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Inter-relationships between innovation and market orientation in SMEs

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Abstract

Purpose – This study aims to explore the nature of the interactions between two strategies, innovation and market orientation. By examining the components of these constructs the paper seeks to identify key components of market orientation that are antecedent factors of the innovation performance of the firm.

Design/methodology/approach – Correlation analysis was undertaken on data from a survey of 73 manufacturing firms in the Greater Western Sydney economic development zone in Australia. The data were supplemented by information obtained from the firm's annual reports.

Findings – Innovation was found to be positively correlated to market orientation (customer orientation, competitor orientation and inter-functional co-ordination) and both of these constructs were found to be positively correlated to firm performance and the degree of change in the firm's competitive environment.

Research limitations/implications – Possible limitations are: the low survey response rate; the nature of the sampled population; and the spread of industries involved, which could limit the generalisability of the results. The next steps will be to conduct deeper analysis into the factors that make up the subscales of the two constructs and to determine how market orientation or its associated activities interact with the innovation process.

Practical implications – In order to maximize a firm's financial performance, organizations should increase both their market orientation and their innovation activities as these factors operate synergistically.

Originality/value – This study is arguably the first to establish the finding that the degree of change in the competitive environment and the level of market orientation are linked, and the identification of the components of market orientation that are linked to firm innovation. These findings suggest that firm innovation and firm market orientation are strategic reactions to changes in the firm's competitive environment.

1. Introduction

While a link between market orientation and innovation activity has been established by previous researchers using the industry as the unit of analysis, few studies have been

completed at the firm level. The link can be either negative or positive depending on the level of existing firm innovativeness (Verhees and Meulenberg, 2004). It is the nature of the linkage between these constructs at the firm level that this study explores.

This paper briefly reviews the literature examining the relationship between firm-level market orientation and innovation performance. It then presents a number of research propositions suggested by the literature and explores these propositions using empirical data collected from 73 manufacturing firms in the Greater Western Sydney economic development zone in Australia. The paper concludes by suggesting a future research agenda and related conceptual framework for this research using the firm as the unit of analysis.

2. Innovation

Innovation has a positive impact on the economy (Teece, 2002) and a key element within the entrepreneurial process (Schaper and Colery, 2003). Many definitions of innovation can be found in the literature (Boer and During, 2001; Damanpour, 1991; Damanpour and Fariborz, 1984; Zaltman *et al.*, 1973). Each of these has a common theme, innovation activity must be new to the target audience. When viewed as a process, innovation may also be culture specific (El Sawy *et al.*, 2001).

Innovation, or at least the firm's capacity to innovate, has been shown to have a relationship with firm performance. For example, successful product and process innovation has a positive link to firm performance (Caves and Ghemawat, 1992). New product development can lead to increased market share (Zahra and Covin, 1993) and product innovation has been linked to increasing market share (Banbury and Mitchell, 1995). Studies in Australian manufacturing companies have also found to relationships between financial performance and innovation performance (Yamin *et al.*, 1999).

Overall, this literature indicates that there is a positive relationship between firm innovativeness and firm performance, with many authors suggesting innovation as a firm strategy to achieve superior performance. However, one can conjecture that there may be both internal (to the firm) and external influences on firm innovation performance and the motivation to innovate.

3. Market orientation

Market orientation is an important internal influence and has also been shown to have a positive relationship to firm performance. Market orientation refers to the organization-wide generation, dissemination, and responsiveness to market intelligence (Kohli and Jaworski, 1990). Shapiro (1988) suggests that a number of areas of the business other than marketing participate in all three of these aspects of market orientation; hence, the importance and application of the function is considerably wider than just the marketing department. Market orientation entails: (i) one or more departments engaging in activities geared toward developing an understanding of customer's current and future needs and the factors affecting them; (ii) sharing of this understanding across departments; and (iii) the various departments engaging in activities designed to meet select customers needs (Kohli and Jaworski, 1990, p. 3)

The multi-functional importance of market orientation also means that the communication, interpretation, and dissemination of marketing information must occur between and across

several functional areas of the firm. Furthermore, antecedent factors for market orientation have been categorise into three main categories: (1) senior management factors, (2) interdepartmental dynamics, and (3) organizational systems (Kohli and Jaworski, 1990).

Practitioner articles have also described market orientation as a desirable strategy for companies to pursue, and they have described the practice as "customer led" (Whitehall *et al.*, 2003). This practice entails such things as looking for unmet customer needs, matching these with firm competencies and then obtaining feedback from customers on the desirability of these new offerings. Studies at the industry level of market orientation have found that some firms are practising this strategy to a greater extent than others (Deshpandé and Farley, 1999; Kohli and Jaworski, 1990; Kohli *et al.*, 1993; Narver and Slater, 1990; Pelham, 2000).

