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Article

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ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

Organizational culture, management accounting information, innovation capability and firm performance

Huyen Mong Le¹, Thu Thi Nguyen¹ and Trang Cam Hoang^{2*}

Abstract: Drawing on a contingency theory and a resource-based perspective, the this study examines the relationship between organizational culture, management accounting information, innovation capability and firm performance in Vietnamese small and medium-sized enterprises (SMEs). Data for the study were collected by survey questionnaires from a sample of 200 top-level and middle-level managers in Vietnamese SMEs. The results reveal that management's cultural orientation combined with management accounting information has a significant positive effect on innovation capability and enhanced firm performance. In addition, the results show that the use of management accounting information fully mediates the relationship between management's value orientation towards innovation and firm performance. The study thereby contributes to a greater understanding of the role of management's value orientation towards innovation and management accounting information as levers for innovation capability, which in turn leads to higher firm performance in the context of Vietnamese SMEs.

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PUBLIC INTEREST STATEMENT

Innovation capability is a core-value creating capability in driving the performance of the firm, and as such is currently a topical issue, especially in emerging economies. However, the effect of management's value orientation towards innovation and the use of management accounting information on innovation capability and firm performance is not well understood. This study shows that both management's value orientation towards innovation and the use of management accounting information are important levers for innovation capability, thereby improving the firm performance in Vietnamese SMEs. This implies that Vietnamese SMEs (as well as SMEs operating in other emerging economies) should pay attention to building an innovative organizational culture combined with the contribution of an improved management accounting information in their decision-making.

Subjects: Business, Management and Accounting; Accounting; Management of Technology & Innovation; Small Business Management

Keywords: firm performance; innovation capability; organizational culture; management accounting information; SMEs; Vietnam

1. Introduction

Vietnam is an emerging economy that has transformed from a planned economy to a market-based one (Liem & Hien, 2020; Nguyen et al., 2017). Like many emerging economies in Asia, Vietnam has seen major economic shifts while witnessing a high rate of economic growth (V. D. Ngo et al., 2016). Over the years, Vietnam has consistently been ranked as one of Asia's best investment locations (L. v. Ngo et al., 2019). Vietnamese SMEs account for 98% of the total firms and contribute up to 40% of the total national GDP and 50% of the total employment (GSO, 2020). Vietnamese firms, especially SMEs, are facing increasing competition from not only domestic enterprises but also foreign firms (N. P. Tran & Vo, 2020). Vietnamese SMEs will therefore need to constantly innovate to survive and develop sustainably in the business environment. Human factors (especially managers) and information (including management accounting information) are two of the key factors for the successful implementation of innovative strategies (Liem & Hien, 2020; N. P. Tran & Vo, 2020). However, fear of failure is a psychological characteristic of Vietnamese SMEs that can inhibit innovation by hiding failures, suppressing new ideas, and avoiding risk. In addition, most Vietnamese SMEs practice mainly financial accounting, with little focus on management accounting (Doan, 2016; Le et al., 2020). In response, this study seeks to provide evidence of the relation between management's value orientation towards innovation as captured by management accounting information on the one hand and the innovation capability and performance of Vietnamese SMEs on the other.

The contingency-based management accounting literature has revealed many contingency variables that affect the use of management accounting systems (Otley, 2016). The most commonly examined contingency variables include: perceived environmental uncertainty (Agbejule, 2005; Chenhall & Morris, 1986; Chong & Chong, 1997), competitive intensity (Hoque, 2011; Hoque et al., 2001; Mia & Clarke, 1999), strategy (Chong & Chong, 1997; Le et al., 2020), advanced technologies (Ismail et al., 2018; Mia & Winata, 2014), task uncertainty (Chong, 1996; Soobaroyen & Poorundersing, 2008), interdependence (Bouwens & Abernethy, 2000; Chenhall & Morris, 1986), national culture (Tsui, 2001), and organizational culture (Alshumrani et al., 2018; Baird et al., 2011; 2018). In some studies (Chia & Koh, 2007; Subramaniam & Mia, 2001), management's value orientation towards innovation has been identified as a variable of organizational culture. Drawing on contingency theory, management's value orientation towards innovation may therefore affect the use of management accounting information. The extant literature, however, provides only limited evidence for the effects of management's value orientation towards innovation as an outcome of management accounting information. Our study therefore seeks to bridge this gap in the literature and to provide a more focused discussion using Vietnamese SMEs.

A management accounting system is recognized as an important role in strategic management. Following Simons (Simons, 1990; 1994; 1995), studies have examined the positive role of management control systems¹ in providing information for managers to control and implement strategies (Abernethy & Brownell, 1999; Bisbe & Otley, 2004; Naranjo-Gil & Hartmann, 2007). More recently, studies based on the resource-based view have presented management accounting information as a unique resource of firms (Barney, 1991; Nguyen, 2018) that can promote organizational capability in the form of an improved market orientation (Henri, 2006; Yuliansyah et al., 2019), innovation capability (Henri, 2006; Yuliansyah et al., 2019), organizational learning (Chenhall, 2005; Henri, 2006; Yuliansyah et al., 2019) and additional dynamic capability (Le & Nguyen, 2019). Few studies, however, have examined the context of SMEs in an emerging market such as Vietnam. Furthermore, no study to date has systematically examined the effects of

management's value orientation towards innovation as expressed by management accounting information on innovation capability and a consequent improvement in firm performance. This study is also conducted to fill this research gap.

