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Performance implication of market orientation and use of management accounting systems

The moderating role of accountants' participation in strategic decision making

MO and use
of MASs

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Abstract

Purpose – Drawing upon the resource-based view and the contingency theory, the purpose of this paper is to build and test a framework of: the interaction between market orientation (MO) and accountants' participation in strategic decision making; and its subsequent effect on the use of management accounting systems (MASs), which, in turn, enhances firm performance.

Design/methodology/approach – The hypotheses were empirically tested using partial least square-structural equation modeling with survey data from 171 large business firms in Vietnam. The standardized root mean squared residual value of the composite model was also examined using SmartPLS3 to test the model fit. The marker-variable technique was employed to test common method bias.

Findings – This study has two key findings: first, the use of MAS (in terms of broad scope, timeliness, aggregation, and integration) mediates the effect of MO on firm performance. Second, the degree of accountants' participation in strategic decision making elevates the positive relationship between MO and the use of MAS.

Originality/value – This study is one of the first empirical attempts to test the contingent roles of accountants' participation in strategic decision making and the use of MAS information in driving performance of market-oriented firms in the context of a transition market.

Keywords Market orientation, Management accounting systems, Accountants' participation in strategic decision making, Transition market

Paper type Research Paper

1. Introduction

The traditional hypothesized relationship between market orientation (MO) and firm performance has been well established and validated in the area of marketing (e.g. Jaworski and Kohli, 1993; Narver and Slater, 1990) and strategic management (e.g. Hult and Ketchen, 2001; Morgan *et al.*, 2009). This relationship has been proved to be positive, significant, and robust (Cano *et al.*, 2004; Ellis, 2006; Kirca *et al.*, 2005). In explaining this phenomenon, scholars are motivated to explore how firms possess MO and deploy this market-based asset to develop and sustain competitive advantages (Kirca *et al.*, 2005). Then the market orientation-firm performance linkage has been unpacked and explored by various studies searching for various mediating factors connecting MO and firm performance. For example, organizational innovativeness and learning orientation are mediating factors that have been explored by scholars from the innovation and learning-based perspective (e.g. Baker and Sinkula, 1999;

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Deshpandé and Farley, 2004; Han *et al.*, 1998; Keskin, 2006). Other explored mediating factors are branding orientation (O'Cass and Voola, 2011), product advantage (Langerak *et al.*, 2004), and new products and related marketing programs creativity (Im and Workman, 2004).

Influenced by the MO trend in the 1990s, management accounting research has experienced a boom in an interest in market-oriented management accounting (Helgesen, 2007). This signifies the potential use of management accounting system (MAS) information in the market-oriented setting. The path from the use of MAS to firm performance was validated in some studies (e.g. Agbejule, 2005; Chia, 1995). Specifically, the connection between MO and the use of MAS, via different management accounting techniques, was also examined by some scholars in the field of strategic management accounting (SMA) (Bromwich, 1990; Cadez and Guilding, 2008, 2012). Guilding and McManus (2002) revealed that MO has a positive effect on the use of these following management accounting techniques: customer accounting, customer segment profitability analysis, and valuation of customers or customer groups as assets. However, the review of management accounting literature has found little empirical evidence to support the path from MO to firm performance. The exceptional study by Cadez and Guilding (2008) sought to test the mediating effect of SMA techniques on the relationship between MO and firm performance in Slovenian companies. However, they found a non-significant relationship between MO and the use of SMA. Whether the use of management accounting information, via the design of MAS in terms of broad scope, timeliness, aggregation, integration (Chenhall and Morris, 1986), connects MO to firm performance remains unanswered in emerging markets (Nguyen and Doan, 2016). This question is significant because MO-MAS-performance link can provide managers of market-oriented firms with implications on how to develop and sustain competitive advantages via different dimensions of MAS use.

The second gap is also found at the marketing/accounting interface where little is known about the performance implication of the interaction between marketing and accounting functions, considered limited in the literature (Foster and Gupta, 1994; Phillips and Halliday, 2008; Ruckert and Walker, 1987). Some studies confirmed the performance implications of accountants' participation and involvement in strategic decisions (Cadez and Guilding, 2008, 2012) and operational process changes (Johnston *et al.*, 2002). However, few empirical studies (e.g. Aver *et al.*, 2009) have been done to examine the accounting department's participation in strategic decision making in the MO setting. This kind of participation can be a potential contextual factor that may moderate the relationship between MO and the use of MAS. In other words, the interaction between MO and accounting department's participation in strategic decision making in fostering the MAS use in terms of broad scope, timeliness, aggregation, integration (Chenhall and Morris, 1986) remains unknown in the literature. This gap is significant because bridging it can provide both managerial implications in the way market-oriented companies configure their organizational accounting structure to foster the use of MAS toward competitive advantages (Holm *et al.*, 2016).

