



Strategic orientation and dual innovative operation strategies

Dual innovative operation strategies

Implications for performance of manufacturing SMEs

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127

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Abstract

Purpose – The purpose of this paper is twofold. First, to address a key but neglected area of research in operation and strategy that is the association between strategic orientation of the firm and its innovation emphasis on the current and future operation initiatives. Second, to explore and examine respective performance implications of these two kinds of operation strategies.

Design/methodology/approach – Data from a carefully designed and conducted survey of Malaysia manufacturing SMEs were analysed using a structural equation modelling approach.

Findings – Findings suggest that strategic innovation is strongly associated with both types of innovative operation strategies and they bring about different operational and market performance outcomes for the firm. This sheds light on a new framework for understanding the strategic architecture of innovation in operation strategies.

Research limitations/implications – This study was limited to the small manufacturing firms in Malaysia. As a result, to assess its generalizability it can be replicated in other sectors and also other countries.

Practical implications – Several managerial implications emanate from this research. Most notably is the notion that strategic orientation is a key antecedent of innovation in operation strategies and in particular, it affects both current and future related innovative initiatives. This indicates that executives of manufacturing firms must align their innovative moves with their strategic mind-set to achieve their desired outcomes both operationally and financially.

Originality/value – To the best of knowledge of the author and based on a comprehensive review of past research, this study is original in two ways: first it is the first research that links strategic orientation with dual innovative operation strategies and second it is the first attempt to investigate respective operational and financial outcomes of these associations separately. This framework adds new insights and original value to several bodies of knowledge.

Keywords Business strategy, Operations and logistics management

Paper type Research paper

1. Introduction

Operation and strategy are two distinct yet highly related domains of research in the modern management science. The relationship between these two fields resonates throughout the organization theory literature. Accordingly, operations management concerns the efficiency and effectiveness of daily activities of an organization as a productive unit (Adan *et al.*, 2011; Chase *et al.*, 2006). Strategy is, however, concerned



with the long-term performance of the firm (Porter, 1991, 1996). Thus, it deals with issues ranging from long term planning to competitiveness and profitability (Hitt *et al.*, 2010).

The contemporary post-industrialization era and particularly competitive landscape of twenty-first century have provided a rich theoretical grounding for bridging these two fields. Consequently, the field of strategic operations management and the concept of operations strategy have emerged in an attempt to link daily operational activities with long-term performance and competitiveness of a firm. This literature holds that, a firm whose operation is aligned and consistent with its strategy has a superior advantage over its rivals.

Pioneering works in this context were mainly focus on the manufacturing side of operations management. For instance, Skinner (1969) discussed the link between manufacturing strategy and corporate strategy as a key competitive tool. He later discussed the notion of focused factory as manufacturing with vision (Skinner, 1974) and further emphasized the centrality of operational issues in corporate planning (Skinner, 1992). Anderson *et al.* (1989) argued that, operations strategy is all about aligning operational capabilities with strategic positioning of the firm. They posited that strategic as well as tactical processes shape the competitiveness of a firm and synergistic integration of these two is a fundamental issue in the growing field of organization theory. Hayes and Pisano (1996) advocated this view. They and even spawned a line of thinking on the operation-based view of strategy (Hayes and Upton, 1998).

In short, two schools of thought emerged. The first school argued that strategy is the foundation of operation (Porter, 1996). The second, however, proposed that operation is the foundation upon which strategies are developed (Hayes and Upton, 1998). These two views shared the assumption that, a firm has to gain the capacity to pursue strategic and operational goals simultaneously. Therefore, according to this perspective the key responsibility of managers is to maintain this alignment and ensure its successful implementation (de Lima *et al.*, 2009).

Several frameworks have been proposed to help managers achieve this goal. For example, some have argued for the importance of aligning and pursuing exploratory and exploitative innovations (March, 1991; Jansen *et al.*, 2006; Li *et al.*, 2008). It means that, in order for firms to develop a competitive advantage managers must become ambidextrous by using their both existing competencies and develop new competencies that competitors find difficult to imitate (Jansen *et al.*, 2006). More specifically, competitive benefits accrue to firms who incorporate innovation in their current operational capabilities and develop new related operational capabilities. The former is exploitative in nature and the latter is more of an exploratory nature. This implies innovations in two different fields of operations (Talke *et al.*, 2010) or alternatively can be conceptualized as dual innovative operations strategy.

That being said, this study aims to advance this view by proposing that these two types of innovative operations strategies must be aligned with the dominant strategic logic of the firm known as its strategic orientation (Voss and Voss, 2000; Wang, 2010). Accordingly, the posited relationships account for some of the variations in the firm competitiveness. This idea is echoed in the market fundamentalism philosophy in which innovation is a key to market survival (Kouzman, 2009).

Despite the importance of innovation in strategic operation and competitiveness of manufacturing firms (Terziowski, 2010; Zhang *et al.*, 2004), this dual perspective has received very little attention. A review of the existing literature in this context

corroborated this claim by revealing that very little empirical knowledge is available on the respective role of these two types of innovation in the performance of the firm (Talke *et al.*, 2010; Louis *et al.*, 2010). In addition, the strategic operation literature tends to underemphasize small firms in favour of large firms leaving us with a widening gap about the strategic operation management of innovation in small manufacturing firms (Terziowski, 2010; Lubatkin *et al.*, 2006). Furthermore, to develop a more nuanced understanding of the associations between dual operations strategic, strategic orientation and performance of the firm the concept of environmental uncertainty was incorporated into the analysis. This enables this study to account for the impact caused by environmental contingencies as well.

