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Factors Affecting Management Accounting Organization in Vietnamese Mechanical Engineering Enterprises

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Abstract

Management accounting information serves as a reliable and critically important resource for managers in the process of managing business operations. The quality and effectiveness of management accounting information are highly dependent on the feasibility and efficiency of how management accounting is organized within the enterprise. This study employs both qualitative and quantitative research methods to assess the factors influencing the organization of management accounting in Vietnamese mechanical engineering enterprises (VMEEs). A total of 202 mechanical engineering firms currently operating in Vietnam were surveyed. Multiple linear regression was used to evaluate the impact of factors on management accounting organization in VMEEs. The findings reveal five key factors that positively influence the organization of management accounting in VMEEs: managers' perspectives, information technology, competence of personnel performing management accounting, organizational structure, and production process characteristics, respectively. Based on these findings, the study offers several recommendations for VMEEs and relevant government authorities. These recommendations aim to enhance the feasibility and effectiveness of management accounting organization in VMEEs, thereby enabling more efficient resource utilization, cost savings, and improved competitiveness - not only for VMEEs but also for manufacturing enterprises more broadly.

Keywords: Factors, Management accounting organization, Manufacturing enterprises, Vietnamese mechanical engineering enterprises.

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1. Introduction

Mechanical engineering is the foundational industry, supplying equipment and tools for all economic sectors as well as people's daily needs [1]. This industry helps to automate production processes and increase productivity. In Vietnam, VMEEs are regarded as the driving force behind the country's process of industrialization and modernization as well as have a significant influence on the country's economy. According to the General Statistics Office [2], the Vietnamese processing and manufacturing industry has consistently contributed 21-24% to the GDP since 2016 (the highest contribution), in which, mechanical engineering sector has the largest share of revenue, maintaining a range of 16 - 18.5%. Additionally, it serves as a significant source of employment, generating jobs for over 1.2 million workers, which accounts for more than 16% of the total number of employees in the processing and manufacturing industry. Since 2015, a large number of Free Trade Agreements (FTAs) have created a huge export market for VMEEs. These agreements also facilitated the influx of foreign direct investment (FDI), a shift in supply chains, fostering the expansion of domestic production and business activities. Consequently, the role of VMEEs has increased sharply. It is also an opportunity for VMEEs to enhance their production capacity, achieve breakthroughs, and expand their operations. However, because of adherence to international commitments outlined in the signed FTAs, VMEEs have to face intense competition from multinational corporations that possess substantial resources. Moreover, there is not much room left to intervene with State policies in the development of the mechanical engineering industry and the capacity of VMEEs is tiny. At the beginning of 2020, the global economy suffered significant setbacks due to the COVID-19 pandemic. Although the pandemic has largely been brought under control worldwide, its impact on the economy remains substantial [3]. Consequently, Vietnamese businesses, including VMEEs, have been directly affected by a decrease in FDI and export value of key markets such as the US, Japan, Korea, and the EU [4].

It has been previously verified that management accounting information is a reliable and extremely important source of information for efficient management [5, 6]. In the post-COVID era as well as deeper international economic integration, the importance of management accounting information for effective management becomes even more crucial. Therefore, management accounting needs to be organized more scientifically and rationally to make the management accounting information adapt to the requirements of managers because the quality and effectiveness of management accounting information depend greatly on the organization of management accounting [7].

Moreover, the findings from a survey conducted among VMEEs indicate that the management accounting organization has some limitations, leading to not fully meeting the managers' information requirements. Therefore, it is important to identify the factors affecting the management accounting organization in VMEEs to enhance the quality of information provided. Recently, there have been some empirical studies examining the factors affecting the management accounting organization in manufacturing enterprises in Vietnam. It can be seen that each research study has a different number of factors and directions of influence. Furthermore, VMEEs have unique characteristics compared to other manufacturing enterprises, so it is necessary to determine the factors affecting the organization of management accounting in VMEEs.

The authors combined qualitative and quantitative methods to investigate the impact of factors on the organization of management accounting in VMEEs. Based on the research findings, the authors suggest the most suitable recommendations that help VMEEs and the authorities enhance the feasibility and effectiveness of management accounting organization and, therefore, be able to make the most of resources, save costs, and boost VMEEs' competitiveness in the current context.

2. Literature Review

2.1. Research on the Content of Management Accounting Organization in Manufacturing Enterprises

Management accounting emerged in the early 19th century in response to the growing need for business management information. As the global economy developed, the field of management accounting expanded rapidly to address the increasing demands for information from administrators. Over time, numerous scholars worldwide have examined management accounting from both theoretical and practical perspectives. However, a review of international research reveals that there are limited studies that comprehensively investigate the organization of management accounting. Most authors tend to focus on specific aspects of management accounting organization, such as the individuals involved in its implementation, the application of management accounting methods, or the utilization of information technology in management accounting practices. Among these studies, the majority concentrate on the application of management accounting methods, with less emphasis on the broader concept of organizational aspects.

Horngren et al. [8] extensively covered various topics and approaches within management accounting, including behavioral costs, CVP (Cost-Volume-Profit) relationships, and cost management systems. However, the content of personnel performing management accounting has not been studied in depth compared to others presented in the research. The authors primarily focus on discussing the roles, responsibilities, and professional ethics of individuals engaged in management accounting. Drury [9] and Weetman [10] focused on clarifying the difference between management accounting and financial accounting and determining the contents of management accounting in enterprises, such as cost classification, cost collection and allocation, determining costs by job, to serve short-term and long-term decision making. However, the connotation of "organization" of management accounting is mentioned very little in research. Atkinson et al. [11] had a document on management accounting that has been published many times. The authors focused on management accounting methods such as the ABC method, balanced scorecard, information analysis to support decision making, etc. Personnel implementing management accounting are mentioned by the authors in terms of ways to promote work efficiency. However, the "organizational" perspective has hardly been studied.

Research by Chenhall and Langfield-Smith [12] investigated the application of 42 management accounting techniques in Australian manufacturing enterprises. The authors have systematized management accounting techniques into two groups:

traditional management accounting techniques and modern ones that serve three main functions: performance evaluation, planning, and strategic management. The results show that traditional management accounting techniques, such as break-even point, estimates, budget gap analysis, product cost, are applied more than modern ones. However, new management accounting techniques such as activity-based costing (ABC) are starting to be more widely applied. In addition, large-scale manufacturing enterprises emphasize non-financial information and focus more on strategic management. Many authors have used this approach to investigate the application of management accounting at manufacturing enterprises.

Joshi [13] added techniques, including standard costing, zero base budgeting, and budgeting for planning cash flows in the above research to study 60 Indian medium and large manufacturing enterprises. The results show that traditional management accounting techniques are used more than newly developed techniques. At the same time, businesses in India plan to focus more on traditional management accounting techniques. Sulaiman et al. [14] analyzed the application of management accounting in Singapore, Malaysia, China, and India. The researchers concluded that although having different cultural and national values, countries all widely apply these principles. traditional management accounting techniques, while the level of use of modern ones is still not much. Abdel-Kader and Luther [15] studied the level of use of 38 management accounting techniques in British food and beverage production enterprises. The results are quite similar to the research of Chenhall and Langfield-Smith [12]: traditional management accounting techniques are widely applied by businesses; Newly developed management accounting techniques are considered important, but are rarely used. Askarany [16], Yalcin [17], Ahmad [18], Sunarni [19], and Leite et al. [20] all have similar conclusions. Meanwhile, Tuan Mat [21] believes that modern management accounting techniques should be used not to replace but to complement traditional management accounting techniques to better meet the needs of management accounting information of administrators. Ahmad [18] pointed out that a significant number of businesses have applied both financial and non-financial measures, but the level of reliance on financial measures is greater. Recently, Maryanova et al. [22] mentioned the organization of management accounting in terms of computerization. However, the author only stopped at choosing appropriate software to perform management accounting, developing regulations on management accounting in enterprises, building a system of accounting accounts, accounting books and reports of management accounting, and information technology in management accounting.

