

The role of broad scope MAS information in linking organisational market orientation and performance

Utami Puji Lestari¹, Lanita Winata², Lokman Mia³

¹ Corresponding author. Tel.: +62 (21) 7863537

Email address: utami.lestari@akuntansi.pnj.ac.id (U.Lestari), l.winata@griffith.edu.au (L. Winata), l.mia@griffith.edu.au (L. Mia).

² Tel. +61 (07) 5552 9083

³ Tel. +61 (07) 3735 7112

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ABSTRACT

We investigate the mediating role of information provided by management accounting system (hereafter, MAS information) in the relationships between organisations' market orientation (MO) capability and organisational performance. The data for the study were collected from 131 general managers of medium to large manufacturing organisation in Indonesia. Partial least squares structural equation modelling (PLS-SEM) was used to test the hypotheses. Our literature review reveals that prior research on market orientation and performance ignored the role of MAS information. The results indicate that managerial use of broad scope MAS information partially mediates the relationships between organisation's market orientation and financial, customer, internal business process and learning and growth-related performance. However, the partial mediation role played by managerial use of the scope MAS information in the relationship between an organisation's market orientation and customer-related performance is relatively weak.

By investigating the role of managerial use of broad scope MAS information in the relationship, this study contributes towards theory development. The results also contribute to practice by facilitating managers' understanding of how their organisation's market orientation and managerial use of MAS information can promote the organisation's performance.

Keywords: Market orientation, broad scope MAS information, organisational performance

1. Introduction

To deal with today's fierce competition, companies need to develop and sustain competitive advantage which lead to better performance by implementing suitable strategies (Daniela, 2014; Kuo, 2013; J.-S. Lee & Hsieh, 2010; Mia & Winata, 2014) and innovate products (Heinonen, Holmlund, Strandvik, Witell, & Löfgren, 2013; Sharmelly, 2017). Sustained competitive advantage can be achieved by an organisation which has resources and capabilities that are valuable to customers, rare and difficult to imitate or substitute (Kozlenkova, Samaha, & Palmatier, 2014; Lioukas, Reuer, & Zollo, 2016). Market orientation has been identified as an organisation capability that drives competitive advantage, which in turn, leads to superior organisational performance (Liao, Chang, Wu, & Katrichis, 2011; Najafi-Tavani, Sharifi, & Najafi-Tavani, 2016). As such, previous studies have provided empirical evidence on the positive effect of market orientation on organisational performance (Joseph & Francis, 2015; Y.-K. Lee, Kim, Seo, & Hight, 2015). However, there is still a gap in understanding how market orientation contributes to performance (Murray, Gao, & Kotabe, 2011). For example, whether the positive relationship between market orientation and organisational performance is direct or there is a mediating factor(s) in between. Better organisational performance is achieved not because of the ownership of a resource or capability, but because of the organisation's actions to capitalise it (Junges, Gonçalo, Garrido, & Fiates, 2015; Ketchen Jr, Hult, & Slater, 2007). In other words, market orientation is likely to affect organisational performance through strategic actions/responses taken by an organisation (Foley & Fahy, 2009; Najafi-Tavani et al., 2016; Takata, 2016).

Contingency theory suggests that variations in organisational performance results from the fit (interaction) between an organisation structure and its environmental context (Otley, 2016). Managers analyse the organisation's task environmental, considers the internal characteristics of their organisation and then adjust their behaviour (Otley, 2016; Volberda, Weerdt, Verwaal, Stienstra, & Verdu, 2012). In the context of market orientation, its potential value needs to be aligned with organisational structure to achieve superior organisational performance (Ketchen Jr et al., 2007). An organisational accounting system, including management accounting system (MAS), is an essential part of organisational structure (Mia & Winata, 2014; Otley, 2016). The literature suggests that an organisation needs to use appropriate MAS that will assist managers in achieving organisational goals (Chenhall, 2003). Contingency theory-based literature on MAS indicates how managerial use of the MAS information is influenced by environmental and organisational factors (Chenhall & Moers, 2015; McLaren, Appleyard, & Mitchell, 2016; Passetti & Tenucci, 2016; Watts, Yapa, & Dellaportas, 2014). These factors include an organisation's external environment (e.g. perceived environment uncertainty (PEU) and intensity of market competition), company size and task characteristics (e.g. task uncertainty) (Gordon & Narayanan, 1984; Patiar & Mia, 2008). Other organisational characteristics that may affect MAS design are managerial control, culture, managerial performance, technology, and strategy (e.g. Agbejule & Burrowes, 2007; Chong & Eggleton, 2003; Mia & Winata, 2014; Sharma, Jones, & Ratnatunga, 2006).

However, the relevant literature indicates research on a role of managerial use of MAS information in the relationship between organisational capabilities and performance is still limited. To provide a better understanding of the role of MAS, the existing set of contingency factors need to be expanded (Chenhall & Moers, 2015; Tillema, 2005).

Market orientation is viewed as an organisation's marketing capability that needs to be considered in (management) accounting research (Al-Mawali, 2015; Cadez & Guilding, 2008; Guilding & McManus, 2002; Tanima & Bates, 2015). The relevant literature indicates that market orientation issues (e.g. product-attributes focus, customer-value creation) and (management) accounting information such as costs and profits are interrelated (Inglis, 2008). Guilding and McManus (2002) and Tanima and Bates (2015), for example, report that there is a positive association between market orientation and customer accounting information, which is only one of the aspects of the MAS information. However, the MAS information includes both financial and non-financial information, from internal and external sources, historical and future-oriented (Chenhall & Morris, 1986). These issues are yet to be considered by research on managerial use of MAS information relating to the effectiveness of market orientation.

This study investigates the mediating role of MAS information on the relationships between market orientation and organisational performance. It focuses on managerial use of the MAS information from broad scope perspective including financial and non-financial, historical and future-oriented, quantitative and qualitative information, provided from internal and external sources (Chenhall & Morris, 1986). Broad scope MAS information has been identified by previous studies as having particular significance in assisting managers in the processes of decision making and planning and control (e.g. Mia & Winata, 2014; Nguyen, Mia, Winata, & Chong, 2017). Organisational performance in this study includes financial and non-financial aspects following balanced scorecard perspectives. Many companies today have changed their organisational performance measurement systems by not only focusing on the financial aspects, but also considering non-financial aspects (Abdel-Maksoud, Cerbioni, Omran, & Ricceri, 2015; Adams, Muir, & Hoque, 2014), which includes customer, internal business process and learning and growth perspectives. These indicators provide a better prediction of the company's long-term goals than just short-term profits – which is usually the focus of financial measures (Chen, Hsu, & Tzeng, 2011; Chenhall & Langfield-Smith, 2007, p. 267; Dossi & Patelli, 2010; Luft, 2009).

This study contributes to the literature in several ways. First, this study confirms the arguments that better organisational performance can be achieved by the actions of an organisation to capitalise its capabilities (Foley & Fahy, 2009; Najafi-Tavani et al., 2016; Takata, 2016). Second, this study extend contingency literature in management accounting by providing empirical evidence of the role of broad scope MAS information in maximising companies' market orientation capability to achieve better performance. Third,

this study empirically provides a more comprehensive picture of the effect of market orientation and MAS information on financial aspect and non-financial aspects of organisational performance.

This paper is structured as follows. The following section defines the variable used in this study and discusses the relationships between variables. This is followed by section 3 describing the method used in data collection and data analysis. The results of the empirical analysis of this study are discussed in “Results” section. The last section provides discussion and limitations.

