lack the capacity to fully utilize tariff preferences, rules of origin provisions, or face difficulties complying with technical standards, food safety regulations, and environmental-social certifications that often accompany these agreements. Furthermore, the information system regarding FTAs remains fragmented, and promotional, advisory, and enterprise support activities lack depth, resulting in many businesses missing out on competitive advantages, even in their own domestic market.

Finally, a major challenge facing Vietnam's export activities in general - and exports to Asia and Africa in particular - is the lack of close coordination between enterprises and regulatory agencies. Trade promotion efforts remain fragmented and lack a comprehensive strategic framework. Market forecasting is often delayed, while technical and financial support for businesses is not yet systematically organized. In addition, in the context of increasing global volatility driven by geopolitical conflicts, technological competition, financial risks, and climate change, Vietnam is facing greater pressure from emerging trends such as global supply chain restructuring, sustainable development requirements, emissions reduction, and the shift toward a circular economy. This situation calls for a profound transformation of Vietnam's export ecosystem - from businesses and policies to infrastructure - to become more proactive, adaptive, and resilient.

3. Strategic solutions to promote the export of Vietnamese goods to Asian and African markets

In order to achieve the export growth target of 12%, with a striving goal of 14% in 2025 (Resolution 01/NQ-CP, 2025), it is essential to promote the export of Vietnamese goods to potential markets. As Asian and African markets are playing an increasingly important role in Vietnam's international trade strategy, boosting exports to these two regions requires not only the efforts of enterprises but also a comprehensive and synchronized involvement of the entire policy system, institutions, and government support. Below are several groups of strategic and practical solutions aimed at enhancing the effectiveness and competitiveness of Vietnamese goods in the Asian and African markets in the coming period.

3.1. Improving institutions and export support policies

One of the fundamental solutions is to enhance the trade institutions and support policies for enterprises, especially in the context of Vietnam's deep integration into the global trade system through free trade agreements (FTAs). The government needs to review, adjust, and complete legal documents related to exports, particularly regulations on product quality, traceability, quarantine, and technical standards, in order to facilitate enterprises' access to and expansion in the Asian and African markets. In addition, it is necessary to strengthen the effectiveness of financial policies supporting exports, such as tax incentives, export credit interest rate support, credit guarantee funds, and international trade insurance. At the same time, administrative procedures should be reformed, the customs system modernized, and trade database connectivity among ministries and sectors enhanced to shorten time and reduce costs for enterprises in the trade process.

3.2. Strengthening Trade Promotion and Expanding Market Networks

Trade promotion activities need to be organized in a professional, systematic, and long-term strategic manner. Relevant authorities should actively collaborate with the Vietnamese trade missions abroad to study market trends, update trade information, consumer demand, distribution systems, and specific legal regulations of each country, especially in Africa, a region where Vietnamese businesses still lack information and have limited presence. In addition to participating in trade fairs, exhibitions, and international conferences, it is necessary to implement digital trade promotion programs, utilizing cross-border e-commerce platforms, combined with online B2B activities, to help small and medium-sized enterprises (SMEs) effectively reach foreign customers. At the same time, industry associations should be encouraged to establish representative offices and product promotion centers in key markets such as China, the UAE, Nigeria, Kenya, and South Africa, to enhance brand recognition and build sustainable distribution channels.

3.3. Enhancing Product Competitiveness and Export Quality

In order to effectively compete in the Asian and African markets, where strong competitors such as China, India, Thailand, and Turkey are increasingly present, Vietnamese goods need to be not only affordable but also of high quality, stable, traceable, and meet international technical standards. Enterprises need to invest more in processing, preservation, packaging technology, and product design improvements to enhance value-added content. In particular, the agricultural and seafood industries need to shift strongly towards production models following GAP standards, organic practices, food safety regulations, and supply chain transparency. Additionally, the development of national brands and corporate brands linked to geographical indications, growing regions, and farming areas should be encouraged to build trust and loyalty among international consumers.