Bamber et al. [23] pointed out that personnel performing management accounting were previously only known as personnel in the accounting department. However, in the period of globalization, management accountants are called multi-functional employees of enterprises, working in cross-functional groups, belonging to many departments and reporting to administrators about the production and business of enterprises. Gliaubicas [24] has systematized the changing role of management accountants, from accountants, then participating in the senior management team of enterprises and becoming consultants for decision-making administrators. Ahid and Augustine [6] pointed out that management accountants in the period of globalization are not just daily bookkeepers or information providers but have become decision makers, strategic planners and market analysts. Thus, despite researching in different spatial and temporal contexts, the authors all share the same view that the personnel performing management accounting not only play the role of recording documents and daily books, but also participate in planning, control, performance evaluation, consulting and even decision making. Accordingly, personnel performing management accounting are not only personnel in the accounting department but can also be personnel performing management accounting work in other functional departments in the enterprise.

In Vietnam, management accounting has been taught at universities since the 1990s. At first, research mainly focused on the content and techniques of management accounting. Recently, research on the organization of management accounting has been conducted both theoretically and practically in many types of enterprises, following many different approaches. Each approach has certain advantages and disadvantages. Moreover, the organizational connotations in management accounting organizations have not received enough attention. Researchers still focus mainly on applying technical management accounting methods.

To [25] covered all contents of the organization of management accounting in previous studies. The research determined the contents of management accounting organization according to 5 contents: (1) organizing the building norms and making budget of production and business, (2) organizing the collecting and processing performance information, (3) organizing the analysis of management accounting information (for checking/controlling and evaluating results, for decision making), (4) organizing the providing management accounting information and (5) organizing personnel of implementing management accounting. The authors use the given contents of the management accounting organization. In addition, research on the organization of management accounting has to mention the means of implementing management accounting because applying the achievements of the 4.0 industrial revolution (Industry 4.0) in the field of management accounting has become an inevitable trend. Personnel performing management accounting use means to receive, process, analyze and provide management accounting information to help management accounting work be performed more quickly, accurately and easily. Therefore, the organization of personnel to carry out management accounting goes hand in hand with the organization of means to carry out management accounting [26]. This approach highlights the "organizational" connotation. Accordingly, the organization of management accounting is the process of establishing and maintaining the interrelationship between management accounting methods, management accountants, and means to receive, process, analyze, and provide management accounting information for managers in planning, controlling, evaluating results, and make management decisions in the enterprise to optimize the enterprise's goals.

2.2. Studies on Factors Affecting Management Accounting Organization in Manufacturing Enterprises

International research does not directly approach factors affecting the organization of management accounting, but mainly addresses factors affecting the application of management accounting in enterprises. In essence, organizing management accounting is an enterprise's activity in applying technical methods of management accounting combined with

means and personnel to collect, process, and analyze management accounting information to serve the management of businesses more effectively. Therefore, the factors affecting the application of management accounting in enterprises are also an aspect that impacts the organization of management accounting in enterprises. Some typical research studies are as follows:

Chenhall and Langfield-Smith [12] surveyed in Australian manufacturing enterprises and the results showed that enterprise size and business environment have a significant influence on the application of management accounting techniques in enterprises. In 2006, Chenhall [27] conducted a study to prove that the best way to organize a business is the one that best suits the environment, strategy, technology, scale, and culture of the business. Abdel-Kader and Luther [28] in their study of factors affecting the application of management accounting in food and beverage manufacturing enterprises and businesses in the UK, pointed out 5 factors: Environmental uncertainty; customer resources; degree of decentralization; enterprise scale; Applying advanced manufacturing technology (AMT), applying the total quality management model (TQM), lean production management model (JIT) affects the application of management accounting in enterprises. Choe [29] found a positive relationship between the information technology application and the amount of management accounting information created. Chia and Koh [30] and Dik [31] point out the positive influence of corporate culture on the application of management accounting.

Wu et al. [32] studied factors affecting the application of management accounting in Chinese joint venture enterprises, including enterprise size, foreign partners, knowledge of senior managers and employees. Research results show that enterprise size and senior managers' knowledge have a significant influence on the application of management accounting. Luther and Longden [33] and Gerdin [34] hypothesized that the structure of an enterprise has an impact on the application of management accounting in enterprises. However, the authors have not tested this hypothesis. Tuan Mat [21] with actual testing at Malaysian manufacturing enterprises has filled this gap, and pointed out that competition, business strategy, and advanced production technology have a positive impact on the application of management accounting. In 2011, Tuan and Smith [35] used the SEM model to confirm that production technology and changes in the company's organizational structure and strategy have a positive impact on the application of management accounting in manufacturing enterprises. Abdel-Maksoud [36] pointed out the relationship between the level of innovative management practices, the level of automation in production, and the application of modern management accounting techniques when conducting research with 240 manufacturing enterprises in Egypt.

Ahmad [37] pointed out that enterprise size, competition in the market, commitment of administrators, and advanced production technology have a significant influence on the application of management accounting in small and medium-sized enterprises in Malaysia. In 2015, Ahmad and Mohamed Zabri [38] continued to explore the factors affecting the application of management accounting at medium-sized manufacturing enterprises in Malaysia and showed similar results to [37].

Research by Nyakuwanika et al. [39] has shown that if managers are well-trained in management accounting knowledge and fully aware of the role and effects of management accounting in enterprise management, the management accounting organization of that enterprise will be better.

Bogale [40] showed that businesses will use modern management accounting applications to adapt to changes in the surrounding environment. Similarly, research by Tuan Mat and Smith [41] has shown changes in the business environment that affect the application of management accounting. According to the authors, environmental changes bring more competition, so they have motivated businesses to invest in modern production technology and better organization in the production process management to improve product quality, save costs, and maximize performance. These changes affect the choice of management accounting techniques in enterprises. This result is similar to the study of Shields [42]: businesses implement many modern management accounting techniques as a result of changes in the business environment.

Leite et al. [20] conducted quantitative research to explore the influence of factors on the use of management accounting techniques at Portuguese textile companies. The authors have proven that advanced production technology positively and directly affects the application of management accounting. This result is consistent with Sulaiman et al. [14] and Sunarni [19]. In fact, if companies operate in an environment of technological innovation, using modern technology and modern management, of course, the application of management accounting is promoted [20].

Nair and Nian [43] pointed out that enterprise size and advanced production technology have a significant positive influence on the application of management accounting in enterprises in Malaysia. Shahzadi et al. [44] research in Pakistan has shown that the effects of environmental uncertainty, competition, modern production techniques, TQM model, JIT model affecting to the application of management accounting.

In Vietnam, there have been some empirical studies examining the factors affecting management accounting organization in manufacturing enterprises in recent years. Doan [45] collected data from 220 medium and large-sized enterprises, using descriptive and inferential statistics (including t-tests and structural equation modeling) combined with qualitative data from interviews with 20 accounting heads/vice heads. This paper proved that both decentralization and competition impact positively and significantly on the application of new management accounting practices.

Research results of Hùng [46] confirmed the size of enterprises, corporate culture, business strategies of enterprises, competition, and the level of awareness of management accounting of owners/managers of enterprises, the level of state ownership has a positive impact on the level of application of management accounting in small and medium-sized enterprises in Vietnam. However, contrary to other studies, this work did not find a relationship between the level of management accountants and the level of management accounting application in enterprises. At the same time, if investment costs for technology and consultants serving the enterprise's management accounting organization are low, it will increase the feasibility of applying management accounting.