INSERT FIGURE 1 HERE

2. Literature Review and Hypotheses Development

2.1 The relationship between market orientation and managerial use of the MAS information

Prior researchers (Narver & Slater, 1990; Zhang & Duan, 2010) suggest that market orientation assist an organisation in creating superior value for its customers, which in turn, leads to superior organisational performance.

A management accounting system (MAS) is an information system that provides the information required by managers to manage resources and to create value (Thabet & Alaeddin, 2017). The scope of MAS information refers to the dimensions of focus, quantification, and time horizon (Chenhall & Morris, 1986; Ghasemi, Mohamad, Karami, Bajuri, & Asgharizade, 2016; Hammad, Jusoh, & Ghazali, 2013). Chenhall and Morris (1986) state that the MAS provides information from internal (i.e., operations, marketing, finance, and human resources) and external sources; this information may be economic (such as GNP, total market sales, and market share) or non-economic (such as demographic factors, consumer tastes, competitor actions and technology advances). In terms of quantification, the MAS information includes financial as well as non-financial information (Cheng, 2012; Hammad et al., 2013). In relation to the time horizon, the MAS information provides both historical data and future event estimation (e.g. war, climate change, and new technologies), which may have an important effect on the organisation’s competitiveness and future performance (Cheng, 2012; Hammad et al., 2013). This study focuses on managerial use of the MAS information.

Organisations with a high market orientation have a relatively strong external focus towards customers and competitors (Best, 2009). It is expected that the MAS information will tend to be more useful in high market-oriented organisations (Guilding & McManus, 2002). The focus of MAS information is on marketing concerns, product innovation, strategic planning and predictive information related to these decision areas (Mia & Chenhall, 1994). To support organisations’ ability to implement a market-oriented approach, it is important that they invest in some marketing management capabilities such as pricing, product development and promotions; to do these, organisations need to collect and analyse market

information (Murray et al., 2011; Vorhies & Harker, 2000). Organisations with a strong market orientation will attach relatively high significance to the need for marketing-oriented knowledge such as customer information (Guilding & McManus, 2002). Managers need to use relatively more of the MAS information, such as sales reports and customer surveys to improve their understanding of customer requirements and perceptions about products (Cillo, De Luca, & Troilo, 2010; Slater & Narver, 1998), which in turn, may assist companies to create and offer products and services that meet those needs (Chuang, Morgan, & Robson, 2015; Jaworski & Kohli, 1993). The MAS information also provides information about competitors' product attributes, services, capabilities, strategies, and technology, which may help organisations to analyse competitors' strengths and weaknesses, and develop strategies to combat competitors' actions/activities more appropriately (Tillema & van der Steen, 2015). Organisations can examine competitors' actions/activities for ideas about, for example, improvement of design and price of their own products (Tseng, 2014); therefore, their products become superior to competitors' products.

Based on the above rationale, it is predicted that the more a company pursues market orientation, the more its managers are likely to use the MAS information. Hypothesis one below formally presents the rationale.

H1. There is a positive relationship between the extent to which a company pursues market orientation and its managers' use of the MAS information.

2.2 The relationship between market orientation and financial performance

Financial performance shows the success of companies to achieve financial objectives related to increasing profitability, higher revenue and better asset utilisation (Bosilj-Vuksic, Milanovic, Skrinjar, & Indihar-Stemberger, 2008; Kaplan & Norton, 1996).

Organisations with a high market orientation are continuously learning about customer expressed and latent needs and about competitor capabilities and strategies, sharing the knowledge broadly throughout their organisation and acting in a coordinated and focused manner (Slater & Narver, 1998). Companies can then create and offer new products that may be judged superior by customers because they meet not only the current needs but also potential future needs of customers (Cillo et al., 2010; Katila & Ahuja, 2002). In other words, companies with a high market orientation are likely to retain current customers, attract more new customers, and can create new markets, resulting in increased sales and profitability, which are indicators of financial performance. Previous studies indicate the positive relationship between market orientation and financial performance (e.g. Kirca, Jayachandran, & Bearden, 2005; Y.-K. Lee et al., 2015; Slater & Narver, 1994; Wang, Chen, & Chen, 2012). The following hypothesis presents the argument.

H2. There is a positive relationship between the extent of employing market orientation and financial performance.

2.3 The relationship between market orientation and customer-related performance (CRP)

CRP indicates the ability of companies to provide quality products and services that meet customer needs (Bosilj-Vuksic et al., 2008), and it clarifies customer perceptions and opinions towards companies (Kaplan & Atkinson, 1998).

As companies with high market orientation have a high commitment to create and maintain superior value for their customers (Narver, Slater, & MacLachlan, 2004; Slater & Narver, 2000), they are continually learning about the current and potential future needs of both current and potential customers (Slater & Narver, 1998). They are also learning about competitors' goals, strategies, offerings, resources and capabilities (Murray et al., 2011; Porter, 1998), and disseminating the information generated from this assessment throughout the organisation (Kohli & Jaworski, 1990; Kumar, Subramanian, & Strandholm, 2002; Polo Peña, Jamilena, & Molina, 2012). Consequently, they can anticipate customer needs, and can offer products and services to satisfy those needs better than their competitors, resulting in higher customer satisfaction and loyalty, and greater market share (Kirca et al., 2005; Y.-K. Lee et al., 2015; Voola & O'Cass, 2010; P. Williams & Naumann, 2011). Hence we posit hypothesis three below.

H3. There is a positive relationship between the extent of employing market orientation and customer-related performance.

2.4 The relationship between market orientation and internal business process-related performance (IBP)

The internal business process-related performance captures companies' ability to develop products, to produce and deliver products to customers, and to provide after-sales service to customers (Kaplan & Norton, 1996).

Highly market-oriented organisation is effective in getting all functions within the organisation to work together to provide superior customer value, and is successful in removing the wall between functions (Clark, Toms, & Green, 2014; Cravens & Piercy, 2003; Liao et al., 2011; S. K. S. Wong & Tong, 2012). Hooley, Greenley, Cadogan and Fahy (2005) report that market orientation is positively associated with the quality of human resource management, financial management, and operational management, which means that market orientation is an important factor affecting the whole organisation, rather than just affecting the marketing activity.

To develop a new product successfully, an organisation needs organisation-wide market information collection and dissemination across departments, and organisation-wide responsiveness to this information, in order to minimise sources of uncertainty in meeting customer needs (Kohli & Jaworski, 1990; Polo Peña et al., 2012). In a market-oriented organisation, top management encourages individuals in organisation to track changing markets, to share market information with others in the organisation, and to be more responsive to market needs (Fang, Chang, Ou, & Chou, 2014; Jaworski & Kohli, 1993; Kibbeling, der Bij,

& Weele, 2013). Moreover, managers of market-oriented companies encourage risk taking and accept occasional failures as being natural (Jansen, Vera, & Crossan, 2009; Jaworski & Kohli, 1993; Olson, Slater, & Hult, 2005). Consequently, subordinates are more likely to propose and introduce new offerings in response to customers' needs (Jaworski & Kohli, 1993), leading to a shorter time to market and a greater number of new products and services that match customer needs.

As highly market oriented companies are likely to offer new products that are superior in quality to that of their competitors' (Paladino, 2008), they need to monitor and implement suitable control strategies to ensure their product's quality. An appropriate quality control system may have some advantages – such as improvement in product quality; reduction in operating expenses; reduction in product defects, scrapping and wastage; and material efficiency (Tyagi & Sharma, 2011). They also tend to serve their customers optimally by offering superior after-sales service, considered to be a source of competitive advantage (Gaiardelli, Saccani, & Songini, 2007; Gebauer, 2008; Kursunluoglu, 2014). Companies tend to improve the quality and efficiency of after-sales services, such as high spare parts availability, more repair centres, longer maintenance contracts, advanced training, offers of product upgrades, shorter repair time for returned product and faster responses to customer complaints (Gaiardelli et al., 2007; Malgwi & Dahiru, 2014). All the discussions above lead to the following hypothesis.