Finally, due to the rising importance of developing economies and limited understanding of the differences between developed and developing markets (Amoako-Gyampah and Boye, 2001) this study focuses on Malaysia as a developing economy to provide new insights into the generalizability and applicability of management science in different economies.

Therefore, it is the intention of this study to: examine the relationship between strategic orientation of the firm and its dual innovative operational strategies and investigate the respective operational and market performance outcomes of these two choices in face of environmental uncertainty. This approach enables this study to develop and test a model that employs a contingency approach within a previously unrecognized orchestration of variables to explain relatively less known sources of variation in the competitive performance of the firm. As a result, it extends and adds to several bodies of knowledge including innovation management, strategic management of operation and competitiveness of small firms.

The remainder of this paper is organized as follows. The next section explains theories and hypotheses of the research. It will be followed by a section on the design and methodology of the research. Then, the analysis and results will be discussed. Finally, the research concludes with a discussion on the theoretical and practical implications as well as limitations and directions for future research.

2. Literature review and research hypotheses

A firm's strategic behaviour is guided by its strategic orientation (Kumar *et al.*, 2011) and reflected in its positioning in the markets (Woolley, 2011; Li *et al.*, 2008). Therefore, strategic orientation of the firm portrays its operational, marketing and entrepreneurial posture. That is how a firm achieves its goals in markets by taking risk, investing in innovation, becoming proactive and developing future-oriented foresight (Kumar *et al.*, 2011).

Prior research on the operation strategies has paid little attention to the question of "whether or not this strategic orientation is related to the specific operation strategies of the firm". More specifically, prior studies have mainly examined the role of strategic innovation in the firm's overall operational efficiency and effectiveness (e.g. Talke *et al.*, 2010; Terziowski, 2010). Therefore, there is reason to assume that the existing literature on this subject is dominated by a holistic view and lacks fine-grained specific examinations. Few exceptions are, however, noticeable. For instance, Ramayah *et al.* (2011) found that market orientation as a sub-set of strategic orientation is directly related to the innovation in service quality and performance of firms in Malaysia. Gaur *et al.* (2011) conducted a survey of Indian manufacturing SMEs and found a positive association between the marketing side of strategic orientation and performance of the firm. Salomo *et al.* (2008) also found a positive relationship

between firm's innovation orientation and its innovativeness. This studies show that strategic orientation of the firm is positively associated with the emphasis of the firm on innovative activities.

Despite these attempts, the association between the strategic orientation of the firm and its emphasis on innovation in the current operational practices and future relevant practices known as the duality or field-specialization of innovation has not been adequately examined. Salomo *et al.* (2008) argued that different focus on these fields is likely to result in different performance outcomes. This logic is built upon the argument developed by March (1991) suggesting that, at any given point in time a firm can only engage in either improving its current competencies such as operational efficiencies or developing new ones. Extending this argument to the innovative operational choices, we posit that any given firm can emphasize innovative moves either in its current operational priorities or in its relevant to-be-developed (i.e. future) priorities. The former implies an exploitative nature whereas the latter is more of an exploratory nature.

In light of the foregoing discussion, strategic orientation logic implies that a firm's operation must be aligned with its strategic priorities (Porter, 1996; Schniederjans and Cao, 2009). So, consistent with the prior research (e.g. Laforet, 2009; Schniederjans and Cao, 2009; Ramayah *et al.*, 2011) we reason that a firm' strategic orientation navigates its strategic moves including innovative priorities in the market place (Talke *et al.*, 2010). Therefore, the strategic orientation of the firm is associated with both types of innovative operation strategies as they indicate the positioning of innovation in the operational logic of the firm. Consequently, the followings are predicted:

- H1a. There is a positive relationship between the strategic orientation of the firm and its choice of innovatin in the current operational strategies.
- H1b. There is a positive relationship between the strategic orientation of the firm and its choice of innovatin in the relevant future operational strategies.

According to the exploration and exploitation logics (March, 1991) these two strategic logics require different sets of organizational activities, priorities and structure (Kyriakopoulos and Moorman, 2004; Menguc and Auh, 2008; Li *et al.*, 2008). Therefore, operational implementation of two fields would result in different outcomes in terms of marketing and financial as well as operational performance (Popadiuk, 2012; Salomo *et al.*, 2008). Thus, these two types of innovative operation strategies lead firms to follow different paths towards operational efficiency and effectiveness. This variation would cause firms to achieve different market performance.

Research in this context has been silent; we thus are interested in examining this issue by investigating how innovation in the current or future relevant operational strategies (efficiency and effectiveness practices such as cost reduction, flexibility, delivery, etc.) would lead to heterogeneous performance outcomes for Malaysian manufacturing SMEs. This reasoning is consistent with the industrial organization in the neo-classical view of economics (Porter, 1980, 1985) which suggests that in a given industry both types of strategies could lead to an above average return (i.e. competitive advantage). This advantage could be mostly temporary as competitors constantly imitate each other's moves. Therefore, in accelerating industries such as manufacturing the relative performance contributions of these two innovative models reveal new insights into dynamism of industrial competitiveness. Few studies

shape our basic understanding of this assumption. For example, Shiang and Nagaraj (2011) show that innovation in Malaysian manufacturing firms is a key to industrial competitiveness. Rasiah *et al.* (2011) also found an association between innovations in operation and financial performance of manufacturing firms.

