HO CHI MINH NATIONAL ACADEMY OF POLITICS

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FACTORS AFFECTING E-COMMERCE ADOPTION BY SMALL AND MEDIUM-SIZED AGRICULTURAL ENTERPRISES IN VIETNAM

SUMMARY OF DOCTORAL DISSERTATION

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INTRODUCTION

1. Rationale for choosing the topic

1.1. Theoretical urgency

Against the backdrop of global digital transformation, e-commerce has become an important driver of business model innovation, enhanced competitiveness, and sustainable economic growth. Over the past more than three decades, research on e-commerce adoption at the enterprise level has developed along three main theoretical approaches: (i) Diffusion of Innovations theory (Rogers, 2003), which emphasizes perceived benefits, compatibility, and behavioral intention; (ii) the Resource-Based View (Barney, 1991), which regards access to and reconfiguration of financial, human, and technological resources as determinants of innovation intention; and (iii) Institutional Theory (North, 1990; DiMaggio & Powell, 1983), which highlights legal constraints, social norms, and policy implementation capacity.

In practice, many studies integrate these theories through the TOE (Technology - Organization - Environment) framework proposed by Tornatzky & Fleischer (1990). This is not an independent theory but a classification framework that groups factors into the three contexts of Technology, Organization, and Environment: the Technology group is often grounded in Diffusion of Innovations theory (benefits, compatibility), the Organization group in the Resource-Based View (financial resources, infrastructure, human resources), while the Environment group reflects institutional and market conditions (the State, partners, competitors). This approach allows these theoretical lenses to be integrated systematically into a unified analytical model at the enterprise level.

However, empirical surveys have mainly focused on the industrial and service sectors or on urban enterprises, where infrastructure and managerial capacity are more favorable, while agriculture has received far less attention. Evidence from developing economies shows that contextual particularities can alter the impact structure: Rowe et al. (2012) observed significant differences between SMEs in Vietnam and those in other countries, while Rahayu & Day (2015) emphasized the role of market conditions in Indonesia. The institutional approach further clarifies this contextual nature: Gibbs & Kraemer (2004) and Shih, Dedrick & Kraemer (2005) demonstrated that legal barriers and policy implementation capacity in each country can determine the scope and degree of e-commerce adoption.

From this body of findings, two theoretical gaps can be identified. First, studies specifically on small and medium-sized agricultural enterprises (SMAEs) remain very limited, even though this group is characterized by small scale, constrained resources, low managerial capacity, seasonal products, geographically dispersed production, and infrastructure and business habits that are not yet compatible with e-commerce. Second, there is still no integrated analytical framework capable of simultaneously connecting and explaining the relationships among technology, organizational capability, market conditions, and institutional-policy constraints in the Vietnamese

context, thereby limiting the ability to explain differences in the degree of e-commerce adoption and reducing the generalizability of previous results.

Accordingly, the dissertation adopts an integrated approach combining three theoretical lenses: (i) diffusion of innovation, (ii) the resource-based view, and (iii) institutional theory. This approach makes it possible to analyze both internal and external enterprise factors simultaneously, linking technological, organizational, and market factors with the institutional environment in order to comprehensively test the factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam. In particular, the dissertation clarifies the role of the State as a creator of the legal framework, digital infrastructure, support mechanisms, and market regulation - an aspect that previous studies have not analyzed systematically - thereby adding empirical evidence and refining the theoretical framework to better fit Vietnam's economic context.

1.2. Practical urgency

Agriculture continues to play a pillar role in Vietnam's economy, contributing nearly 12% of GDP and creating jobs for around 30% of the social labor force. Small and medium-sized agricultural enterprises account for more than 95% of all agricultural enterprises and play a key role in organizing production, marketing agricultural products, and sustaining farmers' livelihoods [19]. Yet this very group is in the weakest position in the digital transformation process. In practice, the implementation of e-commerce among small and medium-sized agricultural enterprises reveals many bottlenecks. In terms of internal resources, most of these firms are small or micro in scale, with limited capital, outdated technology, and scarce digital human resources; most leaders have little experience in implementing e-commerce. In terms of infrastructure and support services, logistics, preservation, and e-payment systems remain fragmented, while the seasonal and perishable nature of agricultural products makes stable participation on e-commerce platforms difficult. In terms of institutions and policy implementation, although the Government has issued the National Digital Transformation Strategy and the Digital Agriculture Development Strategy, local implementation remains inconsistent, management capacity is limited, and support mechanisms are not closely tailored to the characteristics of small and medium-sized agricultural enterprises. In terms of market conditions and trust, concerns over quality, traceability, and risks in online transactions make consumers reluctant to buy agricultural products via e-commerce, thereby limiting enterprises' capacity to expand markets [22]. In this context, without in-depth research to clearly identify the influencing factors and the regulatory and supportive role of the State, small and medium-sized agricultural enterprises risk being left behind in the process of e-commerce adoption. The consequences would be declining competitiveness, widening digital inequality between rural and urban areas, and difficulty in achieving the goal of agricultural digital transformation by 2030.

2. Research objectives, tasks, and questions

Research objective: The dissertation aims to clarify the factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam, with particular emphasis on the role of the State and its mechanism of influence in relation to technological, organizational, and market factors. On that basis, it proposes policy recommendations to promote e-commerce adoption by this group of enterprises in line with the orientation of digital economy and digital agriculture development in Vietnam to 2030, with a vision to 2035.

Research tasks: To review, analyze, and evaluate domestic and international studies; systematize and clarify the theoretical foundation; develop an appropriate research model and scales; conduct qualitative research, preliminary quantitative research, and formal quantitative research to test the model, measure the influence of the factors, and analyze the State's mechanism of influence; and on that basis propose policy recommendations. The dissertation also focuses on answering four questions concerning: the current state of e-commerce adoption; the influencing factors and their degree of influence; the role and mechanism of the State's impact; and policy recommendations to 2030 with a vision to 2035.

3. Research object and scope

Research object: The dissertation examines the factors affecting e-commerce adoption by SMAEs in Vietnam, with a particular focus on the influence of the State as a multidimensional factor: directly through policies, infrastructure, and support programs, and indirectly through its influence on technological, organizational, and market factors.

Scope of content: The dissertation focuses on six factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam, including: (i) benefits obtained from e-commerce adoption; (ii) compatibility of e-commerce adoption; (iii) the enterprise's financial resources, physical facilities, and human resources; (iv) enterprise leadership; (v) business partners and competitors; and (vi) the State. In the empirical study, e-commerce adoption is approached and measured through the enterprise's intention to adopt, continue using, and expand e-commerce.

Scope of actor: The dissertation identifies the State as the governing actor within the research scope, including central and local state management agencies directly related to e-commerce development, digital transformation, and agricultural development.

Scope of respondents and research setting: Survey respondents are enterprises operating under Vietnamese law, whose main business is in agriculture and which belong to the small and medium-sized enterprise group; primary data were collected from 419 enterprises across provinces and centrally governed cities nationwide using a controlled convenience sampling method by enterprise size and geographic

distribution. The dissertation also refers to the experience of several countries such as China, South Korea, and Thailand in order to draw lessons for Vietnam.

Time scope: Secondary data were collected during 2000 - 2025, mainly focusing on 2017 - 2025. Primary data were collected through expert interviews in January 2024, a preliminary quantitative survey from February to March 2024, and an official quantitative survey from November to December 2024. Policy recommendations are proposed for the period to 2030, with a vision to 2035.

