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STRATEGIC ORIENTATIONS, THE MEDIATING EFFECT OF ABSORPTIVE CAPACITY AND INNOVATION: A STUDY AMONG MALAYSIAN MANUFACTURING SMES

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Strategic orientations (SOs) and absorptive capacity can significantly enhance innovation capacity in manufacturing Small and Medium Enterprises (SMEs). This study explores the relationship of SOs i.e., Market Orientations (MOs), Entrepreneurial Orientations (EOs) and Customer Orientations (COs) to absorptive capacity on the one hand, and to innovation on the other hand. The study also delves into the issue of how absorptive capacity mediates the effects of SOs on innovation in manufacturing SMEs from emerging countries' perspective. This study uses a cross-sectional design and quantitative data collected through a structured interview of top managers from 360 manufacturing SMEs. The

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findings show that MO, EO and CO have positive and significant effects on innovation and that absorptive capacity partially mediates SOs' effects on innovation.

Keywords: Market orientation; customer orientation; entrepreneurial orientation; product and process innovation; absorptive capacity; manufacturing SMEs; innovation.

Introduction

Small and Medium Enterprises (SMEs) are the largest segment of commercial activities internationally and their contribution to growth and sustainability of any economy deserves to be a topic of constant research (Suprapto *et al.*, 2009). For example, Singapore is home to 154,000 SMEs, accounting for 99.3% of total business enterprises in the country, contributing 46% to GDP and 63% towards total employment (Gupta *et al.*, 2013). The scenario is relatively similar in neighbouring countries such as Malaysia where SMEs have been identified as the most significant contributor towards economic growth (Aziz and Samad, 2016). According to the SMEs' annual report 2010/2011, SMEs comprised approximately 99.2% of entire business entities within Malaysia as at 2010. They are credited with 42% of the total GDP, 19% of total exports, and up to 56% of the total employment rate in the country (Chelliah, 2010). Performance of SMEs remains crucial due to their continuous and significant contribution to the national GDP (Moorthy *et al.*, 2012). However, despite the high levels of contribution, SME performance and their sustainability in emerging countries are found to receive inadequate attention from researchers, which formed the initial motivation for this study.

SMEs in the manufacturing sector in Malaysia are defined as firms involved in agro-based industries and manufacturing-related services having either less than 150 full-time workers; or an annual sales turnover which is below RM25 million (SME Corporation Malaysia). Manufacturing-related SMEs in Malaysia can generally be classified into three major categories: micro, small, and medium enterprises involved in various sectors, such as, food and beverages (15.0%), metal and non-metallic mineral products (16.7%), and textiles and clothing (23.2%) (Aris, 2007; Herath and Mahmood, 2014). Manufacturing SMEs represent 96.6% of the total manufacturing establishments registered with the Companies Commission in Malaysia (Aziz *et al.*, 2014). These enterprises are primarily located on the west coast of peninsula Malaysia, which is more, industrialised and has port facilities, such as Johor, Perak, Selangor, and Pulau Pinang. Recent research suggests that the already significant contributions of manufacturing SMEs in Malaysia (35%) is expected to increase further to 50% of total production output in the manufacturing sector by 2020 (Chelliah, 2010; Saleh and Ndubisi, 2006).

Recognising the significance of SMEs in the manufacturing sector, research shows that the government in Malaysia provides extensive aid to support SMEs. In the Seventh and Eighth Malaysian Plans and the Second Industrial Master Plan (IMP2), the Malaysian government introduced a number of incentives to help SMEs involved in diverse areas of business operations (Saleh and Ndubisi, 2006). Support services undertaken by government and non-government organisations to improve the performance of manufacturing SMEs are primarily concentrated on strengthening the competitive advantages of manufacturing SMEs by focusing on functional and material aspects. Through proper training and mentorships, these supports could be extended to intangible resources and capabilities such as strategic orientation (SO), absorptive capacity, and innovation capability of the firm; thus enabling it to achieve superior performance.

Previous studies have identified various types of SO dimensions including market orientation (MO), customer orientation (CO), and entrepreneurial orientation (EO) all of which play a vital role for firms in acquiring superior performance (Beliaeva *et al.*, 2018; Engelen *et al.*, 2015; Jaworski and Kohli, 1993; Morgan *et al.*, 2009; Sisay *et al.*, 2017; Zhang and Yang, 2018). SO, in such context, refers to the processes, principles, practices, and decision-making techniques that direct organisational activities (Herath and Mahmood, 2014; Zhou and Li, 2010). Interestingly, Han *et al.* (1998) pointed out that the influence of SO components on firm's innovativeness is substantial for their effect on performance. It is obvious that under intense competitions in present global economic landscape firms need to be innovative in order to survive the competitive marketplace (Peng and Delios, 2006; Rosli and Sidek, 2013). Innovation, thus, has been identified as a crucial research topic in both production and service research literature (Farhang, 2017; Kimorop *et al.*, 2018; Sutapa *et al.*, 2017; Ostrom *et al.*, 2015; Wong and Huang, 2014). The ability to constantly improve products, processes and services through the adoption of the latest techniques and strategies are the most vital characteristics of any successful business. Such traits in firms can be considered as the elements that business innovation is composed of, and therefore innovation is perceived as a critical factor for business organisations in order to survive and maintain a competitive edge (Milling and Stumpfe, 2000). Particularly in the case of SMEs, empirical evidence supports the notion that innovation plays a key role in acquiring superior performance (Rauch *et al.*, 2009). Innovation can enhance firms' overall performance by transforming businesses' capacity towards global competition and expansion (Dhesi, 2010). It is through conceiving new products and processes that firms absorb novel technological and market-related knowledge, thus the eventual superiority in performance (Lichtenthaler and Lichtenthaler, 2009).