Practitioner articles suggest that superior market orientation can lead to superior firm performance in the market place, "today's top companies are customer led" Whitehall *et al.* (2003, p. 111). This philosophy has infiltrated the practitioner literature from studies that suggest an increased level of market orientation can lead to improvements in firm performance (Atuahene-Gima, 1996; Han *et al.*, 1998; Deshpandé and Farley, 1999; Dobni and Luffman, 2000; Dawes, 2000; Narver and Slater, 1990; Verhees and Meulenberg, 2004).

The overriding proposition of the literature is that increased market orientation will lead to higher firm performance. Higher firm performance means that more value will be created for the shareholders of the firm, in practice this is usually measured through increased sales performance or improved firm profits. Thus, both academic and practitioner literature generally link both innovation and market orientation to improved firm performance. We now turn to an examination of the literature linking these two firm strategies.

4.   Innovation and market orientation

A cross-sectional Australian study of 600 firms found a significant negative correlation between market orientation and the product newness to customers suggesting that market orientation helps reduce chances of a firm producing innovations that require major behavioural changes on the part of potential customers for adoption (Atuahene-Gima, 1996, p. 94). Han *et al.* (1998) found that innovations support the conversion of market-oriented business philosophy into superior corporate performance. Others have also found that market orientation activities by firms were correlated with firm innovativeness (e.g. Erdil *et al.*, 2004).

While there appears to be a correlation between market orientation and innovative performance, this correlation may not be positive. For example, paradigm-breaking innovation may cause market dissonance. Firms who are responsive to market intelligence (one factor in market orientation) would prefer not to create this dissonance and would therefore be less likely to undertake innovation activity that would create a situation where customers would need to change their behaviour (Tauber, 1974). One example of innovation activity that could necessitate a change in customer behaviour is discontinuous (or disruptive) innovation (Christensen, 1999). In some industries market orientation is not important to the innovative process and may have a negative influence on product novelty (Atuahene-Gima, 1996; Kohli and Jaworksi, 1990).

Verhees and Meulenberg (2004) in their study of SMEs found that market orientation inhibited product innovation in firms that were already highly innovative, while market

orientation stimulated innovation in firms that were less innovative. While these findings may appear to be contradictory, there was no attempt to categorise the type of innovation that the firm was undertaking.

Low *et al.* (2005), also reported the following findings:

1. no relationship was established between environmental factors (such as firm size, ease of market entry) and the constructs of either innovation or market orientation;
2. a relationship *was* found between changes in the competitive environment and both the innovation and market orientation constructs; and
3. a relationship was found between the constructs of innovation and market orientation.

This paper extends Low *et al.*'s (2005) study and introduces the following propositions:

P1. Changes in the firm's competitive environment will be positively correlated with the innovativeness of the firm. *P2.* Changes in the firm's competitive environment will be positively correlated with the market orientation of the firm. *P3.* A high level of market orientation will be linked with high levels of innovation. *P4.* Innovation has a positive correlation with firm performance. *P5.* Market orientation has a positive correlation with firm performance.

5. Methodology and analysis

5.1 Data collection

This study utilised two previously developed scales to measure the market orientation and innovation of firms. These scales show high reliability and have gained a level of acceptance in the literature. The first scale used is the the Slater and Narver (1994) fourteen item market orientation scale. This scale has consistently had a test–retest reliability of 0.8 or higher (Beardon and Netemeyer, 1999). The second scale, used to measure innovation, was a contained in the "ENTRESCALE" as refined by Covin and Slevin (1989) to measure entrepreneurship. This scale was chosen since it shows strong validity in numerous studies (Covin and Slevin, 1989; Khandwalla, 1977; Miles and Snow, 1978) and has also been shown to have validity in cross-cultural and inter-language situations (Knight, 1997). Both scales consist of a number of subscales, customer orientation, competitor orientation, and inter-functional coordination for the market orientation scale; and innovativeness and proactiveness for the ENTRESCALE scale. These two scales were incorporated into the one questionnaire together with questions designed to capture business performance (financial) along with industry and industrial environmental conditions.

Entrepreneurship (as measured by the "ENTRESCALE") has two dimensions, innovativeness and pro-activeness. Innovativeness is the act of finding "creative or novel solutions to challenges confronting the firm" (Knight, 1997, p. 214); while "pro-activeness is the opposite of reactiveness and is associated with aggressive posturing relative to competitors" (Knight, 1997, p. 214).