Research by Hieu et al. [7] on factors affecting the organization of management accounting in paper manufacturing enterprises has shown that competition, technology and production techniques, the scale of the enterprise, the participation

of managers and the qualifications of accountants positively affect the management accounting organization. Le et al. [47] showed that 5 factors positively affecting management accounting application in Vietnam firms include business size, the level of technology, human resources, organizational structure as well as culture in Vietnamese enterprises.

Thai [48] conducted a quantitative analysis of factors affecting the application of management accounting techniques in enterprises in Northern of Vietnam. The results show that competitive pressure, the level of decentralization in businesses, the level of IT application, administrators' attention to management accounting, and the professional qualifications of accountants have a positive impact. Among them, the professional qualifications of accountants have the strongest impact.

Through an overview of typical domestic and foreign research, it is necessary to continue research to determine the factors affecting the organization of management accounting in manufacturing enterprises. The paper synthesizes factors inside and outside enterprises that affect the organization of management accounting of the enterprises from typical previous studies as follows:

Factors inside the enterprise: Researchers have shown the positive impact of factors on the organization of management accounting in manufacturing enterprises, including: awareness, participation, attention, and commitment of managers to management accounting; production technology; characteristics of the production process; enterprise size; qualifications of individuals performing management accounting; business strategy; corporate culture; level of decentralization; enterprise organizational structure; information technology; and environmental uncertainty. On the contrary, the cost factor of organizing management accounting has a negative impact on the organization of management accounting in enterprises. The costs of technology investment and consulting services for the organization of management accounting in businesses are low, which will increase the feasibility of organizing management accounting.

Factors outside the enterprise: Researchers point out the positive impact on the organization of management accounting of factors such as competition, business environment, level of state ownership and customer resources.

3. Methodology

To achieve the proposed research goals, the authors combine qualitative and quantitative methods. These methods complement each other in the process of collecting, processing and analyzing data.

3.1. Research Sample

According to the General Statistics Office [2], Vietnam has had more than 34,000 VMEEs since the end of 2023. There are many criteria to classify enterprises, but to ensure reliability, the authors rely on criteria for classifying enterprises according to capital and labor size published in the Statistical Yearbook of the General Statistics Office [2]. Therefore, there are over 3,000 enterprises that have a workforce of more than 50 employees and capital exceeding 50 billion dong, meanwhile, there are more than 30,000 smaller enterprises, consisting of fewer than 50 employees and capital lower than 50 billion dong. These enterprises often originate from household businesses and cooperatives, and they face challenges such as unstable production and business operations. As a result, they frequently outsource their accounting work. Furthermore, the level of management competence is not good, administrators do not concentrate on management accounting, and management relies mainly on experience. Surveying on the organization of management accounting in these enterprises does not give practical or scientific significance due to the lack of data reliability. Additionally, these enterprises face significant limitations in terms of resources to establish effective management accounting systems. They also lack competitiveness and readiness to adopt new technologies, unlike enterprises with a capital size of over 50 billion dong and 50 employees. Therefore, in order to ensure research consistency and ensure that businesses have the necessary resources to implement proposed solutions and recommendations, the paper focuses solely on VMEEs with a capital of 50 billion dong and 50 employees or more.

Green [49] states that the sample size required for research is influenced by several factors, including the desired data reliability (in terms of generalizability to the population characteristics), tolerance, and reaching the minimum sample size required for performing tests, regression analysis, EFA analysis (2 methods require largest sample size). Yamane [50] introduced a formula for determining the sample size based on the estimated population size when the study population is known.

$$n = \frac{N}{1 + Ne^2}$$

N is the overall scale; e is the allowable error, usually from 5 - 10%. With 3000 medium and large-sized companies and considering an acceptable margin of error, the minimum required sample size for the study ranges between 97 and 353 enterprises.

According to Green [49], the minimum sample size for regression analysis is 50 + 8m (m is the number of independent variables). Thus, for the research with an expected number of independent variables of 7 (detailed explanations for these are presented in 3.3 Measurement scales), the minimum sample size is n = 50 + 8x7 = 116 businesses. According to Hair et al. [51], the minimum sample size for EFA analysis is 5 times the total number of observed variables: the topic has 26 observed variables of 7 expected independent variables; the minimum number of research samples is n = 5 x 26 = 130 businesses.

To ensure the survey process is feasible, the data collected is reliable, and the businesses are representative of the overall study, the author uses a judgmental non-random sampling method. VMEEs selected for the survey are members of the Vietnam Association of Mechanical Industry (VAMI) and Vietnam Association for Supporting Industries (VASI), which are the two largest and most prestigious mechanical associations in Vietnam. All VMEEs belonging to VAMI and VASI have stable production and business activities, are influential in the industry, and have succeeded in participating in the production networks of multinational corporations in both domestic and export markets, belonging to the economic sectors throughout

the territory of Vietnam. VAMI and VASI have 297 enterprises in total, a number that meets the requirements for research sample size.

Thanks to the support of relatives, friends, and colleagues, from January to the end of May 2024, the authors contacted 297 VMEEs, and 202 VMEEs agreed to let the authors survey the current situation of management accounting organizations. This number is more than the given minimum sample size. Enterprises that agreed to participate in the survey all had a scale of more than 50 employees and capital of over 50 billion dong, belonged to all economic sectors, were evenly distributed in large industrial cities of Vietnam, focusing on motorbikes and motorbike spare parts; household mechanics and tools; automobiles and auto parts; electrical equipment, electronic. According to data from the General Statistics Office [2], these are strong sub-sectors of Vietnamese mechanical engineering, with industrial production value accounting for nearly 70% of the industrial production value of mechanical engineering nationwide. Therefore, the 202 enterprises surveyed by the authors are representative of VMEEs.

3.2. Data Collection Method

3.2.1. Document Research Methods

To obtain secondary data to serve the topic, the authors identified keywords about the research topic, including management accounting organization, manufacturing enterprises, factors, and VMEEs. The collected documents are classified and interpreted to elicit meaning, gain understanding, and develop empirical knowledge. Documents inside VMEEs include accounts, accounting books, management accounting reports, regulations of the enterprises and other documents. Documents outside VMEEs include scientific research papers, proceedings of international conferences, textbooks, PhD thesis, data from offices such as the Ministry of Finance, the General Statistics Office [2], the Vietnam Association of Mechanical Enterprises (VAMI) and the Vietnam Supporting Industry Association (VASI) related to the topic. It is a basis to build a preliminary survey researching on factors affecting management accounting organization in VMEEs.

3.2.2. In-depth interview method.

The semi-structured interview method is applied to this research to find out the current state of management accounting organization in VMEEs. The authors directly asked questions to the Chief Accountant, Heads of Departments, and Managers and recorded (with permission) their answers. Due to time, budget, and distance constraints, the authors collected data from only ten enterprises that have medium or large sizes and the organization of the centralized and decentralized accounting apparatus in both limited liability and joint-stock types to conduct interviews. The list of companies includes: Hanoi Mechanical Company Limited, 17 Mechanical Company Limited, Tri Cuong Industry Company Limited, Lam Son Company Limited, LILAMA Corporation, Thanh Cong Group Joint Stock Company, Export Mechanical Joint Stock Company (EMTC), Machine Parts Joint Stock Company No. 1 (FUTU1), Tomeco Electromechanical Joint Stock Company, and Dong Anh Mechanical Joint Stock Company. They may represent the research sample of 202 selected businesses. The authors conducted interviews in both forms: face-to-face interviews and online interviews (via phone or Google Meeting). After interviewing the 16th expert, the authors could not find any new information, so they decided not to select more experts to interview. The authors do not provide detailed information about the experts due to their companies' regulations and personal reasons. Each interview often lasts between 30 to 45 minutes. The results of this method have provided useful information to complete the survey questionnaire.

