

Hung, Bui Quang; Hoai, Tu Thanh; Hoa, Tran Anh; Nguyen, Nguyen Phong

Article

Performance implication of management accounting systems in market-oriented firms: Empirical evidence from Vietnam

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*Corresponding author: Tu Thanh Hoai, School of Accounting, University of Economics Ho Chi Minh City, 59C Nguyen Dinh Chieu, Vo Thi Sau Ward, District 3, Ho Chi Minh City, Vietnam
E-mail: hoaitt@ueh.edu.vn

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Santiago Gutierrez-Broncano,
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of Castilla-La Mancha, Spain

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ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

Performance implication of management accounting systems in market-oriented firms: Empirical evidence from Vietnam

Bui Quang Hung¹, Tu Thanh Hoai^{1*}, Tran Anh Hoa¹ and Nguyen Phong Nguyen¹

Abstract: Drawing upon the resource-based view, this study examines the effects of two key elements of market orientation, i.e. customer orientation and competitor orientation, on the use of management accounting information to enhance firm performance. The partial least squares structural equation modeling (PLS-SEM) results from data collected from top- and mid-level managers working in 279 large companies in Vietnam indicate both customer and competitor orientation have positive effects on the use of management accounting systems (in terms of broad scope, timeliness, aggregation, and integration). This, in turn, enhances firm performance. The study's results provide various theoretical and managerial implications for building and developing management accounting systems for Vietnamese companies.

Subjects: Business; Management and Accounting; Accounting; Management Accounting

ABOUT THE AUTHORS

Bui Quang Hung is the Vice President of the University of Economics Ho Chi Minh City, Ho Chi Minh City, Vietnam. His research interests are management accounting and accounting information systems. He has publications in *Cogent Economics and Finance*, *Journal of Innovation & Knowledge*, *Review of Quantitative Finance and Accounting*, *Heliyon*, *PLoS One*, *Fluctuation and Noise Letters*, and *Journal of Asian Business and Economic Studies*.

Tu Thanh Hoai is a researcher at the School of Accounting, University of Economics Ho Chi Minh City, Ho Chi Minh City, Vietnam. Her research interests include internal control systems, management accounting and leadership. She has papers published in *Cogent Business and Management*, *International Public Management Journal*, *Sustainable Development*, *Corporate Social Responsibility and Environmental Management*, *Sage Open*, *Heliyon*, and *Journal of Asian Business and Economics Studies*.

Tran Anh Hoa is the Dean of the School of Accounting, University of Economics Ho Chi Minh City, Ho Chi Minh City, Vietnam. Her research interests are management accounting and internal control systems. She has publications in *Heliyon*, *Journal of Economic Development*, *Journal of Asian Business and Economic Studies*, and various prestigious international conferences.

Nguyen Phong Nguyen is a lecturer at the School of Accounting, University of Economics Ho Chi Minh City, Ho Chi Minh City, Vietnam. His research focuses on the interfaces between accounting and other disciplines. His publications have appeared in *Cogent Business and Management*, *Human Resources Management*, *Industrial Marketing Management*, *European Journal of Marketing*, *Public Management Review*, *International Public Management Journal*, *Journal of Product and Brand Management*, *Business Strategy and the Environment*, *Journal of Accounting and Public Policy*, *Asia Pacific Business Review*, *Sage Open*, and others.

Keywords: market orientation; customer orientation; competitor orientation; management accounting systems; firm performance

1. Background

Vietnam is a vibrant and market-oriented economy (Nguyen & Tu, 2022). Moreover, Vietnam's integration into the global economy has been a driving force behind its economic development. Participation in organisations and alliances brings various opportunities but also leads to threats to the Vietnamese economy. To improve their competitiveness, Vietnamese businesses need to discover appropriate development strategies (Tu et al., 2023). Therefore, the company's market orientation is of extreme importance to the development of the company. On the other hand, Vietnam's accelerated international economic integration process requires companies to prioritise customer and competitor orientation (Nguyen, 2018). Customer orientation aims to understand the customers' current and future needs and create a strategy to produce and deliver products/services to satisfy these needs. Competitor orientation aims to identify the competition and respond in a timely manner to changes in competitors' situations. Previous studies found that market orientation results in increased customer satisfaction and loyalty and firm performance (e.g., Kohli & Jaworski, 1990; Langerak, 2003; Narver & Slater, 1990; Narver & Slater, 1990, p. 2; Subramanian & Gopalakrishna, 2001; Wernerfelt, 1984, p. 38).

Notably, how market orientation enhances firm performance has been extensively examined in previous studies incorporating various mediators, including learning orientation (Keskin, 2006) and brand orientation (Urde et al., 2013). Management accounting studies have also explored the potential interaction between accounting information and market orientation, with studies on the intervening roles of customer accounting (Guilding & McManus, 2002) and competitive accounting (Cadez & Guilding, 2012) in market-oriented organisations. Consequently, the intervening role of management accounting is of paramount importance in these organisations because management accounting systems (MASs) can provide top managers with relevant information for making decisions to explore and exploit market potential (Chenhall, 2003).