Our departure from these studies, however, is that they neither discussed nor incorporated the exploratory and exploitative form of innovation in the operation strategies of the firm. To address this shortcoming the followings are proposed:

- H2a.* There is a positive relationship between a firm's choice of innovating current operational strategies and its market performance.
- H2b.* There is a positive relationship between a firm's choice of innovating current operational strategies and its operational performance.
- H3a.* The relationship between a firm's choice of innovating future relevant operational strategies and its operational performance is not significant.
- H3b.* The relationship between a firm's choice of innovating future relevant operational strategies and its market performance is not significant.

Further, the strategic orientation is an antecedent of innovative operation strategies. Since, these strategies have respective impacts on the market and operational performance of manufacturing firms, they can be considered as mediating factors in the link between strategic orientation and firm's performance (MacKinnon *et al.*, 2012; Stone-Romero and Rosopa, 2011). In order to examine this intervening influence we further argue that strategic orientation of the firm would have, besides proposed indirect effect, a direct impact on its operational and market performance. Prior research offers mixed evidence. Some support this relationship. For instance, Stock and Zacharias (2011) argued that innovation in the strategic orientation would directly influence market performance. Kumar *et al.* (2011) also used market orientation as a sub-factor of strategic orientation and found similar results.

On the contrary, some other for instance, Rosenbusch *et al.* (2011) showed that innovation orientation does not necessary always lead to a better market performance. Furthermore, operational performance seems to be overlooked by scholars in this context. The only study addressing the link between strategic orientation and operational performance is the work of Raymond and St-Pierre (2005) which reports a positive link between strategic adoption of advanced manufacturing systems and operational performance of Canadian manufacturing SMEs.

Given the above, exploring the link between strategic orientation and operational and well as market performance of manufacturing SMEs in Malaysia could advance literature. It could help understand better the inconclusive results regarding the unclear role of strategic orientation and operational performance of firms. It can also enrich the currently limited literature on the strategic orientation of Malaysian SMEs. Hence:

- H4.* A positive relationship between firm's strategic orientation and its market performance is expected in manufacturing SMEs.
- H5.* A positive relationship between firm's strategic orientation and its operational performance is expected in manufacturing SMEs.

The above hypotheses follow the general universalistic paradigm in the strategic management. That is, some factors (here the strategic orientation) has identifiable impacts on the performance of the firm regardless of the environmental contingencies (Hitt *et al.*, 2010). Strategic operation literature also suggests that performance of a firm is largely influenced by a concomitant consideration of environmental conditions (e.g. Jusoh and Parnell, 2008; Jusoh, 2010; Qi *et al.*, 2011).

It is axiomatic to say that firms show different performance under different environmental conditions (Zhang *et al.*, 2012; Wong *et al.*, 2011). More specifically, prior research in operation research exhibits a variety of aspects studied by scholars regarding the performance of firms under environmental uncertainty. For instance, Wong *et al.* (2011) argue that a higher degree of supply chain integration leads to better performance under uncertainty. Qi *et al.* (2011) also assert that environmental uncertainty moderates the link between supply chain strategy and business performance of firms in China.

Similarly, Jusoh and Parnell (2008) and Jusoh (2010) found a positive correlation between the degree of uncertainty and performance outcomes of business strategies in Malaysian manufacturing firms. According to this line of thinking and consistent with the notion that environmental uncertainty influences performance outcomes of different strategies (Zhang *et al.*, 2012; Wong *et al.*, 2011; Jusoh, 2010) we argue that environmental uncertainty would moderate the intensity of the association between two types of innovative operation strategies (current and future) and their market and performance outcomes. As a result, the following hypotheses are proposed:

- H6a.* Environmental uncertainty moderates the intensity of the relationship between a firm's choice of innovating current operational strategies and its market performance.
- H6b.* Environmental uncertainty moderates the intensity of the relationship between a firm's choice of innovating current operational strategies and its operational performance.
- H6c.* Environmental uncertainty moderates the intensity of the relationship between a firm's choice of innovating future relevant operational strategies and its operational performance.
- H6d.* Environmental uncertainty moderates the intensity of the relationship between a firm's choice of innovating future relevant operational strategies and its market performance.

3. Research design and methodology

Survey instrument

Consistent with Ramayah *et al.* (2011) and Kim and Lee (2010) this study employed previously developed and tested measures to ensure validity, reliability and scientific robustness (Sekaran, 2009). Accordingly, the following measures have been used in this study.

Variables and measures

Strategic orientation of the firm was measured based on the conceptualization of Venkatraman (1989) and Escribá-Esteve *et al.* (2009). This measure consists of nine

items taken from Escribá-Esteve *et al.* (2009) which is a modified version of the initial 21 items developed by Venkatraman (1989). The reliability of measure is high (0.720). We adopted this measure for our variable due to its utilization in a recent work of SMEs and high reliability that is above generally accepted value of 0.6 (Nunnally and Bernstein, 1994). All items were scaled using a five-anchor Likert style from 1 being “strongly disagree” to 5 being “strongly agree”. A sample item is “Establish deliberated plans to cope with environment opportunities and threats”.