3.4. Strengthening the Capacity to Access and Utilize Free Trade Agreements (FTAs)

Effectively leveraging the FTAs that Vietnam has signed is a key lever to penetrate deeper into the Asian and African markets. However, many enterprises, especially small and medium-sized ones, still face challenges in grasping information and utilizing FTA tools. Therefore, it is necessary to strengthen training, workshops, legal consulting, and technical support on origin rules, quality certification, and import standards of target markets. In addition, Vietnam should proactively negotiate and expand bilateral FTAs with African countries that do not yet have existing trade agreements, while also tapping into the role of multilateral agreements such as the AfCFTA (African Continental Free Trade Area) to broaden access channels and reduce trade costs for enterprises.

3.5. Developing Logistics Infrastructure and the Export Support Ecosystem

High logistics costs and underdeveloped infrastructure are significant bottlenecks in export activities to distant markets like Africa. Therefore, the government should prioritize investing in the development of port systems, warehouses, and inter-regional logistics centers, especially in key border and seaport areas like Hai Phong, Cai Mep – Thi Vai, and Ho Chi Minh City. At the same time, Vietnamese logistics enterprises should be encouraged to collaborate with international partners to develop direct shipping routes to Africa, reducing reliance on third-party transshipment countries. In parallel, an export support ecosystem should be established, including international trade consulting centers, banks specialized in export financing, internationally accredited testing facilities, and real-time market information systems.

3.6. Strengthening Regional Linkages and Business Integration in the Value Chain

To enhance sustainable export capacity, Vietnam must focus on creating strong, interconnected export clusters that are closely linked to raw material-producing regions. This would involve fostering deeper collaboration among farmers, cooperatives, processing companies, and export enterprises. By developing these clusters, businesses will benefit from a more integrated and efficient supply chain, allowing for greater value addition at each stage of the production and export process. Additionally, Vietnam should prioritize promoting advanced value chain models such as "from farm to table" and "green production -clean exports," which are increasingly in demand in international markets. These models focus on traceable, sustainable production processes, which not only meet growing global demand for high-quality and eco-friendly products but also ensure consistent supply and transparency for consumers.

The focus should be placed on regions with strong export potential, such as the Mekong Delta, Central Highlands, and Southeast regions, where agriculture and natural resources are abundant. By strengthening linkages between local farmers and enterprises, these regions can establish a more resilient and competitive export network. Importantly, creating a transparent and traceable supply chain will enhance the credibility of Vietnamese products, helping to build trust with international consumers. Furthermore, developing these regional linkages will reduce intermediary costs, which often increase prices and reduce competitiveness in the global market. It will also streamline the logistics processes, ensuring timely and cost-effective delivery of goods. By expanding these regional networks and aligning them with market demands, Vietnam will be able to increase both the volume and value of its exports, particularly in the Asian and African markets, while maintaining a competitive edge in the global economy.

Conclusion: In the context of a rapidly changing global economy, influenced by factors such as the transformation of global supply chains, rising protectionism, geopolitical conflicts, and pressure from new trade standards, the need to redefine Vietnam's export strategy has become urgent. The Asian and African markets, with their geographical characteristics, population size, development potential, and increasingly open markets, have proven to be key regions in Vietnam's export market expansion strategy. The results achieved in recent years demonstrate the great potential and steady growth trends in trade with Asian and African countries. Export turnover has grown steadily, the structure of exports has shifted positively, and the competitiveness of agricultural, seafood products, and processed industrial goods has steadily improved. However, alongside these positive signals, Vietnam faces several challenges, such as a high dependence on a few key markets, uneven product quality, high logistics costs, a lack of market information, and limited capacity to fully leverage FTAs. To effectively seize opportunities and overcome barriers and challenges, Vietnam needs a comprehensive, coordinated, and in-depth approach, combining institutional improvement, enhancing business capacity, boosting trade promotion, strengthening value chain linkages, and developing export support infrastructure. In particular, emphasis should be placed on building a national brand, improving production technology, complying with international standards, and digital transformation across the entire supply chain. Expanding and effectively tapping into the Asian and African markets will not only be significant for trade but will also contribute to enhancing Vietnam's position on the international trade map, creating a solid foundation for sustainable economic development in the long term. This is not only a strategic direction but also an inevitable requirement in the process of deep integration and proactive adaptation to the new global economic landscape.

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