Our study attempts to contribute to the contingency-based management accounting literature in several ways. First, our research fills the research gap by examining the direct effect of management's value orientation towards innovation on the use of management accounting information. Specifically, the management's value orientation towards innovation is a contingency variable related to the organizational culture that affects the use of management accounting information. Second, this study adds to the literature with an application of the mediating fit form of contingency theory to explain the effect of the management's value orientation towards innovation on firm performance via the use of management accounting information. Third, our findings reveal the role of management's value orientation towards innovation following the use of management accounting information in promoting innovation capability and firm performance. Our findings thereby provide an insight into the antecedents and consequences of the use of management accounting information, especially in the context of SMEs operating in emerging economies as Vietnam.

The remainder of the paper is structured as follows: Section 2 presents the background. The theoretical literature review is presented in Section 3. The empirical literature review and hypotheses development are presented in Section 4. Section 5 presents the research design. The empirical research results and discussions are presented in Section 6. Finally, Section 7 presents summary and conclusion.

2. Background

The effect of contingency factors on the use of accounting management information in Vietnamese firms has been studied by Doan (2016), Le et al. (2020), Nguyen (2018), and Nguyen and Doan (2016). These studies have revealed the impact of contingency variables such as competition (Doan, 2016; Le et al., 2020; Nguyen & Doan, 2016), decentralization (Doan, 2016); strategic change (Le et al., 2020), market orientation (Nguyen, 2018; Nguyen & Doan, 2016). While other prior studies in Vietnam have research settings in large firms, the research of Le et al. (2020) focuses on SMEs. This research has revealed the importance of management accounting information in Vietnamese SMEs, which are under intense competitive pressure.

In recent years, innovation capability has remained as an interesting research topic in Vietnam. As a result, there are many studies on the effect of innovation capacity on the performance of Vietnamese firms (Nam & Tram, 2019; Phan, 2019; Trinh & Nguyen, 2017). These studies have revealed the important role of innovation capacity as a determinant of the success of Vietnamese firms, especially SMEs. Even though Vietnamese SMEs are increasingly important in the economy (Huynh, 2019), such firms remain weak and vulnerable (Nam & Tram, 2019). The enhancement of innovation capacity is therefore a key factor in the improvement of competitiveness to ensure the rapid and sustainable development of Vietnamese SMEs (Nam & Tram, 2019).

Building on prior research, this study examines the management's value orientation towards innovation, as a contingency variable, which may then affect the use of management accounting information. In addition, the study examines the relationship between management's value orientation towards innovation with the use of management accounting information on the innovation capacity and performance of Vietnamese SMEs. The research is therefore directed at the enhancement of an innovative culture and management accounting system in promoting the success of Vietnamese SMEs.

3. Theoretical literature review

3.1. Contingency theory

The contingency theory represents a major theory in management accounting research (Burkert et al., 2014; Chenhall, 2003; 2006). Drawing on contingency theory, researchers have argued that there is no optimal design of a management accounting system, instead, contingency factors such as size, technology, environmental uncertainty, or strategy determine the specific optimal design (Chenhall, 2006; Otley, 2016). If management accounting deviates from this optimal design (for example, too little or too much information is provided), firms may suffer from lower performance due to a state of misfit (Burkert et al., 2014).

The concept of “fit” has been described as the heart of contingency theory (Burkert et al., 2014; Otley, 2016). There are four essential forms of fit: (1) Selection fit; (2) Interaction fit; (3) Systems fit; and (4) Mediating fit (Chenhall & Chapman, 2006; 2018; Gerdin & Greve, 2004). In the four fit forms above, the mediating fit form is often related to the paths between the contextual variables, the aspects of the management accounting variable, and aspects of the organizational outcome (Chenhall, 2006). Recently, Structural Equation Modeling (SEM) and the support of statistical software such as LISREL, AMOS, and Smart PLS make the mediating analysis easier (Baines & Langfield-Smith, 2003; Cadez & Guilding, 2008; Naranjo-Gil & Hartmann, 2007). This fit form has also been used in prior studies (Baines & Langfield-Smith, 2003; Cadez & Guilding, 2008; Chong & Chong, 1997). The mediating models may identify the antecedents to a management accounting variable, or they may demonstrate how the relationship between management accounting variable and performance are explained by mediating variables (Chenhall, 2006). Chenhall (2006) emphasizes the importance of decomposing the relationship between the use of management accounting information and performance into the direct effects and indirect effects via the mediating variable that captures the total effects of the use of management accounting information on performance. We are therefore motivated in this study to build a mediating model to test the mediating effect of using management accounting information on the relationship between management’s value orientation towards innovation and firm performance. In other words, we seek to determine how the fit between organizational culture and management accounting information systems can contribute to an improvement in the firm’s innovation and performance.