Absorptive capacity is the ability of a firm to recognise the value of new, external information, assimilate it, and apply it to commercial ends (Cohen and

Levinthal, 1990). In times of market and technological turbulence, absorptive capacity has proven to bolster firms' knowledge-based capability (Lichtenthaler and Lichtenthaler, 2009). As firms adopt novel technological and market-related knowledge, absorptive capacity becomes crucially relevant to new processes, practices, and decision-making techniques of the firm, therein SO, translating into innovation and performance (Lichtenthaler, 2009; Lichtenthaler and Lichtenthaler, 2009). Cohen and Levinthal (1990) highlighted the cumulative characteristic of absorptive capacity capable of initiating an extreme case of path-dependence in firms. Accordingly, absorptive capacity is influential in the formation of expectations. In uncertain business conditions, absorptive capacity enables new processes, practices and decision-making techniques that direct organisational activities toward accurate prediction of the nature and commercial potential of technological advances, therein innovation.

The relationship between SO, absorptive capacity and innovation can be explained by two theories; the resource-based view (RBV) (Barney, 1991) and firms' dynamic capabilities extensions (Teece *et al.*, 1997; Morgan *et al.*, 2009). According to the RBV, resource immobility and resource heterogeneity are potential sources that give firms' their competitive edge (Barney, 2000). Dynamic capabilities are another useful theory that describes firms' resource acquisition in rapidly changing environments. This theory posits that the capabilities used to acquire and deploy firms' resources in current market conditions can facilitate the achievement of superior performance (Morgan *et al.*, 2009; Teece *et al.*, 1997). Thus, the idea is to combine and deduce from both RBV and dynamic capabilities perspectives. By doing so, this study theorises that firms undergo two simultaneous resource acquisitions to drive superior performance; the first is to possess rare, valuable, inimitable, and non-substitutable resources; and the second is to acquire complementary capabilities that leverage on such resources to match changing market conditions (Morgan *et al.*, 2009; Teece, 2007).

As such, by orchestrating resources in a certain way, organisational resources can be transformed into capacities and assets (Day, 1994). One of the key organisational resources is SO which is of fundamental importance of any firm. SO is a capacity that translates the firm's business philosophy of deeply rooted beliefs and values into clear and distinct organisational direction towards superior performance (Gatignon and Xuereb, 1997). Such beliefs and values not only define the resources to be employed and deployed, but also transcend complementary capabilities such as absorptive capacity. When combined, these capacities and resources become a cohesive whole. Thus, this study explicates the sources of competitive advantage as a combination of capacities that are interaction-based, intangible, and difficult to imitate, trade, or duplicate, and complimentary capabilities.

Previous research studied SO components such as market orientations, entrepreneurial orientations and COs separately. Although some research has addressed the current issue under study, there is a lack of studies that significantly address the particular context of emerging and/or developing countries SMEs such as that of Malaysian SMEs. While governments have been displaying much interest in SME policies related to firms' ability to innovate, there is a lack of rigorous empirical work on the determinants of innovation amongst SMEs in developing countries (Lee and Ging, 2007). Second, although previous studies indicate a possible indirect linkage between dimensions of SO and innovation, theoretical inadequacy exists in terms of propositions and empirically tested, sound, mediators (Wang *et al.*, 2016). Third, in terms of innovation, most of the existing literature concentrates either on product or process innovation whereas this study considers both simultaneously, which is significant for a deeper understanding of the firms' innovation performance. More importantly, this study aspires to contribute practically by highlighting strategies that would help improve the innovativeness of SMEs thereby contributing toward higher performance. Moreover, this study focuses on the actions and strategies that SMEs in an emerging country context could implement on their own. The present study seeks to determine how SMEs could employ strategies pro-actively in their routine operations to enhance performance instead of depending on the help of external agencies, such as the government. Furthermore, this study answers the call of existing literature that stresses the need to exploit innovation-related research for SMEs, as it is evident that innovation plays the key role in attaining superior performance, specifically among SMEs (Klomp and Van Leeuwen, 2001; Rauch *et al.*, 2009).

Literature Review

SO is a well-known and widely used concept in the literature concerning organisational performance of businesses. Studies have identified quite a few types of SO dimensions including EO, MO, CO, innovation orientation, cost orientation, learning orientation, competitor orientation, interaction orientation and employee orientation. Although numerous existing studies have researched the relationship between single dimensions of SO and firm performance, there have not been many attempts to examine the holistic effect of a combination of several SO dimensions (Rauch *et al.*, 2009). This is despite the fact that it has been strongly argued that studies on SO need to be diverted from examining the effect of a single SO dimension to a combined and holistic effect of several SO dimensions (Grinstein, 2008; Hakala, 2011; Jones and Rowley, 2011). Following this suggestion, a few recent studies focused on the combined effect of several SOs and showed that it is

a more effective approach to study SO and the organisational performance paradigm (Baker and Sinkula, 2009; González-Benito *et al.* 2009).