3.2.3. Observation Method

The authors used the observation method to better grasp the characteristics of operations, production and business, and management accounting organization in VMEEs. From there, it serves as a basis to explain the factors affecting the organization of management accounting in VMEEs.

Similar to the in-depth interview method, the authors asked for and received permission from ten business leaders to observe the actual production and business activities. These businesses are exactly the ten businesses mentioned in the above method. During 2024, the authors visited the businesses many times to observe. The results include documents, images, production and business processes, and management accounting information in VMEEs. It took a long time to ensure the reliability of the information obtained. The results serve as the basis for the authors to complete the survey questionnaire.

3.2.4. Group Discussion Method

The authors use the group discussion method to ask experts for variables and scales in the model of factors affecting the organization of management accounting in VMEEs.

The authors chose a full group discussion with eight to ten experts (this type requires the largest number of people among others). The selected experts need to have experience and knowledge of management accounting organizations relating to manufacturing firms, as well as the ability to propose solutions to improve the organization of management accounting in VMEEs. The authors contacted 10 experts and divided them into 2 groups including: (1) practical experts who are chief accountants and managers in VMEEs with at least university degrees and 5 years of experience in their current positions; (2) experts who are lecturers and researchers in management accounting, with at least 10 years of teaching at top universities in Vietnam, at least at the PhD level, and many published research papers on management accounting. Nine experts agreed to participate in the online discussion via Google Meet. The number of experts meets the requirements of the full group format selected, so the authors did not contact additional experts. During the discussion, the variables and scales of the model were discussed and determined as a basis to build a questionnaire to find out factors affecting the organization of management accounting in VMEEs.

3.2.5. Questionnaire Survey Method

Based on the literature review, results of actual observations, in-depth interviews, and group discussions were used to build a questionnaire to serve quantitative research on factors affecting the organization of management accounting in VMEEs. The subjects of the investigation were senior managers and chief accountants. After providing information about the purpose of the investigation and a commitment to using survey information, the authors divided the survey questions into three parts: (1) General information of respondents and businesses related to capital and labor; (2) Screening questions; (3) Factors affecting the organization of management accounting in VMEEs.

The questions are represented by observed variables of five independent variables that are explained in section 3.3 below. Observed variables are measured using the 5-point Likert scale, including the following points – (1) Strongly disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly agree.

3.2.5.1. Trial Investigation

Before conducting a large-scale official investigation, the authors conducted an investigation test within a narrow scope of 10 selected enterprises for case study. The purpose of trial investigation is to detect and correct complex or inappropriate questions, errors, unclear expressions to form the officially questionnaire. Moreover, the scales in the survey are compiled from many different previous researches so the preliminary investigation is extremely important that the trial subjects resemble the official sample as closely as possible [51] and should reflect the main components of the study. Calder et al. [52] stated that convenience sampling is a commonly used method for research trial quantitative research. The survey sample size should be from 12 to 30 [53]. Therefore, the authors conducted a pilot survey with a survey sample of 20 the questionnaires were sent to 10 case study enterprises. Using the results obtained, the authors used SPSS 26 software to determine Cronbach's Alpha and Corrected Item-Total Correlation. The higher the Cronbach's Alpha coefficient, the more reliable the scale is. However, this is a new study, the authors chose Cronbach's Alpha coefficient ≥ 0.6 and Corrected Item-Total Correlation ≥ 0.3 is acceptable [51]. The test results show all observed variables pass reliability requirements. Therefore, after being corrected for grammar errors and expression will be subject to a formal investigation.

3.2.5.2. Official Investigation

The author conducted an official investigation of 202 enterprises. The time frame is from June 2024 to October 2024. The methods of investigation included: direct visits to businesses; sending the Google form link of the survey via Zalo or email; and calling directly to communicate and collect answers. To ensure comprehensive information collection while maintaining the concentration of survey data, each company was distributed 2 questionnaires. A total of 404 questionnaires were distributed; however, only 392 were received from the 202 companies.

3.3. Measurement Scales

Based on the literature review, it is possible to generalize the factors affecting the organization of management accounting in manufacturing enterprises, including: enterprise size, decentralization, organizational structure, managers' awareness, managers' participation, managers' attention, managers' commitment, production technology, production process characteristics, information technology, qualifications of individuals performing management accounting, business strategy, environmental uncertainty, cost of organizing management accounting, corporate culture, competition, state ownership, business environment, and customer resources.

Among the above factors, some of them are similar, so the authors adjust factors to build a model. The four factors "managers' awareness," "managers' participation," "managers' commitment," and "managers' attention" all express the viewpoint of managers about the management accounting organization. Managers with knowledge of management accounting will see the role and effect of management accounting information on business management, leading to attention, support, and commitments to organizing management accounting scientifically, rationally, and more effectively [7, 54, 55]. Therefore, these four factors can be combined and measured solely through the factor "managers' perspective" on the management accounting organization, with two observed variables: managers' awareness and support for the organization of management accounting. Moreover, to organize management accounting, companies need to invest in labor, technology, and consulting services costs. These costs are only accepted if managers have a demand for management accounting information and evaluate the benefits of management accounting information as greater than its costs. Therefore, the factor "cost of organizing management accounting" is not considered an independent variable of this model; it is measured through the factor "managers' perspective" with the content that managers accept the costs of management accounting organization in the enterprise [46, 56].

The organizational structure is considered a formal specification of tasks, powers, and responsibilities of each person and department of the enterprise toward the common goals (the enterprise is divided into departments). On the other hand, it regards the relationship, control, and power model of departments in the enterprise. Each department has to evaluate its performance through its own reporting system [47]. Meanwhile, the "decentralization" factor refers to the level of autonomy delegated to managers in decision-making [12]. Therefore, this factor is reflected in the "organizational structure" factor and is measured through the factor "organizational structure." A business with a strict organizational structure and clear decentralization will require more management accounting information as well as promote a more scientific and effective management accounting organization.

The factor "corporate culture" emphasizes the importance of supporting each other in order to achieve the common goals of the enterprise [57], which is necessary for maintaining good relationships between departments (as expressed in the process

of dividing into departments). These concepts are similar and are partly reflected in the factor of "organizational structure." Therefore, "corporate culture" is considered in relation to the factor of "organizational structure."

Production process characteristics of manufacturing enterprises are expressed in various aspects: production technology; inputs such as raw materials, labor; production management models like TQM, JIT [20, 28]. Therefore, the authors use only one representative factor "production process characteristics". Clear production stages, full inputs, modern production technology, and modern production management systems promote management accounting organization.

The factor “business size" expressed through revenue, average number of employees, number of departments, amount of capital [28, 37]. However, in Vietnam, revenue, average number of employees participating annual social insurance, and total capital are the three criteria used commonly to determine business size [58]. Therefore, the authors propose observed variables of the factor "business size" based on this decree. The larger size of the enterprise, the modern, scientific and appropriate the management accounting is organized more reasonable [28, 37]. The larger enterprise requires the more complex management accounting organization as well as have better potential capital for management accounting organization.