H4. There is a positive relationship between the extent of employing market orientation and internal business process-related performance.

2.5 The relationship between market orientation and learning and growth performance (LG)

Learning and growth-related performance is defined as the ability of companies to explore efficient knowledge, human resources and information technology management (Bosilj-Vuksic et al., 2008).

Kohli and Jaworski (1990) argue that market orientation yields some social advantages to employees as it raises a personal relationship between employees and the organisation. Market orientation also promotes a sense of pride in belonging to one big organisation family in which all departments and individuals work toward the common goal to meet and exceed customer needs and expectations (Jaworski & Kohli, 1993). In a highly market-orientated organisation, employees have greater innovation opportunities (Ozkaya, Droge, Hult, Calantone, & Ozkaya, 2015; Tsai, Chou, & Kuo, 2008), as the organisation accepts irregular failures as being normal (Jansen et al., 2009; Jaworski & Kohli, 1993; Olson et al., 2005). Such companies also tend to give greater employee training and to improve company information systems by using a computerised information systems. Employee training can improve employee competence in innovation (Sung & Choi, 2014), and a computerised information system can provide faster support to employees' ongoing monitoring of customers, their potential needs, and market conditions. As a result, employees can work more efficiently and may be more satisfied as their skills improve. Further, employees have more opportunities to be more

creative, developing their ideas to produce new products. This involvement will lead not only to employee efficiency and satisfaction, but also to commitment and retention. The above discussion leads to the following hypothesis.

H5. There is a positive relationship between the extent of employing market orientation and learning and growth-related performance.

2.6 The relationship between the MAS information and financial performance

The MAS information can provide information related to external factors that may be economic, such as GNP and market share, and non-economic, such as customer preferences, competitor actions, and technology advances (Chenhall & Morris, 1986). This information can help companies to understand current and future customer needs (Jaworski & Kohli, 1993; Pansari & Kumar, 2017). The MAS information also provides information about competitors such as competitor product attributes, services, capabilities, strategies, and technology. This information can help organisations to analyse competitor strengths and weaknesses, which in turn may help them to develop more appropriate strategies to deal with competitor actions and activities (Najafi-Tavani et al., 2016; Takata, 2016). Organisations can examine competitors' actions and activities for ideas about, for example, improvement of design and price of their own products (Najafi-Tavani et al., 2016) and marketing activities (Krush, Sohi, & Saini, 2015), thereby keeping their own products superior to competitors' products. By understanding customer needs, competitor actions, and economic conditions, companies can develop realistic prices, target appropriate market segments, and implement suitable marketing efforts (Patiar & Mia, 2008), resulting in higher sales and profit. The following hypothesis presents the above discussion.

H6. There is a positive association between managerial use of the MAS information and financial performance.

2.7 The relationship between the MAS Information and CRP

The MAS information provides organisations with information such as customer needs and expectations and also competitor activities (Chenhall & Morris, 1986). Organisations having such information can examine present and future needs and expectations of customers. For instance, by using the MAS information such as competitors' product attributes, services, capabilities, strategies, and technology, companies can recognise and analyse competitor potencies, limitations, strengths and strategies (Mia & Winata, 2014). This may assist them to anticipate changes in customer needs (Kohli & Jaworski, 1990). Better understanding of customer needs and expectations can assist companies to predict such needs (Slater & Narver, 1994) and then to quickly offer products and services that meet those needs (Boujena, Johnston, & Merunka, 2009). Put differently, managerial use of the MAS information may help companies to respond faster both to customer needs and to distribute products to customers, leading to increased customer satisfaction. Highly

satisfied customers tend to make repeat buying that leads to greater sales (Y.-K. Lee et al., 2015; Orel & Kara, 2014). Moreover, new customers also start purchasing the products, resulting in a higher market share (Y.-K. Lee et al., 2015). The hypothesis below summarises the discussion.

H7. There is a positive association between managerial use of the MAS information and customer-related performance.

2.8 The relationship between the MAS information and IBP

The MAS information provides managers with information for setting appropriate performance targets (Ismail, Isa, & Mia, 2018) and monitoring the achievement of these targets (Mia, 2000). In relation to the product development activities, companies may set targets such as time to market a new product, number of new designs, number of product design modifications and number of new patents (El-Baz, 2011; Langerak, Hultink, & Griffin, 2008). Regarding activities of producing and delivering products to customers, a manufacturing company, for example, may set performance targets for a budgeted volume of production, costs, wastage rates, levels of inventory, defects rates, and capacity utilisations to monitor its operation's process (Mia, 2000). In terms of providing after-sales service to customers, companies may set targets such as customer call abandon rate, response and repair time, percentage of response below time limit, and number of spare parts delivered in delay (Cavalieri, Gaiardelli, & Ierace, 2007; Gaiardelli et al., 2007). After organisations set a target, managers need to monitor the actual performance towards achieving it, and to take appropriate action if required (Mia, 2000). If the actual performance is below the target, managers then can evaluate the planning developed and take appropriate actions to achieve the target. As a result, managers can improve their internal business process performance (Mia, 2000).

Monitoring includes not only comparing actual performance with targets, but also benchmarking: that is, comparing the company's performance with appropriate external sources, such as those of competitors or the industry average (Winata & Mia, 2004). For benchmarking, companies need to use MAS information such as manufacturing lead-time, material usage, number of on-time deliveries (Hoque, 2003), and industry's practices, standards, regulations and technologies (Perego & Hartmann, 2009). By benchmarking, companies can search for best practice, innovative ideas, and efficiencies that lead to continuous improvement of their business process (Meybodi, 2015). Companies can benchmark their practices against competitors and other firms in the industry to ensure their own business process performance achieves or exceeds that of these others (W. P. Wong & Wong, 2008). If company business process performance is below that of the competitors and/or the industry average, then the company can evaluate its planning to improve its business process in the future. The following hypothesis summarises this discussion.

H8. There is a positive association between managerial use of the MAS information and internal business process-related performance.

2.9 *The relationship between the MAS information and LG*

The MAS information provides managers with information for setting performance evaluation standards and feedback on achievements of employees (Nguyen et al., 2017); it also provides financial and non-financial information (Mia & Winata, 2014). Managers can use this information to develop broader and more complete measures to evaluate their employees' performance (Hartmann & Slapnicar, 2009). More-comprehensive performance measures provide employees with a stronger, clearer understanding of the link between employee effort and their performance, which in turn motivate them to employ more effort (Schulz, Wu, & Chow, 2010). More-comprehensive performance measures also result in a more appropriate rewards system (Marginson, McAulay, Roush, & van Zijl, 2014; Schulz et al., 2010). Rewards motivate employees to give maximum effort in performing their tasks (Qureshi, Zaman, & Shah, 2010; Schulz et al., 2010). If employees are motivated by an appropriate reward, they are likely to improve their task performance. They tend to increase their work efficiency, including enhancing their ability to use computerised information to obtain more-accurate and timely information. The following hypothesis summarises this argument.

H9. There is a positive relationship between managerial use of the MAS information learning and growth-related performance.

