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STUDY OF INTERCONNECTIVITY OF OPERATIONS AND IT'S AFFECTS ON CAPABILITY OF FIRM

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ABSTRACT

This paper examines the relationship of a firm's operations capability on the perceived competitiveness of its customer and efficiency performance. Measures of operations capability are developed for this purpose. Three hypotheses that relate operations capability to competitive turbulence and firm competitiveness are tested using data from a sample of Australian SMEs (n =152). The impact of operations capability on firm competitive perceptions was found to be significant while controlling for firm type variables: SME status, manufacturing focus and competitive turbulence. The perception of competitive

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turbulence was not related to operations capability development. The paper concludes considering some practices adopted by SMEs, which has been identified here as a strong predictor of firm competitiveness.

Keywords: firm competitiveness, firm performance, hierarchical analysis, operations capability, small to medium businesses.

INTRODUCTION

This paper explores how a competitive advantage might be created within organisations that develop a set of operation's related tasks/practices. These tasks are the right kind of combination of equipment, people, procedures and processes to meet the need of the customers and market. In a changing market condition, operations capability is a key to succesfully delivering corporate strategy (Hill 2005). This internally coherent bundle of practices are argued to create an operations capability that a firm might leverage to perform better than their competitors. This operations capability is considered to have the potential to provide a capability-based source of competitive advantage for a firm. Extant literature describes firm competitiveness as a multi-dimensional and relative concept (Feurer and chaharbaghi, 1994, Corbett and Wassenhove, 1993, Shurchuluu, 2002; Shee, 2002; Ambastha and Momaya, 2004). Competitiveness is the ability to design, produce and market products or services superior to those offered by competitors, considering price and non-price factors (Momaya et al., 2001; Garelli,

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2003). Two key areas of competitive performance that may be directly affected by a firm's operations capability are the areas of efficiency and customer service (Desarbo et al., 2005).

An operations capability may contribute to firm competitiveness since such functional level capabilities are imperfectly substitutable and imperfectly imitable (Barney, 1991). Operations capability is defined as an internally coherent bundle of practices that are commonly seen as belonging within the discipline of operations (Hill, 2005). A firm can build this operations capabilility by putting up the practices that improve the management of its production facilities, manufacturing processes, quality control, logistic integration, cost control efficiency, durability of its relationship with channel members and the operations-based order winners with its customers.

Capabilities are the complex groups of skills and accumulated knowledge, exercised through organisational processes that enable firms to coordinate activities and make use of the assets (Day, 1994; Song et al., 2005). Firm resources can be bundled to build capabilities, such as operations capability, and these capabilities can be leveraged to create and maintain value for customers (Sirman, 2007). An organizational capability can be seen as set of organizing principles that have a high stability over time and which are reflected in the selection and prioritization given to certain practices within an organization (Ulrich and Dave 1991).

Firms build these operations capabilities over a period of time while operating through market turbulence and competition all around. In other words, competitive turbulence dimensions force a

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firm to build on its capabilities to help sustainable survival in the market. A number of studies (Vickey and Droge, 1993; Tracy et al., 1999; Kathuria, 2000) have established the fact that operations capability may have an influence on firm competitive perception. Investment in operations capability leads to better firm shaped by a firm's operations capability. The model investigated in this study is depicted in Figure 1. The proposed model rests on the following propositions: First, that operations capability affects firm performance; and second, that competitive turbulence increases the likihood that operations capability is developed; and finally, that larger firms and manufacturing firms may have different levels of competitve turbulence and levels of operations capability The following section discusses the conceptual grounds for constructs and relationships depicted in our framework.