There are two research questions proposed in this study:

RQ1. How firms possess MO to enhance performance?

RQ2. How do accountants (in market-oriented firms) influence this possession?

This study aims to examine the performance implications of the interaction between MO strategy and accountants' participation in strategic decision making. In doing so, this study adds to the view of Cadez and Guilding (2008) by challenging that rather than influencing the use of MAS information directly, accountants' participation in strategic decision making can also be a potential moderating factor that explain the difference in the use of MAS information across market-oriented firms. Furthermore, this study aims to investigate the impact of the enhanced used of MAS, as the results of the interaction between MO and accountants' participation in strategic decision making, on firm performance in the context of Vietnam, an emerging market.

To formulate the research model and answer the research questions this study employs two underpinning theories: the resource-based view (RBV) and the contingency theory. The former refers to the competence a firm possesses which can be identified and sustains its competitive advantages in the market (Wernerfelt, 1984). In this regard, the RBV suggests that such competitive advantage can be obtained through its ability to accumulate resources and capabilities that satisfy VRIN (valuable, rare, inimitable, and non-substitutable) conditions (Dyer and Singh, 1998). This study argues that both MO and MAS use are strategic resources that can meet the VRIN conditions. Drawing on the RBV, this study posits that there is a path from MO to firm performance via the use of MAS. Additionally, the contingency theory suggests that key strategic requirements vary depending upon environmental conditions (Chenhall, 2003; Prescott, 1986). This study claims that the use of MAS is contingent on the fit between marketing strategy (MO) and internal organizational context/ environment (accountants' participation strategic decision making). In other words, a potential moderating role of the use of MAS, a contextual factor, with respect to the MO-firm performance link can be explained from the contingency perspective. Drawing upon the RBV and the contingency theory, this study confirms the MO-MAS-PEFR path in the Vietnamese context (Nguyen and Doan, 2016) and introduces the moderating effect of an accounting factor (accountant's participation in strategic decision making) on the path, which has not been examined in previous studies. The obtained results can help explain the process through which MO strategy and the MAS environment can be integrated toward enhancing firm performance.

The paper is presented as follows. First, both the RBV and the contingency theory allow for addition of the two contingent factors (i.e. MAS use and accountants' participation in strategic decision making) to the link between MO and firm performance. This study then presents the research design and analysis as well as the results, discussion, and implications.

2. Theoretical background, research model, and hypotheses

2.1 *The mediating role of MAS*

MO refers to the orientation of a firm (in terms of customer orientation, competitor orientation, and interfunctional coordination) toward creating superior value for its customers (Narver and Slater, 1990). MAS are generally defined as the systems that generate management accounting information for internal users. According to Chenhall and Morris (1986), the MAS have four dimensions: broad scope, timeliness, aggregation, and integration. Traditional MAS information in terms of scope would include information that is confined to the organization, financial in nature and essentially historical. Nevertheless, broad scope MAS information would also provide information that is external, non-financial, and future-oriented including probabilistic data. Timeliness refers to the provision of information on request and the frequency of reporting systematically collected information (Chenhall and Morris, 1986). An MAS that is characterized by the existence of high frequency reports and rapid feedback is considered to be more useful than one that lacks these features (Chenhall and Morris, 1986). The aggregation dimension refers to the aggregation of information according to functional areas over time, which can be reflected in summary reports of activities of business units in a condensed format (Chenhall and Morris, 1986). Integration relates to the interaction between sub-units of mutual dependence in term of information sharing (Bouwens and Abernethy, 2000).

In market-oriented firms, MAS processes provide more broad scope information (including both financial and non-financial information). Firms need both financial information (e.g. customer revenues, customer costs, and customer profitability) and non-financial information regarding the customer value-creating processes (e.g. customer satisfaction, customer loyalty, and antecedents of those performance measures). Firms with a high level of

MO have a relatively strong external orientation (Guilding and McManus, 2002). For example, firms with a high level of customer orientation are more likely to develop and use MAS (broad scope and timeliness) information with respect to customers' preferences and behaviors to customize or develop products and create superior value for customers more effectively than their competitors (Inglis, 2005). In addition, competitor orientation clearly requires the use of MAS developed as part of a customer orientation, enabling a competitor-cost comparison to be undertaken at the same (product) level (Inglis, 2005). Therefore, MO can have a positive effect on the use of MAS.

The hypothesized relationship between MAS and firm performance can be explained via the RBV of the firm (Peteraf, 1993; Wernerfelt, 1984). The RBV refers to competitive advantage obtained through a firm's ability to accumulate resources and capabilities that satisfy the VRIN conditions (valuable, rare, inimitable, and non-substitutable) (Dyer and Singh, 1998). This study argues that MAS is a strategic resource that meets the VRIN conditions. MAS can disseminate products/services and finance and market information across functional boundaries within the firm so that this information can be processed and converted into knowledge via learning. According to the knowledge-based theory, knowledge is a valuable resource that can result in competitive advantage and superior performance (Grant, 1996).