The present study draws from the combination of three key SO dimensions: EO, MO, and CO. EO has been attributed as a crucial variable that influences at both individual and joint performance levels, resulting in overall firm's superior performance (Lee *et al.*, 2011; Polat and Mutlu, 2012. According to Pérez-Luño *et al.*, 2011), innovation in firm occurs in concert with proactiveness and risk — taking propensity, thus representing a firm's entrepreneurial orientation. Market orientation, on the other hand, is the cornerstone of both marketing management and strategy paradigms and forms the base for high quality marketing applications. This construct also plays a significant role in the success and superior performance of firms in the long run (Jaworski and Kohli, 1993). Marketing, customer, and entrepreneurship dimensions of the SO paradigm are primarily selected because of their conceptual similarity and theoretical overlapping in the following areas: opportunistic in nature; focused on change; and innovative in management approach (Jones and Rowley, 2011). Moreover, empirical evidence indicates that there is a significant correlation between MO, CO, and EO, and that they strongly contribute towards corporate success (Miles and Arnold, 1991).

Market orientation, absorptive capacity, and innovation

Market orientation stresses the need for a firm to gain, disseminate, and react to market generated intelligence, obtained from the organisation's target market and present and prospective competitors (Jaworski and Kohli, 1993). Previous research has much emphasised the relationship between market orientation and innovation (Han *et al.*, 1998) as it has been found that several significant innovations have been generated from market intelligence derived from consumer insights (Hippel, 1988), which is actually the focal point of market orientation. Yet, the study by Zhou *et al.* (2005) had shed light on the contradictory nature of market orientation as one of the three key organizational resources. In the one hand, market orientation facilitates technology-based innovations with posthumous elevated benefits to mainstream customers, and on the other, inhibits market-based innovations.

To explicate the relationship between market orientation, absorptive capacity and innovation, this study employs the theories of RBV and dynamic capabilities extension (Barney, 1991; Teece *et al.*, 1997; Morgan *et al.*, 2009). In the present context, this study applied RBV to Day's (1994) emphasis that organisational resources can be translated into capacities and assets. RBV was applied on SO, a significant composition of organisational resources. Congruently, dynamic capabilities theory was applied on absorptive capacity, a social construct deemed as a knowledge-based complementary capability (Lichtenthaler and Lichtenthaler,

2009). Thus, by combining and deducing from both theories of RBV and dynamic capabilities, it is perceived that the possession of rare, valuable, inimitable, and non-substitutable resources allows firms to develop complementary capabilities that, through innovations, can leverage the said resources to match changing market conditions and drive superior performance.

Interestingly, studies also exist that found market orientation to effect certain types of innovation negatively (Zhou *et al.*, 2005). The contradictory findings and significance associated with the construct, influenced that study to assume that the concept of market orientation requires deeper exploration, and therefore this study identifies market orientation as a key factor to effect innovation via absorptive capacity, thereby hypothesizing the following:

H_1: *Market Orientation has a significant positive effect on Absorptive Capacity among the Manufacturing SMEs.*

Customer orientation, absorptive capacity, and innovation

CO is the other significant SO dimension for any organisation (Wang *et al.*, 2015) and could be defined as sufficient perception of one's target market, as required to generate superior value for them constantly (Slater and Narver, 1995). The construct involves every activity that is related to information creation and distribution, followed by appropriate reaction by an organisation toward present and prospective customer needs and preferences (Jaworski and Kohli, 1993). Previous research held that CO could indirectly affect innovation performance (Keskin, 2006). A study by Govindarajan *et al.* (2011) reported the positive effect that mainstream CO has on radical innovations but held a negative effect on disruptive innovation. Further, the construct of emerging CO was found exclusively positive toward disruptive innovation, thus no association with radical innovations. In a separate study, Arnold *et al.* (2011) confirmed that a firm's focus on customer acquisition augments radical innovation performance but attenuates incremental innovation. However, contrasting effects were found in the interaction of a firm's SO and customer retention.

However, according to more recent study, CO influences product and service innovativeness in manufacturing firms positively, directly, and indirectly (Wang *et al.*, 2016). To explicate the relationship of CO, absorptive capacity and innovation, this study again applies the dual theories of RBV and dynamic capabilities extensions (Barney, 1991; Teece *et al.*, 1997; Morgan *et al.*, 2009). The RBV perspective is applied on CO as a dimension of SO, which herein is a key organisational resource. This theory is useful as it supports the present context where organisational resources can be translated into capacities and assets (Day, 1994) such as SO. Additionally, this study draws on the theory of dynamic capabilities extensions to examine absorptive

capacity, a construct regarded as a knowledge-based complementary (dynamic) capability (Lichtenthaler and Lichtenthaler, 2009). In such contexts, where CO symbolises an organisational strategic position toward consumers (Jaworski and Kohli, 1993; Slater and Narver, 1995), customer-oriented models of organisational resources need to be developed (Arnould, 2008); and to accomplish this, it is essential to examine how customer-centric strategies influence a firm's capacities to build unique resources and thereby sustain a competitive advantage.