3. **Research Method**

3.1 *Sample and data collection Procedure*

The data were collected from the general managers of medium to large manufacturing companies in Indonesia. General Managers were considered to be the person most likely to provide accurate data concerning market orientation, managerial use of the MAS information, and organisational performance. As per Indonesia Law No. 20/2008 about Micro, Small and Medium Enterprises, medium to large companies are those with minimum annual sales of two billion five hundred million rupiahs (around US\$177,500) (Bank Indonesia, 2008).

From the Indonesian Ministry of Industry database containing 23370 medium to large manufacturing companies, 1000 of such companies were selected at random. The survey questionnaire was mailed to the general manager (GM) of each of the selected companies with a cover letter seeking the GM's participation in the study by completing the questionnaire attached. The cover letter also explained the purpose of the study, contained assurance of (i) privacy of the responses, (ii) anonymity of the participant and the company, and (iii) making a summary of the results available to the participant GM on request. Of the 1000 mails containing the questionnaire and the cover letter sent, 103 were returned because of incorrect addresses or the company had closed; 25 GMs emailed to inform that they were unable to participate in the survey because of lack of time or the company policy. Of the 134 questionnaire returned, 131 were fully complete. There was no outlier found in the sample data set. Therefore, the total number of questionnaire used for data

analysis was 131, representing a 13.1 percent response rate, which is within the 10-20 percent average response rate for surveys of top management respondents (Menon, Bharadwaj, & Howell, 1996; Voola, Casimir, Carlson, & Agnihotri, 2012). The sample was diverse within manufacturing industry representing food and beverages, textile, garment, tobacco, leather products, rubber and plastic products, paper, wood processing, furniture, basic metal, electrical machinery, chemical and chemical products, motor vehicles, other transport equipment, publishing, printing and reproduction of recorded media, machinery and equipment, medical, precision and optical instruments, and recycling. Table 1 presents the descriptive statistics for sample demographics.

INSERT TABLE 1 HERE

Non-response bias was tested by comparing the early and the late responses. The early-late response evaluation can demonstrate how the sample differs as response rate increase with time and efforts (Dalecki, Whitehead, & Blomquist, 1993). Statistical analysis (Mann-Whitney U-test) revealed no significant differences in the median scores of variables between the 20 percent of the early and late responses.

3.2 Measurement of variables

This study used well-established instruments to measure the variables. The questionnaire was translated from English into Bahasa Indonesia and then translated back into English to ensure that the meaning of the intent questions did not change. All of the instruments were pilot-tested and refined before they were used in the study. While measurement of the variables is briefly discussed below, further discussions appear in Section 4.1 and 4.2.

3.2.1 Market orientation

The measure for market orientation is based on the instrument developed by Deshpande and Farley (1998). This instrument has been used in previous studies (e.g. Baker & Sinkula, 2009; Green, Chakrabarty, & Whitten, 2007; Ordanini & Maglio, 2009; Sanal, Alpan, Aren, Sezen, & Ayden, 2013) Respondents were asked to indicate their extent of agreement with how well the statements describe the actual norms in their business. They were asked to respond on a seven-point Likert-scale (1 = “strongly disagree”, 7 = “strongly agree”). With reference to the pilot test, due to inapplicability of the items to this study research setting, items MO7 and MO10 were removed from the instrument.

3.2.2 The MAS information

The MAS information was measured using a six-item scale developed by Chenhall and Morris (1986). The use of MAS information instrument has been used in previous studies (e.g. Mia & Winata, 2014; Patiar & Mia, 2015; Soobaroyen, 2008). The respondents were asked to indicate on seven-point Likert-scale (1 = “very low”, 7 = “very high”), the extent to which they use each information for decision-making.

3.2.3 Organisational performance

The instrument for measuring each aspect of organisational performance was adapted from Hoque and James (2000). This instrument has been used in previous studies (e.g. Lau & Sholihin, 2005; López-Nicolás & Meroño-Cerdán, 2011). Respondents were required to indicate their company's organisational performance relative to that of competitors by rating it on a seven-point Likert-scale ranging from 1 (significantly below average) to 7 (significantly above average). Following the pilot study, item Cust6 was eliminated because some companies did not have competitor information related to this item. Results

This study used PLS-SEM with SmartPLS (Ringle, Wende, & Becker, 2015) software for the analysis. PLS-SEM is effective to test the proposed model because, like other covariance-based SEM approaches (e.g. LISREL and AMOS), both the measurement model (the relationship between the latent variable and its indicators) and the structural model (the relationship between the constructs in the model) are examined simultaneously (Gefen, Straub, & Boudreau, 2000; Hair, Sarstedt, Ringle, & Mena, 2012). PLS also has fewer constraints and statistical specifications than covariance-based SEM techniques, and is therefore suitable for situations where the data might take no notice of normality assumptions (Chin, 1998). Moreover, to ensure accurate results, PLS has a minimum demand regarding sample size (Hair et al., 2012). The minimum sample size for a robust PLS should be equal to ten times of (a) the largest number of formative indicators in a specific construct in the model, or (b) the largest number of structural path pointed at a specific construct in the structural model. The model of this study has no formative construct and two structural paths; the minimum sample size for this study is 20. The sample size of this study is 131, therefore, suitable for PLS analysis. In evaluating the PLS models, this paper followed the procedure suggested by Hulland (1999): firstly, assessing the reliability and validity of the measurement models, then assessing the structural model.

4.1 Measurement issues

This study assessed the individual item reliability of the constructs in the study through the dimensions and loading of measurement items. Although PLS literature suggests that factor loading of each item should be equal or higher than 0.7, Hair, Black, Babin, Anderson and Tatham (2010) suggest that sample size needs to be considered in interpreting the loadings. Following Hair et al. (2010), as this study has sample size of 131, to obtain a power level of 80 percent at 0.05 significance level, items with loadings below 0.5 should be eliminated from the relevant dimension. As a result, items MO8 and MO9 from market orientation variable, items Cust1, Cust5, Cust7 and Cust8 from customer-related performance, and items IBP2 and IBP4 from internal business process-related performance, were deleted from the final measurement model¹.

¹ For market orientation items, the results from a principal component factor analysis (oblique rotation) revealed that item MO8 had factor loading below 0.5, while item MO9 did not form part of one-dimensional market orientation variable.

The final factor loadings for each variable are presented in Table 2. The composite reliability and the Cronbach Alpha of each construct presented also in Table 3 was satisfactory, with composite reliability exceeding the accepted reliability threshold of 0.70 (Hair et al., 2012).

The average variance extracted (AVE) values for all instrument reported in Table 3 were greater than 0.5, suggesting achievement of convergent validity (Bagozzi & Yi, 1988; Hair et al., 2012). The value of the square root of AVE related to all instrument presented in Table 3 were significantly greater than any other corresponding row or column entry of the correlations among constructs, thus providing support for the Fornell–Larcker criterion of discriminant validity (Fornell & Larcker, 1981; Hair et al., 2012). Each item of all instrument (see Table 2) loaded higher than all of its cross loadings, which indicates that the cross loadings criterion of discriminant validity is satisfied (Hair et al., 2012).

INSERT TABLE 2 HERE

INSERT TABLE 3 HERE

4.1 Common Method Bias Test

Because the data were collected using self-completed questionnaire, this study conducted Harman’s one-factor test (Podsakoff & Organ, 1986) and a common method factor test suggested by Podsakoff, MacKenzie, Jeong-Yeon and Podsakof (2003) and Williams, Edwards and Vandenberg (2003) and adapted to PLS analysis by Liang, Saraf, Hu and Xue (2007) to assess the possibility of common method bias.