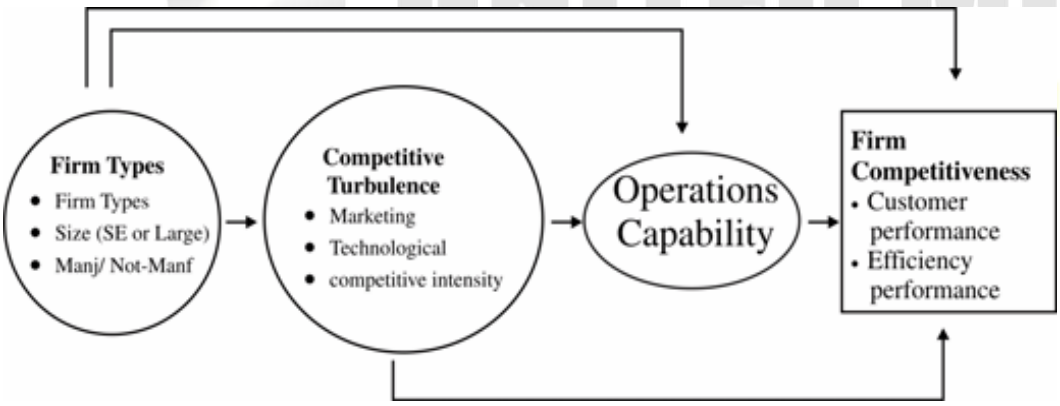

Figure 1: Conceptual Framework of Operations Capability and Firm Competitiveness

Operations Capability

Operations capability is one potential point of differentiation between a firm and its

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competitors (Tracy et al., 1999). A firm's profile of capabilities is a reflection of the firm's history of resource allocation stemming from strategic decisions to performance (Ward et al.,1994). Although there is no direct comparison

This study attempts to bridge the gap by considering the operations capability as a bundle of individual capabilities put together and investigates its effect on firm

PERFORMANCE.

Respond to the perceived level of environmental turbulence in their competitive arena. Firms tend to develop these possible, we can compare it with similar studies that considered the relationship of operations capability with that of firm performance. In particular, a range of studies have captured individual capability such as TQM (Samson and Terziovski, 1999) and production (Vickey and Droge, 1993; Tracy, 1999) for instance but not considered the holistic view of operations capability having a causal relationship with firm performance. This study attempts to bridge the gap by considering the operations capability as a bundle of individual capabilities put together and investigates its effect on firm performance. The purpose of this study is, therefore, to investigate the following research question: does the level of competitive turbulence increase the likelihood of developing operations capability and do firms with high levels of operations capability have greater levels of perceived competitiveness measured through customer

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performance and efficiency performance?

CONCEPTUAL FRAMEWORK AND HYPOTHESIS FORMULATION

Competitiveness, as defined earlier, is the ability to meet the market desire. Any key measure of competitiveness can be, by definition, market- or customer-oriented (Corbett and Wassenhove, 1993, pp. 109) and external to the firm. The two dimensions this study will look at are customer performance and efficiency performance and how these are capabilities under market competition and then become competitive. Some authors (Desarbo et al., 2005, pp. 59] have identified strategic capabilities of firms in various functional areas such as marketing and market-linking, inf orma tion technology, production pr ocesses and technology, and overall management of firms. This paper attempts to build on this research (Desarbo et al., 2005) by conceptualizing an operations capability as a functional level capability that could create competitive advantage to differentiate between firms.

The operations capability of a firm includes its supply chain practices such as customer linking, durable relationships with suppliers, other channel members and customers. It also includes demand chain information practices that enable a firm to respond swiftly to changing customer needs and to exploit its technological strengths most effectively (Day, 1994). Information technology systems for internal communication help the firm communicate market information effectively across all relevant functional areas to direct the new product development process, to

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facilitate cross-functional integration and technology and market knowledge creation. Further, operations capability takes into account technology related issues, such as the production process, manufacturing facilities, product related logistics capability and quality control. Quality control allows a firm to keep costs down and/or differentiate its offerings. Increased production efficiency reduces costs, improves consistency in delivery, and ultimately increases competitiveness (Day, 1994). Details of scale items for the construct operations capability can be viewed in Appendix -1. These capabilities should enable firms to achieve high levels of performance measured through customer satisfaction and efficiency measures.

Hypothesis 1 (H1): Firms' operations capabilities have a positive effect on the level of perceived competitiveness (i.e. relative customer performance and relative efficiency performance).

COMPETITIVE TURBULENCE

Managers must remain alert to the external environment which is dynamic in nature. The external competitive environment will vary for the type of industry a firm competes in, whether assessed the extent of promotion and price wars, ability of firms to match competitive offers, competitors' move in the market place. On all of these scales a higher score meant that the environment was more uncertain.

