

**Ministry of Education and Training**

**Ministry of Finance**

**ACADEMY OF FINANCE**

**NGUYEN THU HA**

**IMPROVING THE MANAGEMENT ACCOUNTING  
INFORMATION SYSTEM IN COMMERCIAL  
ENTERPRISES IN THAI NGUYEN PROVINCE**

**Major: Accounting**

**Code: 9.34.03.01**

**SUMMARY OF DOCTORAL DISSERTATION  
IN ECONOMICS**

**HANOI, 2026**

The work was completed at the Academy of Finance

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The dissertation will be defended before the Academy-level Dissertation Evaluation Council at .....at.....hours, on the..... day.... of....., year.....

# INTRODUCTION

## 1. Research Rationale

In the current business context, the commercial environment is experiencing complex changes and increasingly intense competition. Commercial enterprises are facing continuous shifts in customer demand and behavior, competitive pressure from rivals, and market fluctuations. In such a context, timely, accurate, and effective decision-making becomes a vital factor for the survival and sustainable development of enterprises. From a theoretical perspective, studies on management accounting have shown that management accounting information not only provides financial data but also delivers in-depth analyzed non-financial information to support management, planning, cost control, performance evaluation, profit analysis by product and market, and strategic decisions such as market expansion, technology investment, or supply chain optimization. Without an effective management accounting system, enterprises are likely to make subjective decisions lacking scientific basis, increasing risks and limiting their ability to adapt to a dynamic business environment.

Thai Nguyen province is one of the key economic centers in the Northern midland and mountainous region, with diverse economic development, in which the commercial sector contributes significantly to the gross regional domestic product. Commercial enterprises in this area not only meet local consumption demand but also serve as distribution channels to neighboring provinces. The increase in both the number and scale of these enterprises has led to higher requirements for management capacity. To enhance competitiveness, enterprises need to move beyond traditional management approaches, which mainly focus on financial accounting for external purposes. Instead, they require a strong internal information system capable of providing in-depth analysis of costs, revenues, and profits by activity and product, as well as evaluating the performance of different departments. This is particularly important for commercial enterprises, which are characterized by diverse inventory management, significant selling expenses, and profit margins that fluctuate with market conditions. Although the role of management accounting is widely acknowledged, in practice many enterprises, especially small and medium-sized ones in localities such as Thai Nguyen, have not paid adequate attention to or still face difficulties in developing and operating management accounting information systems. Common limitations include a lack of awareness of the importance of management accounting, leading to a focus only on financial accounting; fragmented and non-integrated information systems; insufficient qualified personnel; limited application

of information technology in collecting, processing, and analyzing management accounting data; and cost analysis methods that are not suitable for the characteristics of commercial activities. These limitations directly affect cost control, profit optimization, and decision-making quality, thereby reducing the competitiveness of enterprises.

Given these challenges and limitations, researching and proposing solutions to improve management accounting information systems for commercial enterprises in Thai Nguyen province is an urgent requirement. This study is significant both theoretically and practically. It contributes to systematizing management accounting issues in the commercial sector while providing a comprehensive view of the current situation, identifying weaknesses, and proposing appropriate solutions tailored to the characteristics of local enterprises. Improving management accounting information systems will not only help these enterprises survive but also achieve sustainable development, enhance business performance, and contribute to the overall economic development of the province.

Based on these theoretical and practical urgencies, the author has chosen the dissertation topic: “Improving the Management Accounting Information System in Commercial Enterprises in Thai Nguyen Province.” This study aims to further clarify the importance of management accounting information systems in enhancing managerial effectiveness and competitiveness in the modern business environment, while also proposing solutions to support sustainable enterprise development in the context of globalization and deepening international economic integration.

## **2. Literature Review**

### ***2.1. Studies on Accounting Information Systems and Management Accounting Information Systems***

### ***2.2. Studies on Factors Affecting the Quality of Accounting Information Systems and Management Accounting Information Systems***

### ***2.3. Studies on Accounting Information Systems and Management Accounting Information Systems under the Application of Information Technology and Digital Technologies***

### ***2.4. Research Gaps***

A synthesis of domestic and international studies on Accounting Information Systems (AIS) and Management Accounting Information Systems (MAIS) indicates that this field has received considerable academic attention. However, significant theoretical and practical gaps remain, particularly in the context of digital transformation in Vietnamese enterprises.

First, regarding research approaches to AIS and MAIS, most studies, both domestic and international, approach AIS from the perspective of information processing or management information system models. While this approach helps describe the flow of accounting information, it does not fully reflect the internal structure and interactions among system components. Notable studies by Romney and Steinbart (2018) and Nicolaou (2000) emphasize the role of information technology in AIS operations, yet they mainly focus on technical data processing rather than deeply analyzing the interactions among key elements such as people, data, processes, technology, and internal control. In Vietnam, research has largely focused on financial accounting systems, whereas MAIS, an important tool for planning, control, and strategic decision-making, has not been systematically examined. There is still a lack of comprehensive analytical frameworks for MAIS under current conditions.

Second, regarding factors affecting the quality of AIS and MAIS, numerous studies have identified factors such as technological infrastructure, leadership involvement, user training, organizational culture, and data quality. However, these studies often examine factors in isolation and do not fully assess their interrelationships and combined effects within the system. Research on MAIS quality remains particularly limited, with most studies focusing only on user satisfaction rather than developing comprehensive quantitative models that capture the relationships between system components and MAIS quality. Moreover, existing studies mainly focus on manufacturing or construction enterprises, while commercial enterprises, which rely heavily on real time data and short term decision making, have not been adequately addressed.