Following Harman’s one-factor test, the analysis yielded a 25 factor solution with the largest of them accounting for 28.54% of the variance. These results indicate that common method bias was not a concern in this study.

A second approach with PLS was conducted, in which each indicator in the measurement model is converted into a single indicator construct, and reflectively associated with a method factor (Liang et al., 2007). Common method bias can be assessed by testing the statistical significance of the loadings of the method factor and by comparing the variances of each observed indicator explained by its substantive construct and the method factor (Liang et al., 2007; Siponen & Vance, 2010; L. J. Williams et al., 2003). “If the method factor loadings are insignificant and the indicators’ substantive variances are substantially greater than their method variances, it can be concluded that common method bias is unlikely to be a

Principal component factor analyses (oblique rotation) of customer-related performance and internal business process-related performance yielded two components for each variable, with the above items loaded on the second component. Some participants in the pilot study have also notified that for items Cust5, Cust7 and Cust8, respondents may have difficulties to compare their performance with competitors as these items has not been used widely to measure customer-related performance in Indonesia.

serious concern” (Liang et al., 2007). As shown in Table 4, only six (out of 25) of the method factor loadings were significant, and the indicators’ substantive variances (average of 0.592) were substantially greater than their method variances (average of 0.010). The ratio of substantive variance to method variance is about 59:1. This study therefore concluded that common method bias was not a problem.

INSERT TABLE 4 HERE

4.3 Structural Model

The assessment of the structural model was conducted to test the hypotheses. To determine the path coefficients and the R^2 for each endogenous construct, the bootstrapping procedure was applied. Following Hair, et al. (2012), the bootstrapping procedure used 5000 samples with replacement. Figure 2 shows details of the model test results, while the results of the bootstrapping process are summarised in Table 5 below.

INSERT FIGURE 2 HERE

INSERT TABLE 5 HERE

The PLS results reported in Table 5 indicate that H1 is accepted, since the path coefficient between market orientation and managerial use of the MAS information was positive and highly significant ($\beta = 0.409$, $t = 5.066$, $p < 0.001$). The path coefficients from market orientation to all aspects of organisational performance were also positive and significant, with market orientation positively associated with financial performance ($\beta = 0.221$, $t = 2.795$, $p < 0.01$), customer-related performance ($\beta = 0.317$, $t = 4.478$, $p < 0.001$), internal business process-related performance ($\beta = 0.236$, $t = 2.233$, $p < 0.05$), and learning and growth-related performance ($\beta = 0.251$, $t = 2.392$, $p < 0.01$). Therefore, H2, H3, H4 and H5 are supported.

For the relationships between managerial use of the MAS information and all perspective of organisational performance, the results shows that managerial use of the MAS information has a weak positive association with financial performance ($\beta = 0.141$, $t = 1.362$, $p < 0.1$), a positive relationship with customer-related performance ($\beta = 0.191$, $t = 2.329$, $p < 0.05$), and strong positive associations with internal business process-related performance ($\beta = 0.267$, $t = 2.470$, $p < 0.01$) and learning and growth-related performance ($\beta = 0.283$, $t = 3.485$, $p < 0.001$). Thus, the proposed hypotheses H6, H7, H8 and H9 were supported.

This study also analysed the indirect effect of managerial use of the MAS information. To test the significance of the indirect effects, this study – following Hayes (2009) and Hair, Hult, Ringle and Sarstedt (2014) – used the bootstrapping method with PLS².

² If the result shows that the indirect effect is significant, the Variance Accounted For (VAF) value is then calculated to assess the strength of the indirect effect. The VAF value is obtained by dividing the path coefficient of the indirect effect by the total effect. The total effect is equal to the direct effect of the independent variable on the dependent variable plus the sum of indirect effect(s) through each potential mediating variable. The total effect can be obtained from the PLS-SEM Algorithm. The VAF values of 20%, more than 20% but less than 80%, and 80% and above,

The results presented in Table 6 indicate that managerial use of the MAS information partially mediate the relationships between market orientation and financial performance, customer-related performance, internal business-related performance, and learning and growth-related performance. Note needs to be taken for the indirect relationship between market orientation and customer-related performance, as the VAF value of this indirect effect is just below 20% (19.75%). This is because the direct effect is high and marginally decreases after the inclusion of the mediation variable (Hair et al., 2014).

INSERT TABLE 6 HERE

5. Discussion, conclusions and limitations

This study adds to the research in management accounting and in marketing by conceptualising and testing the role of managerial use of broad scope MAS information on the relationship between one of company's marketing capabilities, market orientation, and organisational performance. As such, this study is amongst the first to provide empirical evidence relating to market orientation, managerial use of MAS information and organisational performance.

The results indicate that market orientation is a significant antecedent of MAS design. The results also suggest that market orientation is one type of capability that drive competitive advantage and contribute to better organisational performance. In this light, the results of this study confirm previous studies (e.g. Joseph & Francis, 2015; Y.-K. Lee et al., 2015; Najafi-Tavani et al., 2016). The results also demonstrate that managerial use of broad scope MAS information is an important antecedent of financial and non-financial organisational performance. As such, the results are consistent with prior studies (e.g. Boulianne, 2007; Ismail et al., 2018; Mia & Winata, 2014; Patiar & Mia, 2008). Finally, the results provide empirical evidence on the role of managerial use of MAS information on the relationship between market orientation and organisational performance. An explanation of these results is that, as an organisation more market-oriented, managers of the organisation need to use greater amount of the MAS information, resulting higher organisational performance.

The results of this study have some theoretical contributions. First, by providing evidence on the direct and indirect effects of market orientation on organisational performance, this study can help to improve our understanding on how market orientation affects organisational performance. It confirms the arguments that better organisational performance can be achieved by the actions of an organisation to capitalise its capabilities (Junges et al., 2015; Ketchen Jr et al., 2007). Second, by providing empirical evidence of the role of broad scope MAS information in maximising companies' market orientation capability to achieve

represent very weak/no mediation (indirect effect), partial mediation (indirect effect), and full mediation (indirect effect) (Hair et al., 2014), respectively.

better performance, this study extends contingency literature in management accounting. It provides a better understanding of the role of MAS design. Third, by investigating not only one aspect of organisational performance but four aspects, namely financial, customer-related, internal business-related and learning and growth-related performance, this study presents a more comprehensive picture of the effect of market orientation and MAS information on organisational performance.

The findings of this study also contribute towards managerial practice. Managerial use of the MAS information in companies pursuing market orientation results in improved each aspect of organisational performance. Therefore, companies that are more market oriented need to guarantee the availability of MAS information in their companies and to encourage their managers to make extensive use of MAS information in their decision-making processes, in order to improve their organisational performance.

There are limitations to this study that need to be addressed. First, the present study only focuses on the role of broad scope MAS information on the relationship between market orientation and organisational performance. However, the MAS information has other characteristics that may affect the above relationship. It might be worthwhile for future research to consider the inclusion of other MAS characteristics. Second, the scope of this study is limited only to the conventional nature of market orientation, which has been conceptualised as responsive (Narver et al., 2004). Given the growing indication in the marketing area that companies need to consider the potential proactive nature of market orientation (Herhausen, 2016; Tan & Liu, 2014), examining the effect of this dimension of market orientation on MAS design and organisational performance may also be worthwhile. Third, the focus of this study is only on market orientation, while there are other types of organisational capabilities, such as entrepreneurship, innovation and organisational learning (Fernández-Mesa & Alegre, 2015; Giniuniene & Jurksiene, 2015; Taheri, Bititci, Gannon, & Cordina, 2019), that may need different use and type of MAS information to achieve organisational performance. Collecting data that considers such capabilities would lead to broader understanding of the topic. Finally, even though this study research model implies causality, for example the organisational performance may affect managerial use of MAS information, the use of a cross-sectional research design is inadequate to draw such conclusion (see Van der Stede, Young, & Chen, 2005). Future research could use longitudinal design to provide greater confidence regarding causality in the proposed model.