Furthermore, the relevance of market orientation in extending the use of MASs was also mentioned by Guilding and McManus (2002), who found that market orientation positively affects the use of management accounting techniques. These include customer accounting, customer assessment, and customer profitability analysis (Nik Abdullah et al., 2022). A recent investigation conducted by Ngo (2021) revealed that market orientation plays a pivotal role in enhancing the sophistication of MASs in terms of broad scope through the incorporation of a wider range of information sources. These encompass external, non-financial, and future-oriented data. Consequently, this influence reverberates and exerts an impact on the performance of businesses in Vietnam. However, there is limited research on the links between the two important dimensions of market orientation, i.e., customer orientation and competitor orientation, and MASs in terms of the four dimensions of MASs, namely broad scope, timeliness, aggregation, and integration (Chenhall & Morris, 1986). Moreover, in the light of the stream, in Vietnam, an upward trend in the use of MASs has been noted (Bui et al., 2023; Tu et al., 2023). Therefore, there is an opportunity for companies to exploit the potential value of different orientations in promoting MASs.

Our study aims to achieve two key research objectives. Firstly, we seek to assess the impact of the extent of use of MASs on customer orientation and competitor orientation. Secondly, we aim to investigate the relationship between customer orientation, competitor orientation, and firm performance. These objectives are reflected in the following research questions: (1) How do customer orientation and competitor orientation influence the extent of use of MASs? and (2) Does the extent of use of MASs significantly contribute to firm performance?

In bridging the research gap and answering the research questions mentioned above, this study proposes and tests hypotheses that explain how companies in an emerging market can improve

their competitiveness by promoting customer orientation and competitor orientation and increasing their use of MASs. This paper is structured as follows: The next section discusses the theoretical background and develops a model underpinned by the resource-based view. Next, the data collection process and the analysis of a cross-sectional survey in Vietnam are presented. Finally, both theoretical and managerial implications are discussed for businesses considering designing MASs to improve the performance of market-oriented companies in emerging markets.

2. Theoretical background and hypothesis development

2.1. Customer orientation and competitor orientation

Starting in the years 1957–1960, the term market orientation has been used in developed countries from a theoretical perspective. Since the 1990s, there has been a growing interest in market orientation from a practical perspective. This study approaches market orientation from the perspective of Kohli and Jaworski (1990) and Narver and Slater (1990), who share a common view of market orientation, i.e., the focus on customers and competitors in market-oriented companies is the responsibility of all organisational functions and does not rest solely on the marketing department. The components of customer and competitor orientation proposed by Narver and Slater (1990) are consistent with the process of constructing market information proposed by Kohli and Jaworski (1990). In addition, the cross-functional coordination dimension in the market orientation scale developed by Narver and Slater (1990) is relevant to disseminating information in the market orientation scale suggested by Kohli and Jaworski (1990). However, Narver and Slater (1990) have not mentioned company responsiveness to market opportunities, which is mentioned by Kohli and Jaworski (1990).

According to Narver and Slater (1990), the three dimensions of market orientation are customer orientation, competitor information, and inter-functional coordination. Customer orientation refers to understanding customer needs and continuously creating outstanding customer value. Therefore, determining the current and future needs of customers is critical. Companies that have information about customer needs can plan how to effectively use their limited resources to deliver value to their customers. Competitor orientation requires a company to capture information about existing and potential competitors and disseminate this information to its functional departments. Companies need to know their competitors' strengths, weaknesses, and competencies to promptly respond to their movements. Inter-functional coordination refers to the collaboration between departments or functions where information is exchanged, which allows the company to allocate resources effectively to create better value for the customer. This means that any individual in any function within the company can contribute to value creation for customers. All functional departments work together in these efforts, not just individual functions. From the market orientation perspective, managers will have an overview of the market, competitors, and the coordination between functions. This will allow them to create more effective planning strategies and propose appropriate business activities in a timely fashion to meet customer needs and respond to competitors.

In this study, we explore two important dimensions of market orientation, i.e., customer orientation and competitor orientation, as they are distinct approaches to achieving a competitive advantage (Zhou et al., 2007). Customer orientation involves analyzing customer needs and preferences to enhance customer satisfaction and potentially attain differentiation advantages. In contrast, competitor orientation may lead to a cost advantage by closely monitoring costs and quickly responding to competitor's marketing initiatives. The effectiveness of each orientation varies depending on specific circumstances, suggesting a contingency perspective of market orientation (Zhou et al., 2007). Hence, our investigation aims to examine whether the impact of these two dimensions of market orientation on the utilization of MASs varies and how this, in turn, influences firm performance.

2.2. Management accounting systems

MASs play an essential role in assisting managers in planning, controlling, and making decisions. In this way, they assist in company development and improve firm performance. Agbejule (2005) and

Chia (1995) studied the impact of MASs on firm performance. Other studies have also studied the path linking market orientation to firm performance, such as organisational innovativeness (Deshpandé & Farley, 2004) and brand orientation (Urde et al., 2013). However, there is little evidence supporting MASs' mediating role in the relationship between customer orientation, competitor orientation, and firm performance. Therefore, the purpose of this study is to explore and evaluate the role of MASs in four dimensions, namely broad scope, timeliness, aggregation, and integration (Chenhall & Morris, 1986), and to discover the links between customer orientation, competitor orientation, and firm performance.

2.3. Resource-based view

Wernerfelt (1984) was the first to develop the foundation for the resource-based view of the companies. The resource-based view focuses on competitor analysis of a company based on tangible and intangible internal resources (Grant, 1991). Companies applying this theory to their activities also bring added value through resource diversification. According to Barney (1991), a resource that creates competitive advantage must satisfy four conditions. They must be valuable, rare, inimitable, and non-substitutable (VRIN). This theory emphasises that these characteristics of resources, namely that they are valuable, rare, difficult to imitate, and irreplaceable, create competitive advantages for companies. However, in a highly competitive environment, companies compete with differences in resources and coordinate and employ resources to effectively achieve their strategic goals.