A mailing list was obtained for 316 firms located in the Greater Western Sydney area and were involved in manufacturing goods for Australian or overseas markets (as determined by their ANZSIC – Australian New Zealand Standard Industrial Classification code). The survey mail out was preceded by a phone call to request participation and ensure the manager

contacted had sufficient firm knowledge to answer the survey questions. Each survey was then individually addressed both to the company and to a specific manager within the firm. Of the 316 surveys distributed 74 were returned (23.4 per cent response). Each questionnaire was reviewed for completeness and of the 74 returned questionnaires 1 questionnaire was considered unusable due to large amounts of missing data, giving 73 usable responses.

We have identified three main limitations to this study. These were:

1. with a response rate of 23.4 per cent there is a possibility of response bias;
2. as the mailing list involved a group of self reported companies who were interested in the topic of innovation (from a network of companies called the Innovative Technology Network) there may be some positive bias towards innovation in the sample; and
3. the broad spread of industries involved and the above sample selection process may have reduced the generalisability of the results.

With regards to limitation one, a validity test as suggested by Armstrong and Overton (1977) was conducted comparing early and late responses. No difference was found between these groups, thus there is only a slight possibility of response bias. The implications of the second limitation may mean that the sample was not representative of firms in Greater Western Sydney, and the third limitation may mean that the results of this study may only apply to manufacturing SMEs within Greater Western Sydney.

5.2 Data analysis

A reliability test was conducted to determine the internal consistency of each scale used in this study. The ENTRESCALE and Market Orientation Scale returned Cronbach alpha coefficients of 0.848 and 0.861 respectively, indicating a high level of internal consistency within these measures (the generally accepted lower limit is 0.7, though some studies allow 0.6 (Hair *et al.*, 1998)).

Through an analysis of demographic and other collected data it was found that the respondents generally operate in a market sector where:

- it is difficult to enter and succeed;
- a few large players dominate the market;
- marketing practices have become more diverse in recent years;
- the majority have increased their research and development (R&D) spending;
- competitors have become somewhat less predictable and more hostile; and
- most firms reported that they were now competing against their major competitors in more areas than three years ago.

Correlation analysis was used to examine the relationship between key variables (Veal, 2005). The relevant correlation coefficients were calculated using the SPSS bivariate correlate command and Spearman's rho statistic for non-parametric data.

The first correlations examined between changes to the competitive environment and the scales measured are shown in Table I.

According to the results in Table I, scale innovativeness is positively correlated with competitor hostility ($rho = 0.254$, $p = 0.032$). There are no significant correlations found between the overall ENTRESCALE and any of the changes in competitive environment factors.

Customer orientation is positively correlated with both technology turbulence ($rho = 0.290$, $p = 0.014$) and competitor hostility ($rho = 0.271$, $p = f.022$) factors. No significant correlations are found between the inter-functional coordination scale and any of the changes in the competitive environment factors. Market orientation is found to have a positive correlation with changes in marketing practices ($rho = 0.0258$, $p = 0.031$). This result means that as the marketing diversity of firms increased these firms scored higher on the overall market orientation scale.

The entrepreneurship and market orientation constructs are shown to be positively correlated ($rho = 0.225$, $p = 0.029$). The innovativeness sub-scale and market orientation is also positively correlated ($rho = 0.281$, $p = 0.008$) meaning that firms were reporting that as market orientation increased so too did firm innovativeness.

Further correlation analysis is conducted on the various subscales using the same procedures, with the significant results summarised in Table II.

Table II we see that innovativeness is positively correlated with both the market orientation subscales of customer orientation ($rho = 0.199$, $p = 0.046$) and competitor orientation ($rho = 0.347$, $p = 0.001$), meaning that as levels of customer orientation or competitor orientation increased so too did the level of reported innovativeness of the firm.

The entrepreneurship construct also had a pro-activeness subscale in addition to the innovativeness scale. This pro-activeness subscale is also positively correlated with both the customer orientation subscale ($rho = 0.300$, $p = 0.005$) and the competitor orientation subscale ($rho = 0.216$, $p = 0.034$). This result again means that as levels of customer orientation or competitor orientation increased so too did the level of reported pro-activeness within the firm.

The subscale of inter-functional co-ordination is not significantly correlated to either innovativeness, pro-activeness or the entrepreneurial construct. This result may mean that these functions are not related to each other, or may be due to the unreliability of this subscale found in this study.