In addition, MAS should be designed to meet different needs of different firms. This argument can be explicated via the contingency theory, which presumes that there is no best way to design the best MAS for all firms (Cadez and Guilding, 2008; Chenhall, 2003). The design of MAS depends on numerous contingent factors (e.g. structure, environmental uncertainty, competitive intensity, technology, competitive strategy, and firm size). Therefore, the configurations of MAS are firm-specific (Abdel-Kader and Luther, 2008) and considered as inimitable resources. Moreover, information from MAS can be processed and converted into knowledge to become a unique strategic resource for competitive advantages (Smith *et al.*, 1996); hence, it satisfies the rare condition. Thus, MAS satisfies the VRIN conditions (Carter and Toms, 2010) and can help firms plan, control, and make better decisions. Therefore, a positive association between the use of MAS and firm performance (PERF) is expected. Building upon the above arguments, MO can positively influence the use of MAS, which, in turn, enhances firm performance. In other words, MO can indirectly influence firm performance via the use of MAS.

Moreover, the direct relationship between MO and firm performance has been well established in the marketing literature (Jaworski and Kohli, 1993; Narver and Slater, 1990). This study argues that MO culture complies with the VRIN (valuable, rare, inimitable, and non-substitutable) conditions (see Zhou *et al.*, 2008). Hence, a positive relationship between MO and firm performance can be hypothesized. In this regard, MO can have both direct and indirect effects on firm performance (via the use of MAS). This study proposes the following mediating hypothesis:

H1. The use of MAS partially mediates the relationship between MO and firm performance.

2.2 The moderating role of accountants' participation

The importance of management accounting practices is increasing with more demands of new business environment. Business organizations require more management accountants with requisite skills and business intelligence who can produce much more qualitative, more future-oriented, and broader scope information (Anderson and Lanen, 1999). In today's business organizations, accountants should be more proactive in developing MAS that support strategic management (Fry *et al.*, 1995). Accountants also play an important role in providing financial and non-financial information in cross-functional teams for strategic

decision making. This study claims that more accountants' participation in providing information for strategic decision making may be productive of higher use of MAS. SMA systems require full cooperation between accountants and other functional managers in term of sharing information via MAS (Bromwich and Bhimani, 2005). Therefore, more accountants' participation in the design and implementation of MAS can promote a higher use of MAS (Abernethy and Bouwens, 2005). In addition, more accountants' participation in MAS development can result in more use of MAS from functional managers with more regular system update (Pierce and O'Dea, 2003).

Based on the contingency theory (Chenhall, 2003), this study argues that the usage of MAS requires a fit (an interaction) between MO and accountants' participation in strategic decision making. In particular, accountants' participation in strategic decision making can reinforce the influence of MO on the usage of MAS for strategic decision making, shaping the role of the accounting department in developing the organization's MAS in a market-oriented setting. In market-oriented firms, accountants' participation in strategic decision making can provide motivation and pressure for accountants to add value to the strategic decision making process (Oliver, 1991). The motivation and pressure instill "a greater appreciation of the justifiability of expending resources developing MAS and also incurring on-going costs" associated with MAS design and implementation (Cadez and Guilding, 2008). Therefore, in market-oriented firms, if accountants participate more in the strategic decision making, they can exert more power toward the MAS development process, and thus market-oriented firms are more likely to spend more resources in MAS design and implementation, thereby promoting more MAS usage. Hence, the link between MO and MAS usage is strengthened with the increase in accountants' participation in strategic decision making. This study proposes the following hypothesis:

H2. Accountants' participation in strategic decision making positively moderates the relationship between MO and the use of MAS.

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

3. Research method

3.1 Sampling and data collection

This study, conducted in Vietnam, an emerging economy, features a data set of 171 large business firms. The sample is restricted to large firms only as these possess sufficient financial resources to operate independent marketing and management accounting functions. According to Degree 56 ND-CP of the Vietnamese government, the conditions of being a large firm are as follows. For the manufacturing industry, firms need to have total capital of more than VND 100 billion, or more than 300 full-time equivalent employees. For service and trading industries, firms need to have total capital of more than VND 50 billion, or more than 100 full-time equivalent employees. To include such specific firms in the

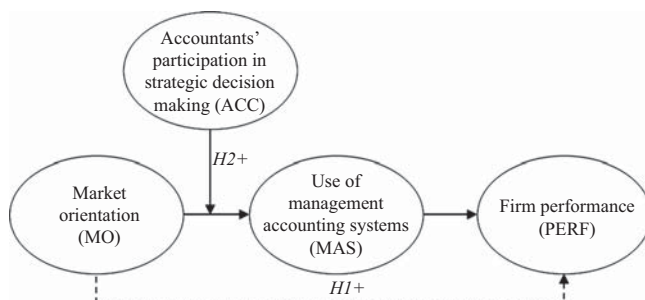


Figure 1.
The proposed model

sample a convenience-sampling approach has been used to identify potential participants and qualifying questions were asked at the commencement of the survey to identify relevant firms. Selection criteria include: presence of independent marketing and management accounting departments; and large organizational size according to the Degree 56 ND-CP.