2.4. Customer orientation, competitor orientation, and management accounting information

Customer and competitor orientation will ensure companies have an overview of customers and competitors so that they can create strategies to develop products/services to satisfy customer needs and timeously respond to competitors. According to previous studies (e.g., Kohli & Jaworski, 1990; Langerak, 2003; Narver & Slater, 1990; Subramanian & Gopalakrishna, 2001), these orientations have a positive effect on firm performance. However, no studies have examined the effects of customer and competitor orientation on the use of management accounting information or the impact that the use of management accounting information could have on firm performance. Therefore, this study will investigate these two specific components, namely the effect of customer and competitor orientation on the use of management accounting information and firm performance.

The relationship between customer orientation, competitor orientation, and the extent of the use of MASs' can be based on the need to employ management accounting information from the marketing department. Management accounting information is suitable for decisions relating to discontinuing products, pricing products, and introducing new products based on market orientation (Daowadueng et al., 2023), playing an essential role in determining target profits and positioning a company in the market to gain a competitive advantage.

The relationship between customer orientation and management accounting information is that MASs provide information on sales and prices of products and services for each specific customer segment (Nik Abdullah et al., 2022). This allows the company to analyze its potential profitability from customer segments. A customer-oriented company will focus on analyzing customer needs and combining this analysis with management accounting information about costs to calculate the selling price for its products better. It can be said that companies with a high level of customer orientation will tend to use more information from MASs. The information employs a broader scope, including financial and non-financial information. Customer satisfaction and loyalty are also associated with sales, customer costs, and the profitability of each customer group. We argue that companies with a market-oriented approach must establish MASs to gather, process, and furnish information about customer preferences. This step is essential for fortifying customer relationships and elevating overall customer satisfaction. Once this information is available, it can be used to help and support managers in making correct and timely decisions. This study proposes the following hypothesis:

H1: Customer orientation has a positive effect on the extent of the use of MASs.

Management accounting information provides cost data that aids companies in setting prices for their products and services, enabling them to respond to the actions of both current and potential competitors (Nik Abdullah et al., 2022). This type of information also allows firms to formulate business plans and develop alternative products and services that are similar in function, prices, or strategies to create competitive advantage and enable a company to compete with its competitors (Hariyati et al., 2019). Competitor-oriented companies will be interested in developing and employing information from MASs to regularly compare their selling prices with those of competitors. These companies must have a strategy to respond in a timely manner to new products and services provided by competitors. Competitor-oriented companies tend to use more management accounting information. Therefore, this study proposes the following hypothesis:

H2: Competitor orientation has a positive effect on the extent of the use of MASs.

2.5. Management accounting systems and firm performance

Mia and Clarke (1999) suggest that managers use MASs to support product pricing decisions, forecast demand, plan material purchasing, and create a marketing strategy. Managers also use management accounting information to decide on a price suitable for their products/services to enable them to compete with their competitors. When managers use management accounting information, they are able to make better decisions about deals and become more competitive in their business. Many studies test the positive relationship between the extent of the use of MASs information in terms of broad-scope and firm performance (e.g., Baines & Langfield-Smith, 2003; Cravens & Guilding, 1999; Mia & Chenhall, 1994; Mia & Clarke, 1999). However, other studies suggest that accounting information has no effect or a negative effect on firm performance. For instance, Agbejule (2005) showed that using a complex MAS hurts firm performance in an environment of low business uncertainty. Perera et al. (1997) did not find a relationship between management accounting information on broadening the scope of a company and firm performance. The studies mentioned above show that there is still no agreement on the positive effect of the use of MASs on firm performance. The opinion still persists that there is no connection, or even an adverse effect. However, this study confirms that the relationship between them is positive.

MASs and firm performance are represented on four dimensions, namely broad scope, timeliness, aggregation, and integration. Broad scope management accounting information is related to events that may happen in the future, non-financial product and market information regarding products, market share growth, customers' demand, the relationship between businesses, competitor information, and macro factors outside of companies. This information is provided immediately upon request, providing timely information once it has been recorded and processed by accounting information systems. Information on these events will be processed and provided quickly. The dynamic activity reports are provided to managers regularly. The information is provided in forms and timelines that help managers analyze business situations in each period and propose the most suitable options for improving firm performance. In addition to the dimensions mentioned above, in management accounting information, there is an integration of information, such as information about the cost and selling price of products/services and detailed information about goals that need to be achieved for each activity within each separate function in the company.

Soobaroyen and Poorundersing (2008) showed that the aggregation of information helps managers handle information effectively and enables them to efficiently plan, control, and make decisions. The aggregation of information helps to reduce the cost of processing information and to make more relevant decisions faster. Therefore, managers can create better business opportunities than the company's competitors. This research also shows that information can

have a broad scope, be an aggregation, or be integrated. The information must be timely because timeliness helps managers to make appropriate decisions and quickly respond to business changes. The timeliness of information meets the urgent requirements for information in making decisions in a competitive environment.