Third, regarding AIS and MAIS in the context of information technology application and digital transformation, although digital transformation trends have been discussed in studies by Pham Hoai Nam (2020), Duong Thi Luyen (2024), and international works such as Bhimani (2020) and Prasetianingrum and Sonjaya (2024), domestic research remains limited in scope and largely descriptive. Many studies have not examined the impact of digital technologies on MAIS quality, nor have they clarified how system components such as people, processes, data, technology, and internal control interact within a digital environment.

Notably, there has been no comprehensive study in Vietnam evaluating the level of MAIS development in commercial enterprises under digital transformation, despite this sector's large scale, fast information processing requirements, and complex data

management needs. The absence of multi factor analytical approaches has resulted in generalized solutions that are not closely aligned with business practices.

Based on the identified research gaps, this dissertation is developed by selectively inheriting and extending prior studies. Specifically, it builds upon fundamental theories of AIS and MAIS, particularly perspectives that view these systems as information processing and management support systems. It also adopts existing research models on factors affecting system quality, as well as evaluation criteria such as information quality, user satisfaction, and impact on organizational performance.

On this basis, the dissertation further develops the research in several key directions: (i) constructing a comprehensive analytical framework for MAIS based on a systems approach, clarifying the interactions among components such as people, data, processes, technology, and internal control; (ii) analyzing and evaluating the current state of MAIS in commercial enterprises in Thai Nguyen province to reflect industry specific and local characteristics; (iii) developing a quantitative research model to identify and measure the impact of various factors on MAIS quality, addressing the limitations of prior studies that considered factors independently; and (iv) proposing solutions to improve MAIS in the context of digital transformation, ensuring feasibility and suitability to practical business conditions.

In summary, this dissertation both builds upon existing theoretical and empirical contributions and addresses existing research gaps, thereby contributing to the development of theoretical foundations and providing practical implications for improving the quality of management accounting information systems in commercial enterprises in Vietnam in general and Thai Nguyen province in particular.

### **3. Research Objectives and Research Questions**

#### ***3.1. Research Objectives***

*General objective:* This dissertation aims to analyze and evaluate the current state of management accounting information systems (MAIS) in commercial enterprises in Thai Nguyen province, identify and measure the impact of factors affecting MAIS quality, and propose solutions to improve MAIS in these enterprises.

*Specific objectives:*

- (1) Systematize fundamental theoretical foundations related to MAIS in enterprises, and review prior studies to identify research gaps as a basis for proposing the research model and hypotheses.
- (2) Analyze and assess the current status of MAIS in commercial enterprises in

Thai Nguyen province, thereby providing comments and a basis for proposing orientations and solutions for improvement.

- (3) Identify and measure the extent to which various factors influence MAIS quality, thereby determining strengths and limitations to enhance MAIS quality.
- (4) Propose feasible solutions to improve MAIS in commercial enterprises in Thai Nguyen province in the future.

### **3.2. Research Questions**

First, how are the theoretical foundations related to MAIS in enterprises systematized?

Second, what is the current state of MAIS in commercial enterprises in Thai Nguyen province, and what bases can be identified to orient improvement solutions?

Third, which factors affect MAIS quality and to what extent do they influence it?

Fourth, what feasible solutions can be proposed to improve MAIS in these enterprises in the future?

## **4. Research Subject and Scope**

**4.1. Research subject:** Management accounting information systems and factors affecting their quality.

**4.2. Research scope:**

- Spatial scope: Commercial enterprises in Thai Nguyen province.
- Time scope: Secondary data from 2020–2024; primary survey data collected from October 2024 to June 2025.
- Survey subjects: Managers and accounting-related staff in commercial enterprises, as they possess relevant expertise and practical experience.

## **5. Research Methodology**

**5.1. Methodological approach:**

Dialectical materialism and historical materialism.

**5.2. Specific methods**

**5.2.1. Qualitative research:**

Conducted through synthesizing theoretical foundations, reviewing domestic and international studies to identify research gaps, and consulting experts to refine concepts, models, hypotheses, and measurement scales. Experts include professors, associate

professors, and PhDs with academic and practical expertise. Case studies and direct consultations with managers and accountants were also used to assess the current situation.

### 5.2.2. *Quantitative research:*

Conducted after qualitative research, based on survey data collected from relevant respondents. Data were processed and analyzed using SPSS 27.0, including tests such as Cronbach's Alpha, Exploratory Factor Analysis (EFA), multiple regression, and diagnostic tests for model validity.

## **6. Contributions of the Dissertation**

*Theoretical contributions:* The dissertation systematizes the theoretical framework of MAIS, clarifies its structure, operating principles, and role in managerial decision-making. It identifies research gaps and develops a comprehensive analytical framework, model, and hypotheses, contributing to the advancement of MAIS theory.

*Practical contributions:* The study provides empirical evidence on the current state of MAIS in commercial enterprises in Thai Nguyen province, identifying strengths and limitations such as weaknesses in cost data collection, inadequacies in management reports, and limited use of specialized software. Based on empirical findings, it proposes feasible and context-specific solutions to improve MAIS, thereby enhancing business efficiency, cost control, and competitiveness, and contributing to sustainable economic development in the province.