Financial information was collected from figures available on the balance sheets and profit and loss statements of the respondent companies, allowing the calculation of some key financial ratios: gross profit margin, asset turnover, and inventory turnover. Gross profit margin is sales less cost of sales divided by sales which gives an idea of gross profit measured as a percentage, the higher this figure is generally regarded as being better. Asset turnover is a measure of how efficiently assets are employed within the business, again a higher figure is regarded as better. Inventory turnover is a measure of how efficiently inventory is managed within the business, again a higher figure is regarded as better. Because these measures are expressed as ratios, they can be used to directly compare companies regardless of firm size.

Three further measures of firm performance were collected, including Return on investment, New product success rate, and Sales growth (ROI, NPSR, and SG, respectively). The main difference between these measures and the other three is that these were self reported by the key informants completing the survey rather than derived from actual financial figures. The literature for both innovation and market orientation suggests that firms who perform well in these areas will have higher firm performance than those who do not. Propositions three and four are concerned with the relationship between firm performance and the constructs of market orientation and innovativeness.

The first test used to evaluate these propositions is the chi-square test for independence or relatedness. No significant relationship is found between the financial measures of gross profit margin and asset and inventory turnover; and either the constructs of Market Orientation or ENTRESCALE or their subscales. The significant results found are shown in Table III.

As Table III shows, significant relationships are found between innovativeness (rho $= 52.037$, $p = 0.000$), pro-activeness (rho $= 45.515$, $p = 0.000$), and the ENTRESCALE (rho $= 39.373$, $p = 0.003$) and the ROI measure. A significant relationship was also found between the ROI measure and customer orientation (rho $= 40.512$, $p = 0.002$). The only other significant relationship highlighted by this statistical analysis is the one between market orientation and the measure of new product success rate (rho $= 25.641$, $p = 0.012$).

Correlations between the constructs of market orientation and ENTRESCALE as well as their subscales of customer and competitor orientation, innovativeness and pro-activeness, and these firm performance measures are calculated next. Table IV highlights the significant correlations that were found.

The findings, shown in Table IV, show that both innovativeness and customer orientation are negatively correlated with ROI, while innovativeness and market orientation are positively correlated with gross profit margin, which is surprising. This outcome is discussed further in the next section.

6. Discussion

In previous analyses (Low *et al.*, 2005) no significant relationships between the business environmental factors of firm size, cost structure, entry ease and industry concentration, and the subscales contained in the constructs of Entrepreneurship and Market Orientation were found. It was concluded that these lack of relationships may mean that the existing industry structure does not affect firms' actions in this regard, or, that environmental factors that do influence these constructs were not identified.

Proposition one states that "changes in the organisation's competitive environment will be positively correlated with the innovativeness of the firm"; we have established that there is a positive correlation between some of the items in the changes of the environment and innovativeness, as measured, of the firm. Support is therefore found for *P1* and there is a relationship between these measures and firm innovativeness.

Proposition two states that "changes in the organisation's competitive environment will be positively correlated with the market orientation of the firm"; we have established that there is a positive correlation between the items measured in the changes of the environment and

the scale and subscales of market orientation, as measured, of the firm. Support is therefore found for *P2* and there is a positive correlation between these measures and the market orientation of the firm.

Proposition three states that "a high level of market orientation will be linked with a high level of innovation"; we have established that the innovativeness of a firm is positively correlated with the market orientation and two sub-scales of customer and competitor orientation of a firm. Support is therefore found for *P3* and high levels of market orientation are normally found with high levels of innovativeness within a firm.

The two constructs being studied, innovation and market orientation, have both been linked to higher firm performance in the literature and propositions four and five proposed that these are linked with higher firm performance. The first set of financial performance indicators (GP, Asset Turnover, and Inventory Turnover) were calculated from *actual* financial figures (figures reported from the balance sheet survey by respondents), while the second set (ROI, NPSR, and SG) were comparative estimates by key informants. The analysis of the self-reported figures indicated that respondents reported that they were performing better than their competitors. However, when the actual financial figures, taken from the official accounting records of the firm, were analysed with the Australian industry average obtained from the Australian Bureau of Statistics the study found that these firms were performing no better than the average for firms operating in the same industry (Australian Bureau of Statistics, 2002). Given these findings, the reliability of the self reported performance indicators must be questioned. If the results are, in fact, over-reported then any analysis of this aspect may be of limited utility.

The analysis found a significant negative correlation between firm innovativeness and ROI, as the firm's innovativeness increases, its return from investments reduces. The analysis also found that as innovation increases inventory turnover reduces. Curiously, the analysis found that as the firm's innovativeness increases, so does its gross profit margin.

There were further conflicting results between market orientation, its subscales and measures of firm performance. For example, as the firm's market orientation increases, so does its gross profit margin. The analysis also found a positive correlation between the subscale of competitor orientation and GP. However, there was a significant negative correlation between market orientation and asset turnover; and between the subscale of customer orientation and ROI.