3.2. Resource-based view

The resource-based view represents a dominant perspective in the strategic literature (Newbert, 2008; Nhon et al., 2020). It seeks to explain the difference in firm performances among different companies in the same industry (Zott, 2003). Accordingly, the research argues that when the companies own the resources that are valuable, rare, inimitable, and non-substitutable, they can gain a sustainable competitive advantage by implementing a strategy of creating a new value which competitors cannot easily achieve, thereby achieving outstanding firm performance compared to competitors in the same sector (Barney, 1991; Wernerfelt, 1984). Drawing on the resource-based view, some studies have argued that innovation capability (Henri, 2006) and management accounting information (Liem & Hien, 2020; Nguyen, 2018) represent unique sources and capabilities and can accordingly play an important role in the success, competitive advantage and performance of the firm. This study is therefore motivated to apply a resource-based perspective to determine the relationship between innovation capacity and firm performance as well as the use of management accounting information in determining the relation with firm performance.

3.3. Management accounting information

Chenhall and Morris (1986) first formalized the four key informational characteristics of management accounting information. This definition is widely adopted in studies (Agbejule, 2005; Bouwens & Abernethy, 2000; Soobaroyen & Poorundersing, 2008). The four informational characteristics are: broad-scope, aggregation, integration, and timeliness. *Firstly*, the scope of information refers to the dimensions of focus, quantification, and time horizon. It includes non-financial information, future-oriented information as well as external environment information. *Secondly*, aggregation refers to the

aggregation of information corresponding to different functional parts of the organization over time. *Thirdly*, integration refers to the interaction between the parts and departments in firms through information sharing. *Finally*, timeliness is conceptualized as the frequency and speed of reporting information.

3.4. Management's value orientation towards innovation

Organizational culture (with six cultural factors of: innovation, outcome orientation, attention to detail, team orientation, respect for people, and stability) was proposed by O'Reilly et al. (1991) and developed and completed by Chatman and Jehn (1994) and Windsor and Ashkanasy (1996). Among the six organizational cultural factors, innovative culture (also known as the management's value orientation towards innovation) has received special attention from research of the organizational culture (Baird, 2007; Baird et al., 2011; 2018; Chia & Koh, 2007; K. M. Baird et al., 2004; Subramaniam & Mia, 2001). Management's value orientation towards innovation reflects the management's beliefs in innovative and creative approaches to work (O'Reilly et al., 1991); and management's value orientation towards innovation influences their attitudes and behaviors towards innovations and innovative activities in their firm (Chia & Koh, 2007; Russell & Russell, 1992; Subramaniam & Mia, 2001).

3.5. Innovation capacity

The literature conceptualizes innovation in a variety of ways (Jiménez-Jiménez & Sanz-Valle, 2011; Thang & Tuan, 2020). However, most of the definitions share two perspectives. The first is that innovation is a behavioral variable. The second is that it is an organization's capacity to change (Calantone et al., 2002). This study focuses on the organization's capacity to be willing to implement change. Following Hult et al. (2004, p. 429), innovation capability relates to "the firm's capacity to engage in innovation; that is, the introduction of new processes, products, or ideas in the organization".

4. Empirical literature review and hypotheses development

4.1. Linking management's value orientation towards innovation to the use of management accounting information

Managers with high-value orientation towards innovation are more likely to pursue creative and innovative ideas, products, or projects than managers with a low degree of value orientation towards innovation. Such ideas, products, and projects may, however, also involve higher uncertainty and greater risk (Subramaniam & Mia, 2001). Some researchers (Agbejule, 2005; Chenhall & Morris, 1986; Chong & Chong, 1997; Fisher, 1996; Gordon & Narayanan, 1984) argue that managers often require more information for decision-making when they face high uncertainty in their work. When perceived environmental uncertainty is high, broad-scope management accounting information becomes essential for evaluating the likely actions of competitors and the needs of customers (Agbejule, 2005). In addition, the integrated and aggregated information has an increasingly important role in providing information for coordination among sub-units (Bouwens & Abernethy, 2000; Chenhall & Morris, 1986). Moreover, timely information is especially useful for managers who need to respond rapidly to changes in a competitive environment and market (Agbejule, 2005; Ghasemi et al., 2016). Consequently, our first hypothesis is proposed:

H₁: Management's value orientation towards innovation has a positive effect on the use of management accounting information.

4.2. Linking the use of management accounting information to firm performance

The function of the management accounting system is to support the manager's plan, its control, and attendant decision-making (Abernethy & Bouwens, 2005). If the management accounting system is not able to process and provide sufficient information for management's decision-making needs, its decisions are likely to be mismanaged (Gupta, 1987). Conversely, better

information facilitates are expected to assist more effective management decisions, which in turn improve firm performance (Baines & Langfield-Smith, 2003; Chenhall, 2003). The relationship between using management accounting information and firm performance has been studied extensively. Although the results are sometimes inconsistent (Chenhall & Moers, 2007), most studies supported the positive relationship between the use of management accounting information and firm performance (Baines & Langfield-Smith, 2003; Chong & Chong, 1997; Gul & Chia, 1994; Hoque & James, 2000; Le et al., 2020; Mia & Chenhall, 1994; Mia & Clarke, 1999; Nguyen, 2018). Therefore, the second research hypothesis is proposed:

H₂: The use of management accounting information has a positive effect on firm performance.