## **7. Structure of the Dissertation**

In addition to the introduction, conclusion, references, and appendices, the dissertation consists of three chapters:

Chapter 1: Theoretical framework of MAIS in enterprises

Chapter 2: Current state of MAIS in commercial enterprises in Thai Nguyen province

Chapter 3: Solutions to improve MAIS in commercial enterprises in Thai Nguyen province

The dissertation also includes figures, tables, and appendices.

## **CHAPTER 1: THEORETICAL FRAMEWORK OF MANAGEMENT**

### **ACCOUNTING INFORMATION SYSTEMS IN ENTERPRISES**

#### **1.1. Overview of Management Accounting Information Systems in Enterprises**

##### ***1.1.1. Basic Concepts***

###### *1.1.1.1. Concept of a system*

According to Nguyen The Hung (2008): “A system is a set of components that are interconnected and operate together to achieve predetermined objectives.”

###### *1.1.1.2. Concept of an information system*

According to Thieu Thi Tam et al. (2014), “An information system is a system whose purpose is to provide information to support human activities within an organization.”

###### *1.1.1.3. Concept of accounting information systems*

In practice, there are various definitions of accounting information systems (AIS) in enterprises. In general, the most important function of AIS is to provide information for users, including: (1) financial information used to summarize, measure, and communicate the financial position of the enterprise, mainly to coordinate activities within the organization; and (2) useful information that supports decision making, primarily for managerial control and operational purposes.

###### *1.1.1.4. Concept of management accounting information systems*

This dissertation inherits and develops previous viewpoints and approaches MAIS from a structural perspective. Accordingly, a management accounting information system in an enterprise is defined as a set of interrelated components, including: (1) people, (2) accounting data, (3) procedures and processes for information processing, (4) technology, and (5) internal control. These components are organized to collect, process, store, and provide both financial and non-financial information for planning, controlling, evaluating, and managerial decision making. This approach enables in-depth analysis of each component, clarifies their level of development and interaction, and provides a basis for proposing comprehensive solutions to improve MAIS in commercial enterprises in Thai Nguyen province.

##### **1.1.2. Classification of management accounting information systems in enterprises**

MAIS in enterprises can be classified based on various criteria to fully reflect their role and structure in management activities.

### **1.1.3. Role of management accounting information systems in enterprises**

MAIS plays a crucial role in the operation and sustainable development of enterprises. It is not only a tool for recording transactions but also an essential component in both strategic and operational management, enabling enterprises to adapt and grow in a dynamic business environment.

## **1.2. Components of Management Accounting Information Systems in Enterprises**

### ***1.2.1. People***

### ***1.2.2. Accounting data***

### ***1.2.3. Procedures and processes for information processing***

### ***1.2.4. Technology***

### ***1.2.5. Internal control***

## **1.3. Related Theories and Factors Affecting the Quality of Management Accounting Information Systems**

### ***1.3.1. Quality of management accounting information systems in enterprises***

### ***1.3.2. Theoretical foundations of factors affecting MAIS quality***

- Behavioral theory
- Systems theory
- Decision usefulness theory
- Diamond model theory

### ***1.3.3. Factors affecting MAIS quality in enterprises***

These include: managers, qualifications of accounting staff, digital technology, interaction among systems, data quality, procedures and guidelines, and accounting software.

## **1.4. International Experience in Management Accounting Information Systems and Lessons for Vietnamese Enterprises**

### ***1.4.1. Experience of Japan***

### ***1.4.2. Experience of France***

### ***1.4.3. Experience of the United States***

### ***1.4.4. Experience of Germany***

### ***1.4.5. Lessons for Vietnam from international experience***

From the experiences of Japan, France, the United States, and Germany, several key lessons can be drawn for application in Vietnam, especially for enterprises facing

integration and intense competition.

First, regarding human resources, it is necessary to improve the quality of management accounting personnel toward multi-skill capabilities, including analytical skills, technological proficiency, and participation in decision making. International experience shows that management accountants are shifting from record keepers to strategic partners.

Second, regarding accounting data, enterprises should develop comprehensive, accurate, integrated, and real-time data systems. Data should include not only financial but also non-financial information for analysis, forecasting, and performance evaluation.

Third, regarding procedures and processes, enterprises need standardized, scientific, and flexible processes to transform data into useful managerial information, while integrating modern techniques such as cost analysis, budgeting, and responsibility center evaluation.

Fourth, regarding technology, enterprises should enhance the application of digital technologies such as ERP, data analytics, artificial intelligence, and cloud computing to automate processes and improve decision making.

Fifth, regarding internal control, a robust control system must be established to ensure transparency, security, and reliability of information, including task segregation, monitoring mechanisms, and technological support.

Sixth, regarding interaction among components, international experience indicates that MAIS is effective only when its components (people, data, processes, technology, and control) are integrated and closely interconnected. Therefore, Vietnamese enterprises should adopt a systemic approach rather than improving each component in isolation.

Thus, applying international lessons will help Vietnamese enterprises modernize MAIS, enhance management capacity, and adapt to the current context of competition and digital transformation.