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The importance of operations capability in small and micro firms are less clear. The OECD definition for a micro firm is a firm with less than 10 employees and a small firm is defined as firm with 10 employees but less than 50. Though it is easily to assume that operations capability would be more important in medium or large firms, it is our contention that it is also important in micro and small firms as well.

Therefore, it is hypothesized that:

Hypothesis 2 (H2): Firms that percieve their environment as comptitively turbulent or who are more Manufacturing focused or who are not micro or small firms will have higher level of operation they are manufacturing or non-manufacturing and the firm's size. The term 'dynamic' refers to a rapid change in technology and market forces externally and its effect on firms internally capability.

Following propositions: First, that operations capability affects firm performance; and second, that competitive turbulence increases the likihood that operations capability is developed; and finally, that larger firms and maufacturing firms may have different levels of competitve turbulence and levels of operations capability.

Hypothesis 3 (H3): Fi rms' operations capability have a positive effect on the level of perceived competitiveness (i.e. relative customer (Teece et al., 1993). In environment scanning practices managers need to cope with uncertainty and reduce it to a minimum (Barringer

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and Bluedorn, 1999). A firm functioning in turbulent rather than stable environments tends to be more innovative, risk taking and proactive (Naman and Slevin, 1993). So the changes in environmental conditions force firms to adjust their capabilities. This happens through bundling of resources to safeguard themselves against environmental changes (Zollo and Winter, 2002) or learning to modify the operating routines for survival. This suggests that operations capability will be higher in environments that have high levels of competitive turbulence. However, some (Zollo and Winter, 2002) contradict that 'firms do integrate, build, and reconfigure their competencies/capabilities even in environments subject to lower rates of change (p.340)'. Therefore understanding the level of competitive turbulence a firm is competing in is important for this study as it may influence both the development of their operations capability and the firm's ability to be competitive.

Environmental uncertainty or competitive turbulence are categorized into three types: marketing environment uncertainty; technological environment uncertainty; and competitive environment uncertainty (Desarbo et al., 2005). We have adapted these three constructs in this study. The marketing environment uncertainty scale was based on customers' product preferences, customer price sensitivity, product needs, changing customer base, and forecasting marketplace changes. The technological environment uncertainty scale included technological rate of change, the extent of technical opportunity, the difficulty of technological forecasting, and the extent of technological development. The competitive environment uncertainty scale performance and relative efficiency performance) even when firms' perceived competitive turbulence, micro or

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small firms (SE) status and Manufacturing focus are controlled for.

COMPETITIVE PERFORMANCE AND COMPETITIVENESS

Competitiveness is defined as the ability to design, produce and market the goods and services better than the competitor (Desarbo et al., 2005; Banwet et al., 2002). Few studies have provided the measurement and evaluation at firm and industries levels (Shee, 2002; Ajitabh, 2003; Ambastha and Momaya, 2004]. Firm performance is the indicator of its operations capability and practices. Competitiveness being multi dimensional (Feurer. and Chaharbaghi, 1994) can be measured on firm level performance indicators: customer performance and efficiency performance (Neill and Rose, 2006). Customer performance of a firm relates to satisfaction, brand loyalty, value system and retention of customers for the future business. The efficiency indicator includes firms' labour productivity, sales growth, market share and reducing selling cost. Firms' competitiveness is a measure of these performance indicators. Similar to other studies measuring competitiveness self-reported comparisons to (Luo et al., 2006; Neill and Rose, 2006) Strategic management journals very often discuss and use terms such as capability, core competency, competitive advantage and competitiveness as a measure of sustainable survival in the market place.

All of them lead to competitive advantage which in turn results in competitiveness. Competence or capability dimensions (e.g. cost, quality, delivery, flexibility, technology and skilled workers

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etc.) drive the competitiveness dimensions (e.g. quality product, speed of delivery, market share, customer satisfaction etc.) for sustainable growth of the firms (Feurer and Chaharbaghi, 1994). It is common in these studies to use self-reported measures of performance from key informants and measures from secondary sources. Some of these self-reported measures of performance are based on comparisons with other firms (Desarbo et al., 2005). These measures could be more accurately described as competitive performance measures. The measures reflect the key informants, usually the CEOs or senior executives of the firms, perceptions of the firm's competitiveness on performance measures in relation to other firms in the industry.