The factor "business environment" and “environmental uncertainty” are influenced by competition as well as political instability, ethnic conflicts, wars, etc. However, in Vietnam, there are no problems related to war, ethnic conflicts or political instability [46] so the authors focus on “competition" with observed variables: price competition and competition in new product development, competition in distribution/marketing channels, competition in market share/revenue, competition in raw material sources [45]. When competition increases, firms have the motivation to invest in modern production technology and better organization to improve product quality, save costs, and maximize performance. These changes affect the management accounting organization.

Nowadays, management accounting information for decision-making needs to be more diverse, complex, accurate, and quick; thus, applying information technology in management accounting is an inevitable trend. Information technology is more modern, and the management accounting organization is feasible and effective. The factor "information technology" is measured through the system of hardware, software, and telecommunications networks [29, 48, 59].

The qualifications of individuals performing management accounting are higher, and the management accounting organization is more successful [7, 46, 48]. However, to perform management accounting work better, individuals also need soft skills (computer skills, teamwork skills, self-study skills, and skills to use and exploit information technology applications); the ability to analyze, report, and advise administrators in decision-making. Furthermore, to enhance employees’ professional expertise, businesses need to have development training programs for people doing management accounting [54, 55]. Therefore, the authors use the factor 'competence of personnel performing management accounting' instead of the factor 'qualifications of personnel performing management accounting'.

There is little evidence from local and international studies regarding the influence of "state ownership" on the management accounting organization of enterprises. Moreover, in the current period, the majority of Vietnamese enterprises have been equitized, and the State only intervenes in the production and organization of state-monopolized enterprises that manufacture electricity, water, and oil. The factor "customer resources" is not included in the research model because, in Vietnam, it is almost impossible to determine and measure the strengths and weaknesses of customer resources. Therefore, it is not feasible to measure the impact of this factor on the management accounting organization in Vietnam [56]. There are few studies that have proven the impact of the "business strategy" factor on the organization of management accounting in enterprises. As a result, the aforementioned factors are not considered in the model.

The authors believe that there are 7 independent variables with a total of 26 variables observing the impact on the organization of management accounting in manufacturing enterprises includes: "managers’ perspective”, "organizational structure", "production process characteristics", "business size", “competence of personnel performing management accounting”, "information technology", "competition". Moreover, these factors have a positive impact on promoting the organization of management accounting at manufacturing enterprises.

To clarify the factors and observed variables in the research model, the authors implemented actual observations of VMEEs, in-depth interviews with VMEEs, and group discussions with experts. As a result, "managers’ perspective," "organizational structure," "information technology," "competence of personnel performing management accounting," and "characteristics of the production process" are chosen as independent variables in the research model, while "competition" and "business size" are not considered as factors. According to experts, although the factor "competition" is an external factor affecting the organization of management accounting, the level of impact of competition on the organization of management accounting depends on the subjective feelings of the administrators. If administrators fully evaluate competition and realize the role of management accounting information, they will command, participate in supervision, support implementation, and accept costs to promote a better organization of management accounting. Therefore, 9 out of 9 experts agreed that this factor can be considered through the managers’ perspective with the observed variable namely "evaluating the competition." Regarding the factor "business size," 9 out of 9 experts agreed that large-scale companies often have a large volume of transactions and a complex organizational structure, increasing the demand for information to control and evaluate outcomes and make decisions. Meanwhile, large-scale enterprises often have better financial potential to invest in the organization of management accounting. However, 8 out of 9 experts agreed that although business size is a factor that positively impacts the organization of management accounting, changing business size to strengthen the organization of management accounting is difficult due to a series of problems such as capital, human resources, consumer markets, etc. As a result, 8 out of 9 experts agreed that this variable should not be included in the research model. This viewpoint is similar to the research results of Thai [48].

After gathering, shortening, and adjusting the measurement scales to suit the characteristics of VMEEs, the research model includes five independent variables, which are "managers' perspective" (MANA), "characteristics of the production process" (CHAR), "information technology" (TECH), "competence of personnel performing management accounting" (COMP), and "organizational structure" (ORGA), along with one dependent variable, which is "management accounting organization" in VMEEs (MANO). Furthermore, all factors have a positive impact on the management accounting organization in VMEEs.

Table 1.
Measurement scale.

Factor	Code	Variables	Source
Management accounting organization	MANO 1	Organizing the building norms and making budget of production and business	Hieu, et al. [7]; Maryanova, et al. [22] and To [25].
	MANO 2	Organizing the collecting and processing performance information	
	MANO 3	Organizing the analysis of management accounting information (for checking/controlling and evaluating results, for decision making)	
	MANO 4	Organizing the providing management accounting information	
	MANO 5	Organizing personnel of implementing management accounting	
Managers' perspective	MANA 1	Awareness of management accounting organization	Chenhall [27]; Wu, et al. [32]; Rahayu [55]; Ahmad [37]; Nyakuwanika, et al. [39]; Ahmad and Mohamed Zabri [38]; Hùng [46]; Hieu, et al. [7] and Nguyen and Nguyen [56].
	MANA 2	Evaluating the competition	
	MANA 3	Supporting the organization of management accounting	
	MANA 4	Accepting costs of management accounting organization	
Characteristics of the production process	CHAR 1	Strict production stages	Sulaiman, et al. [14]; Abdel-Kader and Luther [28]; Tuan Mat [21]; Tuan and Smith [35]; Abdel-Maksoud [36]; Ahmad [37]; Sunarni [19]; Leite, et al. [20]; Nair and Nian [43]; Le, et al. [47] and Hieu, et al. [7].
	CHAR 2	Full input of the production process	
	CHAR 3	Modern production technology	
	CHAR 4	Modern production management system	
Information technology	TECH 1	Modern hardware	Choe [29]; Chenhall [27]; Chae, et al. [59]; Thai [48] and Le, et al. [47].
	TECH 2	Modern telecommunications network	
	TECH 3	Advanced software	
Competence of personnel performing management accounting	COMP 1	Degrees/certificates of personnel implementing management accounting	Hùng [46]; Hieu, et al. [7] and Thai [48].
	COMP 2	Soft skills	
	COMP 3	Ability to advise managers to make decisions.	
	COMP 4	Professional programs for personnel implementing management accounting	
Organizational structure	ORGA 1	Enterprise divided into departments with specific tasks, powers and responsibilities	Luther and Longden [33]; Gerdin [34]; Chenhall [27]; Chia and Koh [30]; Abdel-Kader and Luther [28]; Tuan Mat [21]; Dik [31]; [45]; Thai [48] and Le, et al. [47].
	ORGA 2	Each department evaluates its own performance	
	ORGA 3	Each department has its own reporting system	

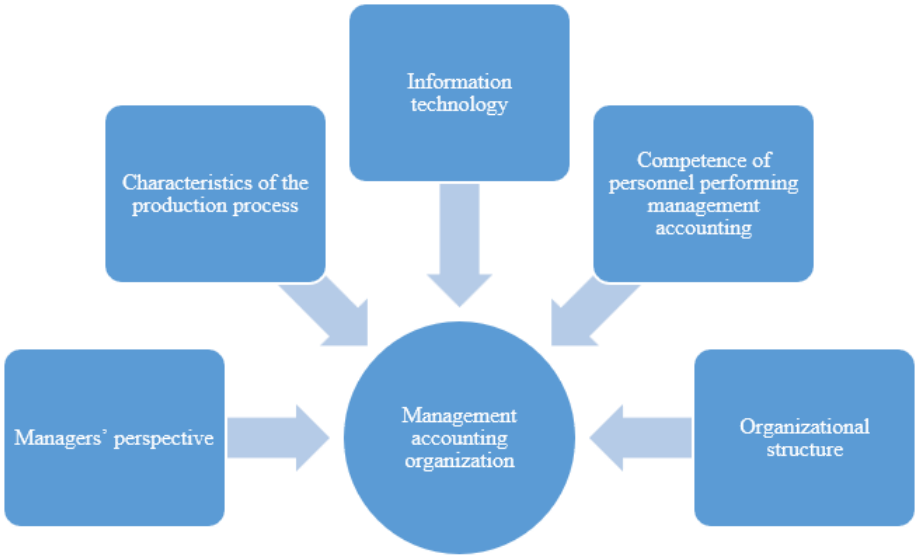

Figure 1.
Conceptual framework.