## **CONCLUSION OF CHAPTER 1**

## **CHAPTER 2: CURRENT STATUS OF MANAGEMENT ACCOUNTING INFORMATION SYSTEMS IN COMMERCIAL ENTERPRISES IN THAI NGUYEN PROVINCE**

### **2.1. Overview of Commercial Enterprises in Thai Nguyen Province**

#### ***2.1.1. General overview***

Thai Nguyen is a midland and mountainous province in Northern Vietnam, holding an important geographical position in the Northern midland and mountainous economic region. In 2020, the province had 1,332 commercial enterprises, which gradually increased to 1,856 enterprises by 2024.

#### ***2.1.2. Organizational structure of business management and accounting systems***

Regarding organizational structure, most commercial enterprises in Thai Nguyen province, especially small and medium-sized enterprises (SMEs), adopt a line functional model.

#### ***2.1.3. Characteristics of commercial enterprises and their influence on MAIS***

In general, factors such as enterprise size, business sector, technological level, and human resources directly influence the structure, level of development, and operational efficiency of MAIS in commercial enterprises in Thai Nguyen province.

### **2.2. Current Status of Management Accounting Information Systems in Commercial Enterprises in Thai Nguyen Province**

To objectively assess the current state of management accounting information systems in commercial enterprises in Thai Nguyen, the study conducted a survey of 450 firms. To ensure reliability and comprehensiveness, the respondents were selected as chief accountants, accounting managers, or chief financial officers - individuals with a thorough understanding of the organization, operation, and personnel characteristics of the accounting department, as well as how the management accounting information system operates within the enterprise. After excluding invalid responses, 407 valid questionnaires were retained, of which small and medium-sized enterprises accounted for the majority (92.1%). The survey results were aggregated and analyzed based on five core factors reflecting the structure and effectiveness of the system, including: (1) human resources, (2) accounting data, (3) information processing procedures and protocols, (4) technology, and (5) internal control. To obtain a more comprehensive and in-depth view of the actual situation, in addition to survey data collection, the author also conducted case studies at several representative commercial enterprises in the province. These firms were selected to reflect diversity in size, business sectors, and

levels of information technology application in management accounting, including Hai Dang Joint Stock Company, Chau Hiep Co., Ltd., Hoang Gia Trading and Construction Development Co., Ltd., Thai Binh Nguyen VN Co., Ltd., and De Nhat Tra Viet Co., Ltd. This approach helps clarify how the system is organized, operated, and applied in practice, thereby providing supporting evidence for the survey findings and contributing to the proposal of appropriate solutions tailored to the specific characteristics of commercial enterprises in Thai Nguyen.

### ***2.2.1. Human factor***

Human resources are the central factor determining the operational effectiveness of management accounting information systems within enterprises. Professional competence, experience, technological capability, managerial awareness, and the allocation of responsibilities among accounting staff directly influence the ability to provide accurate, timely, and useful information for managerial decision-making. Survey results from 407 commercial enterprises in Thai Nguyen indicate that the human factor remains a significant limitation in the structure of management accounting information systems, particularly among small and medium-sized enterprises, which account for 92.1% of the surveyed firms.

### ***2.2.2. Current status of the data factor***

Accounting data constitutes the core foundation of management accounting information systems, determining the accuracy, completeness, and timeliness of information provided to managers. However, survey results from 407 commercial enterprises in Thai Nguyen indicate that the data factor within these systems still faces many limitations, particularly among small and medium-sized enterprises, preventing the system from fully delivering its managerial value.

The findings show that most enterprises primarily rely on financial accounting data derived from transactions such as revenue, costs, inventories, fixed assets, and receivables/payables. Meanwhile, non-financial data (such as production data, labor productivity, and customer satisfaction) is largely not incorporated into the system. Specifically, only 23.5% of small and medium-sized enterprises collect and store non-financial data for internal analysis, compared to 52.6% among large enterprises. This indicates that the data scope in small and medium-sized enterprises remains limited and does not fully reflect the overall operational picture of the business.

### ***2.2.3. Current status of information processing procedures and protocols***

Within the structure of management accounting information systems, procedures and protocols act as the “backbone,” ensuring that accounting activities are organized

consistently, controlled effectively, and oriented toward providing information for decision-making. However, survey results from 407 commercial enterprises in Thái Nguyên indicate that this factor remains underdeveloped, particularly among small and medium-sized enterprises. Existing accounting processes mainly focus on recording, financial reporting, and tax compliance, while stages related to analysis, planning, and managerial decision-making have not yet been clearly standardized.

#### ***2.2.4. Current status of the technology factor***

The application of modern technology not only helps automate accounting processes but also enables large-scale data analysis, improves accuracy and timeliness, and supports strategic decision-making by managers. However, survey findings from 407 commercial enterprises in Thai Nguyen reveal a significant disparity in the level of technology adoption in management accounting information systems between small and medium-sized enterprises and large enterprises.

#### ***2.2.5. Current status of the internal control system factor***

A survey of 407 commercial enterprises in Thái Nguyên shows that the internal control system in management accounting remains limited, particularly among small and medium-sized enterprises. Control regulations and procedures have not been systematically established, are largely formalistic, and depend heavily on the personal experience of chief accountants or chief financial officers.

### **2.3. Research on factors affecting the quality of management accounting information systems in commercial enterprises in Thái Nguyên province**

#### ***2.3.1. Research methodology description***

The dissertation combines two main approaches: quantitative and qualitative methods. Accordingly, the research process is designed as follows:

##### **Step 1: Developing research hypotheses and model**

Based on foundational theories and identified research gaps, the study establishes hypotheses and a research model suitable for the research context.