RESEARCH METHODOLOGY

SAMPLE AND DATA COLLECTION

The sampling frame consisted of a judgmental sample of small and medium enterprises (SMEs) from seven states and a capital teritory in Australia. We drew our sample of 3144 predominately SMEs

MEASURES OF CONSTRUCTS

For firm type varaibles, firms that stated their industry as Manufacturing were coded 1 and all other firms were coded 0 (as Non-Manufacturing focused). All firms with less than 50 employees were coded 1 (SE) and those with 50 or more were coded 0 (non-SE). All scale based constructs were adapted and measured with existing, well-validated multiple- item scales. In Appendix 1,

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we report the items used to measure each of the scales and its sub-scales, internal consistency, and the response format employed in the questionniare.

Competitive turbulence was measured using an existing scale (Desarbo et al., 2005) that in turn referred to the original constructs (Jaworski and Kohli, 1993). Further, the construct was categorised into three sub-scales: marketing environment, technological environment, and competitive intensity. We scored each item on a 11-point likert scale, ranging from 'strongly disagree' (0) to 'strongly agree' (10).

We used these three sub- from Australian exporters' e-database with criteria based on those firms that revealed their revenues (either domestic or export or scales to assess the business environment or conditions in the primary markets that the respondent firms currently serve.

Therefore understanding the level of competitive turbulence a firm is competing in is important for this study as it may influence both the development of their operations capability and the firm's ability to be competitive.

We both for the year 2006. We administered the self-report survey in July through December 2007. We received 407 non-response questionnaires due to wrong address, missing addressee and formal statements of wishing not to participate in the survey. A total of 152 firms returned usable surveys, resulting in a response rate of 5.6 percent. The plausible reasons for this low response rate

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could be due to problems with the database which on follow up had a number of addressee errors. There were no sign of any systematic bias in the returns. Tests for response bias also indicated clear and separate factor structure as predicted in the initial design. The definition used for micro and small interprises (SE) was that used by the OECD and consisted of micro firms less than 10 employees, small firms with 10 employees but less than 50, medium firms with 50 employees but less to 250. Large firms were those that had 250 employees and more.

The firms that responded to the survey represented a broad cross-section of industries comprising 41 percent of firms from manufacturing, 12 percent from agriculture, forestry and fishing, 12 percent from wholesale and retail trade, and 5.3 percent from building and construction. The sample was predominately SME 94.7 percent. The sample constituted 71 percent of firms having employees less than 50 (SE) and remaining 29 percent firms having employees ranging from 50 to 2000 with 23.5 percent being less than 250.

The respondents represented 87 percent general manager/CEO/president/managing director with 85 percent indicating they had nine or more years of work experience and almost all involved in the strategic decision making process. The sample constituted 91.5 percent male respondents and only 8.5 percent females. measure sub-scale marketing environment with 6 items to assess different aspects of customers' preferences for existing and new products, product pricing, customer price sensitivity, changing customer base and other aspects of customer-product-pricing market environment. A sample item included: "In our kind of business, customers' product

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preferences change quite a bit over time." We measured sub- scale technological environment with 6 items to assess different aspects of technology and its rate of change, new product ideas through technological forecasting, technological opportunity and other aspects of technology. A sample item from this scale included: "A large number of new product ideas have been made possible through technological breakthroughs in our industry." We measured sub-scale competitive intensity with 6 items to assess different aspects of market competion, extent of promotion and price war, relative movement of the firms to match the offer as compared to the competitors and other competitive aspects. A sample item included: "Competition in our industry is cutthroat."