Based on the conceptual framework combined with the actual observation, in-depth interviews, and group discussions with experts, 5 research hypotheses are proposed as follows:

Hypothesis H1: Managers' perspective has a positive influence on management accounting organization in VMEEs

Hypothesis H2: Characteristics of the production process has a positive influence on management accounting organization in VMEEs

Hypothesis H3: Information technology has a positive influence on management accounting organization in VMEEs

Hypothesis H4: Competence of personnel performing management accounting has a positive influence on management accounting organization in VMEEs

Hypothesis H5: Organizational structure has a positive influence on management accounting organization in VMEEs

This model is different from the model of Hieu et al. [7], one of the few researchers who directly studied the factors affecting the organization of management accounting in manufacturing enterprises using quantitative methods. Their research model did not include the factor "organizational structure." Meanwhile, management accounting is a part of the enterprise, so the organization of management accounting can be affected by the organizational structure of the enterprise [28, 33, 34].

3.4. Data Processing Method

3.4.1. Qualitative Processing Method

Qualitative information obtained from document research, observation, interviews, and group discussions is classified into two groups: theoretical information and practical information. With theoretical information, the authors looked for similarities and differences between them to discover the research gap. After that, the authors deduced, developed, and generalized the research problem. With practical information, the researcher translates the comments and reformats the images and information obtained. Furthermore, the authors analyzed the relationships between information groups to get an overview of the research problem.

3.4.2. Quantitative Processing Method

Authors exported the survey results to Excel to determine which questionnaires were not fully answered. The results obtained were that out of 392 questionnaires, 384 met the requirements, and 8 were eliminated because of incomplete answers. The difference between the chief accountant's answer and the manager's answer of an enterprise would be clear in the processing of data. The authors conducted encryption, converted data into SPSS 26 software, and processed it quantitatively: Descriptive statistics, Reliability statistics, EFA, Pearson correlation analysis, and Multiple linear regression analysis.

4. Results

4.1. Characteristics of Responders

The characteristics of responders are expressed in the table below:

Table 2.
Characteristics of responders.

Characteristics			Frequency	Percent (%)
1	Gender	Male	207	53.91%
		Female	177	46.09%
		Total	384	100.00%
2	Job title	Chief Accountant • Male • Female	198 28 170	51.56%
		Manager • Male • Female	186 179 7	48.44%
		Total	384	1005
3	Academic qualification	Bachelor	340	88.54%
		Master	41	10.68%
		Doctor	3	0.78%
		Total	384	100.00%
4	Work experience in current position	< 5 years	180	44.88%
		5 - <10 years	170	44.27%
		10 - <15 years	31	8.07%
		>= 15 years	3	0.78%

The given table show that 207 responders are male (53.91%), and 177 people are female (46.09%). This is a popular figure of gender in mechanical engineering enterprises. Except for accounting positions who are mainly female, personnel in other departments, especially company directors, are often male. The results of the academic qualification depict that the majority of the responders have university degrees (340 ones - 88.54%), 41 ones have a master's degree (10.68%), and only 3 ones have Doctor degree (0.78%). About work experience, the number of responders have "<5 years" work experience accounts for the largest proportion (44.88%), following by "5 - <10 years" ones (44.27%). Only 3 people have over 15 years work experience.

Table 3.
Characteristics of enterprises.

Characteristics			Frequency	Percent (%)
1	Type of enterprise	Joint Stock company	194	50.52%
		Limited liability company	190	49.48%
		Total	384	100%
2	Enterprise age	< 5 years	32	8.33%
		5 - <10 years	96	25.00%
		10 - <15 years	127	33.07%
		15 - <20 years	65	16.93%
		>= 20 years	64	16.67%
		Total	384	100.00%
3	Capital size	50 to 100 billion Dong	186	48.44%
		Over 100 billion Dong	198	51.56%
		Total	384	100%

The table provides information about the type, age, and capital size of surveyed VMEEs. Overall, it is notable that the proportion of joint-stock companies and limited liability companies is the same, approximately 50%. Regarding enterprise age, firms aged 10 - <15 years made up the largest part of surveyed VMEEs (33.07%), followed by companies aged 5 - <10 years (25%). The proportion of enterprises aged 15 - <20 years and those aged >= 20 years are quite similar, approximately 17%. The businesses that have operated for under 5 years represent the smallest proportion (8.33%). In terms of capital size, enterprises with a capital scale of over 100 billion VND account for a slightly larger proportion than enterprises with a capital scale of 50 - 100 billion VND.

4.2. Characteristics of Production and Business Activities of Vietnamese Mechanical Engineering Enterprises

VMEEs products are diverse, including complete function machines and equipment (cars, motorcycles, electrical equipment, etc.), machine parts or components, and spare parts (gears, shafts, valves, cams, etc.). However, components and spare parts are the most renowned. The production process consists of numerous steps: procurement, preservation, and storage of input materials; preparing tools, machinery, and equipment for production; and preparing the place to manufacture and conduct production (billet fabrication, cutting, heat treatment, assembly, and packaging).

Each production stage must strictly comply with the design and is usually carried out in a workshop with specific tasks such as casting, cutting, rolling, forging, etc. Each production step usually includes some operations, and an operation often

includes different production technology processes. Production stages are often carried out in series; the finished product of one stage is the input for the next stage, so it has to ensure correct and sufficient principles (Just in Time) as well as productivity and product quality. Therefore, production expenses in mechanical enterprises are often complex, and cost norms are often based on technical methods and are made not only by the accounting department but also by other departments like the technical department, production manager department, raw materials department, etc. The information about production costs needs to be provided accurately, completely, and in a timely manner for each stage/product/order to managers. From there, it affects the organization of individuals, means, management accounting methods, and the relationship between departments performing management accounting tasks. In addition, the popular characteristic of mechanical engineering enterprises is the application of production automation and the use of information technology at a high level. On the other hand, factories of VMEEs are usually located far from city centers to decrease environmental pollution. They significantly affect the design of hardware systems, networks, as well as management software, including accounting software.

4.3. Descriptive Statistics

According to the results of the descriptive statistics of the variables, the mean value related to management accounting organization in VMEEs ranges from 3.18 to 3.43. This shows that all opinions agree that businesses have implemented management accounting and achieved a fairly average level on a 5-point scale.