4.3. The mediating role of the use of management accounting information

Hypothesis 1 proposes that management's value orientation towards innovation has a positive effect on the use of management accounting information. In which case, we anticipate that the use of management accounting information has a positive effect on firm performance (Hypothesis 2). We might therefore anticipate that management's value orientation towards innovation will affect firm performance through the use of management accounting information. Additionally, we draw on the mediating fit form of contingency theory (Chenhall, 2006; Chenhall & Chapman, 2018) to argue for a mediating role of management accounting information. Accordingly, we argue that a management accounting information system is able to provide a broad-scope, integrated, aggregated, and timely management accounting information, which fits with the organizational culture, thereby enhancing firm performance. Thus, we propose the third hypothesis as follows:

H₃: Management's value orientation towards innovation has an indirect effect on firm performance via the use of management accounting information.

4.4. Linking management's value orientation towards innovation to innovation capability

Firms are currently able to gain a competitive advantage by implementing innovative strategies of innovative ideas and products (He & Wong, 2004). Such strategies are often supported by innovative cultures whereby innovative ideas are promoted (Subramaniam & Mia, 2001). In a highly innovative organizational culture, managers will encourage experimentation, encourage new and creative ideas, more easily accept risk projects, with a willingness to try out new diverse techniques (O'Reilly et al., 1991; Subramaniam & Mia, 2001). Similarly, Chia and Koh (2007, pp. 194–195) argue that: "In an organization, a high degree of management's value orientation towards innovation will imply that management is likely to value innovation more favorably. Such predisposition is likely to result in a high level of adoption of that innovation". Thus, we anticipate a positive relationship between management's value orientation towards innovation and innovation capability, with a higher degree of management's value orientation towards innovation resulting in a higher level of innovation capability. From the above arguments, we propose the fourth hypothesis as follows:

H₄: Management's value orientation towards innovation has a positive effect on innovation capability.

4.5. Linking the use of management accounting information to innovation capability

Innovation capacity is the firm's capacity to introduce new processes, products, and ideas into the organization (Hult et al., 2004). This means firms have to take risks (Martinez-Costa et al., 2019). In such context, firms often require sophisticated management accounting information (Bouwens & Abernethy, 2000; Mia & Chenhall, 1994). In addition, management accounting information facilitates planning and coordination in the organization (Bouwens & Abernethy, 2000), technological

change (Mia & Chenhall, 1994), decentralization (Gerdin, 2005; Hartmann, 2005), customization (Perera et al., 1997), and flexibility (Abernethy & Lillis, 1995), which are related to innovation capacity (Shortell & Zajac, 1990). Perera et al. (1997) show that management accounting information is especially necessary for firm efforts to satisfy its customers' needs. The firms, therefore, requires management accounting techniques that provide broad-scope information for managers to implement flexible strategies (Abernethy & Guthrie, 1994). We, therefore, propose our hypothesis as follows:

H₅: The use of management accounting information has a positive effect on innovation capability.

4.6. Linking innovation capability to firm performance

Innovation capacity is required if firms are to maintain themselves with a rapidly changing environment and is, therefore, one of the key drivers of long-term success in business (Baker & Sinkula, 2002; Lyon & Ferrier, 2002). The positive effect of innovation capacity on firm performance has been supported by many theoretical and empirical studies (Calantone et al., 2002). According to the resource-based view of the firm (Barney, 1991), innovation capacity is a socially complex and imperfectly imitable capability that generates competitive advantage and better performance (Auh & Menguc, 2005; Henri, 2006). Moreover, most empirical studies provide evidence that the relationship between innovation capacity and performance is positive (Calantone et al., 2002; Jiménez-Jiménez & Sanz-Valle, 2011; Keskin, 2006). The overall reason is that innovation capacity enables the firm's staff to apply new ways of producing products or services (Hult et al., 2004). Such behaviors "provide the basis for the survival and success of the firm well into the future" (Hult et al., 2004, p. 429). We, therefore, propose the hypothesis:

H₆: Innovation capability has a positive effect on firm performance.



The research model and corresponding hypotheses are shown in Figure 1.

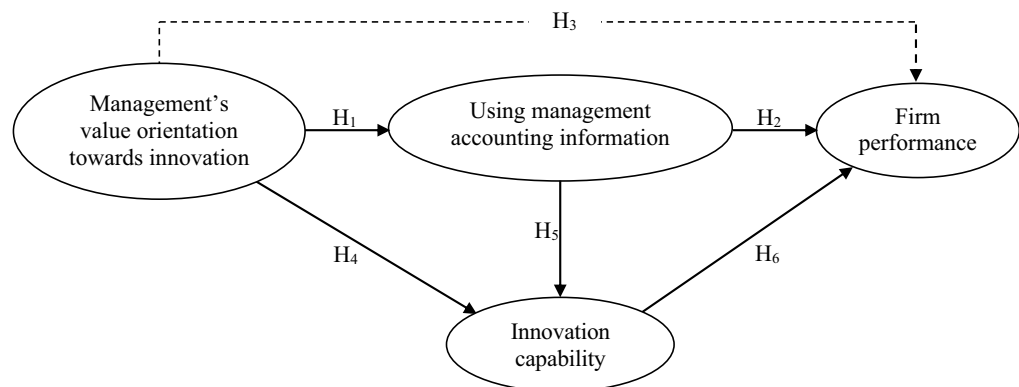
5. Research design

5.1. Sampling and data collection

A self-administered questionnaire was sent to middle and top managers selected from the list of members of the Association of SMEs in South Vietnam (ASMES), Danang Association of SMEs (DANASME), and the Hanoi SMEs Association (HANOISME). These are the three major associations that include firms in Ho Chi Minh City, Binh Duong, Dong Nai (in the South), Da Nang (in the Central) and Hanoi (in the North). The firms in these cities/provinces account for over 62% of the total number of firms in the country (MPI, 2020). A selection of members from these associations was

Figure 1. Research model.