Based on the resource-based theory suggested by Peteraf (1993) and Wernerfelt (1984), this study argues that MASs that include the four dimensions, namely broad scope, timeliness, aggregation, and integration, are the resources of companies that satisfy the VRIN conditions. Companies that want to have a competitive advantage and succeed need to pay attention to improving VRIN by developing resources that are valuable, rare, inimitable, and non-substitutable. MASs provide information to all functions in companies. Everyone can access information and receive value from the information that furthers the company's values. Developing good MASs depends on organisational structure, business environment, competitive pressure, company size, and other factors. Competitors want to imitate and use the optimal MAS to benefit from its advantages. Therefore, MASs satisfy the VRIN conditions. When the information from MASs is disseminated to all employees and correctly analyzed, it will give a company an advantage, thus meeting the VRIN's rare condition. Based on the resource-based theory, this study shows that MASs can provide useful information (product, financial, and market). Thus, enhanced use of MASs offers firms vital insights into products, strategies, finances, competitors, and markets, aiding businesses in agile and apt responses to changing environments (Bui et al., 2023). In other words, the use of MASs can help companies considerably in making timely decisions that are suitable for business change to benefit the company. Therefore, this study proposes a third hypothesis as follows:

H3: The extent of the use of MASs has a positive effect on firm performance.

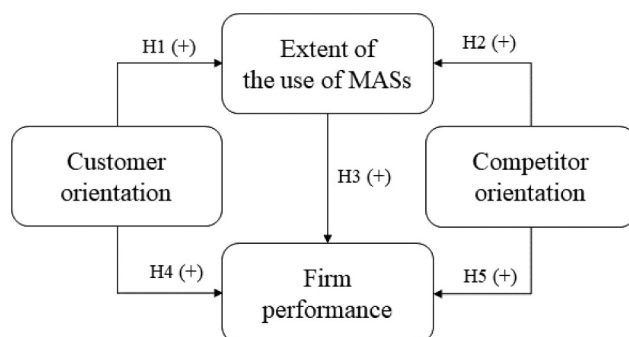
2.6. Customer orientation, competitor orientation, and firm performance

Calantone et al. (2002) and Jaworski and Kohli (1993) argued that customer and competitor orientation positively affect competitive advantage. Market-oriented companies will get information about customer needs and will offer products/services that bring satisfaction and superior value to customers, when compared with competitors. Those companies will also provide better service than competitors, increasing customer satisfaction and creating a long-term relationship. Customer-centric information from MASs can enable businesses to offer products/services aligned with customer demands (Ngo, 2021). This can improve sales, expand market share, and ultimately improve firm performance. From the centralisation and constant monitoring of customers, companies can set operational goals to quickly deal with business problems that continuously arise regarding customers (Reychav & Weisberg, 2009). In addition, customer-oriented companies tend to have more satisfied and loyal customers, and sales and market share tend to increase more quickly (Langerak et al., 2004). Therefore, this study proposes the following hypothesis:

H4: Customer orientation has a positive effect on firm performance.

In addition, competitor orientation helps companies glean information on their competitors. Once a company has that information, it can offer products/services that are highly competitive and further increase customer satisfaction, thereby affecting firm performance. Through concentration and constant monitoring of competitors, companies can actively set operational goals to quickly deal with competitors' business problems (Reychav & Weisberg, 2009). Moreover, insights into competitors' strengths and weaknesses gleaned from competitor-related information obtained from MAS can enable the formulation of contingency plans to counteract their actions (Ngo, 2021). Thus, this study proposes the following hypothesis:

Figure 1. Research model and hypotheses.



H5: Competitor orientation has a positive effect on firm performance.

The research model and hypotheses are shown in Figure 1.

3. Research methods

3.1. Sample

This study employed a quantitative approach to collect survey data from companies in Vietnam. The target informants were senior managers (CEO, CFO, member of the Board of Directors, member of the Board of General Directors' Board) and middle managers (deputy heads of departments) of large companies in Vietnam. The rationale behind selecting large companies is rooted in their possession of dedicated marketing departments and their utilisation of MASs. The survey questionnaire was pilot tested by 20 managers of large companies in Vietnam to ensure that the questions were easy to understand. The revised questionnaire was then sent to 4,753 email addresses of top and middle managers. These addresses were obtained from our personal LinkedIn network. This study used SurveyMonkey to send emails to participants.

To minimise the common method bias in our cross-sectional survey, we collected data twice, i.e., time 1 (T1) and time 2 (T2). The T1 survey was used to collect data regarding customer orientation, competitor orientation and demographic information. Six months after T1, the T2 survey was sent out to obtain information about the use of management accounting systems, and firm performance. We received 1,592 responses to the T1 survey. We removed 783 questionnaires received from medium and small companies, leaving 809 completed questionnaires. For the T2 survey, we sent emails to the T1 informants and received 291 completed responses. As the unit of analysis of this study is business organisation, we carefully removed 12 responses from overlapping companies (prioritising selecting people in higher positions with more seniority). Finally, we were left with 279 responses that were eligible for data analysis.