Emphasis on the innovation in the future relevant operation strategies was operationalized by a measure adopted and modified for the purpose of this study from Talke *et al.* (2010). The measure consists of ten items all use a seven-anchor Likert scale from 1 being “strongly disagree”, 4 being “neutral” and 7 being “strongly agree”. The reliability is 0.68 that is deemed acceptable. A sample item is “In our firm we plan to improve certain technologies”.

Emphasis on the innovation in the current operation strategies was operationalized by a measure adopted and modified for the purpose of this study from the study of Alegre-Vidal *et al.* (2004). It uses 16 items targeting four operational strategies (cost, quality, delivery and flexibility) each with four items. Reliability of the measure is high (0.87). Similar to the measure for future relevant operation, these items were anchored using a seven-anchor Likert scale from 1 being “strongly disagree”, 4 being “neutral” and 7 being “strongly agree”. A sample item is “We currently focus on innovation methods to reduce product cost by lowering labour costs”.

Market performance was measured by the financial performance of the firm. Hence, three items were adopted from the study of Swink *et al.* (2005). Reliability of this measure is high (0.75). These items address relative market share growth, return on investment and overall performance of the firm. These three items were all anchored on a five-point Likert scale from 1 being “far worse than” to five being “far better than”. A sample item is “relative to our competitors our market share growth rate has been”. This subjective relative measure is widely used in SMEs where objective data are not available (Swink *et al.*, 2005). Furthermore, relative measures encourage executives to provide accurate data based on their managerial perception of their firm (Raymond and St-Pierre, 2005).

Operational performance was measured using a seven-item indicator adopted from the studies of Peng *et al.* (2011), Alegre-Vidal *et al.* (2004), Flynn and Flynn (2004) and Lin and Shih (2008). Items for cost efficiency performance, quality performance and delivery performance were taken from the study of Peng *et al.* (2011) (four items) and three items were adopted from the studies of Alegre-Vidal *et al.* (2004), Flynn and Flynn (2004) and Lin and Shih (2008) for flexibility performance. Reliability of this composite measure is high (0.84). All items use a five-point Likert scale from 1 being “far worse than” to five being “far better than”. A sample item is “relative to our competitors our per cent of orders delivered on time has been”.

Finally, environmental uncertainty was measured using a four-item scale developed by Waldman *et al.* (2001) asking managers to assess uncertainty in the economic, social, political and technological aspects of their business environment. This measure has an acceptable reliability (0.63) and has been frequently used in the context of SMEs (Lubatkin *et al.*, 2006; Ling *et al.*, 2008). These four items uses a five-point Likert format as 1 being equal to “strongly disagree” to 5 being equal to “strongly agree”. A sample item is “our business environment is very dynamic, changing rapidly in technical, economic, and cultural dimensions”.

Control variables

In this study, four control variables also known as covariates were used to minimize the possibility of confounded results caused by spurious effects. These four are:

- (1) country of manufacturing base;
- (2) the economic sector;
- (3) firm age; and
- (4) firm size.

The effects of these were accounted for by limiting the scope of research to the small Malaysian manufacturing firms and calculating the amount of variance in the performance of the firm explained by the combined effects of firm age and firm size.

Pilot testing

According to Schwab (2005) any survey needs to be pilot tested. Therefore, a two-phase pilot testing method suggested by Schwab (2005) was employed. In the first phase, five industrial experts reviewed the questionnaire and approved its design and clarity. In the second phase 35 MBA students with managerial experience in manufacturing sector from four universities in Malaysia (MMU, UM, UPM and UKM) answered the questionnaire to test for internal consistency, reliability and context validity of our survey items (Terziovski, 2010). The result of these tests revealed that the survey is valid for the context of our study and external validity can be established.

Sampling and data collection

Malaysia is an important developing economy in the South East Asia (Ahmad, 2012). This gives further credence to the significance of the studying manufacturing firms in Malaysia. Accordingly, for the purpose of this study a simple random sampling strategy was applied to the population of manufacturing SMEs in Malaysia. However, due to scope of this study and the methodological constraint that a firm is basically appropriate for investigation when it is large enough to allows formulation and execution of specific tasks (Laforet, 2008), this study focuses on firms trading for more than five year with 50 to 500 fulltime employees (Islam and Karim, 2011).

To access sample firms, the database of The Federation of Malaysian Manufacturers was chosen, as it is a well-known and funded database providing a randomized list of contact and address of 800 manufacturing SMEs (Ismail, 2009). Following this strategy, survey was sent to the firms along with a consent form explaining the purpose of this study. In addition, in accordance with the suggestions of Dillman (2007) pre-notice calls were made to the firm prior to the distribution of the survey and two rounds of reminding calls were made after the distribution of the survey.

4. Analysis and results

Preparing and examining data

The final data collection procedure resulted in 235 filled questionnaires. After two rounds of data screening we dropped 25 incomplete questionnaires which led us to a workable data set of 210 firms. It indicates a successful response rate of 26 per cent which is above the international average rate of 10-15 per cent of research in manufacturing SMEs (Terziovski, 2010). Additionally, the screening revealed that missing data and outliers are negligible and hence do not pose any threat to the validity the research.