4. Theoretical basis and research methods

4.1. Theoretical basis:

The dissertation integrates three theoretical lenses - diffusion of innovation, the resource-based view, and institutional theory - to explain the factors affecting e-commerce adoption by SMAEs. According to Rogers (2003), Diffusion of Innovations theory emphasizes perceived benefits and the compatibility of technology. Barney (1991), in the Resource-Based View, affirms the role of finance, physical facilities, and human resources in adopting and exploiting technology. The institutional approach of North (1990) and DiMaggio & Powell (1983) clarifies the influence of the legal framework, social norms, and policy implementation capacity.

On that foundation, the conceptual model of the dissertation includes six factors: (1) benefits obtained from e-commerce adoption, (2) compatibility of e-commerce adoption, (3) financial resources - physical facilities - human resources, (4) enterprise leadership, (5) partners and competitors, and (6) the State. The State factor is modeled as a second-order structural construct, measured through sub-factors; after testing and refining the official research model, this factor comprises two core components: market development and shared infrastructure for e-commerce, and the implementation capacity of state management personnel. This approach inherits the spirit of the Technology - Organization - Environment (TOE) framework of Tornatzky & Fleischer (1990), but restructures it into two groups: (i) the State and (ii) the remaining five factors related to technology, organization, and market.

4.2. Research methods:

The dissertation employs a sequential mixed-methods research design consisting of three stages:

(1) Qualitative stage (01/2024): semi-structured interviews with actors in the agricultural value chain to explore and adjust the scales and identify four components of the "State" factor; the data were analyzed thematically.

(2) Preliminary quantitative stage (02 - 03/2024): 215 questionnaires were distributed, of which 203 valid responses were collected; scale reliability was tested using Cronbach's Alpha, and exploratory factor analysis was conducted to remove unsatisfactory indicators.

(3) Official quantitative stage (11 - 12/2024): 450 questionnaires were distributed, yielding 419 valid samples from 63 provinces and cities; the model was tested using two-stage PLS-SEM to handle the higher-order construct "State". Stage 1 estimated the components and assessed reliability, convergent validity, and discriminant validity; Stage 2 estimated the structural model, tested multicollinearity (VIF), and statistical significance through bootstrapping.

Secondary data were collected from state agencies, statistical reports, and scientific works; primary data were collected through interviews and the official survey according to a standardized process.

5. New contributions of the dissertation

5.1. Theoretical contributions

First, the dissertation supplements and tests an integrated analytical framework on the factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam by connecting theoretical approaches on diffusion of innovation, resources, and institutions within a unified research model. The novelty of the dissertation lies not only in inheriting factors mentioned in previous studies, but also in placing technological, organizational, market, and State factors within the same analytical structure to explain e-commerce adoption behavior in the specific context of small and medium-sized agricultural enterprises in Vietnam. Empirical test results show that among the six factors included in the model, four have statistically significant effects; among them, enterprise leadership exerts the strongest influence, followed by the State, partners and competitors, and technological compatibility.

Second, the dissertation clarifies more fully the role of the State as a higher-order institutional factor in research on e-commerce adoption by small and medium-sized agricultural enterprises. Compared with many previous studies that mainly approached the State as an external supporting condition or examined only individual aspects separately, the dissertation structures the State factor into two core components: market development and shared infrastructure for e-commerce; and the implementation capacity of state management personnel. On that basis, the dissertation not only tests the direct effect of the State on e-commerce adoption, but also clarifies the State's indirect mechanism of influence through a number of internal factors and enterprise operating conditions, especially enterprise leadership, perceived benefits, and compatibility.

5.2. Practical contributions

First, the dissertation provides empirical evidence on the ranking and magnitude of the factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam. The findings show that e-commerce adoption by this group is influenced more strongly by the leadership capacity of enterprise leaders, the quality of institutions, market pressure, and the degree to which e-commerce solutions fit

actual operating conditions, rather than relying solely on isolated input supports. This finding suggests that promoting e-commerce adoption in the small and medium-sized agricultural enterprise sector will be unlikely to achieve sustainable effectiveness without a sufficiently trustworthy transaction environment, standardized processes, and strong policy implementation capacity on the part of the State.

Second, based on the research findings, the dissertation proposes a system of policy recommendations oriented toward a synchronized, focused approach grounded in empirical evidence. The recommendations focus on improving the legal framework for the electronic transaction chain; developing digital infrastructure and shared logistics infrastructure; standardizing and interoperably connecting data among enterprises, e-commerce platforms, payment systems, and logistics; strengthening consumer protection and market information transparency; and enhancing the implementation capacity of state management agencies. In addition, the set of indicators validated in the dissertation can serve as a reference tool for assessing readiness and monitoring the results of e-commerce adoption by small and medium-sized agricultural enterprises, thereby supporting management agencies and related organizations in designing, supervising, and adjusting policies more appropriately.

6. Theoretical and practical significance of the research topic

In theoretical terms, the dissertation contributes to supplementing and clarifying the theoretical foundation on the factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in the context of a developing economy. The findings show that explaining e-commerce adoption for this group of enterprises cannot stop at internal enterprise factors or technological attributes alone, but must simultaneously consider the relationship among technology, organizational capability, market pressure, and institutional quality. From that perspective, the dissertation further clarifies the role of the State not only as an external environmental factor, but as a factor capable of directly and indirectly influencing the process of e-commerce adoption by small and medium-sized agricultural enterprises.

In practical terms, the findings provide a scientific basis for formulating and adjusting policies to promote e-commerce adoption among small and medium-sized agricultural enterprises in Vietnam. They also help state management agencies, local authorities, commodity associations, and business support organizations identify more clearly the priority bottlenecks that need to be addressed, thereby enabling them to design support programs in a targeted manner and avoid spreading resources too thinly. For the enterprises themselves, the findings also offer a useful reference in determining which conditions should be strengthened first when implementing e-commerce, especially leadership capacity, adaptability to technology, and the ability to participate in an increasingly competitive digital transaction environment that requires a higher level of trust.

Chapter 1

OVERVIEW OF RESEARCH WORKS RELATED TO THE DISSERTATION TOPIC

1.1. Overview of related studies

International studies show that e-commerce brings many benefits to small and medium-sized agricultural enterprises, such as market expansion, cost reduction, and increased welfare. Deichmann et al. (2016) show that e-commerce helps rural enterprises access markets and reduce price disparities; Aker & Ksoll (2016) confirm that e-commerce helps overcome geographic barriers; Lin et al. (2016) point to positive impacts on sustainable development. In Vietnam, Nguyen Van Chung (2024) and Nguyen Thi Thuy Linh (2019) both indicate a strong trend of e-commerce development but also limitations in digital skills, buying and selling habits, and logistics. In terms of measurement, two approaches are used: (i) based on the actual implementation status/stage (Ahmad et al., 2015) and (ii) based on intention or readiness to adopt, following the behavioral scale of Davis & Venkatesh (2003), later inherited by Abed (2020). The main influencing factors consist of six groups:

(1) Financial resources, physical facilities, and human resources: most studies report positive effects (Alyoubi, 2015; Mthembu et al., 2018; Al-Bakri & Katsioloudes, 2015; Peng et al., 2019; Rahayu & Day, 2015), but some studies find no effect (Grandon & Pearson, 2004; Hoang Dam Luong Thuy et al., 2021).

(2) Enterprise leadership: has a positive effect through strategic orientation and support (Ghobakhloo & Tang, 2013; Lip-Sam & Hock-Eam, 2011; Rahayu & Day, 2015; Mohtaramzadeh et al., 2018; Nguyen Phuc Nguyen et al., 2022), with Rowe et al. (2012) as an exception.