Although it is perceived that CO leads to strategic behaviour that enhance resources, or capacity, for new product or services development resulting in innovation (Wang *et al.*, 2016), research exists that found CO to effect innovation negatively (Im and Workman, 2004). The varied findings and significance associated with CO influenced this study to assume that the construct requires deeper exploration, and therefore this study identifies CO as a key factor to effect innovation via absorptive capacity, thereby hypothesising the following:

H_2: *CO has a significant positive effect on Absorptive Capacity among the Manufacturing SMEs.*

Entrepreneurial orientation, absorptive capacity, and innovation

EO has been attributed as a crucial variable at the firm level that influences firm performance both individually and jointly and thereby results in superior firm performance (Lee *et al.*, 2011; Polat and Mutlu, 2013). EO can be referred to as the capacity of an organisation to detect, identify, realise and use any possible opportunities, in order to gain access into new markets deploying innovative methods, practices and decision-making styles that are considered proactive and risk-taking in nature and support managers to operate in an entrepreneurial style (Lumpkin and Dess, 1996; Rauch *et al.*, 2009; Zahra, 2008).

Previous research revealed that EO strengthens the advantages of knowledge-based resources (Wiklund and Shepherd, 2003). Recent research also supported the view that EO affects innovation performance by means of knowledge management (Madhoushi *et al.*, 2011). Zhou *et al.* (2005) found the construct of EO as a significant variable that not only initiates innovative activities but also enables innovations that are grounded on advanced technology and market disruption principles; both of which are innovations being targeted to permeate emerging market segments. EO is considered as the other pivotal factor for innovation (Wu *et al.*, 2008). It is found to promote values such as openness to new ideas and receptiveness towards innovativeness (Lumpkin and Dess, 1996) and thereby has been long recognised as the catalyst for innovation related actions (Slater and Narver, 1995). It is perceived that EO facilitates a firms' ability to discern

appropriate resources for combination thereby initiating innovation (Nahapiet and Ghoshal, 1998). The environmental dynamism, the risk taking and the proactive characteristics embedded within EO, affects both generation and adoption of innovation (Pérez-Luño *et al.*, 2011).

EO focuses on openness to new ideas, processing them and using them to commercial ends and raising the firms' absorptive capacity in the process. Therefore, this study identifies EO as a key factor to affect innovation via absorptive capacity, thereby hypothesising the following:

H_3: *EO has a significant positive effect on Absorptive Capacity among the Manufacturing SMEs.*

Innovation

This study adopts the Oslo Manual's definition of innovation as "a new or significantly improved product (goods or service) or process (process), a new marketing method or new organisational solution in business practice or in external relations" (OECD, 2005). Innovation is considered as an essential component for both survival and the competitive edge of business organisations (Milling and Stumpfe, 2000). Innovation commonly refer as a tool employed by entrepreneurs in exploiting opportunities for various business operations, whereby entrepreneurs must deliberately make smart choices about the ideas, or sources, of innovation which are able to deliver desired outputs. Particularly in the context of manufacturing companies, innovations related to products and processes generating these products are crucial (Milling and Stumpfe, 2000). Previous research has much stressed the role of innovation in facilitating certain dimensions of SO, such as MO (Hurley and Hult, 1998) and innovation is also identified as a moderator in the relationship between other dimensions of SO (e.g., CO) and firm performance (Voss and Voss, 2000).

According to the literature, innovation success could be measured by means of a firm's process, product, marketing, and managerial innovation (O'Cass and Weerawardena, 2009; Oslo Manual, 2005). However, in view of the study scope, the definition perimeter is established only to product and process innovation (Ayerbe, 2006; Farhang, 2017; Kimorop *et al.*, 2018; Khoo *et al.*, 2014; Prajogo and Ahmed, 2006). Product and technology developments are concepts correlated with both product and process innovation. Constructs of process and product innovation have been developed on the basis of several criteria and have been conceptualised and widely used in previous studies to measure a firm's innovation performance (Khoo *et al.*, 2014; Prajogo and Ahmed, 2006). The criteria determined by the original study included the speed of innovation, the number of innovations, the level of innovativeness and being "first" within the market.

The traits of innovation were compressed into two major segments of innovation: process and product innovation. Product innovation primarily involves the generation of new ideas or creating something, which is either entirely new, or has significantly improved the capacities of the product, whereby such changes are reflected and embedded within the end product and/or services offered by a business entity. Process innovation, on the other hand, refers to changes in the processes followed by firms in creating the end-product and/or services by means of adoption of innovation developed externally, or innovative practices developed within the firm itself (Prajogo and Ahmed, 2006).

Absorptive capacity and innovation

Absorptive capacity refers to the process of acquisition, dissemination, organisational memory, and shared interpretation of information, whereby new insights, or knowledge, that facilitate organisational changes responsible for enhancing performance are developed (Slater and Narver, 1995). The concept of absorptive capacity is defined as the capacity to acquire and use knowledge effectively, and this capacity critically effects firms' innovative activities and business performance (Cohen and Levinthal, 1990). Under the present rapidly changing business environment, a firm's absorptive capacity is vital in increasing its innovation performance and thereby developing a competitive advantage (Khoo *et al.*, 2014).