E-mail surveys were then distributed to top- and mid-level managers from different Vietnamese business organizations. The potential informants are CEOs and board members and other mid-level managers from the marketing and accounting functions of large-sized firms. The targeted informants should satisfy the following conditions. First, they should be top- and/or mid-level managers in Vietnamese companies with the presence of the marketing and accounting departments. Second, they should be responsible for the accounting issues and/or have strong work interactions with the accounting department. Third, they should be knowledgeable about MO and firm performance. Finally, they should have certain job titles, such as CEO, (vice) president, managing director, CFO, chief accountant, marketing manager, and other managerial positions with strong work interactions with the management accounting department.

The sampling frame includes 3,000 e-mail addresses of the potential informants (that may have all the above characteristics) from the principal researcher's personal LinkedIn social network. The original survey items in English have been translated into Vietnamese and back-translated following the procedure suggested by Brislin (1970) by two academics who have competence in both English and Vietnamese. To ascertain the validity of the survey, the translated Vietnamese survey items have been pretested by both managers and academics (with and without accounting background) for wording, relevancy, and comprehension. Final version of the survey questionnaires has been circulated to the potential informants via SurveyMonkey, an online survey administration tool.

By e-mailing 3,000 potential respondents with two follow-ups, the author has received 751 responses. After elimination of 153 incomplete responses, 91 responses with too short response duration (less than 5 minutes), and 346 responses from SMEs, the final sample consists of 171 valid responses. Table I shows the demographics of the participating firms and respondents. The final sample reflects 56.1 percent mid-level managers and 43.9 percent are top-manager respondents. Average tenure of the respondents of 6.8 years indicates that they have adequate experience to represent their firms to answer the survey. The sample comprises 53.2 percent services, 33.3 percent manufacturing, and only 13.5 percent trading firms. The sample well reflects the industrial structure of Vietnam in which the services industry accounts for approximately 50 percent of GDP of Vietnam in 2015 followed by manufacturing at 33 percent (PwC Vietnam, 2016). In total, 79 percent of the sampled firms have total assets of more than VND500 billion. In addition, 76.0 percent of them have more than 500 full-time equivalent employees. In total, 90 percent of them have more than five years of operation. As the response rate is low at 5.7 percent, this study conducts a non-response bias test following the procedure recommended by Armstrong and Overton (1977). The independent *t*-tests reveal no statistically significant differences in all key measures among the first (earliest) and fourth (latest) quartiles of responses, signifying no response bias in this research study.

3.2 Measurement scales and reliability and validity tests

MO is measured using the scale from Zhou *et al.* (2008), which is a short version of Narver and Slater (1990). This construct has eight items, covering three dimensions: customer orientation (three items), competitor orientation (two items), and interfunctional coordination (three items). The scale for accountants' participation in strategic decision making is adapted from Wooldridge and Floyd (1990) and Cadez and Guilding (2012). Respondents have been asked to rate the accountants' participation in five aspects of the strategic

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Demographics	Frequency (<i>n</i> = 171)	Percent	Demographics	Frequency (<i>n</i> = 171)	Percent
<i>Job position</i>			<i>Firm size in total assets (VND billion)</i>		
Top managers	75	43.9	101-200	14	8.2
Mid-level managers	96	56.1	201-500	22	12.9
			501-1,000	22	12.9
<i>Tenure</i>			>1,000	113	66.0
<2 years	23	13.5			
2-5 years	72	42.1	<i>Firm size in number of employees</i>		
6-10 years	45	26.3	201-500	41	24.0
11-20 years	24	14.0	501-1,000	47	27.5
> 20 years	7	4.1	1,001-5,000	50	29.2
			5,001-10,000	15	8.8
<i>Industry</i>			>10,000	18	10.5
Manufacturing	57	33.3			
Trading	23	13.5	<i>Firm type</i>		
Services	91	53.2	100 percent foreign-owned enterprise	52	30.4
			SOEs (≥51 percent states capital)	17	9.9
<i>Firm age</i>			Private company	55	32.2
≤5 years	18	10.5	JV with international partner	23	13.5
6-10 years	31	18.1	JV with local partner	6	3.5
11-20 years	66	38.6	Others	18	10.5
21-50 years	48	28.1			
>50 years	8	4.7			