Appendix A

Survey Questionnaire

Market orientation

The statements below describe norms that operate in business. Please indicate your **extent of agreement** with how well the statements describe the actual norms in your business (1 = strongly disagree, 7 = strongly agree):

| | |
|------|---|
| MO1 | Our business objectives are driven primarily by customer satisfaction. |
| MO2 | We constantly monitor our level of commitment and orientation to serving customer needs. |
| MO3 | We freely communicate information about our successful and unsuccessful customer experiences across all business functions. |
| MO4 | Our strategy for competitive advantage is based on our understanding of customer needs. |
| MO5 | We measure customer satisfaction systematically and frequently. |
| MO6 | We have routine or regular measures of customer service. |
| MO7 | We are more customer-focused than our competitors |
| MO8 | I believe this business exists primarily to serve customers |
| MO9 | We poll end-users at least once a year to assess the quality of our products and services |
| MO10 | Data on customer satisfaction are disseminated at all levels in organisation on a regular basis |

The Use of MAS Information

Please indicate **the extent to which you use the following information for decision-making at work** by placing the appropriate number for each of the following items (1 = not used at all, 7 = used to a great extent):

| | |
|------|--|
| MAS1 | Information relating to possible future events (i.e. next year), such as expected material price, expected sales volume, new environmental regulation ((if historical information is most suitable for your company needs, mark the lower end of the scale). |
| MAS2 | Information on the likelihood of future events occurring (probability estimates), such as probability of an increase in material price, environmental risk assessment. |
| MAS3 | Information of a non-economic nature, such as customer preferences, employee attitudes, labour relations, attitudes of government and consumer bodies, competitive threats, and media conversations about products and/or services. |
| MAS4 | Information on broad factors external to your company, such as economic conditions, population growth, technological developments, GDP rate, best-in-class environmental performance in the industry. |
| MAS5 | Information of a non-financial nature related to production activities, such as output rate, scrap levels, machine efficiency, employee absenteeism. |
| MAS6 | Information related to product markets such as market size, growth in market share (if you find that a financial interpretation of production and market information is most useful for you company needs, please mark the lower end of the scale). |

Organisational Performance

Please indicate your **firm's performance on the following items relative to that of your leading competitors** by placing an appropriate number for each of the following items. For your response, please use the scale below (1 = significantly below average, 7 = significantly above average):

Financial Performance

| | |
|------|--|
| Fin1 | The percentage of operating income to total revenues |
| Fin2 | Sales growth rate |
| Fin3 | Return on investment |

Customer Performance

| | |
|-------|---|
| Cust1 | Market share |
| Cust2 | Customer satisfaction with products/services delivery process |
| Cust3 | Percentage of on-time delivery |
| Cust4 | Customer response time |
| Cust5 | Number of customer complaints in the last two years |
| Cust6 | Percentage of shipments returned due to poor quality |
| Cust7 | Number of warranty claims in the last two years |
| Cust8 | Cycle time from order to delivery |

Internal Business Process Performance

| | |
|------|---|
| IBP1 | Time to market new product |
| IBP2 | Number of new products |
| IBP3 | Percentage of good output to total output (effectiveness of production) |
| IBP4 | Material efficiency |
| IBP5 | Post-sale service quality |
| IBP6 | Post-sale service efficiency |

Learning and Growth Performance

| | |
|-----|---------------------------------|
| LG1 | Employee efficiency |
| LG2 | Employee satisfaction |
| LG3 | Computerised information system |

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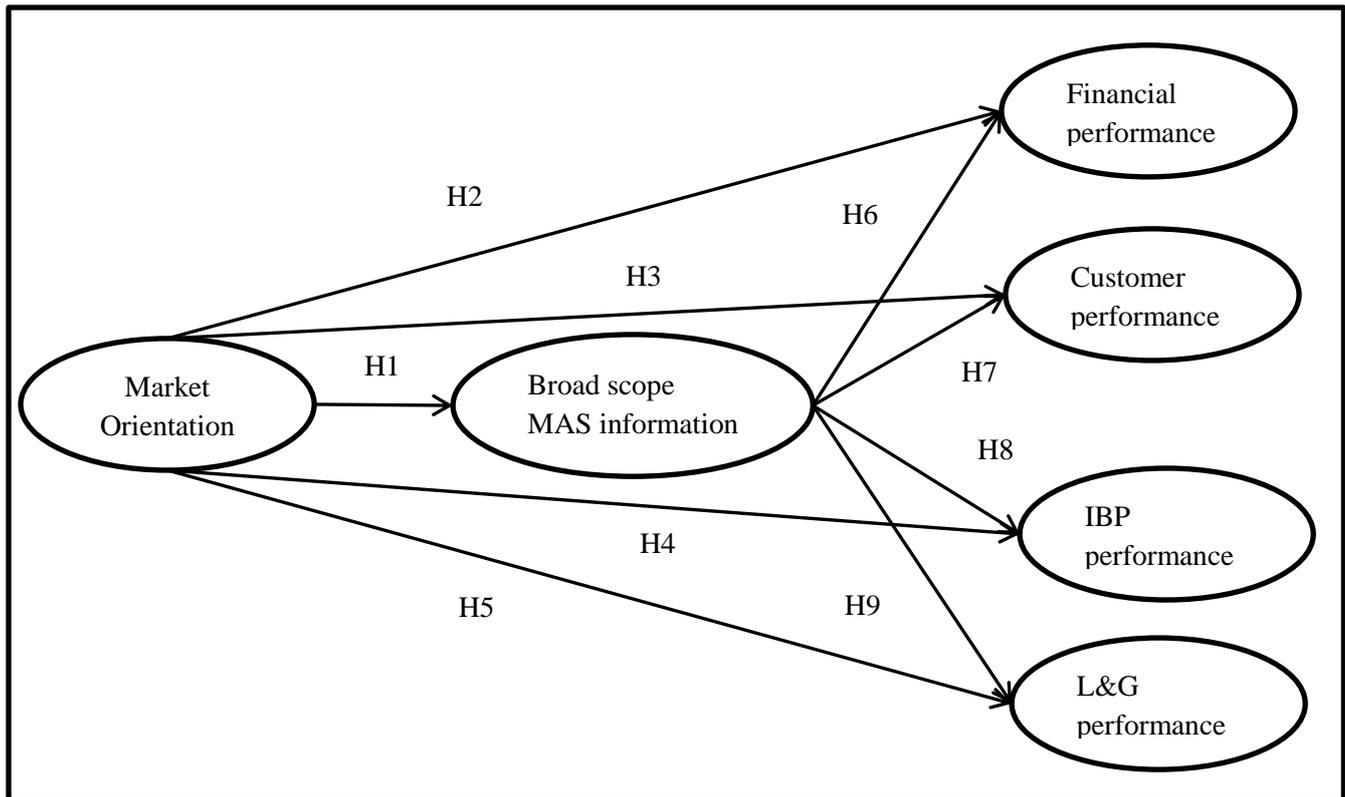