##### **Step 2: Developing preliminary scales**

From the proposed hypotheses and model, and by referencing original scales from previous studies on management accounting information systems and information system quality, preliminary measurement scales are developed to fit the specific context of commercial enterprises in Thái Nguyên. These scales include observed variables used to measure the factors expected to influence system quality.

##### **Step 3: Developing official scales and survey questionnaire**

The preliminary scales are presented and discussed with a group of experts in

accounting, business management, and information technology in Thái Nguyên. Based on expert feedback and consensus, the scales are refined and supplemented to ensure relevance and practical applicability. The finalized scales serve as the basis for designing the official survey questionnaire.

### **Step 3: Assessing scale reliability (Cronbach's Alpha)**

After collecting survey data from commercial enterprises in Thái Nguyên, Cronbach's Alpha is applied to evaluate the reliability and internal consistency of the scales and variables. This step helps eliminate unsuitable or unreliable observed variables, ensuring data quality for subsequent analysis.

### **Step 4: Exploratory Factor Analysis (EFA)**

Once reliability is confirmed, Exploratory Factor Analysis is conducted. This process uses rotated matrices (e.g., Varimax) to identify latent factors and assess the convergence of observed variables into each factor. The EFA results help determine the structure of factors influencing system quality, forming the basis for regression analysis.

### **Step 5: Regression analysis and model development**

Based on EFA results, regression analysis is performed to test the relationships between identified factors and the quality of management accounting information systems. The objective is to build a model representing the determinants of system quality in commercial enterprises in Thái Nguyên.

### **Step 6: Model testing and solution development**

The model's suitability is tested using the R<sup>2</sup> index and by examining potential issues such as multicollinearity, heteroscedasticity, and autocorrelation. Statistical hypotheses are also tested. The findings are then discussed to draw overall conclusions about the influencing factors. Finally, managerial implications are proposed, providing recommendations for enterprises to improve the quality of their management accounting information systems.

## **2.3.2. Research model and hypotheses**

### *2.3.2.1. Research model*

$$\text{CLHT} = \beta_0 + \beta_1\text{NQL} + \beta_2\text{TDNV} + \beta_3\text{CNS} + \beta_4\text{STT} + \beta_5\text{CLDL} + \beta_6\text{TTQT} + \beta_7\text{PMKT} + \varepsilon.$$

### *2.3.2.2. Research hypotheses*

- *H1: Managers have a positive impact on the quality of management accounting information systems in commercial enterprises in Thái Nguyên.*
- *H2: The qualifications of accounting staff have a positive impact on the quality of management accounting information systems in commercial enterprises in Thái Nguyên.*

- *H3: Digital technology has a positive impact on the quality of management accounting information systems in commercial enterprises in Thái Nguyên.*
- *H4: Interaction among systems has a positive impact on the quality of management accounting information systems in commercial enterprises in Thái Nguyên.*
- *H5: Data quality has a positive impact on the quality of management accounting information systems in commercial enterprises in Thái Nguyên.*
- *H6: Procedures and guidelines have a positive impact on the quality of management accounting information systems in commercial enterprises in Thái Nguyên.*
- *H7: Accounting software has a positive impact on the quality of management accounting information systems in commercial enterprises in Thái Nguyên.*

### **2.3.3. Scale development method**

To develop measurement scales, the dissertation first designs preliminary scales, which are inherited from previous research studies. These scales are then refined through discussions with a panel of experts, including professors, associate professors, and PhDs with extensive experience in research, teaching, and practice in accounting and management, to obtain feedback and reach consensus on variables applicable to the context of management accounting information systems in the province. At the same time, based on expert input, the preliminary scales are adjusted to better fit commercial enterprises in Thái Nguyên in relation to system quality.

After refining the preliminary scales, the author develops the official scales and codes the measurement items. These scales are measured using a five-point Likert scale, where 1 represents “Strongly disagree” and 5 represents “Strongly agree.”

### **2.3.4. Sampling and survey method**

The survey was conducted from October 2024 to April 2025. A total of 450 questionnaires were collected; however, after assessing validity, 43 responses were excluded due to uniform answers or excessive missing data. As a result, the final sample size for analysis is 407, which still meets the minimum sample requirement.

### **2.3.5. Data processing method**

#### **Multiple regression model**

The factors representing observed variables used to measure the constructs are regressed to reflect their impact on the quality of the management accounting information system, as follows:

$$CLHT = \beta_0 + \beta_1 NQL + \beta_2 TDNV + \beta_3 CNS + \beta_4 STT + \beta_5 CLDL + \beta_6 TTQT + \beta_7 PMKT + \varepsilon.$$

### **2.3.6. Reliability testing**

### **2.3.7. Exploratory factor analysis**

### **2.3.8. Correlation analysis**

### **2.3.9. Regression analysis**

#### ***Estimated regression model results***

The linear regression model expressing the relationship between the dependent variable and independent variables is as follows:  $CLHT = 0,233 \times NQL + 0,284 \times TDNV + 0,183 \times CNS + 0,218 \times TTQT + 0,144 \times CLDL + 0,134 \times STT + 0,140 \times PMKT$

The results indicate that all regression coefficients of the independent variables are greater than zero. This shows that the factors, including managers (NQL), accounting staff qualifications (TDNV), digital technology (CNS), procedures and guidelines (TTQT), data quality (CLDL), system interaction (STT), and accounting software (PMKT), all have a positive impact on the quality of the management accounting information system (CLHT).