Note: 




combined with a sufficient response rate to ensure representative information. For each enterprise, a top or middle manager (such as CEO, CFO, head of the department) with a minimum of three years' experience was selected to ensure a meaningful understanding of the company and data quality. Our interviewers contacted the respondents in advance by phone to establish their cooperation. Respondents were assured that their answers would be maintained confidential and be used for academic research purposes only. In return for their cooperation they were promised a summary of the survey results.

The questionnaire was sent to the email address of 350 respondents who accepted the survey. After three weeks, the authors sent a reminder email to those who did not respond and after a further reminder email and a last call, the authors obtained 293 responses (83.7%). Because micro-companies often do not have clear business strategies as well as incomplete accounting systems, we chose to eliminate them. After eliminating 57 responses from micro-companies (where the number of employees participating in social insurance is less than 10 people, or the revenue is less than three billion VND), we were able to retain 236 responses. Of the 236 responses, 36 questionnaires were responded by managers that had less than 3 years' experience. A final 200 responses were therefore retained for analysis.

5.2. Measurement scales

First, the original management accounting information scale was developed by Chenhall and Morris (1986) to measure useful awareness of management accounting information. Then, following Agbejule (2005), this scale was adjusted to be more suitable for measuring the level of use of management accounting information. Managers were asked to respond to the level of use of management accounting information on four dimensions: broad-scope (four items), integration (four items), timeliness (four items), and aggregated (three items). *Second*, management's value orientation towards innovation scales were adapted consistent with Chatman and Jehn (1994), O'Reilly et al. (1991), Windsor and Ashkanasy (1996), and McKinnon et al. (2003). This scale has been used in many studies (Baird et al., 2007; 2011; 2018; Chia & Koh, 2007; K. M. Baird et al., 2004; Subramaniam & Mia, 2001). Managers were asked to rate the extent to which they as a member of their firm value the concept of innovation under each item in the instrument on a five-point scale ranging from 1 (not at all) to 5 (to a very great extent). *Third*, innovation capability was measured using a six-item scale adapted from Calantone et al. (2002) and as used by Keskin (2006). Respondents indicated their perceptions on items that were measured on a five-point Likert scale anchored by one (strongly disagree) to five (strongly agree). *Last*, the firm's performance was measured using the scale used by Baines and Langfield-Smith (2003) and Hoque (2011). This measure required respondents to compare the change in their firm performance over the past 3 years, with their competitors, over 10 financial and non-financial dimensions of firm performance. Details of the items are presented in Table 2.

6. Empirical results and discussion

6.1. Descriptive statistics

Table 1 presents the sample information from 200 responses. The results show that most of the firms participating in the survey are in the field of trade and services (59.5%); with agriculture, forestry, and fisheries enterprises accounted for the lowest percentage (4.0%). In terms of revenue, 41.5% of firms have revenue less than 50 billion VND, 32.5% of firms have revenue from 51 billion VND to 100 billion VND, and the remainder are companies with revenue of more than 100 billion VND. The number of employees participating in social insurance was under 50 people for 112 responses (56.0%), from 51 people to 100 people for 78 responses (32.5%), and from 101 people to 200 people for the remainder of the responses. The majority of surveyed firms have an average operating life of 6 to 10 years. In terms of ownership, non-State owned enterprises have the largest percentage, followed by state-owned enterprises, and then Foreign Direct Investment enterprises. Most respondents had the position of middle managers (87.5%), of which the majority were men (76.5%). All of the respondents have bachelor's degrees, with 37.5% of respondents

Table 1. Descriptive statistics of research samples

Demographics	Frequency	Percent	Demographics	Frequency	Percent
<i>Sector</i>			<i>Company's Ownership</i>		
Agriculture, forestry, and fisheries	8	4.0	State-owned	31	15.5
Industry and construction	73	36.5	Non—State owned	143	71.5
Trade and services	119	59.5	Foreign direct Investment	26	13.0
<i>Revenue</i>			<i>Word position</i>		
3–50 billions VND	83	41.5	Top managers	25	12.5
51–100 billions VND	65	32.5	Middle managers	175	87.5
101–200 billions VND	39	19.5	<i>Education</i>		
201–300 billions VND	13	6.5	Bachelor	125	62.5
<i>Number of employees</i>			Master or doctor	75	37.5
10–50 people	112	56.0	<i>Gender</i>		
51–100 people	78	39.0	Male	153	76.5
101–200 people	10	5.0	Female	47	23.5
<i>Firm age</i>			<i>Work experience</i>		
≤ 5 years	83	41.5	3–5 years	57	28.5
6–10 years	94	47.0	6–10 years	122	61.0
> 10 years	23	11.5	> 10 years	21	10.5