Fig.1. Research Model

Table 1

Sample Demographics

| | | Frequency (n = 131) | % |
|------------------|--|------------------------|-------|
| Type of industry | Wood and products of wood except furniture and plating materials | 6 | 4.58 |
| | Garment | 12 | 9.16 |
| | Rubber and plastic products | 9 | 6.87 |
| | other non-metallic mineral products | 4 | 3.05 |
| | Food and beverages | 25 | 19.08 |
| | Textile | 13 | 9.92 |
| | Tobacco | 3 | 2.29 |
| | Furniture | 8 | 6.10 |
| | Paper and paper products | 2 | 1.52 |
| | Recycling | 2 | 1.52 |
| | Leather products | 1 | 0.76 |
| | Publishing, printing and reproduction of recorded media | 6 | 4.58 |
| | Chemical and chemical products | 8 | 6.10 |
| | Pharmaceutical | 8 | 6.10 |
| | Basic metal | 3 | 2.29 |
| | Electrical machinery and apparatus | 4 | 3.05 |
| | Machinery | 4 | 3.05 |
| | Other transport equipment | 3 | 2.29 |

| | | | |
|---------------------|---|-----|-------|
| | Medical, precision and optical instruments | 3 | 2.29 |
| | Radio, television and communication equipment | 2 | 1.52 |
| | Motor vehicles, trailers and semi-trailers | 5 | 3.81 |
| Gender | Male | 111 | 84.73 |
| | Female | 20 | 15.27 |
| Company's Ownership | Domestic/Local-owned company | 91 | 69.47 |
| | Foreign share (Joint Venture) company | 15 | 11.45 |
| | Foreign-owned company | 25 | 19.08 |
| Market of products | Domestic | 48 | 36.64 |
| | Overseas | 68 | 51.91 |
| | Domestic and overseas | 15 | 11.45 |
| Number of employees | 10 to 50 employees | 18 | 13.74 |
| | 51 to 100 employees | 18 | 13.74 |
| | 101 to 200 employees | 18 | 13.74 |
| | 201 to 500 employees | 26 | 19.85 |
| | 501 to 1,000 employees | 14 | 10.69 |
| | 1001 to 5,000 employees | 26 | 19.85 |
| | 5001 to 10,000 employees | 7 | 5.34 |
| | 10,001 to 15,000 employees | 2 | 1.53 |
| | 15,001 to 50,000 employees | 1 | 0.76 |
| | More than 50,000 employees | 1 | 0.76 |

Table 2

Factor loadings from final PLS measurement model

| | Fin | IBP | LG | MO | customer | MAS |
|-------|--------------|--------------|--------------|--------------|--------------|--------------|
| MAS1 | 0.204 | 0.279 | 0.337 | 0.336 | 0.370 | 0.847 |
| MAS2 | 0.182 | 0.295 | 0.286 | 0.278 | 0.252 | 0.778 |
| MAS3 | 0.093 | 0.255 | 0.285 | 0.206 | 0.128 | 0.673 |
| MAS4 | 0.139 | 0.234 | 0.308 | 0.220 | 0.209 | 0.697 |
| MAS5 | 0.142 | 0.280 | 0.221 | 0.326 | 0.199 | 0.663 |
| MAS6 | 0.227 | 0.253 | 0.252 | 0.397 | 0.203 | 0.709 |
| Fin1 | 0.765 | 0.299 | 0.300 | 0.163 | 0.284 | 0.242 |
| Fin2 | 0.880 | 0.257 | 0.391 | 0.298 | 0.359 | 0.211 |
| Fin3 | 0.807 | 0.198 | 0.360 | 0.197 | 0.284 | 0.093 |
| IBP1 | 0.124 | 0.669 | 0.424 | 0.244 | 0.248 | 0.254 |
| IBP3 | 0.315 | 0.676 | 0.418 | 0.198 | 0.462 | 0.399 |
| IBP5 | 0.268 | 0.845 | 0.521 | 0.318 | 0.438 | 0.208 |
| IBP6 | 0.188 | 0.796 | 0.471 | 0.278 | 0.458 | 0.187 |
| LG1 | 0.351 | 0.466 | 0.776 | 0.297 | 0.444 | 0.231 |
| LG2 | 0.326 | 0.515 | 0.872 | 0.309 | 0.409 | 0.357 |
| LG3 | 0.399 | 0.551 | 0.850 | 0.313 | 0.398 | 0.359 |
| Cust2 | 0.478 | 0.422 | 0.459 | 0.264 | 0.754 | 0.220 |
| Cust3 | 0.245 | 0.551 | 0.428 | 0.367 | 0.863 | 0.283 |
| Cust4 | 0.211 | 0.283 | 0.279 | 0.284 | 0.723 | 0.245 |
| MO1 | 0.141 | 0.206 | 0.236 | 0.638 | 0.302 | 0.261 |

| | | | | | | |
|-----|-------|-------|-------|--------------|-------|-------|
| MO2 | 0.314 | 0.273 | 0.307 | 0.783 | 0.343 | 0.291 |
| MO3 | 0.191 | 0.275 | 0.258 | 0.655 | 0.212 | 0.436 |
| MO4 | 0.068 | 0.262 | 0.268 | 0.733 | 0.299 | 0.343 |
| MO5 | 0.252 | 0.256 | 0.270 | 0.827 | 0.322 | 0.269 |
| MO6 | 0.228 | 0.224 | 0.254 | 0.715 | 0.235 | 0.151 |

Table 3

Descriptive statistics, average variance extracted (AVE) statistics, and correlations of latent variables from PLS (n=131)

| | Mean | Standard Deviation | Cronbach Alpha | Composite reliability | AVE | Correlations | | | | | |
|-------|-------|--------------------|----------------|-----------------------|-------|--------------|-------|-------|-------|-------|-------|
| | | | | | | Fin | IBP | LG | MO | Cust | Scope |
| Fin | 4.466 | 0.920 | 0.759 | 0.859 | 0.671 | 0.819 | | | | | |
| IBP | 4.660 | 0.782 | 0.738 | 0.836 | 0.563 | 0.309 | 0.751 | | | | |
| LG | 4.527 | 0.891 | 0.781 | 0.872 | 0.695 | 0.429 | 0.615 | 0.834 | | | |
| MO | 5.782 | 0.835 | 0.820 | 0.870 | 0.530 | 0.279 | 0.345 | 0.367 | 0.728 | | |
| cust | 4.911 | 0.742 | 0.682 | 0.825 | 0.612 | 0.383 | 0.544 | 0.495 | 0.395 | 0.782 | |
| scope | 4.949 | 1.011 | 0.824 | 0.872 | 0.534 | 0.231 | 0.364 | 0.385 | 0.409 | 0.321 | 0.731 |

Fin: financial performance; Cust: customer-related performance, IBP: internal business process-related performance; LG: learning and growth-related performance; MO: market orientation; Scope: broad scope MAS information.

Diagonal elements are the square roots of AVE. Off-diagonal elements are the calculated correlations between latent variables from PLS. All correlations are significant at 0.01 significant level (one-tailed).