### **2.3.10. Diagnostic tests**

#### **Multicollinearity test**

Based on the test results, all independent variables in the model have VIF values less than 2. Specifically, the VIF values for NQL, TDNV, CNS, TTQT, CLDL, STT, and PMKT are 1.341, 1.169, 1.330, 1.242, 1.113, 1.447, and 1.281, respectively. These values not only satisfy but are well below the threshold of  $VIF < 5$ . Therefore, it can be confirmed that multicollinearity does not occur in this regression model.

#### **Autocorrelation test**

Based on the Durbin-Watson coefficient of 1.938, which lies within the acceptable range ( $1 < 1.938 < 3$ ), it can be concluded that the regression model does not exhibit autocorrelation.

#### **Heteroscedasticity test**

Since the distribution density in the Scatter Plot falls within the range from -2.5 to 2.5, the model does not violate the assumption of homoscedasticity.

### **2.3.11. Conclusion of research hypotheses**

After testing, the model shows no defects and ensures reliability. The regression results indicate that all seven hypotheses (H1–H7) are accepted with statistical significance (P-value = 0.000). The factors including managers, accounting staff qualifications, digital technology, system interaction, data quality, procedures and protocols, and accounting software all positively affect the quality of the management

accounting information system in commercial enterprises in Thái Nguyên. Among these, system interaction and digital technology exhibit stronger effects compared to the remaining factors.

### ***2.3.12. Results on the mean values of the measurement scales***

### ***2.3.13. Discussion of research results***

The findings indicate that all factors positively influence the quality of the management accounting information system. Among them, system interaction exerts the strongest impact, followed by digital technology and the competence of accounting staff. Managers play an important role in supervision and orientation; however, their strategic vision remains somewhat limited.

In addition, data quality and procedural processes are still weaknesses that require improvement, while accounting software is highly rated in terms of efficiency and cost. Overall, to enhance system quality, enterprises need to simultaneously improve human capacity, technology, and data governance.

## **2.4. Evaluation of the current status of management accounting information systems in commercial enterprises in Thai Nguyen province**

### ***2.4.1. Strengths***

Survey results and regression analysis show that the management accounting information system in commercial enterprises in Thai Nguyen province has achieved certain developments, reflecting the increasingly clear awareness of enterprises regarding the role of accounting information in management. First, most enterprises have established basic management accounting systems that effectively support the recording, aggregation, and provision of internal financial information. At the same time, the proportion of enterprises using accounting software for data processing and storage has steadily increased. Popular software such as MISA, FAST, BRAVO, and DATAVN has significantly supported accounting work by reducing data entry time, automating report consolidation, and ensuring the accuracy and consistency of information. The application of software also enables enterprises to respond more quickly and promptly to management requirements, especially in the context of intense competition and the need for timely decision making.

Second, the accounting workforce in enterprises is assessed to have relatively good professional qualifications and is becoming increasingly younger. They are proficient in using common accounting software and have a solid understanding of legal regulations and current accounting standards. Beyond their traditional roles of recording and summarizing, accounting staff are increasingly involved in analysis, forecasting, and

advising managers. Many accountants demonstrate flexibility in problem solving, logical thinking, and strong financial control capabilities, contributing to maintaining the validity, transparency, and reliability of management accounting data.

Third, in some large enterprises or those oriented toward sustainable development, modern technologies such as ERP systems, integrated management software, and cloud based data storage have begun to be implemented. The digitalization of accounting processes and data management significantly shortens information processing time, enhances data retrieval and multidimensional analysis, and strongly supports strategic decision making. In particular, the trend of digital transformation has created an important foundation for enterprises to gradually move toward building modern management accounting systems that are closely integrated with other departments such as sales, logistics, marketing, and finance.

Fourth, the active involvement of senior management in operating, supervising, and adjusting the management accounting information system is a notable strength. Many managers have recognized that the system is not merely a tool for recording and reporting but also a crucial foundation for strategic planning, cost control, performance evaluation, and risk prevention. As a result, they proactively direct improvements in processes, develop internal management reports, and encourage the adoption of technological solutions to enhance information quality.

Fifth, most enterprises have initially established basic accounting procedures and relatively clear internal control mechanisms. Some enterprises have detailed, well documented accounting processes with clear delegation of authority and responsibilities among departments, along with cross checking and monitoring mechanisms in information processing and communication. These factors contribute to improving the reliability and security of the management accounting information system and reducing risks of errors or fraud in financial and accounting activities.

Overall, the management accounting information system in commercial enterprises in Thai Nguyen is gradually evolving toward greater modernization, transparency, and effectiveness. Although many issues still need further improvement, the achieved results provide an important foundation for enterprises to move toward stronger application of digital technologies, artificial intelligence, and big data analytics in financial and accounting management in the future.

#### **2.4.2. Limitations**

From the analysis of the current status of management accounting information systems in commercial enterprises in Thai Nguyen province, it can be observed that,

despite the achieved results, the systems still exhibit many limitations. These shortcomings are examined across the five core components of the system and show clear differences between small and medium sized enterprises and large enterprises.