3.2. Measurement scales

This study used scales that are well established in the literature to measure the main variables in the proposed model. The measurement scales for customer and competitor orientation were adapted from Zhou et al. (2008). They were shortened from the Narver and Slater (1990) scale. Customer orientation had three items, and competitor orientation had two items. The scale for the extent of the use of MASs was adopted from Agbejule (2005) and Chenhall and Morris (1986). This scale includes four dimensions, namely broad scope (four items), timeliness (four items), aggregation (three items), and integration (three items). Based on Fornell (1992) and Morgan and Piercy (1998), firm performance was measured using six items. Following this, participants were asked to rank their firm's performance in terms of market share, customer satisfaction, customer retention, sales growth, sales revenue, and overall profitability over the last three years in comparison to that of key competitors. We have opted to assess firm performance using subjective measures instead of the traditional objective measures like return on assets (ROA) and return on equity (ROE), as done in previous studies (e.g., Abdullah & Tursoy, 2021). This

decision is primarily driven by the challenges in obtaining objective firm performance data in Vietnam, as acknowledged by Nguyen et al. (2020). Furthermore, research has established a positive correlation between objective and subjective performance measures (Venkatraman & Ramanujam, 1986), supporting our choice to utilize subjective measures in our evaluation, which has been applied in previous studies (e.g., Latifi et al., 2021). Finally, based on Calantone et al. (2002), this study added company size (assets and full-time equivalent employees) and ownership structure (1 = “with foreign capital”, and 2 = “without foreign capital”) as the control variables for firm performance.

4. Research results

4.1. Sample descriptive statistics

The survey sample of 279 respondents is shown in Table 1, which includes specific information about companies and respondents from the survey forms of the selected study sample. Industry categorisation: the service sector (53%), the manufacturing sector (34.1%), and the commercial sector (12.9%). Company type: private companies (31.2%), companies with 100% foreign capital (31.9%), companies and joint ventures with international partners (13.3%), companies with state capital (9.7%), and companies and joint ventures with local partners (3.9%), and others (10.0%). Company age: 11–20 years accounted for the majority (38.7%) and 21–50 years (28.0%). This means that these companies have had a long time to form and develop the management accounting department. Value of total assets: 79.9% of the companies had total assets of over 500 billion. Size (number of employees): > 500 full-time equivalent employees (77.1%). Respondent profile: top-level managers (43.7%) and mid-level managers (56.3%). The average seniority was 6.95 years, which indicates that respondents have adequate knowledge to evaluate the different aspects of the research issues in their companies.

To guarantee that only eligible respondents completed the survey, the 279 respondents’ profiles were validated using their email addresses. Fifty-two individuals used a corporate email account, while the rest 227 individuals used a personal one. We contacted or emailed 50 (or 22% of the latter group’s responders to check their company affiliation. Except for 42, all of the 50 call-backs indicated that the individuals were still employed by the employer represented on their LinkedIn profiles. Despite the fact that the remaining eight employees had moved positions without updating their profiles, they answered the survey from the perspective of their former company. In addition, following Armstrong and Overton’s (1977) procedure, we compared early and late respondents (i.e. respondents in the first quartile versus those in the fourth quartile) to determine a non-response bias. Independent t-tests revealed no significant difference between early and late respondents ($p > 0.05$). This demonstrates that non-response bias was not a serious issue in our study.

4.2. Reliability and validity analysis

Table 2 indicates that the average variance extracted (AVE) values of the latent constructs (0.61–0.90) were greater than 0.50. Their composite reliability (CR) values (0.90–0.95) were higher than the recommended value of 0.70. In addition, the outer loadings of all the observed scale items in the model (0.72–0.95) were greater than the cut-off value of 0.70 (Hulland, 1999). The t -values of the observed items (20.11–133.12) were greater than 1.96. This indicates a high level of scale reliability.

Table 3 shows that the values of the square root of AVE for the variables (0.78–0.95) (bold numbers on the diagonal) were higher than the correlations between themselves and other variables. This indicates a high level of discriminant validity (Fornell & Larcker, 1981). The correlation values are also less than the values of CR (0.90–0.95) (Table 3), showing that all the scales have discriminant validity. The discriminant validity is based on the correlations between variables being less than the CR. In addition, this study employed Heterotrait-Montrait (HTMT) ratios to evaluate discriminant validity (Henseler et al., 2015). Table 3 indicates that all HTMT ratios (0.43–0.88) were less than or equal to 0.90, which indicates discriminant validity (Henseler et al., 2015).

Table 1. Demographic information of participating firms and respondents

Information sample (n = 279)	Number	Percent
Industry		
• Manufacturing	95	34.1
• Trading	36	12.9
• Services	148	53.0
Firm type		
• 100% foreign-owned enterprise	89	31.9
• SOEs (≥ 51% state capital)	27	9.7
• Private company	87	31.2
• Joint venture with international partner	37	13.3
• Joint venture with local partner	11	3.9
• Others	28	1.0
Firm age (years)		
• ≤5	29	1.4
• 6–10	53	19.0
• 11–20	108	38.7
• 21–50	78	28.0
• >50 years	11	3.9
Firm size in terms of assets (VND billion)		
• 101–200	22	7.9
• 201–500	34	12.2
• 501–1,000	38	13.6
• >1,000	185	66.3
Firm size in terms of full-time equivalent employees		
• 201–500	64	22.9
• 501–1,000	82	29.4
• 1,001–5,000	85	3.5
• 5,001–10,000	22	7.9
• >10,000	26	9.3
Position		
• Top-level managers	122	43.7
• Mid-level managers	157	56.3
Tenure (years)		
• <2	37	13.3
• 2–5	114	4.9
• 6–10	76	27.2
• 11–20	40	14.3
• >20	12	4.3

4.3. Common method bias and model fit

Although we used a two-wave survey in our cross-sectional data collection using a single-informant approach, common method bias can be a serious issue that could cause spurious relationships between variables (Podsakoff et al., 2003). To cope with this issue, we employed