(3) Perceived benefits: most studies confirm a positive relationship (Duan et al., 2012; Ghobakhloo & Tang, 2013; Tornatzky et al., 1990; Leung et al., 2015; Nguyen Phuc Nguyen et al., 2020), while Rowe et al. (2012) and Hoang Dam Luong Thuy et al. (2021) find no statistical significance.

(4) Compatibility: a stable factor with a positive effect (Rahayu & Day, 2015; Rowe et al., 2012; Ahmad et al., 2015; Nguyen Phuc Nguyen et al., 2020).

(5) Pressure from partners and competition: there is much evidence of a positive effect (Al-Qirim, 2006; Rowe et al., 2012; Hoang Dam Luong Thuy et al., 2021; Nguyen Phuc Nguyen et al., 2022), but some studies report no significance (Jeon et al., 2006; Vilaseca-Requena et al., 2007; Ahmad et al., 2015).

(6) The State: an important factor with both direct and indirect effects. In terms of direct effects, the promulgation of enabling institutions, policies, and infrastructure (Alyoubi, 2015; Kabir et al., 2020; Mohtaramzadeh et al., 2018; Mthembu et al., 2018; Ahmad et al., 2015; Agarwal & Wu, 2015; Lekmat, 2018; Hanna, 2018; Cui et al., 2006; Gibbs & Kraemer, 2004; OECD, 2017; Clegg, 2019; Doh et al., 2017) increases

the likelihood of adoption. In terms of indirect effects, the State raises awareness of benefits (Kurnia et al., 2015; Scupola, 2006), standardizes infrastructure and standards (Reinert, 1999; Duan et al., 2023), supports resources and training (Ahmad et al., 2015; Kurnia et al., 2015), motivates enterprise leaders (Ocloo et al., 2025), and stimulates competition through market policies (Gibbs & Kraemer, 2004). In Vietnam, many authors such as Chu Ba Quyet (2022), Nguyen Vu Hong Thanh (2020), Doan Hoang Quan (2021), and Vu Thien Bach (2022) emphasize the State's regulatory role, infrastructure investment, and promotion of rural e-commerce.

Other factors such as perceived complexity, innovation risk, ownership type, and organizational culture (Rowe et al., 2012; Ahmad et al., 2015; Mohtaramzadeh et al., 2018; Li et al., 2010) are mentioned sporadically and inconsistently, so they are not included in the dissertation's main model.

Regarding the theoretical framework, studies often integrate Diffusion of Innovations theory (Rogers, 1962), the Resource-Based View (Barney, 1991, 1997), and Institutional Theory (North, 1990; DiMaggio & Powell, 1983) within the Technology - Organization - Environment framework (Tornatzky & Fleischer, 1990). The dissertation inherits this integrated approach and adjusts it to the Vietnamese context to comprehensively explain the role of the State and the endogenous and exogenous factors affecting e-commerce adoption by SMAEs.

In terms of methods, the research trend has shifted from multiple regression (Ahmad et al., 2015; Rahayu & Day, 2015) to structural equation modeling SEM (Hoang Dam Luong Thuy et al., 2021; Mohtaramzadeh et al., 2018; Nguyen Phuc Nguyen et al., 2022; Chiu et al., 2017; Hussein et al., 2020), combined in some cases with qualitative research (Hanna, 2018; Chu Ba Quyet, 2022). The scales are mainly perception-based, inherited from international studies and tested for reliability, convergent validity, and discriminant validity, ensuring scientific rigor and practical relevance to e-commerce.

1.2. General assessment of the literature review

- Findings clarified by previous studies

Previous studies agree that e-commerce brings many benefits to enterprises, especially to SMAEs: improving efficiency, reducing costs, expanding markets, and increasing competitiveness (Deichmann et al., 2016; Aker & Ksoll, 2016; Lin et al., 2016; Nguyen Van Chung, 2024; Nguyen Thi Thuy Linh, 2019). Domestic and international research shows six core groups of factors affecting e-commerce adoption: (i) perceived benefits (Duan et al., 2012; Ghobakhloo & Tang, 2013), (ii) compatibility (Rahayu & Day, 2015), (iii) financial resources - infrastructure - human resources (Alyoubi, 2015; Mthembu et al., 2018), (iv) enterprise leadership (Ghobakhloo & Tang, 2013; Nguyen Phuc Nguyen et al., 2022), (v) partners and competition (Al-Qirim, 2006), and (vi) the State (Kurnia et al., 2015; Ahmad et al., 2015; Hanna, 2018).

These six factors reflect the interaction among internal capabilities, the business environment, and governing institutions, forming the basis that the dissertation inherits and adjusts for the Vietnamese context. In methodological terms, the studies mainly use perceptual scales and SEM models to handle complex relationships among latent variables (Hoang Dam Luong Thuy et al., 2021; Mohtaramzadeh et al., 2018).

- *Research gaps*

The review reveals four gaps: (1) a lack of studies specifically on SMAEs in Vietnam; (2) inconsistent findings regarding benefits, resources, and leadership; (3) a lack of comprehensive conceptualization of the State, which is often treated separately in terms of law, infrastructure, and communication; and (4) a lack of clarity regarding indirect and mediating relationships among factors.

1.3. Issues selected for study and analytical framework

Accordingly, the dissertation chooses to test the above six factors, approaching the State as an economic management factor with direct effects and spillover effects on the remaining factors. The theoretical framework integrates Rogers's DOI (1962), Barney's RBV (1991), and North's institutional theory (1990) within the TOE model of Tornatzky & Fleischer (1990). The empirical section uses SEM to measure the impacts, thereby proposing management and policy solutions to promote e-commerce adoption by SMAEs and contribute to digital transformation and sustainable digital economic development in Vietnam.

Chapter 2
THEORETICAL BASIS AND INTERNATIONAL EXPERIENCE REGARDING FACTORS AFFECTING E-COMMERCE ADOPTION BY SMALL AND MEDIUM-SIZED AGRICULTURAL ENTERPRISES

2.1. Theoretical basis on the factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam

2.1.1. Concepts, characteristics, and roles of e-commerce adoption by SMAEs

SMAEs: Enterprises of micro, small, or medium scale operating in the agricultural value chain, classified by labor, revenue, or capital.

Characteristics: Small scale, dispersed, low value added; limited management capacity; difficult access to capital and infrastructure; flexible but vulnerable to shocks.

Role: Create jobs, increase rural income; connect farmers to markets; promote sustainable production and product diversification.

E-commerce adoption: According to OECD and UNCTAD (2019), it refers to transactions ordered/received over networks; in Vietnam (Decree No. 52/2013/ND-CP, the National E-commerce Development Plan for 2021 - 2025), it is understood more broadly as the comprehensive digitization of business activities. The dissertation views e-commerce adoption as SMAEs integrating digital tools and platforms into

production, distribution, marketing, and payment in order to optimize operations and capabilities.

Characteristics & roles: Flexible, not limited by space and time; helps expand markets, reduce costs, optimize processes, strengthen branding, and improve competitiveness.

Scale: The dissertation measures e-commerce adoption intention (Ajzen, 1991; Venkatesh et al., 2003; Abed, 2020) through 3 Likert variables: (1) intention to adopt; (2) consideration of stronger use; (3) plan to expand e-commerce.