First, regarding the human factor, the qualifications and awareness of management accounting among staff in small and medium sized enterprises remain limited. Most accountants focus mainly on financial accounting and lack the ability to perform analytical and forecasting tasks for management purposes. In large enterprises, although specialized teams exist, their ability to exploit technological systems and analyze data is still uneven, and the full potential of the system has not been utilized.

Second, regarding processes and information organization, small and medium sized enterprises have not yet developed formalized and standardized management accounting procedures. Activities such as budgeting, cost analysis, and performance evaluation are often carried out in an ad hoc manner, lacking systematic integration into overall management processes. In contrast, although large enterprises have relatively complete procedures, there is still a lack of coordination among departments, resulting in information that is not fully consistent or integrated.

Third, regarding technology, the level of technological application in management accounting information systems remains uneven, particularly among small and medium sized enterprises. Many firms only use standalone accounting software and have not implemented integrated systems such as ERP or business intelligence tools. Data processing is often semi automated and, in some cases, still relies on manual operations. Meanwhile, although large enterprises have invested in modern systems, they have not fully utilized analytical and forecasting capabilities, limiting the competitive advantage that technology can provide.

Fourth, regarding data and information, both the quality of data and the ability to exploit it for management purposes remain limited. In small and medium sized enterprises, data is often fragmented, poorly integrated, and not organized to support management analysis. Reports are mainly historical and lack forecasting information. In large enterprises, although data integration is more advanced, the use of big data and advanced analytical tools is still limited.

Fifth, regarding the managerial environment and strategy, awareness among business leaders, especially in small and medium sized enterprises, of the role of management accounting information systems remains insufficient. Many firms do not view these systems as strategic decision support tools, resulting in superficial implementation. In large enterprises, although there is clearer direction toward digital

transformation and system modernization, implementation remains inconsistent and faces challenges related to costs, human resources, and change management.

### ***2.4.3. Causes of limitations***

The above limitations stem from several systemic causes.

First, limitations in awareness and information management mindset: many business owners and managers still view accounting primarily as a financial recording tool rather than a strategic data source for analysis and decision making. Investment in management accounting information systems is often considered a short-term cost rather than a long-term investment.

Second, constraints in financial and human resources: most small and medium sized enterprises in Thai Nguyen are limited in scale and financial capacity, making it difficult to invest in ERP systems or advanced integrated management software. At the same time, accounting staff often lack formal training in data analysis, system management, and information security.

Third, lack of standardized procedures and professional guidelines: regulations and guidance on organizing management accounting information systems are not sufficiently detailed or consistent across departments, leading each enterprise to operate its system differently without compatibility.

Fourth, the technological environment and policy support are not yet fully developed: the application of digital technology in accounting still faces challenges due to uneven information technology infrastructure, high software maintenance costs, and limited policy incentives from government authorities.

Fifth, the absence of regular monitoring and evaluation mechanisms: most enterprises lack internal audit activities or independent assessments of system quality, resulting in delayed detection and correction of errors.

## **CONCLUSION OF CHAPTER 2**

## **CHAPTER 3: SOLUTIONS FOR IMPROVING THE MANAGEMENT ACCOUNTING INFORMATION SYSTEM IN COMMERCIAL ENTERPRISES IN THAI NGUYEN PROVINCE**

### **3.1. Development orientation of commercial enterprises in Thai Nguyen province**

In the context of globalization and rapid digital transformation, the commercial sector has become one of the key pillars driving economic growth in Thai Nguyen province. Recognizing this role, the Provincial Party Standing Committee issued Plan No. 44-KH/TU dated January 19, 2026 on the implementation of the Commercial and Service Development Project for Thai Nguyen province for the period 2026–2030, aiming to create significant progress from the very first year of implementation and contribute to achieving the objectives of the Provincial Party Congress Resolution for the 2025–2030 term.

#### ***3.1.1. General orientation***

#### ***3.1.2. Specific orientations***

##### ***3.1.2.1. For large scale commercial enterprises***

##### ***3.1.2.2. For small and medium sized enterprises***

##### ***3.1.2.3. For e commerce enterprises and businesses operating on digital platforms***

### **3.2. Requirements and principles for improving management accounting information systems in enterprises**

#### ***3.2.1. Requirements for improving management accounting information systems***

- Provide accurate, complete, timely, and predictive information to support decision making.
- Align with international integration trends, enhance transparency, and approach modern standards.
- Adapt to digital transformation by increasing automation, integration, and data utilization.
- Be suitable for enterprise scale and resources (simple solutions for small and medium sized enterprises, modern systems for large enterprises).

#### ***3.2.2. Principles for improving management accounting information systems***

- Compliance: ensure adherence to legal regulations, transparency, and reliability.
- Suitability: adapt to the operational characteristics and management level of the enterprise.

- Feasibility: ensure implementation is possible with available resources.

### **3.2. Solutions for improving management accounting information systems in commercial enterprises in Thai Nguyen province**

#### ***3.2.1. Human related solutions***

- Improve professional qualifications, technological skills, and managerial thinking of accountants.
- For large enterprises: establish specialized management accounting departments and provide advanced training.
- For small and medium sized enterprises: adopt flexible and multi role structures, enhance practical training, and improve managerial awareness.

#### ***3.2.2. Data related solutions***

- Standardize and digitalize data, ensuring accuracy and timeliness.
- For large enterprises: develop integrated data systems and apply advanced data analytics.
- For small and medium sized enterprises: simplify systems, use integrated accounting software, and strengthen data connectivity among departments.