Table 2. Scale items and latent variable evaluation

Construct and items		Loading	T-value
<i>Broad-scope management accounting information (AVE = 0.69; CR = 0.90, CA = 0.85)</i>			
BROA1	Information that relates to possible future events (if historical information is most useful for your needs, mark the lower end of the scale).	0.88	46.59
BROA2	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).	0.83	31.76
BROA3	Non-economic information, such as customer references, relations, attitudes of government and consumer bodies, competitive threat, etc.	0.80	24.72
BROA4	Information on broad factors external to your organization, such as economic conditions, technological development, etc.	0.81	27.57
<i>Timeless management accounting information (AVE = 0.63; CR = 0.87, CA = 0.80)</i>			
TIME1	Requested information arrives immediately upon request.	0.82	25.53
TIME2	Information is supplied to you automatically upon its receipt into information systems or as soon as processing is completed.	0.76	19.28
TIME3	There is no delay between an event occurring and the relevant information being reported to you.	0.81	32.82
TIME4	Reports are provided frequently on a systematic, regular basis, e.g. daily reports, weekly reports.	0.77	22.22
<i>Aggregation management accounting information (AVE = 0.82; CR = 0.93, CA = 0.89)</i>			
AGGR1	Information in forms, which enables you to conduct what if analysis.	0.92	52.71
AGGR2	Information on the effects of events on particular time periods (e.g. monthly/quarterly/annual summaries, trends, comparisons, etc.)	0.90	45.06

(Continued)

Construct and items		Loading	T-value
AGGR3	Information in formats suitable for input into decision models (such as discounted cash flow analysis or incremental marginal analysis)	0.90	42.06
<i>Integration management accounting information (AVE = 0.65; CR = 0.88, CA = 0.82)</i>			
INTE1	Cost and price information of departments of your business unit.	0.83	30.98
INTE2	Presence of precise targets for each activity performed in all sections within your department.	0.79	25.67
INTE3	Information that relates to the impact that your decisions have on the performance of other departments.	0.82	30.81
INTE4	Information on the impact of your decisions throughout your business unit, and the influence of other individual's decision on your area of responsibility.	0.78	23.16
<i>Management's value orientation towards innovation (AVE = 0.71; CR = 0.91; CA = 0.86)</i>			
VOI1	Being innovative	0.85	36.21
VOI2	Being quick to take advantage of opportunities	0.81	24.01
VOI3	Having a willingness to experiment with new ideas	0.81	28.24
VOI4	Being risk-taking	0.88	51.63
VOI5	Being careful *	—	—
VOI6	Being rules oriented *	—	—
<i>Innovation capability (AVE = 0.64; CR = 0.90; CA = 0.86)</i>			
INNO1	Our company frequently tries out new ideas.	0.85	37.19
INNO2	Our company seeks out new ways to do things.	0.83	35.03
INNO3	Our company is creative in its methods of operation.	0.84	34.10
INNO4	Our company is often the first to market with new products and services.	0.70	13.02
INNO5	Innovation in our company is perceived as too risky and is resisted. *	—	—
INNO6	Our new product introduction has increased over the last 5 years.	0.78	23.13

(Continued)

Table 2. (Continued)

Construct and items		Loading	T-value
<i>Financial performance (AVE = 0.59; CR = 0.88; CA = 0.83)</i>			
PER_F1	Operating profit	0.82	31.95
PER_F2	Return on investment	0.74	18.96
PER_F3	Sales growth rate	0.74	19.19
PER_F4	Cost reduction	0.75	18.66
PER_F5	Cash flow from operation	0.79	29.33
<i>Non—financial performance (AVE = 0.59; CR = 0.88; CA = 0.82)</i>			
PER_nF1	Market share	0.62	10.89
PER_nF2	Market development	0.81	23.10
PER_nF3	Research & development	0.78	21.37
PER_nF4	New product development	0.74	18.21
PER_nF5	Personnel development	0.88	39.65

Note: *: items deleted due to low-outer loadings; AVE: Average Variance Extracted; CR: Composite Reliability; CA: Cronbach's Alpha.

having either a masters or doctor qualification. The average working experience is from 6 to 10 years. The respondents were therefore deemed to have enough sufficient knowledge and work experience to address the statements in the questionnaire.

6.2. Measurement model evaluation results

In this study, we use SmartPLS3 software to analyze the research findings. The results of the scale evaluation for the variables in the model are shown in Table 2. Accordingly, the VOI5 variable has an outer loading of 0.20, VOI6 has outer loading of 0.11 and INNO5 has an outer loading of 0.08 (< 0.50), which should be excluded from the model (Hulland, 1999). After excluding VOI5, VOI6 and INNO5 variables, the factor loading of all items is in the range from 0.62 to 0.92, higher than the cut-off value of 0.5 (Table 2). The t-values of all items are in the range from 10.89 to 52.71, satisfying the condition greater than 1.96 to be statistically significant. The Average Variance Extracted (AVE) of all latent variables in the model is accepted because they are higher than 0.50 (ranging from 0.59 to 0.82) (Hair et al., 2017). Furthermore, the Composite Reliability (CR) of all variables is higher than 0.7 (from 0.88 to 0.93), and Cronbach's alpha is greater than 0.7 (from 0.80 to 0.89) (Hair et al., 2017; Nunnally & Bernstein, 1994). Thus, the scales reach the required reliability and convergence values.