Non-response and late response biases

A *t*-test comparison of means of firm age and firm size across two samples in a two-phase technique (Terziovski, 2010) for late-responding and non-responding firms was performed. *p*-value of <0.05 for both tests (0.022 for late and 0.034 for non-responding) revealed that effects of non-response nor late-response bias are minimal and can be safely neglected.

Convergent and discriminant validity

To assess convergent and discriminant validity we used inter-construct correlation matrix (shown in Table I) and criteria of composite reliability (CR), average variance extracted (AVE), maximum shared squared variance (MSV), and average shared squared variance (ASV) calculated by the results of confirmatory factor analysis in AMOS (Hair *et al.* 2006) (exhibited in table). All inter-construct correlations as shown in Table I are below 0.7, which offer initial evidence for the presence of convergent and discriminant validity (Hair *et al.*, 2006).

Furthermore, the results of additional criteria as explained in Table II revealed more substantive evidence showing that the criteria of convergent and discriminant validity have been met in this study.

Uni-dimensionality and multi-collinearity

For the test of uni-dimensionality of our constructs we used exploratory factor analysis and selected principal axis factoring to see if one key factor for each construct emerges

Constructs	Mean	SD	1	2	3	4	5	6	7
Firm size	57	9.03	1.00						
Firm age	27	5.00	0.07	1.00					
Uncertainty	3.57	1.21	-0.12	0.07	1.00				
Financial performance	3.06	0.95	-0.11	-0.09	-0.04	1.00			
Operational performance	3.34	0.96	-0.08	0.04	0.11	0.09	1.00		
Related future innovative OPS	4.15	0.58	-0.02	-0.3	-0.07	0.18**	0.24***	1.00	
Current innovative OPS	5.71	0.94	0.10	0.09	-0.03	0.25***	0.17*	0.27***	1.00
Strategic orientation	3.11	1.67	-0.03	-0.09	-0.05	-0.17*	-21**	0.19**	0.18**

Notes: *n* = 210. * *p* < 0.05; ** *p* < 0.01; *** *p* < 0.001

Table I.
Inter-construct correlations, means and standard deviations

Factors	Discriminant validity		Convergent validity	
	MSV	ASV	CR	AVE
Strategic orientation (SO)	0.3021	0.154	0.701	0.505
Current innovative operation strategy	0.244	0.166	0.809	0.606
Future related innovative operation strategy	0.256	0.257	0.705	0.503
Operation performance	0.345	0.274	0.888	0.598
Market performance	0.256	0.198	0.865	0.701
Uncertainty	0.210	0.177	0.801	0.688

Notes: Criteria of convergent validity: CR > 0.7, CR > AVE, AVE > 0.5; criteria of discriminant validity: MSV < AVE, ASV < AVE

Table II.
Convergent and discriminant validity

or not. Following this approach, we assessed uni-dimensionality of our multi item constructs and came to conclusion that there is appropriate uni-dimensionality detected in our data. For detecting multi-collinearity between our independent variables, we used collinearity diagnostics in liner regression (Harlow, 2005; Tabachnick and Fidell, 1996). Accordingly, we iteratively regressed pairs of our variables and checked their collinearity threshold (VIF); if it is in the range of four to ten it means that, there is multi-collinearity. Furthermore, tolerance of 0.1 and above also indicates presence of multi-collinearity. However, our VIFs were calculated below three and all tolerances were computed < 0.1 hence we assume that multi-collinearity is not a threat to the results of the study.

Analytic method

For testing research hypotheses a structural equation modelling (SEM) approach was employed. SEM is an advanced method following the logic of multiple regression method (Byrne, 2010), however, it is able to provide a more complete and clear understanding of latent variables and causal relationships between them (Byrne, 2010). Therefore, for the purpose of this research SEM appears to be appropriate. Additionally, maximum likelihood algorithm was chosen as the basis for the structural equation estimation (Byrne, 2001). This is the most common estimation method used in the literature (Hair *et al.*, 2006).

The criteria for the multivariate normality and sample size (power) must be met prior the SEM analysis (Byrne, 2010). In regards to the former, the normality check in AMOS and multivariate kurtosis indicator was used and it was judged that bias from normality is not a threat in our research. Then, in respect to the sample size general rules of thumb suggest that samples of > 200 are highly likely to yield adequate power during model fit. Given this, the analysis revealed that data fits the model with a satisfactory power (MacCallum *et al.*, 1996; Hair *et al.*, 2006). On the basis of the results of the maximum likelihood, four model fit indices (χ^2 /degree of freedom (CMIN/DF), goodness of fit index (GFI), adjusted goodness of fit index (AGFI) and, root mean square error of approximation (RMSEA)) were used to assess model fitness (Byrne, 2001). Accordingly, the model was argued to be adequately fit (CMIN/DF = 2.47, GFI = 0.701, AGFI = 0.888 and RMSEA = 0.079 with p -Close = 0.0507). Following this assessment, a maximum likelihood path analysis was conducted to test the associations in the proposed model. Results have been shown in the Table III. As it can be seen, all paths have been significant. Therefore, the proposed mediated and moderated relationships can be assessed.