Table 2. Scale evaluation

Item	Outer loading	t-value
Market orientation		
<i>Customer orientation (CR = 0.95; AVE = 0.85)</i>		
• Our business objectives are driven primarily by customer satisfaction	0.90	44.47
• Our strategies are driven by beliefs about how we can create greater value for customers	0.94	92.60
• We emphasise a constant commitment to serving customer needs	0.92	60.14
<i>Competitor orientation (CR = 0.95; AVE = 0.90)</i>		
• We regularly share information concerning competitors' strategies	0.95	104.62
• We emphasise the fast response to competitive actions that threaten us	0.95	133.12
The extent of use of management accounting systems		
<i>Broad scope (CR = 0.92; AVE = 0.75)</i>		
• Information that relates to possible future events (if historical information is most useful for your needs, mark the lower end of the scale)	0.80	23.09
• Non-financial information that relates to production and market information such as growth share, etc. (if you find that a financial is most useful for needs, please mark the lower end of the scale)	0.89	40.16
• Non-economic information, such as customer references, relations, attitudes of government and consumer bodies, competitive threat	0.91	65.66
• Information on broad factors external to your organisation, such as economic conditions, population growth, technological development, etc	0.85	40.52
<i>Timeliness (CR = 0.94; AVE = 0.81)</i>		
• Requested information arrives immediately upon request	0.91	70.57
• Information supplied to you automatically upon its receipt into information systems or as soon as processing is completed	0.93	89.08
• There is no delay between an event occurring and the relevant information being reported to you	0.86	21.98

(Continued)

Item	Outer loading	t-value
<ul style="list-style-type: none"> • Reports are provided frequently on a systematic, regular basis, e.g., daily reports, weekly reports 	0.84	42.07
<i>Aggregation (CR = 0.92; AVE = 0.80)</i>		
<ul style="list-style-type: none"> • Information in forms, which enable you to conduct what-if analysis 	0.91	50.19
<ul style="list-style-type: none"> • Information on the effects of events on particular time periods (e.g., monthly/quarterly/annual summaries, trends, comparisons, etc 	0.90	38.38
<ul style="list-style-type: none"> • Information in formats suitable for input into decision models (such as discounted cash flow analysis or incremental marginal analysis) 	0.92	55.70
<i>Integration (CR = 0.94; AVE = 0.81)</i>		
<ul style="list-style-type: none"> • Cost and price information of departments of your business unit 	0.84	31.03
<ul style="list-style-type: none"> • Presence of precise targets for each activity performed in all sections within your department 	0.91	63.01
<ul style="list-style-type: none"> • Information that relates to the impact that your decisions have on the performance of other departments 	0.93	56.63
<ul style="list-style-type: none"> • Information on the impact of your decisions throughout your business unit, and the influence of other individual's decision on your area of responsibility 	0.92	77.10
Firm performance (CR = 0.90; AVE = 0.61)		
<ul style="list-style-type: none"> • Market share 	0.75	25.50
<ul style="list-style-type: none"> • Customer satisfaction 	0.83	42.59
<ul style="list-style-type: none"> • Customer retention 	0.85	53.18
<ul style="list-style-type: none"> • Sales growth 	0.72	20.11
<ul style="list-style-type: none"> • Sales revenue 	0.72	22.74
<ul style="list-style-type: none"> • Overall profitability 	0.83	46.12

the marker variable technique (Lindell & Whitney, 2001) using the question “Are you good at using computers?” since this is theoretically unrelated to all the study variables. The average absolute correlation between the marker variable and all other constructs in our model was 0.10 (*rm*) ($p = 0.22$). After partialling out the effect of *rm*, the average difference between the correlations among all constructs in the model was 0.11. This result shows that common method bias is not a severe problem. Finally, we calculated the standardised root mean squared residual (SRMR) to evaluate

Table 3. Discriminant validity analysis

	1	2	3	4	5	6	7
1. CusO	0.92						
2. ComO	0.75**	0.95					
	0.83						
3. MAS (Scope)	0.47**	0.52**	0.87				
	0.52	0.58					
4. MAS (Time)	0.61**	0.68**	0.70**	0.89			
	0.66	0.75	0.78				
5. MAS (Aggre)	0.39**	0.48**	0.57**	0.68**	0.90		
	0.43	0.54	0.64	0.76			
6. MAS (Integ)	0.49**	0.56**	0.64**	0.67**	0.79**	0.90	
	0.52	0.61	0.70	0.73	0.88		
7. Perf	0.40**	0.45**	0.49**	0.54**	0.51**	0.50**	0.78
	0.44	0.51	0.56	0.60	0.58	0.55	

Notes: 1st value = The correlations between variables (the number below the diagonal); 2nd value = HTMT ratios (italic numbers below the diagonal); The square root of average variance extracted (AVE) (bold numbers on diagonal lines); **: The correlation was significant at 0.01 level (2-tailed t-test).

the model fit. We found that the SRMR of 0.07 was below the cut-off value of 0.08, suggesting a good model fit (Henseler et al., 2016).

4.4. Hypothesis testing results

Five hierarchical PLS-SEM models were created in SmartPLS3 to test the hypotheses. Model 1 established a direct link between customer orientation and firm performance. Model 2 drew a direct relationship between competitor orientation and firm performance. Models 3 and 4 were the augmentations of Models 1 and 2, respectively, by incorporating the use of MASs as a mediator. Model 5 was the final and complete model. This study assessed the magnitude and significance of each path's statistical terms in the structural model representing each of the hypotheses that were tested. The indexes are presented in Table 4, including β coefficient, t -value, and the adjusted R^2 value for all the dependent variables, i.e., MAS and firm performance. These adjusted R^2 values are higher than the minimum level of 0.10 (0.20–0.42), which show that the proposed research model has a high degree of relevance to the collected data.