Table I.
Demographics of the
participating firms
and respondents

process, including identifying problems and proposing objectives, generating and evaluating options, developing details about options, and taking the necessary actions to put changes into place. MAS use is measured following Agbejule (2005) and Chenhall and Morris (1986). As such, managers have been required to rate the “extent of use” of management accounting information systems in terms of broad scope (four items), integration (three items), timeliness (four items), and aggregation (four items) in their respective organizations. Firm performance is measured based on Jaworski and Kohli (1993) and Calantone *et al.* (2002). Following Luo *et al.* (2006), this study incorporates firm age, firm size in terms of total assets and full-time equivalent employees, and ownership (SOE/non-SOE) as control variables (see Table II for the scales of the main constructs).

The measurement scales are first tested in terms of reliability. Table II shows that the outer loadings of all observed variables of all the main constructs range between 0.83 and 0.95 and higher than the cut-off value of 0.5 (Hulland, 1999). All the corresponding *t*-bootstrap values are above 1.96 and are thus statistically significant (range between 6.07 and 96.22). The average variance extracted (AVE) values of all the latent variables are acceptable as they are higher than 0.5 (range between 0.76 and 0.90). In addition, the composite reliabilities of these latent variables are between 0.93 and 0.96. These results indicate a high level of reliability of the measurement scales in the model.

The author evaluates the discriminant validity of the measurements following the procedure proposed by Fornell and Larcker (1981). Table III shows that the square roots of AVE of the main constructs range between 0.87 and 0.95, which are well above the corresponding correlations between these constructs (range between -0.06 and 0.83), thus indicating the discriminant validity of the measurements. In addition, discriminant

Construct and items	Loading	t-value
<i>Market orientation</i>		
Customer orientation (CR = 0.94; AVE = 0.84)		
Our business objectives are driven primarily by customer satisfaction	0.91	41.61
Our strategies are driven by beliefs about how we can create greater value for customers	0.94	62.48
We emphasize constant commitment to serving customer needs	0.91	41.51
Competitor orientation (CR = 0.95; AVE = 0.90)		
We regularly share information concerning competitors' strategies	0.95	92.09
We emphasize the fast response to competitive actions that threaten us	0.95	96.22
Interfunctional coordination (CR = 0.95; AVE = 0.85)		
We regularly communicate information on customer needs across all business functions	0.94	74.79
We frequently discuss market trends across all business functions	0.93	73.07
All of our business functions are integrated in serving the needs of our target markets	0.90	43.90
<i>Use of Management Accounting Systems</i>		
Scope (CR = 0.93; AVE = 0.76)		
Information that relates to possible future events (if historical information is most useful for your needs, mark the lower end of the scale).	0.83	21.76
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	30.08
Non-economic information, such as customer references, relations, attitudes of government and consumer bodies, competitive threat	0.91	46.08
Information on broad factors external to your organization, such as economic conditions, population growth, technological development, etc.	0.86	35.90
Timeliness (CR = 0.94; AVE = 0.79)		
Requested information arrives immediately upon request	0.91	56.40
Information supplied to you automatically upon its receipt into information systems or as soon as processing is completed	0.93	65.81
There is no delay between an event occurring and the relevant information being reported to you	0.87	18.13
Reports are provided frequently on a systematic, regular basis, e.g., daily reports, weekly reports	0.84	35.88
<i>Use of Management Accounting Systems (continued)</i>		
Aggregation (CR = 0.93; AVE = 0.81)		
Information in forms, which enable you to conduct what if analysis	0.90	47.46
Information on the effects of events on particular time periods (e.g. monthly/quarterly/annual summaries, trends, comparisons, etc	0.89	35.98
Information in formats suitable for input into decision models (such as: discounted cash flow analysis or incremental marginal analysis)	0.91	56.46
Integration (CR = 0.94; AVE = 0.81)		
Cost and price information of departments of your business unit	0.84	24.06
Presence of precise targets for each activity performed in all sections within your department	0.91	50.29
Information that relates to the impact that your decisions have on the performance of other departments	0.93	46.60
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	58.92
Accountants' participation in strategic decision making (CR = 0.95; AVE = 0.80)		
Identifying problems and proposing objectives	0.89	7.40
Generating options	0.95	6.66
Evaluating options	0.93	6.56

Table II.
Scale items and latent variable evaluation

(continued)

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Table II.