Table 3 shows the discriminant validity of the scale through the square roots of Average Variance Extracted (AVE) of all constructs ranging from 0.77 to 0.91, which are well above the corresponding correlations between these constructs (from -0.01 to 0.66). Moreover, the correlation coefficients of constructs (numbers below the diagonal) are smaller than the Composite Reliability (CR) (shown in Table 2 with values from 0.88 to 0.93) which demonstrate that the scales for constructs ensure discriminant validity (Fornell & Larcker, 1981). Lastly, we employed the Heterotrait-Montrait (HTMT) test to evaluate the discriminant validity of constructs (Henseler et al., 2015). Table 3 shows that the HTMT values, which were computed based on a bootstrapping routine, ranging between 0.19 and 0.65 (significantly below 0.90), provide clear evidence for discriminant validity.

6.3. Hypotheses testing results

The coefficient of determination (R^2) is used to assess the predictive capability of the exogenous variables. Results in Table 4 show that R^2 values of using management accounting information are weak ($R^2 = 0.18$); R^2 values of firm performance and innovation capability are medium (R^2 Firm

Table 3. Construct means, standard deviations, and correlations

Construct	1	2	3	4	5	6	7	8
1. Management's value orientation towards innovation	0.84							
2. Broad-scope management accounting information	0.26 0.30	0.83						
3. Timeless management accounting information	0.26 0.31	0.55 0.65	0.79					
4. Aggregation management accounting information	0.19 0.22	0.60 0.68	0.53 0.63	0.91				
5. Integration management accounting information	0.24 0.28	0.64 0.76	0.52 0.64	0.66 0.78	0.81			
6. Innovation capability	0.38 0.44	0.43 0.50	0.55 0.66	0.52 0.60	0.62 0.74	0.80		
7. Financial performance	0.08 0.11	0.32 0.39	0.26 0.32	0.35 0.41	0.40 0.49	0.38 0.45	0.77	
8. Non—financial performance	−0.01 0.09	0.28 0.32	0.17 0.20	0.38 0.43	0.41 0.49	0.38 0.45	0.46 0.56	0.77

Note: numbers on the diagonal (bold) are the square root of Average Variance Extracted (AVE); In each cell, the first value indicates the correlation between variables and the second value (italic) is the HTMT ratio.

performance = 0.25; R^2 Innovation capability = 0.45) (Hair et al., 2017). The results also reveal the variance-inflating factor (VIF) <0.5 (Hair et al., 2017). The correlation coefficients among the variables are lower than the cut-off value of 0.7 (Table 3), so that multicollinearity between the independent variables is not an issue in this study (Tabachnick & Fidell, 2012).

Predictive relevance (Q^2) is also used to evaluate the out-of-sample predictive power. The results of Table 4 show that the Q^2 coefficients of the exogenous variables are greater than zero. Thus, they support the model's predictive capacity (Hair et al., 2017).

To examine hypotheses about the relationships, we rely on the value of the coefficient β , p-value, and t-value (see Table 4).

Surveying the results in Table 4, we observe that all the hypotheses are supported with a statistical significance of 1% (t-value >2.58). The values of the coefficient β on the paths are

Table 4. Hypotheses testing results				
Effects	β	p-value	t-value	Conclusion
Indirect effects				
H ₁ : Management's value orientation towards innovation → Using management accounting information	0.29***	0.003	2.97	Do not reject null hypothesis
H ₂ : Using management accounting information → Firm performance	0.30***	0.001	3.36	Do not reject null hypothesis
H ₄ : Management's value orientation towards innovation → Innovation capability	0.22***	0.001	3.21	Do not reject null hypothesis
H ₅ : Using management accounting information → Innovation capability	0.57***	0.000	8.81	Do not reject null hypothesis
H ₆ : Innovation capability → Firm performance	0.32***	0.000	3.56	Do not reject null hypothesis
Indirect effects				
H ₃ : Management's value orientation towards innovation → Firm performance	0.13***	0.005	2.79	Do not reject null hypothesis
R^2 Using management accounting information = 0.18 R^2 Innovation capability = 0.45 R^2 Firm performance = 0.25	Q^2 Using management accounting information = 0.04 Q^2 Innovation capability = 0.28 Q^2 Firm performance = 0.10			

Note: *** Correlation is significant at the 1% level (2-tailed t-test).

positive, indicating that the significant relationship between the variables in the model is positive. From the tests of hypotheses H_1 , we confirm that management's value orientation towards innovation has a significant and positive effect on the use of management accounting information ($\beta = 0.29$; $p < 0.01$; $t = 2.97$). Our findings, therefore, support hypothesis H_2 ($\beta = 0.30$; $p < 0.01$; $t = 3.36$), meaning that the greater the use of management accounting information, the higher the firm's performance. Significant and positive relationships are found between management's value orientation towards innovation and innovation capability ($\beta = 0.22$; $p < 0.01$; $t = 3.21$), meaning that hypotheses H_4 is supported. Our findings indicate that the level of use of management accounting information has a significant and positive impact on innovation capability ($\beta = 0.57$; $t = 8.81$), so that hypothesis H_5 is also supported. Hypothesis H_6 is also supported ($\beta = 0.32$; $p < 0.01$; $t = 3.56$), implying that innovation capability plays a significant role in promoting firm performance.