Table 4

Common method bias analysis

| Construct | Indicator | Substantive factor loading (R1) | R1 ² | Method factor loading (R2) | R2 ² |
|---|-----------|---------------------------------|-----------------|----------------------------|-----------------|
| Financial performance | F1 | 0.752**** | 0.566 | 0.030 | 0.001 |
| | F2 | 0.806**** | 0.650 | 0.069 | 0.005 |
| | F3 | 0.905**** | 0.819 | -0.096** | 0.009 |
| Customer-related performance | C2 | 0.760**** | 0.578 | 0.035 | 0.001 |
| | C3 | 0.818**** | 0.669 | 0.046 | 0.002 |
| | C4 | 0.774**** | 0.599 | -0.094 | 0.009 |
| Internal business process-related performance | IBP1 | 0.626**** | 0.392 | 0.017 | 0.000 |
| | IBP3 | 0.329** | 0.108 | 0.325*** | 0.106 |
| | IBP5 | 0.967**** | 0.935 | -0.089* | 0.008 |
| | IBP6 | 0.970**** | 0.941 | 0.138** | 0.019 |
| Learning & growth-related performance | LG1 | 0.830**** | 0.689 | -0.039 | 0.002 |
| | LG2 | 0.887**** | 0.787 | -0.026 | 0.001 |
| | LG3 | 0.785**** | 0.616 | 0.065 | 0.004 |
| | MAS1 | 0.821**** | 0.674 | 0.032 | 0.001 |
| MAS Information | MAS2 | 0.797**** | 0.635 | -0.021 | 0.000 |

| | | | | | |
|--------------------|------|-----------|-------|---------|-------|
| | MAS3 | 0.763**** | 0.582 | -0.096 | 0.009 |
| | MAS4 | 0.737**** | 0.543 | -0.049 | 0.002 |
| | MAS5 | 0.629**** | 0.396 | 0.039 | 0.002 |
| | MAS6 | 0.628**** | 0.394 | 0.090 | 0.008 |
| Market orientation | MO1 | 0.619**** | 0.383 | 0.014 | 0.000 |
| | MO2 | 0.725**** | 0.526 | 0.061 | 0.004 |
| | MO3 | 0.491**** | 0.241 | 0.180** | 0.032 |
| | MO4 | 0.734**** | 0.539 | 0.003 | 0.000 |
| | MO5 | 0.910**** | 0.828 | -0.084 | 0.007 |
| | MO6 | 0.850**** | 0.723 | -0.141* | 0.020 |
| Average | | 0.757 | 0.592 | 0.016 | 0.010 |

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$

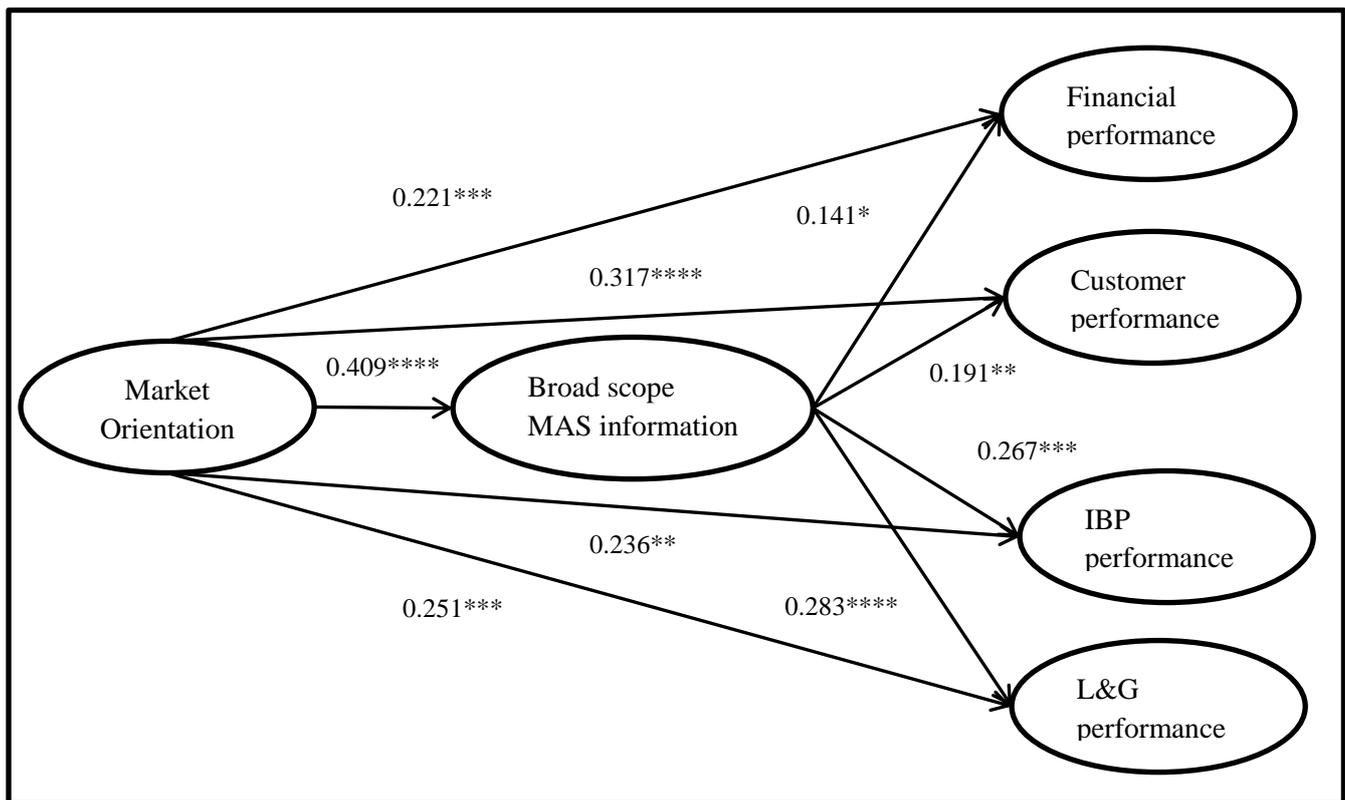


Fig. 2. Partial least squares model: Market orientation, managerial use of the MAS information, financial performance, customer-related performance, internal business process-related performance, and learning and growth-related performance ($n = 131$). * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$ (one-tailed)

Table 5

PLS structural model: path coefficients, t-statistics and R^2 ($n=131$)

| Dependent variables | Independent variable | | R^2 |
|---------------------|----------------------|-----------------|-------|
| | Market orientation | Broad scope MAS | |

| | | information | |
|---|-------------------------------|------------------------------|-------|
| Broad scope MAS information | 0.409 (5.066) ^{****} | | 0.167 |
| Financial performance | 0.221 (2.795) ^{***} | 0.141(1.362) [*] | 0.094 |
| Customer-related performance | 0.317 (4.478) ^{****} | 0.191(2.329) ^{**} | 0.186 |
| Internal business process-related performance | 0.236 (2.233) ^{**} | 0.267(2.470) ^{***} | 0.179 |
| Learning and growth-related performance | 0.251(2.392) ^{***} | 0.283(3.485) ^{****} | 0.201 |

* p < 0.1; **p < 0.05; *** p < 0.01; **** p < 0.001 (one-tailed)

Table 6

Indirect effects, t-statistics, total effect, and VAF

| Relationships | Indirect effect | Total effect | | VAF |
|--|------------------------------|--------------|--------|--|
| Market orientation → managerial use of MAS information → financial performance | 0.058 (1.284) [*] | 0.279 | 20.7% | Partial mediation |
| Market orientation → managerial use of MAS information → customer-related performance | 0.078 (2.130) ^{**} | 0.395 | 19.75% | Almost no mediation (weak partial mediation) |
| Market orientation → managerial use of MAS information → internal business process-related performance | 0.109 (2.537) ^{***} | 0.345 | 31.59% | Partial mediation |
| Market orientation → managerial use of MAS information → learning and growth-related performance | 0.116 (2.021) ^{**} | 0.367 | 31.61% | Partial mediation |

* p < 0.1; **p < 0.05; *** p < 0.01 (one-tailed)