Construct and items	Loading	t-value
Developing details about options	0.86	6.07
Taking the necessary actions to put changes into place	0.88	7.33
Firm performance (CR = 0.96; AVE = 0.82)		
Return on investments (ROI)	0.94	73.70
Return on sales (ROS)	0.92	60.35
Sales growth	0.83	28.05
Return on assets (ROA)	0.92	64.00
Overall profitability	0.92	71.40

Construct	Mean	SD	1____	2____	3____	4____	5____	6____	7____	8____	9____
1. CusO	6.01	1.20	<i>0.92</i>								
2. ComO	5.33	1.42	0.73**	<i>0.95</i>							
3. InterCO	5.37	1.39	0.65**	0.83**	<i>0.92</i>						
4. SCOPE	4.15	1.35	0.44**	0.48**	0.47**	<i>0.87</i>					
5. TIME	4.51	1.28	0.58**	0.65**	0.70**	0.69**	<i>0.89</i>				
6. AGGR	4.62	1.24	0.38**	0.49**	0.50**	0.59**	0.71**	<i>0.90</i>			
7. INTER	4.55	1.28	0.47**	0.56**	0.61**	0.63**	0.69**	0.80**	<i>0.90</i>		
8. ACC	4.09	1.62	0.16*	0.15*	0.14	0.06	0.14*	0.15*	0.08	<i>0.90</i>	
9. FEFF	3.72	0.89	0.32**	0.39**	0.38**	0.30**	0.46**	0.32**	0.37**	0.05	0.91
			0.35	0.43	0.41	0.33	0.49	0.35	0.39	0.06	

Notes: CusO, Customer orientation; ComO, Competitor orientation; InterCo, Interfunctional orientation; SCOPE, MAS use (scope), TIME, MAS use (timeliness); AGGR, MAS use (aggregation); INTER, MAS use (integration); ACC, accountants' participation in strategic decision making; PERF, Firm performance. 1st value = Correlation between variables (off diagonal); 2nd value = HTMT ratio. Square root of AVE (bold diagonal). **Correlation is significant at the 5 and 1 percent levels, respectively (two-tailed *t*-test)

Table III.
Construct means,
standard deviations,
and correlations

validity is demonstrated when the correlation between two constructs (the off-diagonal entries) is not higher than their respective composite reliability (Fornell and Larcker, 1981). Table III shows that no individual correlations (range from -0.06 to 0.83) are higher than their respective reliabilities (range from 0.93 to 0.96), thereby indicating satisfactory discriminant validity. In addition, most of the correlations are consistently smaller than the cut-off value of 0.70 (except four correlations), suggesting acceptable discriminant validity (Tabachnick *et al.*, 2001). This study also employs the Heterotrait-Montrait (HTMT) test, which is more stringent than that of Fornell and Larcker (1981) to evaluate discriminant validity (Henseler *et al.*, 2015). Table III indicates that the HTMT values range between 0.05 and 0.89 (significantly below 1.00), providing the clear evidence for discriminant validity.

Because the correlations between three MO dimensions (customer orientation, competitor orientation, and interfunctional coordination) and some dimensions of the use of MAS are significantly above the cut-off value of 0.70 ($p < 0.01$), the author has examined the variance inflation factor (VIF) for each relationships between the independent variables in

the proposed model to assess the multicollinearity issue. The results show that the VIF values range between 1.00 and 1.96, which are well below the cut-off value of 10 (Joseph *et al.*, 1992), indicating no multicollinearity issue in this study.

4. Hypotheses testing and discussion

Partial least squares (PLS) method is utilized for data analysis in order to test the proposed model and hypotheses. This is because compared to the traditional covariance-based structural equation model (SEM), PLS tends to achieve higher levels of statistical power under equal conditions (Reinartz *et al.*, 2009). Moreover, PLS does not require a large sample and accurately estimates the parameters in a small sample size context (Reinartz *et al.*, 2009). In addition, this study employs SmartPLS3 to estimate the theoretical model.

4.1 Hypotheses testing results

To provide evidence for testing the proposed hypotheses, this study evaluates the strength and significance of individual paths with respect to the predictive relevance of these individual paths in the proposed model. The indices used to evaluate the predictive relevance of individual paths are reported in Table IV, including beta coefficients and *t*-values, along with the adjusted *R*² for each endogenous construct. These indices are calculated on the basis of 500 bootstrapping sampling times. The results indicate that the adjusted *R*² values for all of the predicted variables, use of MAS (0.63) and firm performance (0.19), are both greater than the recommended level of 0.10.

The author develops two models: Model 1 with MAS as the mediating variable and Model 2 without MAS as the mediating variable. The purpose is to test: the direct effect of MO on firm performance (PERF) (Narver and Slater, 1990; Jaworski and Kohli, 1993); and the mediating role of the use of MAS on this well-established relationship. This study’s results confirm the well-established and direct relationship between MO and PERF in the context of Vietnam, showing that MO positively influences firm performance as the β coefficient for the path between MO and PERF is 0.43 and significant at 1 percent level (*t*-value = 5.54; Model 2). *H1* proposes that the use of MAS mediates the relationship between MO and firm performance. This hypothesis is supported as: the β coefficient of the MO-MAS path is 0.60, significant at 1 percent level (*t*-value = 10.92); and the β coefficient of the MAS-PERF path is 0.27 and significant at 5 percent level (*t*-value = 2.85; Model 1).