H1 suggests that customer orientation has a positive effect on the extent of the use of MASs. The results supported this hypothesis (model 3: $\beta = 0.57$; t -value = 12.01; model 5: $\beta = 0.20$; t -value = 2.33). H2 proposes that competitor orientation has a positive effect on the extent of the use of MASs. The results of the data analysis also confirmed this hypothesis (model 4: $\beta = 0.65$; t -value = 17.45; model 5: $\beta = 0.50$; t -value = 6.91). H3 suggests that the extent of the use of MASs has a positive effect on firm performance. The results of the data analysis supported this hypothesis (model 3: $\beta = 0.54$; t -value = 9.05; model 4: $\beta = 0.51$; t -value = 7.29; model 5: $\beta = 0.51$; t -value = 7.17). Therefore, the extent of the use of MASs has a positive effect on firm performance. H4 proposes that customer orientation has a positive effect on firm performance. This hypothesis was supported by the data analysis (model 1: $\beta = 0.37$; t -value = 6.67). H5 conjectures that competitor orientation has a positive effect on firm performance. This hypothesis was also confirmed (model 2: $\beta = 0.43$; t -value = 8.61).

Table 4. Hypothesis testing results

Dependent variable	Model 1		Model 2		Model 3 (the augmentation of model 1 with MAS as the mediating variable)		Model 4 (the augmentation of model 2 with MAS as the mediating variable)		Model 5 (the proposed model)	
	FP		FP		MAS	FP	MAS	FP	MAS	FP
<i>Independent variable</i>										
CusO	0.37				0.57	0.05			0.20	0.01
	(6.67) ^s				(12.01) ^s	(0.82)			(2.33) ^s	(0.11)
ComO			0.43				0.65	0.09	0.50	0.08
			(8.61) ^s				(17.45) ^s	(1.27)	(6.91) ^s	(1.02)
MAS						0.54		0.51		0.51
						(9.05) ^s		(7.29) ^s		(7.17) ^s
<i>Control variable</i>										
Assets	-0.02		-0.03			-0.03		-0.03		-0.03
	(0.36)		(0.49)			(0.65)		(0.66)		(0.63)
Employees	0.08		0.09			0.14		0.14		0.14
	(1.27)		(1.61)			(2.31) ^s		(2.23) ^s		(2.29) ^s
Ownership	0.10		0.12			0.04		0.05		0.05
	(1.82)		(2.42) ^s			(0.82)		(0.99)		(0.99)
Firm age	0.19		0.19			0.18		0.18		0.18
	(3.57) ^s		(3.52) ^s			(3.50) ^s		(3.48) ^s		(3.21) ^s
R ² adjusted	0.20		0.25		0.33	0.38	0.42	0.39	0.43	0.38
<i>Indirect effect</i>										
CusO→MAS→FP								Estimate	LLCI	ULCI
								0.10	0.02	0.20
								(2.07) ^s		
ComO→MAS→FP								0.26	0.17	0.38
								(5.04) ^s		

Notes: numbers in brackets: t-values; ^s: significance at 5% level (two-tailed t-test); SE: standard error; LLCI: lower level of the 95% confidence interval; ULCI: upper level of the 95% confidence interval; CusO: Customer orientation; ComO: competitor orientation; MAS: use of management accounting systems; FP: firm performance.

This study also performed a Sobel test, based on Preacher and Hayes (2004), to test the mediating role of MAS for customer orientation, competitor orientation, and firm performance. In addition, this study used a bootstrap technique using SPSS software with Process Macro, thereby indicating the indirect relationship between independent variables and the dependent variable and providing a confidence interval for this coefficient (Preacher & Hayes, 2004). Therefore, this result indicates the indirect effects of customer orientation and competitor orientation on firm performance via the use of MASs were 0.10 and 0.26, respectively ($p < 0.05$; correlation confidence interval 95%), Sobel value 2.07 and 5.04, respectively ($p < 0.01$). Moreover, when the use of MASs was added as the mediator in the relationship between customer orientation and competitor orientation, the significant effects of customer orientation and competitor orientation on firm performance became insignificant, respectively (model 3: $\beta = 0.05$; $t\text{-value} = 0.82$; model 4: $\beta = 0.09$; $t\text{-value} = 1.27$). These results show that the use of MASs fully mediates the effects of customer orientation and competitor orientation on firm performance.

5. Discussion and implications

5.1. Theoretical implications

This study has the following theoretical contributions. First, by addressing two research questions that delve into the influence of customer orientation and competitor orientation on the extent of use of MASs, as well as the subsequent impact of heightened MAS utilization on firm performance, this study contributes significantly to the existing body of knowledge at the intersection of management accounting and marketing. To achieve this, we examine data collected from 279 large firms in Vietnam, establishing and validating the connections between two important elements of market orientation—customer orientation and competitor orientation—and the extent of use of MASs, further extending to demonstrate their combined influence on firm performance. This study provides more insights into the fully mediating role of MASs in the relationship between customer orientation, competitor orientation, and firm performance. In doing so, this study adds to previous studies about the mediating effect of MASs on the relationship between market orientation and firm performance in emerging market contexts (e.g., Ngo, 2021; Nguyen, 2018). Specifically, this study confirms the impact of two crucial dimensions of market orientation—customer orientation and competitor orientation—both representing distinct approaches to gaining a competitive advantage, on the extent of MAS utilization, which in turn, enhances firm performance.