Examining mediations and moderations

To examine mediational relationships the stepwise approach proposed by Byrne (2001) was employed. According to this method, we first examine the association between variables in non-mediated model and examine the regression weights calculated by AMOS then a full mediated model is generated and regression weights are calculated then the two models are compared to examine the existence and intensity of mediation. To compare and detect mediation effects we employed the algorithm proposed by Zhao *et al.* (2010).

Applying the algorithm of Zhao *et al.* (2010) in the full-model path analysis we calculate and accordingly argue that both current and future related innovative operation strategies mediate the relationship between strategic orientation and market as well as operational performance of the firm. The type of mediation we found is

	Estimate	SE	CR	p-value
<i>Path full mediated</i>				
Related Strategy ← strategic orientation	0.23	0.038	6.052632	0.000
Current strategy ← strategic orientation	0.28	0.024	11.66667	0.000
Operational performance ← strategic orientation	0.304	0.108	2.814815	0.000
Financial performance ← strategic orientation	0.43	0.115	3.7391	0.000
Operational Performance ← related strategy	0.255	0.067	3.80597	0.000
Financial performance ← current strategy	0.98	0.07	14.0000	0.000
Financial performance ← related strategy	0.33	0.039	8.461538	0.000
Operational performance ← current strategy	0.63	0.037	17.02703	0.000
<i>Path non-mediated</i>				
Financial performance ← strategic orientation	0.53	0.039	13.5897	0.000
Operational performance ← strategic orientation	0.35	0.039	8.97436	0.000

Table III.
Results of a structural equation path analysis

complementary (Zhao *et al.*, 2010). It means that the mediating effect is positive and significant but not complete and other mediating factors can be included as well. Put simply, there might be other factors that impact the relationship between strategic orientation and operational and market performance of the firm. This is consistent with prior research on the strategic orientation and operation management of the firm that indicate the role of different factors such as customer acquisition in the study of Arnold *et al.* (2011) or TQM in the study of Fuentes *et al.* (2006).

Furthermore, to examine moderation effects we first developed two groups of variables by transforming uncertainty into group one representing high uncertainty and group two representing low uncertainty. Then the critical ratios for differences in AMOS were used separately for each group. In the results, we used pair wise parameter comparisons between high and low uncertainty in our causal structural model. As shown in Table IV, the environmental uncertainty has a moderating impact on all four causations.

Covariates

We controlled for the country of origin and industry through our sampling. However, sampling does not allow and enable us for controlling the impact of firms' size on the market and operational performance of the firm. Therefore, we examined the correlation between firms' size and performance by regressing firm size with firm operational and financial performance and co-varying it with other endogenous variables and then assessing the significance of this correlation. The same method was

Interaction	Un-standardized regression coefficients		
	Independent	Moderator	Interaction
Innovation in new (future relevant) operational priorities and operational performance	0.2	0.2	0.2
Innovation in current operational priorities and operational performance	0.19	0.2	-0.4
Innovation in current operational priorities and market performance	0.25	0.14	0.17
Innovation in new (future relevant) operational priorities and operational performance	0.12	0.17	0.07

Table IV.
Results of the interaction effect analysis

utilized for age of the firm. Results as shown in Table V revealed that these two variables did not have any significant influence on our performance indicators. Furthermore, the total amount of variance carried by these two was negligible ($R^2 = 0.034$).

Common method variance

To detect the likelihood of common method variance and its potential bias (CMB) we used the Harman's single-factor test suggested by Podsakoff *et al.* (2003). Accordingly, we selected the variables fitted in our model during confirmatory factor analysis. Then we ran a principal axis factor analysis with no rotation and instead of using eigenvalue we limited our number of extracted factors to 1. If the emergent factor accounts for variance more than 50 per cent of our model it indicates existence of CMB and implies the likelihood of highly biased variations in our causal directions. However, our results of single factor extraction demonstrate only 28 per cent (27.758) of variation. Therefore, we assume that common method bias does not statistically impact our research. Furthermore the selection of different anchoring in the measure (i.e. combination of five and seven point Likert scale) can be assumed to be one of the reasons that decreased the likelihood of the occurrence of common method bias (Podsakoff *et al.*, 2003).

Results of hypotheses testing

Our analysis on structural equation models revealed that there is a positive strong relationship between strategic orientation of a firm and its choice of emphasizing innovation on the current operational priorities ($b = 0.28$, p -value < 0.05) and also the choice of emphasizing innovation on the related future operational priorities ($b = 0.23$, p -value < 0.05). Therefore, we have empirical evidence showing that our *H1a* and *H1b* cannot be rejected.

Similarly, it was found that the firm's choice of emphasizing innovation in the current operational priorities (innovative operational strategies) is positively associated with its market ($b = 0.98$, p -value < 0.05) and operational performance ($b = 0.63$, p -value < 0.05). It means that in our sample, firms with higher emphasis on incorporating innovation in their current operational priorities (i.e. cost, time, flexibility and quality) has achieved higher profitability and met better their operational objectives. Therefore, we would reasonably argue that *H2a* and *H2b* cannot be rejected.