The Cronbach's alpha for marketing environment was 0.57 (0.62 after refinement by deleting questionnaire item number 5), technological environment was 0.63 (.87 after deleting questionnaire item no 5) and competitive intensity was 0.73. An alpha level of 0.70 or above is generally considered to be acceptable (Cronbach, 1951). The relatively low reliability coefficient alpha of 'marketing environment' in this study was considered acceptable as evidenced by few studies from the literature (.68 for market turbulence sub- scale in (Jaworski and Kohli, 1993), but alpha values for the same sub-scale were not reported in Desarbo et al. (2005). Realibility alpha were as low as 0.52 and 0.65 resepctively for two differrnt consrtructs in a study by (Song and Parry, 1997, pp. 7; Luo et al., 2006) and were accepted. In a study by Barringer et al.,(1999) coefficient aplha for strategic controls (alpha = 0.64) and environmental turbulence (alpha = 0.67) were less than 0.7 but accepted for discussion. Only marketing environment was below .7 after the scale was optimised. The other two optimised scales were used

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in the following analysis. Though whether the scales were optimised or not it made no substantive differences to the results.

Operations capability was adapted from the original scale suggested by researchers (Desarbo et al., 2005). This scale includes the capabiltiies in the area of market-linking, information technology, a 11-point likert scale, ranging from '0% performance' (0) to '91-100% performance' (10). The Cronbach alpha for customer performance is 0.94 and efficiency performance is 0.84. We measured the sub-scale customer performance with 6 items to assess different aspects of firm's customer related performance by measuring customer satisfaction, loyalty, retention and lifetime value. A sample item included: "Delivering customer value.' We measured the sub-scale efficiency performance with 5 items to assess different aspects of fi rm 's performnce by measuring labour productivity, market share, sales growth and measures of cost reduction and labor productivity.

This measure was considered more suitable for this sample than using secondary performance production technology and logistics management. We scored each scale item on a 11-point likert scale, ranging from 'much worse' (0) to 'much better' (10)

The majority of the firms that are in focus of this study are not listed and usually is the case for most SMEs internationally. As a consequence secondary financial data is Cronbach alpha for operations capability construct was 0.83 for the sample overall and was 0.88 for micro firms and

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0.84 for small firms. The scale seems to be useful measure of operations capability in micro and small firms (SE). There were, however, two significant mean differences on items depending on organisational size. The main differences was that micro and small firms (SEs) placed a greater emphasis on creating durable relationships with suppliers than larger firms. Micro firms placed a greater emphasis on channel- bonding that any other size firm. All the other items showed no differences based on organisational size. For manufacturing firms the cronbach alpha was .85 and for non- manufacturing it was .82.

We measured operations capability with eight items. These were

1. Capabilities of creating durable relationship with our suppliers
2. Channel-bonding capabilities (i.e. creating durable relationship with channel members such as whole sellers, retailers, etc.)
3. Information technology systems for internal communication (e.g., across different departments, across different levels of the organization, etc.)
4. Manufacturing processes
5. Production facilities
6. Quality control skills
7. Integrated logistics systems
8. Cost control capabilities

Competitive performance perception was measured using two sub-scales customer performance

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and efficiency performance adapted from an existing study (Luo et al., 2006; Neill and Rose, 2006). We scored each scale item on generally not available for these types of studies. Such secondary financial data even if was available would need to be controlled for the underlying profitability of the markets that the firms were competing in if relative competitiveness was to be identified. This study was focused on a firm's perceived competitiveness within a firm's principal served market.

The first part of the assessment of the operations capability scale was to determine if the scale was a realiable measure and this was done first by determining the overall chronbach alpha for operations capability for the whole sample and then determining if it also held for different size organisations and for manufacturing and non-manufacturing firms. The cronbach alphawas above .8 for all sub- categories within the sample.

The second part of the assessment of the operations capability scale is to confirm if the scale items had meaningful predictive validity for not only manufacturing firms but also for non-maufacturing firms. To determine this the correlations of each operations capability item within the scale for manufacturing and non-manufacturing firms were assessed against both efficiency and customer performance, the citerion variables. As Table 1 below illustrates all items were meaningful predictors for either or both manufacturing and non-manufacturing firms of customer competitive performance and efficiency competitive performance. The scale as a whole, Operations Capability, was stronger for manufacturing than non- manufacturing but was a meaningful and a strongly

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significant predictor for both. The threshold for a meaningful zero-order correlation was set at .3, even though lower correlations were significant in this sample due to sample size for maufacturing were significant above .25 and for non-maufacturing it was significant above .20. A score of .3 indicates that the item explains approximately 10% of the varaition in the predictor variable. This adds to our confidence in using this measure in our study. relationships were more important predictors of customer performance competitiveness than they were for The variation in the strength of the zero- order correlations of the items withinthe operations capability scale also provided.