#### ***3.2.3. Solutions related to procedures and information processing processes***

- Standardize processes for data collection, processing, reporting, and communication.
- Enhance automation, internal control, and coordination among departments.
- Conduct regular reviews and improvements of processes to increase system efficiency.

#### ***3.2.4. Technology related solutions***

- Recognize technology as a strategic pillar, not only for recording but also for analysis and decision support.
- Build a multi layer integrated technology system including infrastructure, data, security, software, and users.
- Implement integrated accounting software or ERP systems to connect departments and synchronize data.
- Apply artificial intelligence, big data, and business intelligence tools for analysis, forecasting, and data visualization.
- Develop cloud accounting to enhance flexibility and reduce costs.

- Strengthen data security and access control within the system.
- Promote data integration and connectivity across systems through APIs and internal linkages.
- Seek support from the government through policies, training, and digital transformation consulting.

### ***3.2.5. Internal control related solutions***

- Establish a control environment with strong commitment from leadership and a culture of compliance.
- Clearly separate responsibilities to avoid one individual controlling the entire process.
- Set up data and reporting controls to ensure information is accurate and timely.
- Apply technology in control activities such as access authorization, alerts, and transaction monitoring.
- Establish or outsource internal audit functions to provide independent system evaluation.
- Conduct regular monitoring and periodic assessments for continuous improvement.
- Build a culture of transparency and accountability throughout the enterprise.

### **3.4. Recommendations for implementing solutions**

To effectively implement solutions for improving management accounting information systems in commercial enterprises in Thai Nguyen province, close coordination is required among enterprises, government authorities, and educational institutions.

### **3.5. Limitations and directions for future research**

#### ***3.5.1. Limitations of the study***

Although the study has achieved certain results in analyzing the current situation and proposing solutions to improve management accounting information systems in commercial enterprises in Thai Nguyen province, it still has several limitations in terms of research scope, survey timing, methodology, and generalizability of findings. These limitations mainly stem from the specific research context and practical conditions at the time of implementation.

#### ***3.5.2. Directions for future research***

From the identified limitations, it can be seen that research on management accounting information systems in commercial enterprises still offers significant opportunities for further expansion and development. The socio economic context of Thai Nguyen province has undergone notable changes compared to the data collection period, particularly adjustments in administrative boundaries and the merging of several commune level units. These changes not only affect management structures and enterprise distribution but also influence how management accounting information is collected, processed, and utilized. Therefore, an important direction for future research is to update, resurvey, and compare changes in management accounting information systems in commercial enterprises before and after the administrative restructuring, in order to assess the actual impact of these changes on the quality, scale, and level of system development.

### **CONCLUSION OF CHAPTER 3**

## CONCLUSION

In the context of rapid globalization and digital transformation, improving management accounting information systems has become an essential requirement for commercial enterprises in Thai Nguyen province. These systems not only support managers in decision making but also serve as tools to enhance competitiveness, optimize resources, and promote sustainable development.

Survey results indicate that most enterprises have paid attention to organizing information systems for management purposes; however, the level of development remains limited. Many firms still focus primarily on financial accounting, while management accounting, which provides information for planning, control, and performance evaluation, has not received adequate attention. Key elements such as human resources, data, technology, and processes still show significant gaps between theory and practical implementation.

In an increasingly competitive environment, management accounting information systems should be viewed as strategic management tools that enable enterprises to adapt flexibly, forecast trends, and identify risks and business opportunities. International experiences from Japan, France, the United States, and Germany show that these systems are effective only when modern technology is combined with high quality human resources, supported by a culture of transparency, discipline, and continuous improvement. These lessons are highly relevant for enterprises in Thai Nguyen in their efforts to enhance their systems.

Based on the analysis of influencing factors, the dissertation proposes five key groups of solutions: developing qualified management accounting personnel with strong analytical skills; standardizing and digitalizing accounting data; improving processes for data processing, aggregation, and reporting; investing in technological infrastructure; and strengthening internal control to ensure transparency and reliability of information. Improving management accounting information systems not only enhances internal management efficiency but also contributes to local economic development and international integration. This is a long-term process that requires strong commitment from enterprises, along with support from government agencies, professional associations, and educational institutions. With proper awareness and coordinated implementation, management accounting information systems will become a foundation for sustainable development of enterprises in Thai Nguyen in the digital era.

**LIST OF THE AUTHOR’S RESEARCH WORKS  
RELATED TO THE DISSERTATION**

1. Nguyen Thu Ha (2023), “International Experience on Management Accounting Information System and Lessons for Vietnamese Enterprises”, *Proceedings of International Conference: Sustainable economic development and business management in the context of globalization (SEDBM6)*, Financial Publishing House, ISBN: 978-604-79-3882-7, 379-384.

2. Nguyen Thu Ha (2023), “Orientation to improve the management accounting information system in enterprises in the context of globalization”, *Proceedings of International Conference: Sustainable economic development and business management in the context of globalization (SEDBM6)*, Financial Publishing House, ISBN: 978-604-79-3882-7, 446-449.

3. Nguyen Thu Ha (2025), “Trends in the Development of Management Accounting Information Systems in the Digital Economy,” *Journal of Finance and Accounting Research*, No. 302, pp. 29–32.