The level of evaluation for organizing the analysis of management accounting information is the lowest. This result is similar to the findings from in-depth interviews with managers in VMEEs. The data on production costs of VMEEs is complex, making it difficult to analyze information that meets managers' requirements; thus, they still mainly rely on their experience to make decisions. The survey results reflecting content related to the managers' perspective also ranged from 3.01 to 3.67. Among these, the managers' awareness of management accounting organization received the highest score (3.67/5). This is because the business context is more challenging, and managers have a desire to properly and fully understand the cost items to develop appropriate cost-saving measures. Therefore, they have begun to pay more attention to management accounting. However, most managers of VMEEs are originally mechanical engineers, so their understanding of management accounting is not very strong, leading to the acceptance of management accounting organizational costs remaining at an average level (3.01/5). Regarding the production process characteristics factor, the scores ranged from 2.83 to 3.32. This is consistent with the reality in VMEEs, which are still developing, and the machinery is still outdated compared to other countries. In particular, the application of modern production management methods is not yet widespread (2.83/5), mainly occurring in large enterprises and suppliers of auxiliary products to leading corporations such as Toyota, Honda, etc. The evaluation of information technology application in management accounting tasks has an average score ranging from 3.0 to 3.26. According to the results of observations and interviews in VMEEs, the network system does not completely meet job requirements. Additionally, VMEEs mainly use accounting software to handle management accounting tasks, resulting in low job satisfaction. The average score assessing the competence of personnel performing management accounting is slightly higher, ranging from 3.22 to 3.53. Individuals ensure appropriate professional qualifications (3.22/5), possess suitable soft skills to perform management accounting (3.42/5), and the ability to advise managers is rated at 3.55/5. Furthermore, VMEEs have paid attention to and supported appropriate professional courses (3.53). Due to the requirement for rigor in the production and business process, the observed variables of the factor "organizational structure" are all evaluated above average. Among them, the highest score is for "enterprise divided into departments with specific tasks, powers, and responsibilities" (3.56/5), followed by "each department evaluates its own performance" (3.33/5) and "each department has its own reporting system" (3.28).

4.4. Reliability Statistics

The results of testing the reliability of the variables are shown in the following table:

Table 4.
Summary of assessment of the reliability of the variables.

Cod	N of Items	Cronbach's Alpha	Min of Corrected Item-Total Correlation
MANO	5	0.868	0.634
MANA	4	0.803	0.581
CHAR	4	0.845	0.519
TECH	3	0.678	0.438
COMP	4	0.834	0.638
ORGA	3	0.850	0.562

The results show that all independent and dependent variables have Cronbach's Alpha coefficients from 0.678 to 0.868 $\geq$ 0.6, so they meet reliability requirements. The Corrected Item-Total Correlation coefficient of all observed variables of the independent and dependent variables is > 0.3, ensuring the requirements. Therefore, the 23 observed variables are all meaningful and ensure reliability, and are included in the analysis in the next steps.

4.5. Exploratory Factor Analysis (EFA)

EFA analysis results for independent variables with KMO = 0.617 > 0.5, Sig Bartlett's Test = 0.000 < 0.05, observed variables are correlated with each other in the factor, EFA exploratory factor analysis is suitable method to analyze the model in the next steps Table 5.

Table 5.
KMO and Bartlett's Test of independent variables.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.617
Bartlett's Test of Sphericity	Approx. Chi-Square	5042.325
	df	153
	Sig.	0.000

The data shows that there are 5 factors extracted with the criterion Eigenvalue > 1 with a total cumulative variance of 72,172% ≥ 50%, so the EFA model is appropriate

The results of the rotation matrix, Table 6, show that the variables have been grouped into 5 groups as originally proposed by the author. There is no observed variable that loads on both factors, no observed variable that does not have a loading factor, and no observed variable that is transferred to measure another factor. Therefore, all variables are retained without removing any ones and the group of observed variables for each factor is kept the same.

Table 6.
Rotated Component Matrix.

	Component				
	1	**2**	**3**	**4**	**5**
CHAR4	0.808				
CHAR2	0.802				
CHAR1	0.725				
CHAR3	0.694				
MANA3		0.795			
MANA2		0.786			
MANA4		0.769			
MANA1		0.765			
COMP3			0.844		
COMP4			0.838		
COMP1			0.824		
COMP2			0.753		
ORGA3				0.913	
ORGA2				0.883	
ORGA1				0.693	
TECH2					0.733
TECH1					0.716
TECH3					0.618

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Note: a. Rotation converged in 5 iterations.

After analyzing EFA with independent variables, the authors continued to analyze EFA with dependent variables and obtained results as shown in the Table 7:

Table 7.
KMO and Bartlett's Test of the dependent variable.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.772
Bartlett's Test of Sphericity	Approx. Chi-Square	1021.480
	df	10
	Sig.	0.000

It can be seen that KMO coefficient = 0.772 > 0.5, Sig Bartlett's Test coefficient = 0.000 < 0.05. This shows that exploratory factor analysis is completely appropriate; the observed variables are correlated with each other in the factor and are statistically significant at the 0.05 level. The result of the total variance extracted of the dependent variable shows that there is 1 factor extracted at Eigenvalues equal to 3.290 > 1. Total variance extracted = 65.794% ≥ 50% so the EFA model is appropriate. This factor explains 65.794% of the data variation of the 5 observed variables participating in EFA. All observed variables have loading factors > 0.5, with good statistical significance. The rotation matrix does not appear. The scale ensures unidirectionality, the observed variables of the dependent variable converge quite well.

4.6. Pearson's Correlation Analysis

The linear correlation coefficient of the five independent variables with the dependent variable "management accounting organization" in VMEEs has a value ranging from 0.278 to 0.504, which means the independent variables are all correlated

with the dependent variable and have a positive relationship with each other. The variables in the model are all correlated and statistically significant with significance values < 0.05.

4.7. Multiple Linear Regression

The results of multiple linear regression analysis between independent variables which are ORGA, COMP, MANA, CHAR, TECH and dependent variable MANO are illustrated in Table 8:

Table 8.
Model Summary[b.]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.703[a]	0.494	0.488	0.3328	1.888

Note: a. Predictors: (Constant), ORGA, COMP, MANA, CHAR, TECH
b. Dependent Variable: MANO.

Adjusted R Square = 0.488 shows that the independent variables included in the regression analysis affect 48.8% of the variation of the dependent variable, the remaining 51.2% is due to variables outside the model or random error. Durbin-Watson = 1.888 is in the range of 1.5 - 2, so the result does not violate the assumption of first-order serial autocorrelation [60].

Table 9.
ANOVA analysis of variance.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	40.953	5	8.191	73.942	0.000[b]
	Residual	41.872	378	0.111		
	Total	82.825	383			

Note: a. Dependent Variable: MANO
b. Predictors: (Constant), ORGA, COMP, MANA, CHAR, TECH
Test F = 73.942, Sig value = 0.000 < 0.05, so the regression model is suitable for the data set and can be used.

Table 10.
Coefficients of the official regression model.

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-0.372	0.198		-1.879	0.061		
	MANA	0.495	0.040	0.502	12.477	0.000	0.827	1.210
	CHAR	0.081	0.038	0.098	2.159	0.031	0.656	1.525
	TECH	0.255	0.044	0.264	5.812	0.000	0.647	1.546
	COMP	0.183	0.030	0.227	6.027	0.000	0.943	1.061
	ORGA	0.098	0.035	0.118	2.837	0.005	0.773	1.293

Note: a. Dependent Variable: MANO.

All independent variables have Sig < 0.05, so they are statistically significant and have an impact on the dependent variable. The VIF coefficients of the independent variables are all less than 2, so the data does not violate the assumption of multicollinearity Green [49]. All regression coefficients are > 0, and all independent variables included in the regression analysis have the same impact on the dependent variable. Based on the magnitude of the standardized regression coefficient Beta, we have the following standardized regression equation:

MANO = 0.502 MANA + 0.264 TECH + 0.227 COMP + 0.118 ORGA + 0.098 CHAR + ε

5. Discussion

Through quantitative research results using SPSS, there are 5 factors that positively influence the organization of management accounting in VMEEs, in order of the managers' perspective, information technology, competence of personnel performing management accounting, organizational structure, and production process characteristics. This result is different in the order of influencing factors from the research of Hieu et al. [7] conducted with paper manufacturing enterprises which points out that technology and production techniques have the strongest and most fundamental impact on the contents of management accounting organization, followed by the size of the enterprise, the participation of managers, and the accounting officer degree. Each factor in the model is as follows:

"Managers' perspective" has the strongest impact on the organization of management accounting in VMEEs with a standardized Beta coefficient of 0.502. That means, under the condition that other factors remain unchanged, an increase in the managers' perspective of 1 unit will increase the feasibility and effectiveness of the management accounting organization by 0.502 units. This result is consistent with previous studies such as Rahayu [55], Ahmad [37], Hùng [46], Hieu et al. [7], and Hung et al. [54].