Hypothesis 2 (H2): *Firms that percieve their environment as comptitively turbulent or who are more Manufacturing focused or who are not micro or small firms will have higher levels of operation capability.*

m a n u f a c t u r i n g firms.These relationships seem consistent with what would be expected for these different types of firms. additional face validity. In manufacturing firms cost control and production facilities were the capabilities most strongly related to efficiency competitive performance. In manufacturing firms production facilities were also strongly correlated to customer competitive performance.In non- manufacturing firms these capabilities were less significant but for non-maufacturing firms channel bonding and supplier

Table 1: Operations Capability Items Zero-order Correlation Strength on Citerion Variables for

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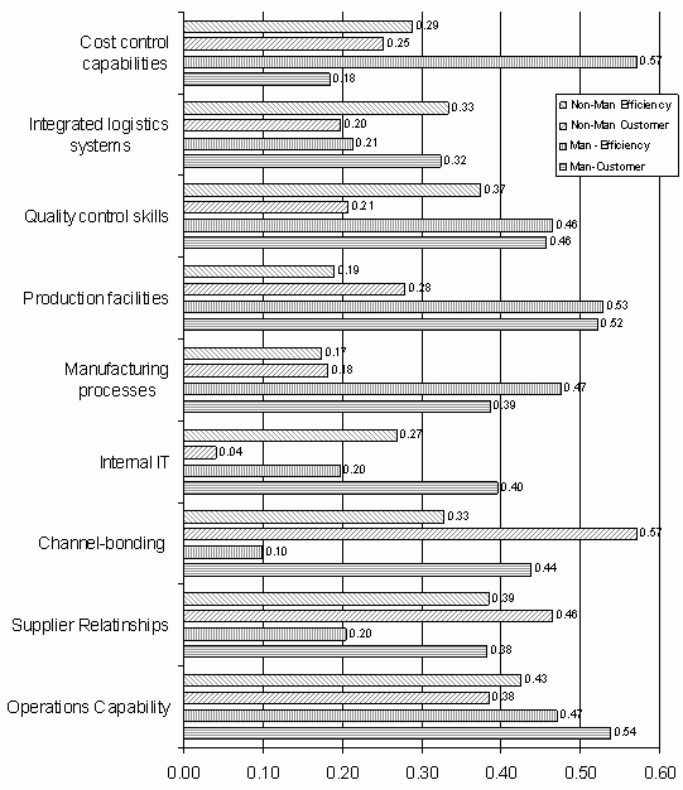
Manufacturing and non-Manufacturing Firms



RELATIONSHIP BETWEEN COMPETITIVE TURBULENCE, OPERATIONS CAPABILITY AND FIRM COMPETITIVENESS

Operations capability explains the variation in the competitive perception measures of customer and efficiency performance. This paper includes competitive performance measured by perceptions of customer performance and efficiency performance. Operations capability dimensions that emerge from within the firm describe the scale. Competitiveness was a measure of

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firm performance compared to other competitors in firm's principal served market segment. Item inter-correlation (Table 2) indicates that operations capability is positively correlated to customer performance (.43) and efficiency performance (.43).

Hypothesis H1 was initially tested using zero order correlation as shown in Table 2. That means operations capability is positively and significantly correlated to Customer performance (R 152= .43, p< .01) and to efficiency performance (R 152 = .43, p< .01). This hypothesis was Zero-order correlation strength supported at the zero-order correlation level.

Hypothesis H2 was tested using zero order correlation as shown in Table 2. The zero-order correlations found no relationship between operations capability and competitive turbulence. This hypothesis was not supported at the zero- order level and the results were reconfirmed with hierarchical regression (hence no results presented).