The analysis of regression weights in unconstrained full structural model showed that there is a positive relationship between firms' choice of emphasizing innovation in the future related operational priorities and operational ($b = 0.26$, p -value < 0.05) and financial performance ($b = 0.33$, p -value < 0.05). In other words, although, in overall, these associations are less significant than those of between current operation strategies but they cannot be statistically neglected. Therefore, we assert that *H3a* and *H3b* cannot be statistically accepted.

Table V.
Estimates of covariates

			Estimate	SE	CR	<i>p</i>
operperf	←	Size	-0.140	0.071	-1.963	0.061
Financial	←	Size	-0.142	0.068	-2.097	0.076
operperf	←	Age	-0.190	0.091	2.087	0.091
Financial	←	Age	-0.172	0.038	4.526	0.197

Referring to the unmediated structural model, it is to be noticed that the relationship between strategic orientation and financial as well as operational performance of the firm is relatively significant ($b=0.53$ and $b=0.35$ at p -value <0.05). These relationships were further observed in full-mediated model ($b=0.43$ and $b=0.30$ at p -value <0.05), respectively. Hence we cannot statistically reject $H4$ and $H5$. $H6a$ to $H6d$ have been previously discussed in the moderating section. To conclude, it has been statistically found that uncertainty moderates relationships between two types of innovative operation strategies and two performance outcomes. We further showed that uncertainty serves as a positive moderator by strengthening these associations.

5. Discussion and implications

Discussion

This study applies the notion of current and relevant future innovative choices of executives (Talke *et al.*, 2010) in the context of operation strategies of manufacturing firms. This approach adds value to this body of knowledge and completing studies of Tajeddini (2011) and Peng *et al.* (2011). This approach is also new to the operation strategy literature in general and manufacturing strategy in particular. Little, if any, is available using this dichotomy in this context (see e.g. Jabar *et al.*, 2011; Salomo *et al.*, 2008; Rosenbusch *et al.*, 2011). In addition, the utility of this approach comes to the context of competitive priorities Malaysian manufacturing firms in that, it offers a new means for formulating operations strategy in firms operating in developing economies (Aboelmaged, 2010; Jabar *et al.*, 2011; Islam and Karim, 2011).

Theory and practice in manufacturing firms have mostly focused on either operational performance (e.g. Peng *et al.*, 2011; Gaur *et al.*, 2011) or financial performance (e.g. Islam and Karim, 2011; Terziovski, 2010) of manufacturing strategies such as quality improvements (e.g. Kim *et al.*, 2011) or innovativeness (Das and Joshi, 2007; Talke *et al.*, 2010). So, there is a lack of an integrative view investigating both dimensions of performance from a general innovative perspective. This study adds original value to this line of research by providing a model that examines both from a new context.

Finally, this model is believed to offer the first or at least a very early view of the link between strategic orientation and innovation in the current and future operational strategies of firms in the Malaysian manufacturing sector. This is justified by a comprehensive review of literature in the academic databases including Ebsco Business premier and ISI Web of Knowledge. In light of these arguments, we believe that our theoretical model and empirical results offer new original insights for both researchers and practitioners interested in a more-nuanced understanding of the types and consequences of various innovative operation strategies.

Consistent with expectation from the literature we found that strategic orientation is an antecedent of firm's general strategic innovative initiatives (Arnold *et al.*, 2011). We specifically found that strategic orientation as a one-dimension construct representing managers' general proclivity or propensity to develop and maintain a certain approach to markets, could directly influence their choice of emphasizing on innovation in both current operational priorities and future related priorities. Therefore, we establish the ideas that strategic orientation must be included into studies that address the formulation and modification of strategic choices related to the firm's operation. The present study gives additional credence to prior studies that advocate a link between certain aspects of business orientation and strategic choices pertinent to

innovation. Take, for example the link between customer retention orientation and the firms emphasis on both radical and incremental innovations (Arnold *et al.*, 2011) or Avlonitis and Salavou's (2007) study on the association between entrepreneurial orientation (a sub-set of SO) and product innovativeness. Therefore extending the literature on SO into operation research, we argue that our study theorized and empirically validated the idea that firm's with a high degree of strategic orientation (i.e. a proclivity to be innovative, competitive and aggressive by doing experimentation and taking risks proactively) are better able to include innovative strategic choices in their current and future operation.

Therefore, by these findings we lend further support to the notion of strategic innovation and its role in the innovative moves of a firm. So our findings are in accord with Jeong *et al.* (2006) who found that SO in Chinese manufacturing SMEs is associated with their product development. Although we did not specify the consequences of innovative operation strategies such as new product or process developments but we situate our findings within the same context with Arnold *et al.* (2011), Avlonitis and Salavou (2007) and Jeong *et al.* (2006).

From a different angle, consistent with prior research on the performance of SMEs (Escribá-Esteve *et al.*, 2009; Fuentes *et al.*, 2006; Gaur *et al.*, 2011) we provided further support to the idea that strategic orientation could be perceived at a determinant of performance with a key distinction that we empirically showed the mediating role of operation in this association. Particularly two types of innovative operational moves were examined and generated supportive evidence for this claim.

Moreover, we developed additional insights into performance of manufacturing SMEs from Malaysian perspective. Like Gaur *et al.* (2011) from India we also showed that Malaysian manufacturing SMEs can benefit from developing and utilizing a strategic orientation. In addition we extended this link by showing that the fit between SO and operation strategies enables the firm to boost its productivity and profitability. This is consistent with Lau and Bruton (2011) who argued and linked strategic orientations with strategies of high technology ventures in two transition economies and found similar results. This implies that manufacturing SMEs can improve their operation by aligning it with their strategies by developing a strategic orientation.