2.1.2. Factors affecting e-commerce adoption by SMAEs

2.1.2.1. Group of five enterprise, technology, and market factors

(1) Financial resources - physical facilities - human resources

Concept: The readiness and quality of capital, IT-logistics infrastructure, data, and workforce digital skills; Barney's RBV framework (1991, 1997) emphasizes VRIN/VRIO. Mechanism: (i) activating organizational capabilities; (ii) expected value generated by resource complementarities; (iii) accumulation of specific intangible assets -> increasing adoption intention. Measurement (5-point Likert): understanding of e-commerce; readiness to access technology; proficiency in computers and the Internet; adequate physical facilities and finance. Hypothesis: H1 (+).

(2) Enterprise leadership

Concept: The degree of strategic priority, understanding of e-commerce, and openness to innovation (RBV - the role of transforming resources). Mechanism: (i) activating and coordinating resources; (ii) creating expected value from resource combinations; (iii) guiding learning and standardization, accumulating intangible assets -> reinforcing intention. Measurement (5-point Likert): prioritizing e-commerce; understanding e-commerce; openness to innovation. Hypothesis: H2 (+).

(3) Benefits obtained from e-commerce adoption

Concept: Relative advantage (DOI - Rogers, 1962/1983): expanding markets/revenue, reducing costs, improving customer relationships. Mechanism: DOI chain knowledge -> persuasion -> decision -> implementation -> confirmation; higher perceived benefits -> stronger intention. Measurement (5-point Likert): expanding markets/revenue; reducing costs; improving customer relationships. Hypothesis: H3 (+).

(4) Compatibility of e-commerce adoption

Concept: The extent to which e-commerce fits processes, systems, and customers-suppliers (DOI - Rogers, 1962/1983). Mechanism: Higher compatibility -> lower perceived risk, higher expected effectiveness -> stronger intention. Measurement (5-point Likert): little need to change processes; suitability for customer needs; suitability for suppliers. Hypothesis: H4 (+).

(5) Business partners and competitors

Concept: Sources of institutional pressure from customers, suppliers, and competitors (Institutional theory - DiMaggio & Powell, 1983). Mechanism: coercive pressure (requirements for digital transactions) + normative pressure (industry practices) + mimetic pressure (imitating success) -> legitimizing e-commerce -> stronger intention. Measurement (5-point Likert): customers value e-commerce highly; suppliers respond positively; competitiveness increases thanks to e-commerce. Hypothesis: H5 (+).

2.1.2.2. The State factor

- Direct influence of the State

Mechanism: Coercive: laws, standards, and shared public infrastructure -> reducing uncertainty and transaction costs. Normative: digital transformation programs, training, promotion of cashless payments -> digital professional norms. Mimetic: communication, pilot models, consumer protection -> legitimate models and greater market trust. Measurement (4 dimensions): (i) legal framework and technological infrastructure; (ii) policies and enterprise support services; (iii) consumer protection and market trust; (iv) implementation and supervision capacity. Overall hypothesis: H6 (+).

- Indirect influence of the State on each factor

Main contents: (a) legal framework; (b) policies and enterprise support; (c) organization of the management apparatus and inter-agency coordination; (d) transparent and effective inspection and supervision. Theoretical basis: institutional theory - coercive, normative, and mimetic pressures (DiMaggio & Powell, 1983) shape enterprise innovation behavior.

On resources: standards - incentives - support access criteria -> reconfiguring finance, infrastructure, and human resources. H6a (+).

On leadership: digital leadership standards and pilot models -> strategic orientation and legitimization of decisions. H6b (+).

On perceived benefits: the "rules of the digital game," traceability standards, and protection mechanisms -> higher perceived relative advantage. H6c (+).

On compatibility: data and process standards, operational guidance -> easier integration into operations. H6d (+).

On partners/competitors: digitalization of procedures, industry standards, exemplification, and rankings -> legitimizing pressure within the chain. H6e (+).

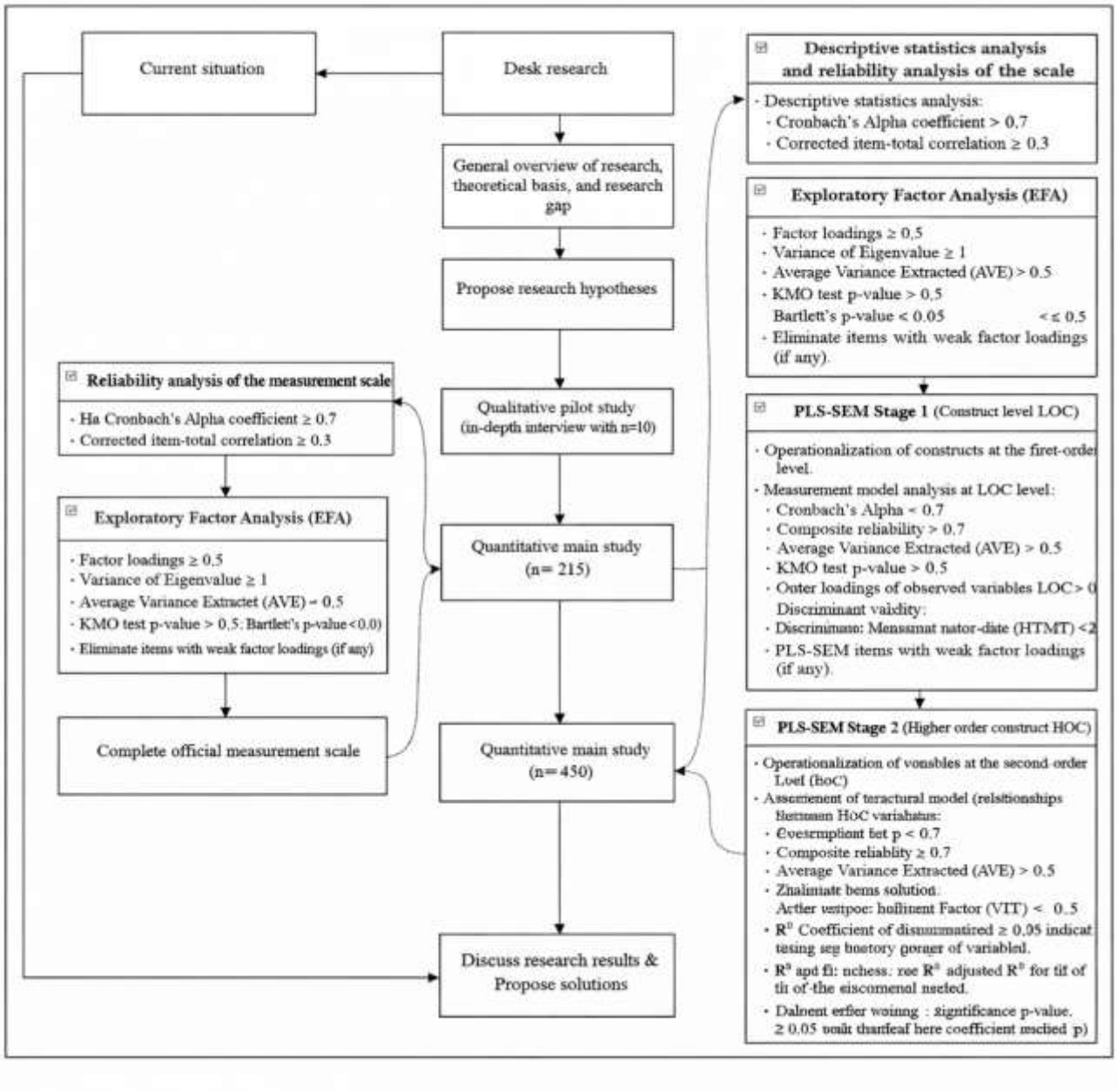
2.2. International experience regarding factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam

The dissertation selects China, South Korea, and Thailand because all share many similarities with Vietnam and have representative experience in promoting agricultural e-commerce. International experience shows that for small and medium-sized agricultural enterprises to adopt e-commerce effectively, it is necessary to act simultaneously on institutions, digital infrastructure and logistics, transaction platforms, digital skills, enterprise leadership capacity, and market ecosystem linkages. The key lesson for Vietnam is that the State must play a facilitating role, prioritize shared infrastructure and services, improve skills and management capacity, develop models suited to actual conditions, and simultaneously foster linkages among enterprises, platforms, logistics, and markets.