Hypothesis H3 was tested using hierarchical regression analysis to test the robustness of this relationship identified in Hypothesis H1. We conducted a hierarchical regression (see Table 2) where we examined the relationship between operations capability and the two performance measures after we controlled for size (SE), type of firm (Manufacturing vs. Non-Manufacturing and the turbulence of the competitive environment (Marketing environment, technological environment, competitive intensity). The outputs of the regression test are summarized in Table 2.

Table 2: Mean, Standard Deviation and Zero-order Correlation

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	Mean	SD	1	2	3	4	5	6	7	8
1. Manufacturing	-	-	-							
2. SE	-	-	-.08	-						
3. Marketing environment	5.98	1.45	-.02	.12	*.57*					
4. Tech. environment	5.36	1.61	-.12	.08	.48**	*.63*				
5. Competitive intensity	5.24	1.76	-.04	-.01	.34**	.23**	*.73*			
6. Operations Capability	7.67	1.60	.09	.03	.07	-.06	-.01	*.83*		
7. Customer performance	6.23	1.78	-.03	.17*	.05	.07	.00	.43**	*.94*	
8. Efficiency performance	6.74	1.39	-.08	.03	.02	.03	.07	.43**	.60**	*.84*

* p < .05 ** p < .01 n = 152 Cronbach alpha italicized on diagonally

Hypothesis H3 sought to examine if a firms' operations capability has a positive effect on a firm's customer performance and efficiency performance even when firms' perceived competitive turbulence, SE status and Manufacturing focus are controlled for. This was supported for both competitive perception measures of customer performance and efficiency performance (see Table 3).

Table 3: Hierarchical Regression: Operations Capability and Competitiveness (Efficiency and Customer Performance)

		Efficiency Performance					Customer Performance			
		B	se	Beta	ΔR^2		B	se	Beta	ΔR^2
Step 1					0.001					0.026
	(Constant)	6.18	0.30				7.22	0.27		
	Manufacturing	-0.10	0.30	-0.03			0.01	0.27	0.01	
	SE	0.08	0.32	0.02			0.56	0.29	0.16	
Step 2					0.001					0.010
	(Constant)	6.19	0.74				6.82	0.68		
	Manufacturing	-0.10	0.30	-0.03			0.06	0.28	0.02	
	SE	0.08	0.32	0.02			0.54	0.30	0.16	
	Marketing environment	0.01	0.12	0.01			-0.02	0.11	-0.02	
	Technological environment	0.01	0.11	0.01			0.11	0.10	0.11	
	Competitive intensity	-0.02	0.09	-0.02			-0.01	0.08	0.01	
Step 3					0.151**					0.166**
	(Constant)	3.34	0.90				4.05	0.81		
	Manufacturing	-0.03	0.28	-0.01			0.13	0.25	0.04	
	SE	0.08	0.30	0.02			0.55	0.27	0.16	
	Marketing environment	-0.03	0.11	-0.03			-0.07	0.10	-0.06	
	Technological environment	-0.03	0.10	-0.03			0.07	0.09	0.07	
	Competitive intensity	-0.03	0.08	-0.03			-0.01	0.07	-0.01	
	Operations Capability	0.50	0.10	0.40***			0.48	0.09	0.41***	

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B = Unstandardized coefficients. ß= Standardized Coefficients, se= standard error of B, ΔR^2 = change in R square. * p< .05, ** p< .01,* p< .001.**

DISCUSSION AND MANAGERIAL IMPLICATIONS

The purpose of this study was to explore the relationship between operations capability and firm competitiveness while controlling for SMEs size (i.e. SE or large) and firm type (i.e. manufacturing vs. non-manufacturing). Firm competitiveness is a measure of firm performance. The correlations between operations capability and competitiveness measures (e.g. customer performance and efficiency performance) are reportedly significant. This is confirmed further by regression analysis which indicates operations capability has significant effects on firm competitiveness measured through customer performance and efficiency performance. Firms with high level of operations capabilitity resulted in higher perceived effciency and higher customer performance.

finding is consistent partly with other studies where the authors have dealt with individual item(s) of firm capability such as TQM (Samson and Terziovski, 1999), and production competencies (Tracy et al., 1999; Vickey and Droge, 1993) that have effect on business performance. More specifically, competitive priorities (e.g. cost, quality, delivery and scope flexibility) seem to perform better on customer satisfaction (Kathuria, 2000); the relationship with TQM and firm

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performance is significant (Samson and Terziovski, 1999); a high level of competitive capabilities lead to high level of performance (Tracy et al., 1999); and production competence has more of an effect on business performance (Vickey and Droge, 1993). Surprisingly, the results indicated that the competitive turbulence (e.g. marketing environment, technological environment and competitive intensity) has no effect on operations capability development or firm competitiveness.