Knowledge acquisition coupled with knowledge dissemination is known to affect innovation positively (Darroch, 2005). Previous research identified absorptive capacity acting as a conduit that plays an instrumental role in facilitating innovation within an organisation (Tsai, 2001). In the context of product innovation, recent research revealed that absorption capacity significantly mediates the relationship between external knowledge inflows and innovative performance (Moilanen *et al.*, 2014). Regarding process innovation, it has been found that firms aspiring to enhance the rate of innovation must master their absorptive capacity first (Andreeva and Kianto, 2011). It is argued in literature that a firm that is not able to absorb new external knowledge will not be able to derive any innovation benefit (Kostopoulos *et al.*, 2011). Other studies also found absorptive capacity to have a positive influence on innovative behaviour generation, and simultaneously the construct has also been found to improve the effectiveness of developmental processes related to novel products (Fosfuri and Tribó, 2008; Jantunen, 2005). Therefore, this study identifies adsorptive capacity as a significant factor to effect innovation and thereby the following hypothesis is posited:

H_4: *Absorptive Capacity has a significant positive effect on Innovation among the Manufacturing SMEs.*

The mediating role of absorptive capacity

The concept of mediation is a way to explain the process, or mechanism by which one variable affects another. In this study, absorptive capacity functions as a mediating variable. It acts as a social construct that transmits the effect of one variable (MO, EO & CO) to another variable (Innovation). Since in this study, MO, CO and EO have been conceptualised as key constructs effecting absorptive capacity and a relationship between absorptive capacity and innovation has also been synthesised, the study therefore rationally expects absorptive capacity to significantly mediate the association between MO, CO and EO with Innovation, among Manufacturing SMEs in Malaysia, and hence the study puts forth the following hypothesis:

H_5: *Absorptive Capacity mediates the association of MO, CO and EO with Innovation among Manufacturing SMEs.*

Research Methodology

This study uses a cross-sectional design and quantitative data collected through a structured interview of registered SMEs in Peninsular Malaysia. The sampling frame for this study was made up of Malaysian SMEs listed on the public website: Malaysian SME Business Directory by SME Info Portal (2014). This list of registered SMEs includes all sorts of business sectors including manufacturing, manufacturing-related services, mining and quarrying, services (including ICT), construction, primary agriculture, and others. The population sample selected for this study is SME owners, and top-level managers in the manufacturing industry, registered with the SME Malaysian Business Directory via the SME Info Portal (2014). According to the Department of Statistics, Malaysia 2013, there are 37,861 manufacturing firms in the SME category thus 400 SME firms were selected by adopting the random sampling method to identify potential respondents using a table of random numbers. This study selected 400 SME, with the expectation that more than 300 SMEs would agree to allow one of their senior managers to be interviewed. Complete data from more than 300 SMEs was expected to be sufficient to test the model, as Wolf *et al.* (2013) recommend that the range of the sample requirement for structural equation modelling is from 30 to 460 units. The respondents were chosen from Selangor, Johor, Penang, Perak, Kelantan, and Terengganu as they make up the majority (79%) of the manufacturing firms in the country. From the selected 400 sample SMEs, complete data was collected from 360 manufacturing SMEs from the selected states through a structured interview.

Research instruments

The interview questions were adopted from earlier studies with minor modifications where needed. MO refers to the SMEs' propensity to acquire, disseminate, and respond to market information (Liu *et al.*, 2002; Baker and Sinkula, 2009). A total of ten items were adopted from the study conducted by Deshpande and Farley (1998) with minor modifications based on the scope of this study. EO reflects the methods, practices and decision-making styles in terms of enterprises' propensity to exploit new opportunities (Shane and Venkataraman 2000; Baker and Sinkula, 2009). Six items were adopted from the study conducted by Gonzalez-Benito *et al.* (2009) with minor modifications to adjust to the scope of this study. CO refers to the SMEs' orientation toward providing superior value for customers (Slater and Narver, 2000; Deshpande Farley and Webster, 1993). Twelve items were adopted from the study conducted by Ramani and Kumar (2008) with minor modifications. Absorptive capacity refers to the ability to transform new knowledge into usable knowledge through the processes of assessment, assimilation, and application. A total of nine items were adopted from the study conducted by Cadiz *et al.* (2009) with minor modifications. Finally, innovation was measured as the combination of product and process innovation. Product innovation refers to the introduction of completely new products, or a new quality of product, to customers who are not yet familiar with it (Schumpeter, 1935). Seven items were adopted from the study conducted by Suriati (2014) with minor modifications based on the scope of this study. Process innovation refers to the new methods of production and/or new means of managing commodities commercially (Schumpeter, 1935). Eight items were adopted from Suriati (2014) with minor modifications based on the scope of this study.

Summary of Findings

Demographic characteristics

A complete set of data was collected from 360 manufacturing enterprises in Peninsular Malaysia. Among the 360 manufacturing SMS's, most of them were established between the years 1988 to 2010. The mean years of operation among the manufacturing enterprises is 19.49 years with a standard deviation of 11.32 years. Out of 360 manufacturing SME's, a total of 78 or 21.7% SMEs does not employ any skilled foreign workers. Among the remaining 222 SME's, the mean number of foreign skilled workers is 9.69 with a standard deviation of 7.82 workers. Only 10 out of 360 SME's employed more than 100 skilled foreign workers. This indicates that Malaysian manufacturing SME's employ mostly local talent and relatively few skilled foreign workers.