Chapter 3
RESEARCH METHODS

3.1. Research design and research model

The mixed-methods research process for the factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam is as follows: Desk research: systematizing theory, reviewing the literature, identifying gaps, and proposing the model. Qualitative research: interviewing owners/managers of SMAEs and management officials to explore factors and adjust the scales. Preliminary quantitative research: distributing 215 questionnaires; testing reliability (Cronbach's alpha) and conducting exploratory factor analysis to refine the scales. Official quantitative research: distributing 450 questionnaires; standardizing a 5-point Likert scale for all indicators; estimating the model using partial least squares structural equation modeling under a two-stage approach (Sarstedt, 2021).



Source: Synthesized and proposed by the doctoral candidate.

Figure 3.1: Research process for examining determinants of e-commerce adoption among agricultural small and medium-sized enterprises in Viet Nam

Research model. Dependent variable: intention to adopt e-commerce. Six influencing factors: (1) financial resources - physical facilities - human resources; (2) enterprise leadership; (3) benefits obtained from e-commerce adoption; (4) compatibility of e-commerce adoption; (5) business partners and competitors; and (6) the State (a higher-order variable with 4 dimensions: legal framework & technological infrastructure; enterprise support; consumer protection; implementation capacity). Hypotheses to be tested. H1 - H5: the five enterprise, technology, and market factors positively affect e-commerce adoption. H6: the State has a direct positive effect; H6a - H6e: the State has indirect positive effects on each of the remaining factors.

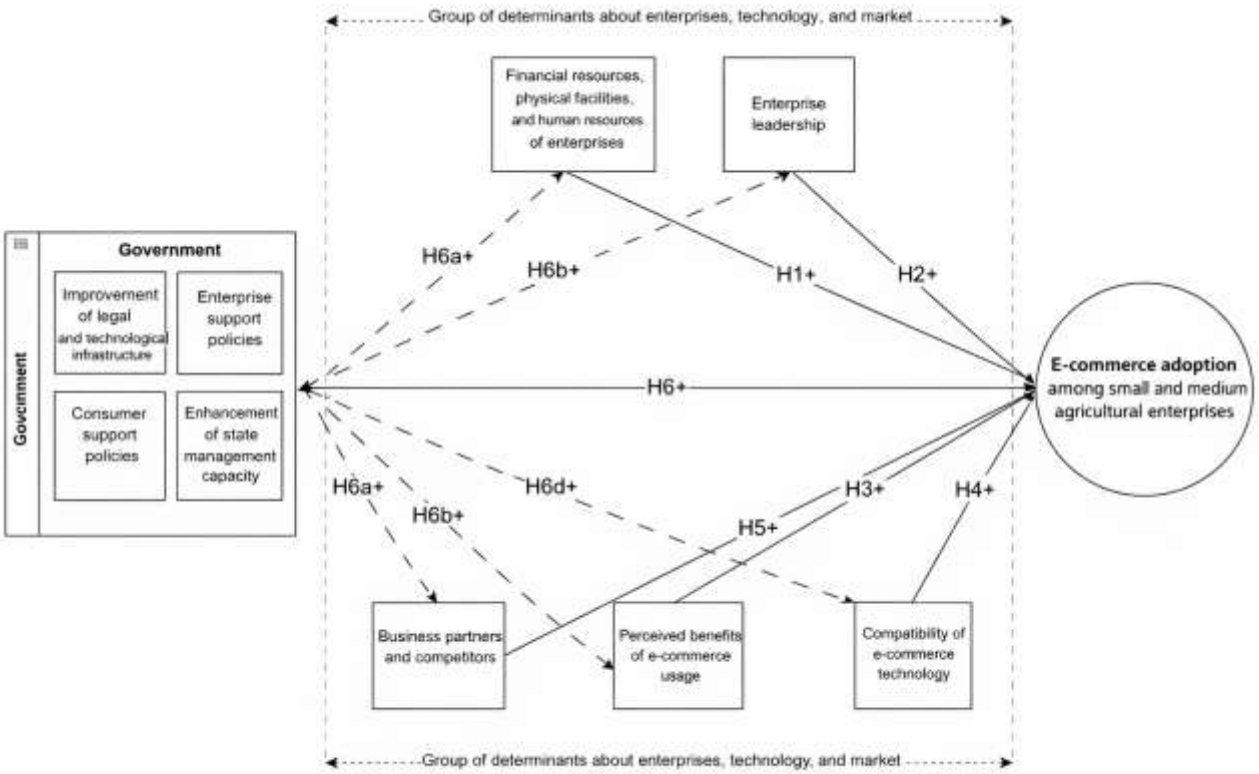


Figure 3.2: Research model on the factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam

Source: Research model proposed by the doctoral candidate.

The research hypotheses are as follows, with the direction of influence of each hypothesis (positive/negative) explained in detail in Chapter 2 of the dissertation:

(i) For the group of five enterprise, technology, and market factors:

- Hypothesis 01 (H1): The enterprise's financial resources, physical facilities, and human resources positively affect e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam.

- Hypothesis 02 (H2): Enterprise leadership positively affects e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam.

- Hypothesis 03 (H3): Benefits obtained from e-commerce adoption positively affect e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam.

- Hypothesis 04 (H4): Perceived compatibility of e-commerce adoption positively affects e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam.

- Hypothesis 05 (H5): Business partners and competitors positively affect e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam.

(ii) For the State factor:

- Hypothesis 06 (H6): The State positively affects e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam.

- Hypothesis 6a (H6a): The State positively affects the enterprise's financial resources, physical facilities, and human resources.

- Hypothesis 6b (H6b): The State positively affects enterprise leadership.

- Hypothesis 6c (H6c): The State positively affects the benefits obtained from e-commerce adoption.

- Hypothesis 6d (H6d): The State positively affects perceptions of the compatibility of e-commerce adoption.

- Hypothesis 6e (H6e): The State positively affects business partners and competitors.

- Finalization of the official scale: A preliminary quantitative survey of 215 SMAEs was conducted; Cronbach's alpha reliability coefficients and exploratory factor analysis were used to remove unsuitable variables and standardize language and structure.