Second, this study shows the need for designing MASs based on four dimensions, according to Chenhall and Morris (1986), namely broad scope, timeliness, aggregation, and integration, to improve firm performance. Third, the study's results contribute to the theoretical knowledge of the role of management accounting information from many different perspectives. Lastly, this study also found that MASs satisfy VRIN conditions, consistent with previous studies in emerging market contexts (e.g., Bui et al., 2023; Nguyen, 2018). Designing and developing MASs will significantly help the companies increase competitive advantage and firm performance in a competitive environment.

5.2. Managerial implications

This study has managerial implications as follows. The result that customer orientation positively affects firm performance via the fully mediating role of the use of MASs indicates that employing a market-oriented approach and using MASs could bring competitive benefits to firms. Therefore, this study claims that companies should promote customer orientation (Zhou et al., 2008) and align their business objectives to enhance customer satisfaction. Business strategies should be based on customer value creation and satisfying customer needs.

Second, given that competitor orientation positively affects the extent of the use of MASs, which in turn enhances firm performance, this study recommends that companies should strengthen competitor orientation. Specifically, companies need to increase competitor orientation in the

following ways: all staff should regularly share information about competitors, and companies need to have plans in place to respond to the actions of existing and potential competitors timeously and to continually learn from competitors about trends, knowledge, and strategies (Zhou et al., 2008).

Third, data analysis shows that competitor orientation is incredibly important and has a powerful effect on the extent of the use of management accounting information in large companies in Vietnam. This effect is greater than the customer orientation effect (β coefficient for the path from competitor orientation to firm performance is greater than the β coefficient for the path from customer orientation to firm performance). This result shows that companies in Vietnam currently attach great importance to competitor orientation to develop a competitive strategy. Therefore, they should develop an MAS to cope with increasing competitive pressure. This result is also consistent with Vietnam's international integration conditions and companies' globalised economy challenges.

Finally, this study has shown a crucial mediating role of using an MAS in the relationship between customer orientation, competitor orientation, and firm performance. However, companies will face difficulty in achieving superior competitive advantage and improved firm performance if they only care about customer and competitor orientation. Therefore, this study proposes that companies should pay more attention to customer and competitor orientation, combined with using MASs, to improve firm performance. In addition, companies should design and develop MASs based on four dimensions, namely broad scope, timeliness, aggregation, and integration. Regarding broad scope, companies need to focus on non-financial information regarding products, customers, competitors, and the business environment.

Regarding timeliness, information needs to be provided to managers in a timely manner, e.g., continuously updated and processed reports or regular notices (weekly, monthly, and quarterly). Regarding aggregation, companies should design appropriate forms to avoid overlap and to save information processing costs. This will also help managers capture information quickly to analyze, control, and employ information, and make timely decisions. Information must also be integrated into all functions in the company. The goals of each function must be consistent with the overall goals of companies.

5.3. Limitations and future research directions

This study has some limitations. First, this study has only looked at the effect of customer and competitor orientation on MASs without considering the opposite effect. Does the use of accounting information systems affect customer and competitor orientation? In general, this study focuses on researching the influence of customer and competitor orientation on firm performance via MASs' mediating role. Other studies should examine this causality issue. Second, the use of management accounting information systems and firm performance depends on other contingent factors such as competitive intensity, environmental variability, and technological changes. These factors should be addressed in future studies. Third, the current study did not examine the possible ramifications of the latest advancements in accounting software and enterprise resource planning (ERP) systems on the hypothesized relationships. It can be argued that modern technological developments and enhancements have the potential to significantly affect various crucial aspects, such as data flow charts, data recording and retrieving, and internal report sharing (Trigo et al., 2014), which can play a moderating role in the relationship between market orientation and MASs. Consequently, future research endeavors must consider this factor while assessing the development and utilization of accounting software and ERP systems, particularly in the context of Vietnam, a rapidly evolving nation. Fourth, it is essential to explore the antecedents of MASs in relation to specific corporate governance attributes. These attributes include the distinction between the roles of CEO and chairman, the independence of the chairman, the frequency of board meetings, the attendance of directors, and the level of engagement of the audit committee.

Investigating these factors is crucial as they have the potential to influence the adoption and utilization of MASs (Arunruangsirilert & Chonglertham, 2017).

Finally, the research setting of this study is limited to the Vietnamese market context. Consequently, it is necessary to conduct further research in other market contexts to obtain a more comprehensive understanding of the phenomenon. Such inquiries would enable a more nuanced and comparative analysis of the relationship between market orientation and the adoption of MASs. As such, future research efforts must focus on investigating the impact of contextual factors on the relationship between market orientation and MASs across diverse market settings.

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Author details

Bui Quang Hung¹
 ORCID ID: <http://orcid.org/0000-0001-5817-5637>
 Tu Thanh Hoai¹
 E-mail: hoaitt@ueh.edu.vn
 ORCID ID: <http://orcid.org/0000-0002-9739-6800>
 Tran Anh Hoa¹
 ORCID ID: <http://orcid.org/0000-0002-4975-7624>
 Nguyen Phong Nguyen¹
 ORCID ID: <http://orcid.org/0000-0002-9724-8939>

¹ School of Accounting, University of Economics Ho Chi Minh City, Ho Chi Minh City, Vietnam.

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