In regards to hypothesis H_3 , the results (Table 4) reveal that the indirect effect of management's value orientation towards innovation on firm performance through the use of management accounting information is significant ($\beta = 0.13$; $p < 0.01$; $t = 2.79$). Furthermore, the direct effect of management's value orientation towards innovation on firm performance is insignificant ($\beta = -0.09$; $p > 0.05$; $t = 1.14$). Therefore, the use of management accounting information is that of mediation for the relationship between management's value orientation towards innovation and firm performance.

6.4. Common method bias testing results

In this study, a top-level or mid-level manager has been chosen to represent their firm's responses to our questionnaire. Because a manager responds to all statements (observed variables) in the questionnaire, this may lead to a common method bias (Podsakoff et al., 2003). We, therefore, applied Harman's single-factor test to assess for a common method bias. This is a method that is commonly applied in many recent studies to test common method bias (Le & Nguyen, 2019; Li & Liu, 2014; Naranjo-Gil & Hartmann, 2007; Nguyen, 2018; Y. T. Tran & Nguyen, 2020; L. v. Ngo et al., 2019). The results show that the first factor accounted for only 31.12%, implying that single-source bias is not a significant concern (Podsakoff et al., 2003).

6.5. Discussion

Firstly, the results of this research reveal that management's value orientation towards innovation has a positive direct effect on the use of management accounting, which in turn leads to higher firm performance. In addition, this study reveals a fully mediating role of using management accounting in the relationship between management's value orientation towards innovation and firm performance. As a result, this study contributes to the contingency-based management accounting research, specifically: our study provides empirical evidence to reinforce the literature on the relationship between management's value orientation towards innovation and the use of management accounting information in SMEs. Furthermore, management's value orientation towards innovation as a contextual variable affects the use of management accounting information (Chia & Koh, 2007; Subramaniam & Mia, 2001). In addition, this study provides empirical evidence to reinforce the feasibility of the mediating model as proposed by Chenhall (2006). The study has determined outcomes that are consistent with the arguments of Chenhall (2006) and Otley (2016) that management's value orientation towards innovation does not automatically lead to a higher firm performance. We conclude that management's value orientation towards innovation promotes firm performance via maintaining and developing sophisticated management accounting information systems that support managers' decision-making, especially decisions in regard to the firm's innovation. In such a manner, the study has contributed to the management accounting literature by offering more complete explanations of the antecedents and consequences of the use of management accounting information (Chenhall, 2006; Luft & Shields, 2003).

Secondly, our results provide empirical evidence to support a positive relationship between innovation capability and firm performance (financial and non-financial) for Vietnamese SMEs. Under competitive pressure, firms have to innovate continuously to satisfy customers and respond to competitors (Calantone et al., 2002; Helfat et al., 2007; Keskin, 2006). At present, Vietnamese SMEs not only compete with each other and with large enterprises, but also compete with powerful multinational corporations, with no industry or field able to avoid such competitive pressure (Otley, 2016). Thus, innovation capability is one of the key drivers for the success of SMEs (Keskin, 2006), implying that SMEs must sustain a constant effort to improve the quality and diversity of their products and services; improve fast delivery and utility processes; and increase investment in research and development activities, in order to gain competitive advantage, thereby enhancing firm performance.

Thirdly, the results provide empirical evidence to support the effects of management's value orientation towards innovation and the use of management accounting information on innovation capability. These results imply that Vietnamese SMEs must improve their management accounting information system to provide broad-scope, timeless, aggregated, and integrated information to implement a successfully innovative strategy. In addition to traditional management accounting practices, SMEs should learn and adopt strategic management accounting practices such as activity-based costing, balanced scorecards, and total quality management (Cadez & Guilding, 2008). In addition, firms also need to develop and maintain an organizational culture toward innovation that supports innovative and creative ideas (Subramaniam & Mia, 2001).

7. Summary and conclusion

This study has revealed a positive relationship between management's value orientation towards innovation as influenced by management accounting information, and the firm's innovation capability and outcome firm performance. In addition, the study has revealed a fully mediating role of management accounting information in the relationship between management's value orientation towards innovation and firm performance based on the mediating fit form of contingency theory.

Our study, nevertheless, has limitations. Firstly, the sample size is quite small ($n = 200$) and may not be highly representative of the population. Secondly, this study does not include all the control variables that can affect firm performance. Thus, further studies are called on to examine the impact of control variables such as size, firm age, sector, ownership structure, and so on (see Nguyen, 2018; Nguyen & Doan, 2016). Thirdly, this study employs cross-sectional data, which has inevitable drawbacks in reflecting the evolution of the use of management accounting information and firm performance. The use of longitudinal data might also provide a future direction for studies (see Luu, 2017). Finally, although we have checked common method bias according to consistent with Podsakoff et al. (2003), future studies may be able to design more carefully constructed research, specifically by dividing the questionnaire into two parts and sending it to two different respondents, and by collecting both primary data (survey) and secondary data for the analysis.

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Note

1. Management control systems is a broader term that encompasses management accounting system and also includes other controls such as personal or clan controls (Chenhall, 2006).

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