Additionally, a firm and particularly small firm can focus on either exploratory initiatives or exploitative initiatives (March, 1991). Following this notion we argued that a firm can emphasize innovative in current operation as an exploitative logic or develop new relatively innovative operation priorities in the form of an exploratory logic. Hypothesizing this, we related this idea to the strategic orientation of the firm and found that strategic orientation is typically related to both types of innovative initiatives. This finding is in line with recent studies. For instance, Kyriakopoulos and Moorman (2004) argued and showed that marketing orientation of the firm is related to the firm's exploratory and exploitative strategies and Li *et al.* (2008) unveiled a relationship between firms' market orientation and exploratory as well as exploitative innovations.

Drawing upon these discussions, we believe that our research added new insights into literature by: first, developing a previously unexplored orchestration of variables into the link between universalistic and contingency view of operation-strategy-innovation-performance and second, generating insights from an emerging economy whose manufacturing SMEs contribute greatly to its national economy. The next section discusses contributions and implications of this research.

Theoretical implications

We added to and expensed the literature on operation strategy by introducing a two dimensional view of innovation in operation strategies: innovation in the current operational priorities and innovation in the future related operational priorities of the firm. We empirically examined these priorities and established a link between these two and strategic orientation as an antecedents and operational as well as market performance as strategic consequences. This advances the current literature in operation strategies by explaining that innovation in operation can take two different forms. In addition, we found that these two different innovative emphases would impact firm's competitiveness differently.

Alternately, we also enriched the current understanding of innovation in small business literature by showing that innovative operation strategies in manufacturing SMES is related to their operational and financial performance. This model could open new research doors to investigate performance of SMEs from different perspectives as will be articulated later in this chapter.

Finally, we built upon strategic contingency and environmental uncertainty perspective and developed the idea that in Malaysian manufacturing SMEs managers' perception of uncertainty is a factor that could impact emphasis on innovation and performance outcomes of the firm. This would increase the ability of managers to develop necessary competencies and innovative initiatives under uncertainty and also broaden the understanding of the behavior and performance of Malaysian manufacturing SMEs.

Managerial implications

This study suggests that executives could both improve market performance on their firm in short run and secure increase in operational performance in long run by developing an alignment between their strategies objective and operation strategies. Equally importantly, it can be argued that having a clear strategic orientation can help managers succeed at this endeavor. Our results show that firms with lower emphasis on strategic orientation experience lower degree of innovation in both current and future related operation and subsequent performance indicators. Thus, executives are suggested to develop a clear orientation and link it to their operation in order to boost innovativeness, efficiency and performance.

It was also found that, consistent with expectations from the exploration and exploitation paradigm (March, 1991) managers of SMEs can direct their attention to either emphasizing and incorporating innovation into current operational priorities (exploitation) or future related operational priorities (exploration). More specifically, emphasizing on both current and future related innovation could disorient firm and negatively impact its performance. However, focusing on each direction could boost operational effectiveness and market performance of the firm. This could be associated with the resource limitations and restrained operational scope of SMEs. Therefore, managers are advised to plan and incorporate one strategic innovative emphasis and change or revise it as their orientation and uncertainty in the market necessitate them to do so.

6. Limitations and directions for future research

This study is not without limitations. First, subjective measures were used to assess SME's innovative operations strategy and performance indicators. Subjective measures are subject to psychological biases and recall limitations

(Blindenbach-Driessen *et al.*, 2010; Wall *et al.*, 2004). Therefore more studies replicating these measures and also using different measurement methods are recommended to assess the validity and generalizability of these findings and also shed new lights on the proposed causal links.

Second, we focused on the Malaysian manufacturing SMEs. Although this empirical context is significant (United Nation Development Program, 2007) and allowed us to benefit from a homogenous population in a single economic sector but it implies a limiting factor in our sampling. Therefore future attempts can be aware of this limitation and address it by: first, designing cross-sectional studies; second, focusing of large manufacturing firms; and third, using data from the manufacturing SMEs in other similar countries in the ASEAN region such as Indonesia, Thailand and Singapore.

Third, performance measurements have been a perplexing subject of debate (Blindenbach-Driessen *et al.*, 2010). It is assumed that financial performance of a firm can be accessed from a number of indicators such as customer equity, rate of product development and other indicators which primarily emphasize profitability rather growth (Wall *et al.*, 2004). Since profitability is not quite similar to the growth (Helfat *et al.*, 2007), a potential limitation arises from our measurements approach that is to be acknowledged.

7. Conclusion

A model consisting of direct and indirect links between the strategic orientation and two relatively less-explored types of innovative operation strategies namely innovation in the current operational priorities (exploitative in nature) and innovation in relevant future priorities (exploratory in nature) and respective contributions of these two innovative strategies to the market (financial) and operational performance of the firm developed and tested using data from Malaysian manufacturing SMEs. In addition, environmental uncertainty was found to moderate these associations. Theoretical and managerial implications of these findings were discussed and a number of areas for future research were illuminated.

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Further reading

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