3.2. Scale construction and development

- Preliminary scale: Basis: the review in Chapters 1 and 2 and qualitative interviews; all variables were measured on a 5-point Likert scale. The group of 05 enterprise, technology, and market factors inherits international and domestic scales: Financial resources - physical facilities - human resources: Rowe et al. (2012); Abed (2020); Hoang Dam Luong Thuy et al. (2021); Nguyen Phuc Nguyen et al. (2022). Enterprise leadership: Rowe et al. (2012); Mohtaramzadeh et al. (2018); Abed (2020); Hoang Dam Luong Thuy et al. (2021); Nguyen Phuc Nguyen (2022). Benefits obtained from e-commerce adoption: Rowe et al. (2012); Mohtaramzadeh et al. (2018); Abed (2020); Hoang Dam Luong Thuy et al. (2021); Nguyen Phuc Nguyen et al. (2022). Compatibility of e-commerce adoption: Rowe et al. (2012); Hoang Dam Luong Thuy et al. (2021); Nguyen Phuc Nguyen et al. (2022). Business partners and competitors: Rowe et al. (2012); Mohtaramzadeh et al. (2018); Chiu et al. (2017); Hoang Dam Luong Thuy et al. (2021); Nguyen Phuc Nguyen et al. (2022). The second-order factor "State" was newly developed in the dissertation from the perspective of economic management, selectively inheriting from Rowe et al. (2012); Chiu et al. (2017); Mohtaramzadeh et al. (2018); Abed (2020); Hoang Dam Luong Thuy et al. (2021). It consists of 4 first-order factors, each with 3 observed variables (12 variables in total): legal-tech infrastructure-shared public services; enterprise support (policies, training, consultancy, finance); consumer support/protection (market trust); implementation capacity of management agencies. The dependent variable (e-commerce adoption by SMAEs) measures intention based on the 3-item scale of Venkatesh et al. (2003), also used by Abed (2020); Hussein et al. (2020); and Hoang Dam Luong Thuy et al. (2021).

3.4. Data analysis methods

The analysis sequence proceeds from descriptive statistics -> Cronbach's & EFA (preliminary) -> scale refinement -> descriptive analysis -> Cronbach's & EFA (official + VIF) -> two-stage PLS-SEM (measurement of LOC/HOC and structural testing). Bootstrapping results (standardized coefficients, SE, p, f^2) form the basis for discussion and conclusions.

Chapter 4
CURRENT SITUATION OF FACTORS AFFECTING E-COMMERCE ADOPTION BY SMALL AND MEDIUM-SIZED AGRICULTURAL ENTERPRISES IN VIETNAM

4.1. Operational situation and current status of e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam period 2020 - 2025

By the end of 2023, Vietnam had more than 12 thousand agricultural enterprises (over 95% of them small and medium-sized), with small scale and limited technology and capital. Although there has been progress in high-tech models, investment and value-chain linkages remain weak. In e-commerce, 68% of enterprises sell via social media, 41% have websites, and 40% participate in platforms, yet only 40% use electronic contracts, showing that the digital transaction chain remains incomplete even though most firms assess it as effective. A survey of 419 enterprises shows that adoption intention is only at an average level (approximately 2.4/5), focusing more on maintenance than expansion.

Overall, enterprises have only reached the "transaction" stage and have not yet attained the "expansion" stage. It is necessary to standardize a closed electronic process, support logistics, and improve the legal framework in order to promote deeper e-commerce adoption in agriculture.

4.2. Current situation of the factors affecting e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam period 2020 - 2025

Group of enterprise, technology, and market factors: Small and medium-sized agricultural enterprises lack capital, IT infrastructure, and digital human resources; their understanding of e-commerce is at an average level, but their "readiness for innovation" is low, resulting in a gap between awareness and action. Enterprise leadership shows a desire for innovation, yet knowledge and the level of priority given to e-commerce remain weak. Perceived benefits (market expansion, cost reduction, improved customer relationships) do exist, but are not yet large enough due to the lack of measurement tools and data exploitation capacity. Compatibility is the "bottleneck": internal processes, customers, and suppliers have not been digitized in a synchronized

manner, causing enterprises to lean toward lightweight models on social media. Pressure from partners/competitors exists but is not yet widespread; upstream actors (suppliers), in particular, remain very weakly digitized.

The State factor: The legal framework, infrastructure, and management apparatus have improved, but the level of impact perceived by enterprises remains low, especially in connection infrastructure and logistics, support programs, and the promotion of payments/training. A relatively positive point lies in implementation capacity (procedures and violation control), but it still remains below the median.

Policy implications: Priority should be given to "implementation and compatibility" rather than to expanding investment in satellite cold-storage clusters, traceability standards, and minimum digital obligation packages (streamlined electronic contracts/invoices). Support should be designed by capability tier, focusing on leadership and operations (micro-certificates, on-site mentoring, digital output KPIs). The chain's "interaction interface" should be standardized (GS1 codes, data messages, ODR), and a shared public platform linking platforms, logistics, and payments should be opened. Direct economic incentives (credit based on order data, tax incentives/deductions for digital investment) and rating/scoring mechanisms should be created to amplify mimetic effects across the entire industry.

4.3. Survey research results for small and medium-sized agricultural enterprises in Vietnam

Qualitative interviews with 8 respondents (enterprises and management agencies) confirm that all 6 factors in the model affect e-commerce adoption by SMAEs: leadership, resources, benefits, compatibility, partners-competition, and the State. The State affects not only directly but also indirectly through infrastructure, support, and implementation capacity. The interviews also helped add a new component: "implementation capacity of state management personnel."

The preliminary quantitative survey (203 samples) shows that all scales are reliable (Cronbach's Alpha > 0.7; KMO = 0.839; total variance extracted = 72.6%). After EFA, 27 observed variables were retained, forming 6 independent factors, among which the State factor consists of 2 components: market development & shared infrastructure (NTH) and implementation capacity (NQL).

The official survey of 419 SMAEs in 63 provinces shows that the level of e-commerce adoption remains low (mean score 2.4 - 2.5/5). PLS-SEM results confirm that the model has high explanatory power (R^2 = 73.5%). There are 4 factors with statistically significant effects: enterprise leadership (the strongest), the State, partners-competition, and compatibility. The two factors of benefits and resources do not have significant effects. The State also indirectly affects leadership, benefits, and compatibility.

Overall, leadership plays the central role; the State exerts spillover effects; partners and compatibility determine the degree of operation; while resources and benefits are not yet the main drivers. The level of e-commerce adoption by SMAEs has only reached the "transaction" stage and has not yet achieved the "integration" stage.

The dissertation makes a new contribution by establishing a two-component State model (infrastructure-market and implementation capacity), while also providing empirical grounds for the solutions in Chapter 5: improving infrastructure and institutions, upgrading implementation capacity, and promoting e-commerce adoption by SMAEs through a synchronized, focused approach.

4.4. Overall assessment of the research results

The dissertation uses a mixed design (desk research - qualitative - quantitative) to build and test a 6-factor model, adding the new State component of "implementation capacity." The scales achieve good reliability and validity; the adjusted model fits the Vietnamese agricultural context. The level of e-commerce adoption by SMAEs remains basic and not deeply integrated; the main bottlenecks are an incomplete electronic transaction chain, low process-partner compatibility, and limited organizational and financial capacity. The results emphasize the central role of leadership; the State has both direct and spillover effects, while pressure from partners/competition is not yet strong enough. A new contribution is the two-component State model (infrastructure-market and implementation) and the identification of the upstream "break" in the value chain. Policy implications include closing the order-contract-e-invoice process, setting minimum data and operational standards, open logistics/cold-chain gateways, promoting digital payments, enhancing leadership capacity through a "learn-do-mentor" model, piloting models and connectivity rankings, treating digital contracts/orders as information assets, and supporting "compatibility vouchers."

Chapter 5
POLICY RECOMMENDATIONS FOR STATE TO PROMOTE AFFECTING FACTORS TO E-COMMERCE ADOPTION BY SMALL AND MEDIUM-SIZED AGRICULTURAL ENTERPRISES IN VIETNAM

5.1. New context

The agricultural value chain is being digitized rapidly (social media, specialized platforms, electronic contracts/invoices, traceability), digital-logistics infrastructure is gradually improving, and requirements for transparency, safety, and sustainability are rising. The role of the State is shifting toward ecosystem creation (institutions-infrastructure-data-human resources) and PPPs for cold logistics, digital platforms, and data-based finance. E-commerce is positioned as a tool for digitizing the entire chain of "order -> electronic contract -> invoice -> reconciliation -> storage -> ODR."