The implications of the findings of this study in the SME sample are many. Our results suggest that operations capability is a significant predictor of firm competitiveness. Ta rg eting on competitive performance offer s new perspectives on efficient Our results indicate that customer performance perceptions are influenced significantly (ß=.41***)

Hypothesis 2 (H2): *Firms that percieve their environment as comptitively turbulent or who are more Manufacturing focused or who are not micro or small firms will have higher levels of operation capability.*

Management of operations capability elements. High correlation indicates higher capability leads to higher performance in by operations capability. Similarly, firm efficiency perceptions are influenced significantly (ß =.40***) by operations capability. Operations capability is a set of practices that seem to influence the firm performance. This both the counts. This assumes that performance can be the key indicator of overall sustainable firm competitiveness. The findings

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from Table 1 suggest that for manufacturing SMEs, cost control and production facilities seem to be strongly focused (r> 0.5); quality control and manufacturing processes seem to be moderately focused (0.4< r <0.5) for efficiency performance. However, quality control, internal IT and channel bonding are moderately correlated to manufacturing SMEs for customer performance. Quality is concerned with how firms design, produce products and services to promote conformance and minimizes variations (Sitkin et al. 1994) and integrate production and processes (Samson and Terziovski, 1999). Since firms are sets of interlinked processes, quality improvement of these processes will lead to higher competitiveness. Identifying and prioritizing capabilities to enhance quality would require a focus on innovation through market scanning.

Non-manufacturing SMEs are strongly correlated with channel bonding (i.e. creating durable relationship with channel members such as whole sellers, retailers, etc.), and moderately correlated to supplier relationship for customer performance. However, integrated logistics, quality control skills, channel bonding and supplier relationships are weakly correlated (0.3< r <0.4) for efficiency performance.

The managerial challenge is to build on each of the above elements of operations capability by nurturing and honing them through careful integration with the competitive environment. No mater, how strong or weak is the relationship. As it never happens right away, slow and steady approach might be the best alternative. Competitiveness cannot be improved unless it is measured.

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Measurement provides a mean to improve upon the existing one and perform better than competitors around.

Capability building never happens immediately must be nurtured over time. Finding and gaining competitiveness is a constant quest. Remembering as Ulrich (1993) pointed out, competitiveness is not based on production facilities and processes, quality control, logistics management, supplier relationships and internal IT etc. but is derived from within the firm as a result of collective actions of all of them. Then, if competitiveness is still not achieved, a review of strategy and managers' participation in the strategy building process (Tracey et al., 1999) seem to be crucial.

RESEARCH LIMITATIONS AND FUTURE RESEARCH AGENDA

Like most research of this type, the investigation has limitations. First, it did not pretend to analyse all possible practices that might be considered to be scale items of operations capability. The study revealed the competitive turbulence dimensions had no effect on operations capability within the SMEs sample. Such a finding needs replication, particularly given the small sample of firms used in this study. Second, two of the three scales used under competitive environment had low alpha values (< .7). However these alphas were not inconsistent with those reported in the extant literature and optimised scales were used in the analysis. This suggests there may be a need for more refined instruments to measure these important constructs.

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CONCLUSION

This paper provided an initial exploration of how operations capability, among other functional level capabilities, might create competitive advantage by creating differentiation between firms. An operations capability was conceptualized as an internally coherent bundle of practices that a firm might leverage to perform better than its competitors. The study found that firms with high levels of operations capability resulted in higher perceived efficiency and customer performance resulting in higher competitiveness ranking of a firm. This relationship between operations capability and firm competitiveness was shown to be a robust one regardless of the effect of the competitive turbulence (e.g. marketing environment, technological environment and competitive intensity) for SMEs.

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