The mean number of employees among these 360 manufacturing enterprises is 85.25 with a standard deviation of 57.66. The types of the selected manufacturing enterprises include basic metal (13.6%); chemicals, including petroleum (8.6%); electrical and electronics (11.4%); fabricated metal (6.1%); food, beverage and tobacco (12.5%); machinery (5.8%); manufacture of furniture (5.6%); medical, precision and optical instruments (2.2%); non-metallic mineral (1.9%); paper, printing and publishing (5.6%); plastic (7.8%); recycling (5.0%); rubber (2.5%); textiles, clothes and leather (1.7%); transport (0.8%); wood and wood products, including furniture (3.9%) and others (5.0%). Finally, most of the interviewee's from the selected manufacturing SMEs, who represented their enterprise, hold "mid-level management" positions (53.9%) followed by "top management" (35.8), and "owner/CEO" (6.4%).

Reliability and validity analysis

Table 1 below shows the criteria used to evaluate the reliability of the items used in this study. These criteria include Cronbach's alpha, composite reliability, and Average Variance Extracted (AVE). The Cronbach's alpha value for all indicators is more than 0.7, which means all the items used are reliable. As for composite reliability, the value for all indicators is more than 0.7, representing reliable items. In terms of AVE, the value should be higher than 0.50, and as noted in Table 1, all the AVE values for the constructs are higher than 0.50, which indicates acceptable convergent validity.

Indicators are also checked for discriminant validity and considered reliable when outer (component) loadings are higher than 0.7, and a construct's loading should be higher than all of its cross-loadings. Component loading with a value of 0.5 is also acceptable if the AVE value is higher than 0.5. As presented in Table 2, all the indicator loadings (except for item no 8, CO) are higher than 0.7, which is also higher than the entire cross-loadings, confirming discriminant validity. The Fornell–Larcker assesses the discriminant validity at the construct level.

Table 1. Reliability and validity.

Variables	No. of items	Mean	Standard deviation	Cronbach's alpha	Composite reliability	AVE
Entrepreneurial orientation	6	5.2148	1.09244	0.941	0.953	0.772
Customer orientation	12	5.4382	0.86324	0.948	0.955	0.641
Market orientation	10	5.4733	0.91913	0.959	0.964	0.729
Absorptive capacity	9	5.2383	1.01849	0.965	0.970	0.783
Innovation	14	5.4393	0.92004	0.951	0.957	0.614

Table 2. Outer model loadings and cross-loadings.

	Entrepreneurial orientation	Market orientation	Customer orientation	Absorptive capacity	Innovation
Entrepreneurial orientation					
Item 1	**0.796**	0.431	0.342	0.320	0.620
Item 2	**0.873**	0.476	0.397	0.384	0.581
Item 3	**0.874**	0.480	0.334	0.377	0.667
Item 4	**0.923**	0.524	0.409	0.432	0.631
Item 5	**0.878**	0.520	0.466	0.464	0.639
Item 6	**0.920**	0.541	0.484	0.467	0.668
Customer orientation					
Item 1	0.337	**0.751**	0.565	0.453	0.430
Item 2	0.391	**0.835**	0.614	0.530	0.451
Item 3	0.396	**0.834**	0.637	0.563	0.481
Item 4	0.429	**0.859**	0.624	0.603	0.474
Item 5	0.471	**0.843**	0.636	0.567	0.535
Item 6	0.409	**0.767**	0.512	0.519	0.518
Item 7	0.450	**0.863**	0.637	0.599	0.517
Item 8	0.428	**0.638**	0.376	0.459	0.500
Item 9	0.504	**0.803**	0.554	0.573	0.578
Item 10	0.512	**0.804**	0.592	0.602	0.573
Item 11	0.546	**0.787**	0.588	0.573	0.558
Item 12	0.546	**0.800**	0.584	0.570	0.571
Market orientation					
Item 1	0.318	0.495	**0.798**	0.514	0.437
Item 2	0.396	0.540	**0.830**	0.553	0.507
Item 3	0.365	0.614	**0.859**	0.572	0.504
Item 4	0.413	0.612	**0.845**	0.629	0.514
Item 5	0.423	0.613	**0.865**	0.630	0.546
Item 6	0.414	0.651	**0.863**	0.577	0.517
Item 7	0.429	0.637	**0.890**	0.597	0.520
Item 8	0.394	0.644	**0.875**	0.561	0.504
Item 9	0.401	0.691	**0.858**	0.570	0.493
Item 10	0.421	0.668	**0.854**	0.580	0.558
Absorptive capacity					
Item 1	0.378	0.602	0.586	**0.860**	0.491
Item 2	0.360	0.587	0.543	**0.853**	0.409
Item 3	0.358	0.613	0.579	**0.877**	0.462
Item 4	0.388	0.631	0.601	**0.902**	0.483
Item 5	0.420	0.656	0.617	**0.908**	0.498
Item 6	0.453	0.638	0.623	**0.898**	0.534
Item 7	0.476	0.639	0.635	**0.907**	0.549
Item 8	0.459	0.580	0.612	**0.890**	0.537
Item 9	0.434	0.560	0.604	**0.865**	0.485

Table 2. (*Continued*)