Hypothesis	Dependent variable	Model 1 (with MAS as a mediating variable)				Model 2 (without MAS)	
		β	<i>t</i> -value	β	<i>t</i> -value	β	<i>t</i> -value
		<i>Independent variable</i>					
<i>H1</i>	MO	0.60	10.92***	0.24	2.50**	0.43	5.54***
	MAS			0.27	2.85***		
	ACC	0.32	2.31**				
<i>H2</i>	ACC × MO	0.36	2.97***				
	<i>Control variable</i>						
	Size (assets)			0.04	0.55	0.04	0.57
	Size (employees)			0.05	0.62	0.04	0.52
	Firm age			(0.08)	1.02	(0.07)	0.91
	Ownership			(0.06)	0.89	(0.09)	1.20
	Adjusted <i>R</i> ²	0.63		0.19		0.16	

Table IV. Partial least squares results for theoretical model

Notes: MO, market orientation, ACC, accountants’ participation in strategic decision making; ACC × MO: the interaction term between ACC and MO; MAS: Use of management accounting systems; PERF: firm performance. *, **, *** Denote a significance at 10, 5 and 1 percent, respectively (two-tailed *t*-test)

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Comparing Models 1 and 2, this study finds that the positive effect of MO on firm performance in Model 1 ($\beta = 0.43$; t -value = 5.54) becomes weaker in Model 2 ($\beta = 0.24$), but is still significant (t -value = 2.50). The reduction in the direct effect provides evidence of partial mediation (Kline, 2015). Thus, the use of MAS partially mediates the relationship between MO and firm performance, thus supporting the first hypothesis.

In addition, this study employs Sobel test following the suggestion of Preacher and Hayes (2004) to further test the mediating role of MAS on the relationship between MO and firm performance (PERF). This study also adopts a bootstrap technique, using SPSS with the Process Macro add-in (Model 4) and computing the correlations between the dependent variables and independent variables with their corresponding confidence intervals (CIs) (Preacher and Hayes, 2004). The results indicate that the correlation of the indirect effect of MO on firm performance is 0.13 ($p < 0.05$; CI range between 0.04 and 0.24), and Sobel statistics = 2.83 ($p < 0.01$). This result indicates that the use of MAS partially mediates the impact of MO on firm performance, supporting *H1*.

H2 proposes that accountants' participation in strategic decision making has a positive moderating effect on the relationship between MO and the use of MAS. This means that the positive association between MO and the use of MAS may be strengthened when accountants highly participate in strategic decision making. This study creates an interaction term $ACC \times MO$ after mean centering the moderating variable (accountants' participation in strategic decision making) and the independent variable (MO) that constitute the interaction term in order to mitigate potential multicollinearity (Aiken *et al.*, 1991). The second hypothesis is supported as the β coefficient for the path between the interaction term, $ACC \times MO$, and MAS is 0.36, significant at 1 percent level (t -value = 2.97; Model 1). In addition, when accountants involve more in strategic decision-making, firms are required to use more MAS information. This is supported by this study's results in which the β coefficient for the link between ACC and MAS is 0.32 and significant at 5 percent level (t -value = 2.31; Model 1).

4.2 Model fit and common method bias

The standardized root mean squared residual (SRMR) value of the composite model is also examined using SmartPLS3 to test the model fit. The SRMR of 0.076 is lower than the recommended value of 0.08, indicating an acceptable model fit (Henseler *et al.*, 2016). As cross-sectional data are collected using a single-informant approach, there might be common method bias effects that lead to spurious relationships among the variables (Podsakoff *et al.*, 2003). The marker-variable technique recommended by Lindell and Whitney (2001) is employed to test common method bias. In particular, the author selects the item "are you confident in using computer?" as a marker variable to control for common method bias. The mean change in correlations of the key constructs ($rU - rA$) when partialling out the effect of rM is 0.12 ($p = 0.22$), providing evidence of no common method bias in this study.

5. Discussion

5.1 Theoretical implications

This study has some theoretical implications. First, as a follow-up to previous studies at the interface between MO and MAS in emerging markets (e.g. Nguyen and Doan, 2016), this study provides further empirical evidence of the importance of accountants' participation in strategic decision making and the use of MAS information in terms of broad scope, timeliness, aggregation, and integration as proposed by Chenhall and Morris (1986) to enhance the performance of market-oriented firms in an emerging economy. In doing so this study adds to the extant literature on the performance implication of management

accounting in a market-oriented setting (Agbejule, 2005; Agbejule and Burrowes, 2007; Mia and Winata, 2014).