"Information technology" is the second factor affecting the organization of management accounting. Under the condition that other factors remain unchanged, an increase in information technology application of 1 unit will increase the feasibility and effectiveness of the management accounting organization by 0.264 units. This research result is consistent with previous studies by Choe [29], Chae et al. [59], and Thai [48].

"Competence of personnel performing management accounting": when other factors remain unchanged, if the competence of personnel performing management accounting increases by 1 unit, it will increase the feasibility and effectiveness of the management accounting organization. 0.227 units. This research result is consistent with previous studies by Hùng [46], Hieu et al. [7], and Thai [48].

"Organizational structure" has a slight impact on the organization of management accounting in VMEEs. When other factors remain unchanged, if the enterprise organizational structure increases by 1 unit, it will increase the feasibility and effectiveness of the management accounting organization by 0.118 units. This result is consistent with the research results of Abdel-Kader and Luther [28], Tuan Mat [21] , and Doan [45].

"Production process characteristics" have a gradual impact on the organization of management accounting. When other factors remain unchanged, if the characteristics of the production process increase by 1 unit, it will increase the feasibility and efficiency of the management accounting organization by 0.098 units. This result is consistent with the research results of Abdel-Kader and Luther [28] and Hieu et al. [7].

6. Conclusions and Recommendations

Based on the results of the analysis of factors affecting the organization of management accounting in VMEEs, the authors have defined five positive factors affecting the organization of management accounting in the following order: the managers' perspective, information technology, the competence of personnel performing management accounting, organizational structure, and characteristics of the production process. The authors propose several recommendations to improve the feasibility and effectiveness of the management accounting organization in VMEEs to help businesses make the most of their resources, save costs, and increase competitiveness to remain strong in the market in the current context of the global economy. Manufacturing businesses may also consider these solutions.

6.1. Improving the Perspective of Managers

The organization of management accounting in each enterprise comes from the perspective of managers. This factor has the strongest and most positive influence. Therefore, to be able to organize management accounting in VMEEs in a scientific, reasonable, and effective way, the first thing managers in VMEEs need to do is change their management thinking from traditional, mainly experiential methods to management using modern management techniques. By wanting to change and accepting change, administrators will proactively update their knowledge by actively participating in training courses from reputable educational organizations and training programs on management skills or manufacturing engineering enterprises' programs to raise awareness of management accounting as well as gain experience. From there, they can actively participate in supporting the organization of management accounting, accepting costs as well as changes within the enterprise to organize management accounting to achieve the desired effect.

6.2. Improving the Competence of Personnel Performing Management Accounting

For personnel in the accounting department, because the production and business activities of mechanical enterprises are complex, reflecting costs through many stages and many items, accounting staff are required to have a solid grasp of management accounting expertise and good knowledge of mechanics. For them, it is necessary to ensure that professional qualifications are appropriate to the functions and tasks of the position they are undertaking, as well as basic training in management accounting. This contributes positively to the quality of management accounting information. In addition, the competitive market creates a demand for high-quality management accounting information; personnel performing management accounting need to have a full range of soft skills to meet job requirements (teamwork skills, self-study ability, foreign language, and information technology skills, ...). At the same time, people who do management accounting must have professional ethics (perform assigned tasks conscientiously, must not violate the ethical rules set out by the enterprise, be careful when conducting work, uphold the principles of ethics, commit, and make every effort to avoid providing misleading or misinterpreted information). VMEEs must select candidates with appropriate professional qualifications, the ability to learn, passion for the profession, and the ability to withstand intense work pressure. In addition, businesses need to pay more attention to the remuneration of each position, create a more professional working environment, and create conditions for career development so that employees can stick with and devote themselves to the business. During the work process, businesses need to regularly reassess the job satisfaction level of personnel performing management accounting to foster, train, and develop workers to keep up with actual requirements, especially in terms of exploiting information technology applications to serve work in the increasingly remote working conditions today. From there, management accounting personnel can analyze, report, and advise administrators in decision-making.

6.3. Improving the Application of Information Technology

Information technology is not a universal solution to the management accounting difficulties of businesses, but it is also not simply a support tool to increase the speed of calculation and information provision. To have a good information technology infrastructure, businesses need to invest in modern hardware with appropriate processing and storage speeds, connect to an internal network based on the Internet, and utilize advanced software that integrates many functions. Great support for the feasibility and efficiency of management accounting organization: Big Data allows quick and simple

processing of operations in management accounting for a short time; Blockchain technology allows the use of cryptography and distributed message protocols to create detailed accounting information according to managers' requirements; Cloud technology allows data storage, minimizing risks for management accounting personnel in accounting data storage, etc. Investment in information infrastructure is not limited to accounting, but it needs to be synchronized with all activities in the enterprise; then it will increase the value of the management information system, in which the accounting system is an important component.

6.4. Improving the Characteristics of the Production Process

According to the survey results, the more modern the machinery, equipment, and production technology processes, the more favorable conditions are created for the organization of management accounting in enterprises. Currently, Vietnam's international economic integration is becoming deeper and deeper, competitive pressure is increasing, while the competitiveness of domestic VMEEs compared to foreign-invested enterprises is low. Therefore, in order to survive and develop, VMEEs are forced to find ways to improve their competitiveness in terms of quality, price, product diversity, etc. With quality being the most important requirement in the field of mechanical engineering, VMEEs need to strictly control all input factors of the production process (raw materials, skilled workers, machinery and equipment, modern technological processes), production operations, and final product quality. Regarding price, to have a competitive selling price, businesses must use resources economically and cost-effectively by: choosing a raw material supplier that ensures both quality and a reasonable selling price; strictly controlling direct labor costs; and regularly maintaining machinery and equipment to ensure quality and optimal capacity. At the same time, businesses should combine comprehensive quality management methods such as TQM, Kaizen Costing method, and the 5S process, so that the production and business processes of the enterprise can be operated scientifically and effectively, ensuring product quality. Moreover, all departments and divisions within the enterprise must be conscious of improving work efficiency to help the enterprise diversify products, distribution channels, and enhance its reputation and brand.

6.5. Improving the Organizational Structure

Departments in enterprises need to be clearly diagrammed and described with functions, tasks, and powers to help the enterprise's organizational structure be more scientific and reasonable. It helps the flow of management accounting information to be smooth. However, it is impossible to provide an organizational structure suitable for all businesses. Therefore, the authors recommend that businesses analyze factors affecting organizational structure and evaluate the current state before providing complete solutions. In addition, businesses need to allow departments to investigate, survey, analyze, and give advice to related managers. For example, human resource and materials managers advise the person in charge of production. However, the advisory department needs to properly perceive that advisory authority does not have the right to decide but rather to support and advise. Consulting needs to be comprehensive, from identifying problems to providing solutions. Business leaders need to ensure that their advisors have enough information and that the advised departments listen to and use the information.

Despite the authors' best efforts to complete this study, several limitations must be mentioned. First of all, the survey sample is representative of approximately 70% of the VMEEs of VAMI and VASI; the authors should expand it in the future. Secondly, some factors affecting management accounting organization have not been researched in the model, such as corporate culture and external consultants, which can be clarified in future studies.

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