	Entrepreneurial orientation	Market orientation	Customer orientation	Absorptive capacity	Innovation
Innovation					
Item 1	0.483	0.537	0.536	0.475	**0.720**
Item 2	0.479	0.465	0.459	0.408	**0.777**
Item 3	0.510	0.524	0.560	0.475	**0.790**
Item 4	0.478	0.436	0.408	0.390	**0.781**
Item 5	0.542	0.491	0.491	0.502	**0.814**
Item 6	0.543	0.490	0.482	0.467	**0.836**
Item 7	0.560	0.538	0.537	0.521	**0.840**
Item 8	0.603	0.525	0.482	0.415	**0.710**
Item 9	0.629	0.479	0.389	0.368	**0.770**
Item 10	0.590	0.553	0.484	0.422	**0.712**
Item 11	0.589	0.483	0.389	0.386	**0.799**
Item 12	0.625	0.506	0.412	0.403	**0.805**
Item 13	0.654	0.546	0.469	0.453	**0.793**
Item 14	0.653	0.477	0.399	0.396	**0.808**

The Fornell–Larcker criterion in Table 3 is largely unable to detect any lack of discriminant validity. Furthermore, the Heterotrait-Monotrait Ratio (HTMT) is an estimate of the correlation between constructs, which parallels the disattenuated construct score creation. Using a value of 0.9 as the threshold, this study concluded that there is no evidence of a lack of discriminant validity and all the constructs meet the criteria.

Table 3. Discriminant validity.

	Entrepreneurial orientation	Market orientation	Customer orientation	Absorptive capacity	Innovation
Fornell–Larcker criterion					
Entrepreneurial orientation	0.878				
Customer orientation	0.567	0.801			
Market orientation	0.467	0.723	0.854		
Absorptive capacity	0.469	0.692	0.679	0.885	
Innovation	0.721	0.645	0.598	0.560	0.784
Heterotrait-Monotrait Ratio (HTMT)					
Entrepreneurial orientation	—				
Customer orientation	0.595	—			
Market orientation	0.484	0.756	—		
Absorptive capacity	0.485	0.720	0.703	—	
Innovation	0.767	0.678	0.619	0.577	—

Structural model

The path coefficients between EO, CO and MO on absorptive capacity are positive and statistically significant at the chosen 5% level of significance. Similarly, the path coefficients between absorptive capacity and innovation are positive and statistically significant at the chosen 5% level of significance. The r^2 value of 0.550 indicates that the 55% variation in absorptive capacity of manufacturing SMEs can be explained by their EO, CO and MO. Furthermore, the r^2 value of 0.314 indicates that the 31.4% variation in innovation among Malaysian manufacturing SMEs can be explained by their absorptive capacity.

Finally, in terms of effect size, the f^2 value of 0.010 indicates a weak effect of EO on absorptive capacity. The f^2 values near 0.15 (0.132, 0.140) indicate a moderate effect size between CO and MO on absorptive capacity, respectively. Finally, the f^2 value of 0.458 indicates a strong effect of absorptive capacity on innovation among manufacturing SMEs in Peninsular Malaysia.

The mediating effect of absorptive capacity between EO, CO and MO on innovation of manufacturing SMEs is measured using Baron and Kenny's four-step mediation approach (Baron and Kenny, 1986). The steps, requirements for next steps, and the status are presented in Table 4. Following these steps, in step one, the coefficient of EO on innovation is found to be 0.732 with *p*-value of 0.000, which satisfies the requirement and allows for conducting step two. Step two tests the effect of EO on absorptive capacity, and shows a significant positive effect, which satisfies the requirement and allows for conducting step three. In step three, the coefficient of absorptive capacity on innovation is 0.562 with a *p*-value of 0.000, which satisfies the requirement and allows for conducting step four. Step four tested the effect of EO and absorptive capacity on innovation. The coefficient between EOs on innovation is 0.274 with a *p*-value of 0.000. The effect of EO on innovation is positive and statistically significant in stage one and four, which indicates the partial mediation of absorptive capacity between EO and innovation among manufacturing SMEs.

As for the mediating effect of absorptive capacity between CO and innovation among manufacturing SMEs, the coefficient of CO on innovation is found to be 0.652 with *p*-value of 0.000, which satisfies the requirement and allows for conducting step two. Step two tests the effect of CO on absorptive capacity, and shows a significant positive effect, which satisfies the requirement and allows for conducting step three. In step three, the coefficient of absorptive capacity on innovation is 0.562 with a *p*-value of 0.000, which satisfies the requirement and allows for conducting step four. Step four tested the effect of customer orientation and absorptive capacity on innovation. The coefficient between COs on innovation is 0.508 with a *p*-value of 0.000. The effect of CO on innovation is positive and

Table 4. Hypothesis testing.

	Beta	t value	Sig.	f^2	Decision
Entrepreneurial Orientation → Absorptive Capacity	0.083	1.729	0.042	0.010	Accepted
Customer Orientation → Absorptive Capacity	0.381	5.560	0.000	0.132	Accepted
Market Orientation → Absorptive Capacity	0.365	5.267	0.000	0.140	Accepted
Absorptive Capacity → Innovation	0.560	12.682	0.000	0.458	Accepted

Mediating: Entrepreneurial Orientation → Absorptive Capacity → Innovation

	Beta	Sig.	Requirements for next step	Decision
ENTO → INNO	0.732	0.000	Statistically Significant	Satisfied
ENTO → ABCA	0.472	0.000	Statistically Significant	Satisfied
ABCA → INNO	0.562	0.000	Statistically Significant	Satisfied
ENTO and ABCA	(ENTO → INNO)		Step 1: p-value < 0.05	Partial
→ INNO	0.274	0.000	Step 4: p-value < 0.05	Mediation