5.2. Orientation, and objectives

Objectives: A closed agricultural e-commerce ecosystem; standardized data; efficient logistics; strong market trust; data-based governance. Targets: e-commerce revenue >20%; e-commerce value added >=9%/year; total retail and e-commerce services >=13%/year; >=70% of enterprises using major platforms/marketplaces; 100% using electronic contracts; digital economy labor >3%.

5.3. Policy recommendations to promote e-commerce adoption for small and medium-sized agricultural enterprises in Vietnam to 2030, with a vision to 2035

5.3.1. Improving the legal framework for a closed agricultural electronic transaction chain

The major bottleneck in today's agricultural electronic transaction chain is the electronic contract, as only about 40% of enterprises use it, far lower than electronic invoices and digital signatures. Concerns over legal risks and online disputes keep readiness low; therefore, the legal framework should be completed soon to close the entire transaction process. It is urgent to concretize the Law on Electronic Transactions (revised) so as to recognize the legal validity of electronic contracts, protect personal data, standardize identification, digital signatures, evidence storage, and establish an online dispute resolution mechanism.

At the same time, regulations on electronic payment, micro digital credit, cybersecurity, and clearing mechanisms need to be synchronized to reduce legal frictions and increase compatibility and perceived benefits for enterprises. The development of e-commerce among small and medium-sized agricultural enterprises should be integrated into digital economy, new rural development, and poverty reduction programs, linked to inter-sectoral coordination mechanisms and measurable criteria.

At the same time, the State needs to create a clear legal corridor to encourage the private sector to provide digital-signature infrastructure, contract authentication, online dispute-resolution portals, cold logistics, and micro-payment clearing. When policies are stable and transparent, private investment will increase, market trust will be strengthened, and agricultural enterprises will be better able to use electronic contracts, resolve disputes online, and operate effectively in the digital environment.

5.3.2. Developing shared digital infrastructure and logistics for agricultural e-commerce

The results in Chapter 4 show that the level of e-commerce adoption by small and medium-sized agricultural enterprises depends strongly on infrastructure: where there is stable telecommunications connectivity, convenient e-payments, and adequate logistics services, enterprises adopt and expand transactions more effectively; conversely, unstable connectivity, cash-payment habits, and the lack of a cold chain reduce perceived benefits, compatibility, and intention to expand. The role of the State is both direct and indirect through upgrading technical standards and reinforcing market trust. Therefore, support should shift from fragmented assistance to creating

shared capabilities that can be operated immediately and whose effectiveness can be measured, thereby closing the chain from order to payment and dispute resolution.

5.3.3. Implementing solutions to promote and support enterprise participation in e-commerce

The dissertation proposes a core set of solutions aimed at shifting policy from input support to capability development and the standardization of a closed electronic transaction process. The State should lead the coordination of the model "Order -> Electronic Contract -> Electronic Invoice," issue streamlined contract templates by commodity group, recognize and rank platforms that meet the standards, and at the same time focus on improving the awareness, managerial mindset, and digital skills of enterprise leaders through modular training, mandatory mentoring, and a digital leadership capability index to link support with implementation results. Support policies should be tiered according to enterprise readiness, prioritize groups with commitment and capability, implement the principle of "learning by doing," establish shared service centers for micro-enterprises, and pilot programs in localities with comparative advantages for later scaling based on quantitative evaluation.

In parallel, the State should create data infrastructure and an "e-commerce commune" model, operate a community data platform connecting marketplaces, postal services, and enterprises; promote markets through online agricultural product weeks, digital fairs, and transparent publication of successful models to strengthen trust. Financial and credit mechanisms should shift toward results-based support: tax incentives, logistics fee support, working capital based on electronic invoices, and acceptance of digital transaction data in appraisal; while encouraging fintech, digital insurance, and risk-sharing through guarantee funds. All of these solutions are aimed at sustainable development: linking e-commerce with ecological and circular agriculture, open data, and predictive analytics, thereby forming endogenous capabilities for small and medium-sized agricultural enterprises to sustain and expand digital operations through 2030. The main groups of solutions are as follows:

(1) The State should issue and disseminate the process "Order -> Electronic Contract -> Electronic Invoice," develop streamlined contract templates by commodity group, integrate digital signatures, traceability, and payment; and apply incentive mechanisms for platforms complying with this process in order to increase data compatibility.

(2) Focus on enhancing enterprises' digital leadership capacity: design training programs and micro-certificates on "Agricultural E-commerce Leadership," combining learning-doing-mentoring; measure results through the rate of closed transactions and traceable products. Build an Agri-Digital Leadership Index for ranking, rewarding, and serving as a basis for support.

(3) Shift support policy from "access to technology" to "digital absorption and operation"; train by role (management, operations, logistics, data), deploy a "digital

intern" model, and establish commune-level shared service centers providing common services (content, invoicing, customer service).

(4) Tier support by readiness level and region: high-capacity groups expand B2B; medium groups learn-do-test; low-capacity groups receive only basic universal support. Focus on pilot models by commodity group, and evaluate effectiveness using three groups of indicators - economic, operational, and social - for scaling up.

(5) Pilot an "e-commerce commune" and an agricultural data center under the PPP model, connecting platforms, postal services, and enterprises; linking e-commerce with traceability, branding, and geographical indications; and forming a consultancy-audit network for e-commerce to measure ROI, cost per order, and revenue from digital channels.

(6) Trade promotion and digital market expansion: maintain programs to bring agricultural products onto platforms, digital fairs, and online agricultural product weeks in order to increase trust and market demand.

(7) Improve finance and credit: shift to results-based support (tax incentives, deductions for digitization costs, reduced logistics fees, encouragement of closed transactions); develop digital credit based on transaction data and invoices, guarantee funds, fintech, digital insurance, and digital financial inclusion for farmers.

(8) Sustainable development: link e-commerce with green and circular agriculture; develop agricultural digital data platforms; apply AI and Big Data to forecast supply-demand and provide early risk warnings.

Thus, the policies aim to build enterprises' endogenous capacity, close the transaction chain, expand digital markets, and ensure the efficient, transparent, and sustainable development of agricultural e-commerce through 2030.

5.3.4. Implementing solutions to promote, support, and protect consumers participating in e-commerce

Empirical results show that expanding access and improving consumers' digital skills increase demand and reduce perceived risk, thereby encouraging enterprises to adopt e-commerce. Therefore, the State should implement basic and advanced digital-skills universalization for citizens - especially in rural, mountainous, and remote areas - through open learning materials, grassroots communication, and the Farmers' Association network, while integrating this effort into local socio-economic development programs to narrow the digital divide. At the same time, information security and electronic identification/authentication must be strengthened: intensify anti-fraud communication, require platforms to adopt safety-by-default design, and deploy a unified State-backed eID system to authenticate sellers, buyers, and documents. The adoption of voluntary standards and trust mechanisms for consumer protection should be encouraged, with reference to ISO/IEC sets and research on domestic "trust labels" to strengthen confidence and fair competition. The online dispute resolution mechanism must be completed together with the electronic evidence framework and streamlined procedures for small transactions, integrated directly into

platforms and expanded to transactions via social media. Finally, consumer-oriented services in the digital agricultural product chain should be standardized through codes of practice by product group, unified data messages and receive-deliver-return processes, a set of basic service indicators, and training and certification linked to platform and shipping fee incentives. This approach is consistent with the model in Chapter 4, in which consumer protection and market trust are components of the State factor, directly and indirectly affecting the level of e-commerce adoption by SMAEs.