Second, the findings from this study support the RBV (Chenhall, 2003) and the knowledge-based view (Grant, 1996) while arguing and providing evidence that MAS is a resource that meets the VRIN conditions and can enable firms to promote learning and create knowledge for competitive advantage and superior firm performance in a competitive environment. The findings also support the contingency theory (Chenhall, 2003; Otley, 1980). The role of accountants' participation in strategic decision making, an important contingent variable, in explaining the use of MAS in market-oriented firms is confirmed. In this regard, difference in the levels of MAS usage across market-oriented firm can be explained via the degree of accountants' participation in strategic decision making, which has not been examined in previous studies. Moreover, firm performance is the outcome of interactions of both marketing factors (e.g. MO) and accounting factors (e.g. accountants' participation in strategic decision making, and the use of MAS).

Third, this study adds to limited research at the marketing/accounting interface (e.g. Nguyen and Doan, 2016; Phillips and Halliday, 2008; Sidhu and Roberts, 2008) with the combination between MO (a marketing variable) and the use of MAS (an accounting variable) in the theoretical model. The findings suggest that firms need to combine marketing strategy (via MO) and MAS to achieve superior firm performance. Additionally, this study adds to Nguyen and Doan's (2016) study by confirming that the enhanced MAS information, as being moderated by accountants' participation in strategic decision making, is a critical pathway connecting MO and firm performance in the context of emerging markets. Specifically, this study has established the paths from MO and firm performance via the use four MAS information dimensions: broad scope, timeliness, aggregation, and integration. Also, meticulously explained is the moderating role of accountants' participation in strategic decision making in fostering the use of MAS in market-oriented companies. This study advocates the view of Cadez and Guilding (2008) by further examining the moderating role of accountants' participation in strategic decision making in the MO-firm performance relationship. This moderating role of accountants' participation in strategic decision making is crucial because there has long been limited understanding of antecedent conditions influencing the design of MAS (Bouwens and Abernethy, 2000; Soobaroyen and Poorundersing, 2008), as it would be necessary for MAS designers to comprehend the relevant moderating variables that may have resulted in a particular MAS design in an organization.

Finally, adding to limited research from emerging markets regarding the integration between SMA and marketing (Cadez and Guilding, 2008, 2012; McManus and Guilding, 2008; Nguyen and Doan, 2016) and research at the marketing/accounting interface (Roslender and Hart, 2003; Roslender and Wilson, 2008; Sidhu and Roberts, 2008), this study extends a powerful discourse upon the possibility of a combination of MO strategy and the design MAS toward enhanced competitive advantages and firm performance.

5.2 Managerial implications

Besides its theoretical implications, this study provides guidance to market-oriented firms to design and implement MAS toward enhanced performance. First, market-oriented firms should consider the moderating role of accountants' participation in strategic decision making on the MO-MAS link when determining the management accounting information needs to cope with competitive pressures. Second, although MO is a necessary condition for enhanced firm performance, it can be integrated with the use of MAS to form a sufficient condition for higher and superior firm performance. This is justified via the important connecting role of MAS in transforming MO to performance. The study also has a practical significance because it provides managers with implications on how to develop competitive

advantages via designing MAS in the market-oriented setting. Following this, market-oriented firms should configure their MAS in terms of broad scope, timeliness, aggregation, and integration (Chenhall and Morris, 1986) to exploit the synergy between their MO strategy and MAS information aiming at a high competitive advantage.

5.3 Limitations and future research

This study, however, is subject to several limitations. First, this cross-sectional study does not take into consideration the possibility that the cause and effect relationships between the research variables may involve certain time lags. For example, participating in strategic decision making will not immediately results in a higher level of MAS usage in market-oriented companies, and this high level of usage will not immediately lead to better firm performance. Therefore, a longitudinal study can be more appropriate for making inferences on the influence of accountants' participation on strategic decision making on the MO-MAS-PEFR chain. Second, cross-sectional survey data can have a serious limitation regarding inferences of causality. This is because cross-sectional survey data can be used to test the correlation between variables but are not able to imply the causal directions assumed among them (Rong and Wilkinson, 2011; Wiley, 2011). Therefore, using cross-sectional surveys to prove the cause and effect relationships between variables in the proposed model can be problematic. For example, some may argue that both being market-oriented to outperform competitors and being participated in strategic decision making of accountants require more MAS usage. In other words, MO and accountants' participation in strategic decision making can be outcomes of MAS usage. This alternative causal sequence may challenge the proposed model in this study. Finally, the outcome variable, firm performance is measured solely based on financial indicators, which are short-term and history-oriented. This variable should be augmented to include non-financial indicators (e.g. customer performance) which are considered long-term and future-oriented. Further research should thus take account of the above listed limitations.

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