Mediating: Customer Orientation → Absorptive Capacity → Innovation

	Beta	Sig.	Requirements for next step	Decision
CUST → INNO	0.652	0.000	Statistically Significant	Satisfied
CUST → ABCA	0.692	0.000	Statistically Significant	Satisfied
ABCA → INNO	0.562	0.000	Statistically Significant	Satisfied
CUST and ABCA	(CUST → INNO)		Step 1: p-value < 0.05	Partial
→ INNO	0.508	0.000	Step 4: p-value < 0.05	Mediation

Mediating: Market Orientation → Absorptive Capacity → Innovation

	Beta	Sig.	Requirements for next step	Decision
MARO → INNO	0.602	0.000	Statistically Significant	Satisfied
MARO → ABCA	0.679	0.000	Statistically Significant	Satisfied
ABCA → INNO	0.562	0.000	Statistically Significant	Satisfied
MARO and ABCA	(ENTO → INNO)		Step 1: p-value < 0.05	Partial
→ INNO	0.407	0.000	Step 4: p-value < 0.05	Mediation

Notes: ENTO = Entrepreneurial Orientation; CUST: Customer Orientation; MARO = Market Orientation; ABCA = Absorptive Capacity; INNO: Innovation.

statistically significant in stage one and four, which indicates the partial mediation of absorptive capacity between CO and innovation among manufacturing SMEs.

Finally, for the mediating effect of absorptive capacity between MO and innovation of manufacturing, the coefficient of MO on innovation is found to be 0.602 with p-value of 0.000, which satisfies the requirement and allows for conducting step two. Step two tests the effect of MO on absorptive capacity, and shows a significant positive effect, which satisfies the requirement and allows for conducting step three. In step three, the coefficient of absorptive capacity on

innovation is 0.562 with a *p*-value of 0.000, which satisfies the requirement and allows for conducting step four. Step four tested the effect of MO and absorptive capacity on innovation. The coefficient between MOs on innovation is 0.407 with a *p*-value of 0.000. The effect of MO on innovation is positive and statistically significant in stage one and four, which indicates the partial mediation of absorptive capacity between MO and innovation among manufacturing SMEs.

Discussion and Conclusion

The effects of MO, EO and CO on absorptive capacity have received limited attention prior to the current study, which fills this long-standing gap in the research literature. Taking into consideration the RBV that focuses on the relationship between firm's resource and its performance along with the dynamic capacities view (DCV) which argues that the main focus should be identifying and adopting market opportunities, and shaping the market; improving detection of entrepreneurial opportunities and the way of exploiting them; and developing techniques for identifying consumer markets trends and focusing on strategies to target them effectively; this study forwards empirical evidence that SOs in SMEs have an impact on absorptive capacity as well as on innovation. Furthermore, absorptive capacity enhances the relationship between SO and innovation. Outward looking views of SO contribute to gaining access to market knowledge and lead to new decisions to exploit and/or explore opportunities for innovation. Based on the supported hypothesis, there are complex relationships between MO, EO, CO and absorptive capacity and innovation. The results are consistent with previous research such as Zhou *et al.* (2005) where MO has a positive impact on innovation. Results show that an integrated approach to SO has a positive and significant, direct effect on innovation, as well as an indirect effect mediated by absorptive capacity and enhanced by SOs. Our results also refute the findings from Berthon *et al.* (1999) stating that MO detracts from innovation. Our findings show that SOs can impact a firm in a variety of ways both directly by enhancing innovation and indirectly by mediating the effects of SO by absorptive capacity. These findings could be related to the Malaysian business culture and the sector of manufacturing SMEs which is considered underfunded and lacks many resources that could be partially compensated for by focused SOs. Future study needs to emphasise context as a variable, whether the context is an emerging or industrialised economy. A comparative study on manufacturing SMEs from developed Vs. emerging countries could be another interesting future research theme. The fundamental contribution of this study is its integrative approach, integrating MO, EO and CO's effects on innovation through the lenses of RBV and dynamic

capability in a single framework. From the results of this study, it is recommended that managers of SMEs should develop strategies on how to focus on SOs and the way these orientations effect both the innovation of manufacturing SMEs and their absorptive capacity. Furthermore, managers should consider how the partial mediation effects of absorptive capacity enhance innovative capacity in manufacturing SMEs and enable them to play important role in the global value chain by focusing on niche sectors and avoiding confrontation with large MNCs. Policy makers should focus not only on job creation via SMEs but also on developing SMEs' capacity by improving institutional, non-market and environmental conditions that foster SOs in SME owners and managers. One of the limitations in this study is the existence of partial mediation that means that other indirect effects could (and probably should) be examined and tested empirically. Partial mediation potentially indicates a need to continue looking for additional mediators that can modify the effects of SOs on innovation. The other limitation of this study is firms' perception of innovation: it remains within the boundary of innovations on product and process. Clearly, the scope in its entirety, as provided in the Oslo Manual (OECD, 2005) is yet unattained, let alone fully explored. Hence, future research should pursue comprehensive investigations on the issues identified in this study. This would deepen the understanding of interaction(s) between firms' strategic focus and innovation performance toward sustainable competitive advantage.

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