5.3.5. Enhancing the implementation capacity of state management personnel in e-commerce

First, strengthen training, capacity-building, and investment in technological equipment for the team implementing state management of e-commerce. The quantitative survey results in Chapter 4 confirm that the implementation capacity of management officials has a significant effect on e-commerce adoption by small and medium-sized agricultural enterprises. Meanwhile, the situational analysis also points to limitations in digital skills and the ability of the enforcement force to monitor the digital market. Therefore, the State needs to develop regular training programs including basic digital skills, advanced digital skills, and specialized skills in e-commerce management. The training content should focus on skills such as extracting and analyzing online information to identify violations; applying big data and artificial intelligence to analyze and provide early warnings of fraudulent behavior; and using technological tools proficiently in inspection and supervision. In addition, it is necessary to invest in technical infrastructure, equipment, and specialized software for management agencies, while establishing coordination mechanisms between the State's monitoring system and e-commerce platforms to promptly detect and handle violations. Holding regular dialogues among management agencies, enterprises, and the community is also an important channel for updating practice and thereby adjusting policies in a timely manner.

Second, improve the organizational apparatus and strengthen inter-sectoral coordination, while promoting decentralization and delegation of authority to local governments. The situational analysis shows that the task of developing e-commerce in agriculture is often separated across different national programs, leading to fragmentation and overlap in implementation. Meanwhile, experience from China shows that strong decentralization to local authorities, especially at the grassroots level, has created dynamism and practical suitability, thereby rapidly promoting e-commerce adoption in rural areas. Accordingly, the policy solution is to review and consolidate the e-commerce management apparatus, ensuring close coordination among the Ministry of Industry and Trade, the Ministry of Agriculture and Environment, the Ministry of Science and Technology, and other relevant agencies. At the same time, decentralization and delegation of authority to localities should be strengthened in implementing support solutions for small and medium-sized agricultural enterprises, together with clearly defined mechanisms of responsibility and authority to avoid creating "gray zones" in governance. Linking e-commerce development performance

to the responsibility of local leaders, along with reward mechanisms and the replication of successful models, will create incentives for grassroots authorities to actively promote e-commerce.

This process must be interconnected between platforms and management agencies, while also standardizing electronic evidence such as order metadata, transport temperature, and delivery images and videos. If disputes are handled quickly and fairly, enterprises will perceive the relative benefits of participating in digital channels more clearly. To enhance implementation effectiveness, a center for analysis and monitoring of agricultural e-commerce directly connected to platforms should be established. This center would extract data from platforms, logistics units, and cold-transport systems in order to detect fraud and counterfeit goods early; at the same time, it would require platforms to provide minimum-level application programming interfaces for inspection work. Periodic publication of a digital market risk-governance index set, such as violation rates, time taken to remove violating content, and refund rates, would create normative pressure for platforms to improve operational quality.

Third, the effectiveness and efficiency of inspection and supervision must be strengthened. To ensure that policies and solutions are implemented substantively, there must be a tight, objective, and scientific inspection and supervision mechanism. The State needs to allocate budgetary and human resources to this activity, while improving the quality of inspectors and examination officers under the requirement of putting "the right person in the right job." The issuance of a set of statistical indicators to measure e-commerce development at national, sectoral, and local levels will be an important tool for monitoring and evaluating policy effectiveness. The quantitative findings of the dissertation show that the State's impact is not only direct through financial policy or infrastructure, but also indirect through raising leadership awareness and promoting technological compatibility. Therefore, when designing the monitoring system, it is necessary to add indicators reflecting these indirect impacts so that policy adjustment can be comprehensive and scientifically grounded.

In addition, in the context of globalization, e-commerce extends beyond the scope of a single country, so international cooperation in management and supervision is necessary. Participation in international networks such as the ASEAN Committee on Consumer Protection (ACCP), the Cross-Border Privacy Rules System (CBPR), and the Global Privacy Enforcement Network (GPEN) will help Vietnam learn from experience while also enhancing the implementation capacity of state management. Alongside supervision by State agencies, the role of associations and social organizations in e-commerce should also be promoted. However, the situational analysis indicates that associations in Vietnam, such as the Vietnam Association of Small and Medium Enterprises in Rural Industries (VARISME), still operate in a limited manner and lack strong links with enterprises in agricultural e-commerce. Therefore, the State needs policies to support, encourage, and enable these social

organizations to play their role as bridges, representatives, and independent supervisors, thereby contributing to more effective state management of e-commerce.

CONCLUSION

The dissertation has clarified the current state of e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam, identified the main influencing factors and the degree of impact of each factor, and proposed policy recommendations to promote e-commerce adoption for this group of enterprises.

The findings show that e-commerce has been implemented in the small and medium-sized agricultural enterprise sector, but the overall level of adoption remains low, fragmented, and has not yet formed a fully closed electronic transaction chain. Many enterprises have applied some components such as electronic invoices, digital signatures, and online transactions, but important components such as electronic contracts, data interoperability, and transaction assurance mechanisms remain bottlenecks.

Based on a survey of 419 enterprises and testing with the PLS-SEM model, the dissertation identifies four factors with direct and statistically significant effects on e-commerce adoption, namely enterprise leadership, the State, partners and competitors, and compatibility. Among these, enterprise leadership exerts the strongest influence, followed by the State. These results show that e-commerce adoption by small and medium-sized agricultural enterprises depends more on the leadership's steering capacity, the suitability of technological solutions, market pressure, and the quality of the institutional environment than on mere awareness of benefits or isolated input support.

A noteworthy finding is that the State not only has a direct influence but also exerts indirect effects through important mediating factors. This confirms that, from an economic management perspective, enterprise e-commerce adoption is not merely an internal issue, but is also closely associated with the legal environment, infrastructure, market conditions, and policy implementation capacity.

Based on the research results, the dissertation proposes a policy orientation that shifts from fragmented input support toward the creation of an enabling environment and synchronized e-commerce operational capacity, focusing on improving the legal framework, developing digital infrastructure and logistics, strengthening enterprise leadership capacity, enhancing consumer protection, and raising the implementation capacity of state management agencies.

Overall, the dissertation has identified the main influencing factors, clarified the prominent roles of enterprise leadership and the State, and proposed a scientifically and practically grounded system of policy recommendations to promote e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam.

LIST OF PUBLISHED WORKS

1. Truong Huy Hoang (2025), "Policy recommendations to promote e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam," Journal of Finance and Accounting Research, (290), pp. 58-61.
2. Truong Huy Hoang and Dau Phuong Linh (2024), "The role of the State in e-commerce adoption by small and medium-sized agricultural enterprises in Vietnam," Journal of Economics and Forecasting, (19), pp. 86-91.
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4. Truong Huy Hoang and Dau Bao Ngoc (2024), "China's experience in rural e-commerce development and lessons for Vietnam," Journal of Economics and Forecasting, (20), pp. 211-216.
5. Truong Huy Hoang (2023), "Promoting e-commerce adoption by small and medium-sized agricultural enterprises after the Covid-19 pandemic," Proceedings of the scientific conference Social Security and Social Issues During and After the Covid-19 Pandemic: Current Situation, Issues Raised, and Policy Directions (under the state-level scientific project Social Security and Social Issues in the Post-Covid-19 Pandemic: New Global Practices and Policy Proposals for Vietnam), Volume 2, pp. 147-157.