When these apparently conflicting results are tabulated (see Table V) the connections become apparent. As shown by these statistics, this study found both innovativeness and market orientation are positively and negatively correlated with measures of firm performance. However, all correlations between profitability measures based on the *actual* performance of the firms and the constructs and sub-scales of innovation and market orientation were positive. This result indicates that as both innovation and market orientation increase the profitability of the firms also increased. While both the inventory turnover and asset turnover calculations were based on actual financial data of the respondent firms, they are measures of efficiency rather than profitability and may not have a material impact on the financial performance of these SMEs depending on their individual funding arrangements.

The correlations found between profitability measures based on a *self-reported* response and the constructs of market orientation and innovativeness were all negative, indicating that as

both innovation and customer orientation (a subscale of market orientation) increase the profitability of the firm decreases. There are two possible interpretations of this analysis: (a) that the self reported results are to be ignored because of the inherent problems discovered in their potential bias or (b) that the self reported figures (ROI) include all costs to the firm whereas GP only accounts for the direct costs of production and hence does not take into account costs such as R&D and financing. We adopt interpretation (a) and will ignore the results from the self-reported figures; however, we acknowledge that these results warrant further study.

We conclude that support is therefore found for *P4* "innovation has a positive correlation with firm performance" and further support is also found for *P5* "market orientation has a positive correlation with firm performance".

Figure 1 summarises the relationships found between changes in the external environment, the constructs of innovation and market orientation, and firm performance.

7.   Implications and future research

Both the market orientation literature and the innovation literature report that higher output (as measured) of these firm strategies can lead to higher firm performance. The implication of this observation is if firms increase their level of market orientation or innovative output this will lead to a positive shift in the level of firm performance, usually measured in financial terms.

Product and process innovation and new product development have all been linked to improvement in firm performance measures such as financial performance and increased market share (Banbury and Mitchell, 1995; Caves and Ghemawat, 1992; Yamin *et al.*, 1999; Zahra and Covin, 1983). Research findings have also shown that an increased market orientation within a firm will improve the performance of the firm (Atuahene-Gima, 1996; Dawes, 2000; Narver and Slater, 1990; Deshpandé and Farley, 1999; Verhees and Meulenberg, 2004).

Previous studies that found significant relationships between market orientation and innovation exist have been studies that used an industry, or large group of companies with some linking factor between them, as the unit of analysis. We suggest that it is the role that individual employees play within the processes of innovation and market orientation that fundamentally brings this relationship about. We further suggest that for firms that exhibit a high level of market orientation, it is the reaction to market forces, by employees as decision makers that determines both the innovation direction and activity. We therefore suggest that to investigate this linkage a qualitative study is required at the firm level to investigate if employees are the linking factor between the constructs of innovation and market orientation.

This study has four major findings:

1. changes in a firm's competitive environment will have an impact on the innovativeness of that firm;
2. changes in a firm's competitive environment will have an impact on the market orientation of the firm;
3. market orientation and innovation are positively correlated; and

4. both market orientation and innovation were found to have a positive relationship with traditional measures of firm performance.

This study has made two advances to the existing literature: (a) the degree of changes in the competitive environment and the level of market orientation are linked and (b) market orientation was found to be linked with firm innovation using the firm as the unit of analysis, previous studies had used the industry as the unit of analysis. These findings suggest that firm innovation and firm market orientation are strategic reactions to changes in the market environment of the firm. Furthermore, it appears that higher levels of environmental change are associated with higher levels of both market orientation and innovation.

The findings indicated a positive correlation between changes in the marketplace and firm innovativeness, and hence the implication that firms were responding to the market place by being innovative. This finding suggests that companies within this industry sector are reactive rather than proactive to market forces. One implication is that gathering market intelligence would enable managers to better predict future actions by competitors once the implications of this intelligence are assimilated by their own firms. The second implication of the finding is that managers should consider being proactive rather than reactive to market forces.

The future direction of our research is to conduct deeper analysis into the factors that make up the subscales of our two constructs and to determine how market orientation or its associated activities interact with the innovation process. We propose to do this using key informant sampling techniques to investigate how managers of the innovation process assimilate market knowledge and actions into determining the strategic direction that the firm may have with regards to innovation activity. Our future research will continue to use the firm as the unit of analysis rather than the industry, as this will enable a deeper understanding of (a) how managers attitudes and reactions to market information shape the firm's market orientation and innovativeness; (b) if these differ between organisations; and (c) if different innovation strategies to similar market information result in different performance outcomes for the firm.
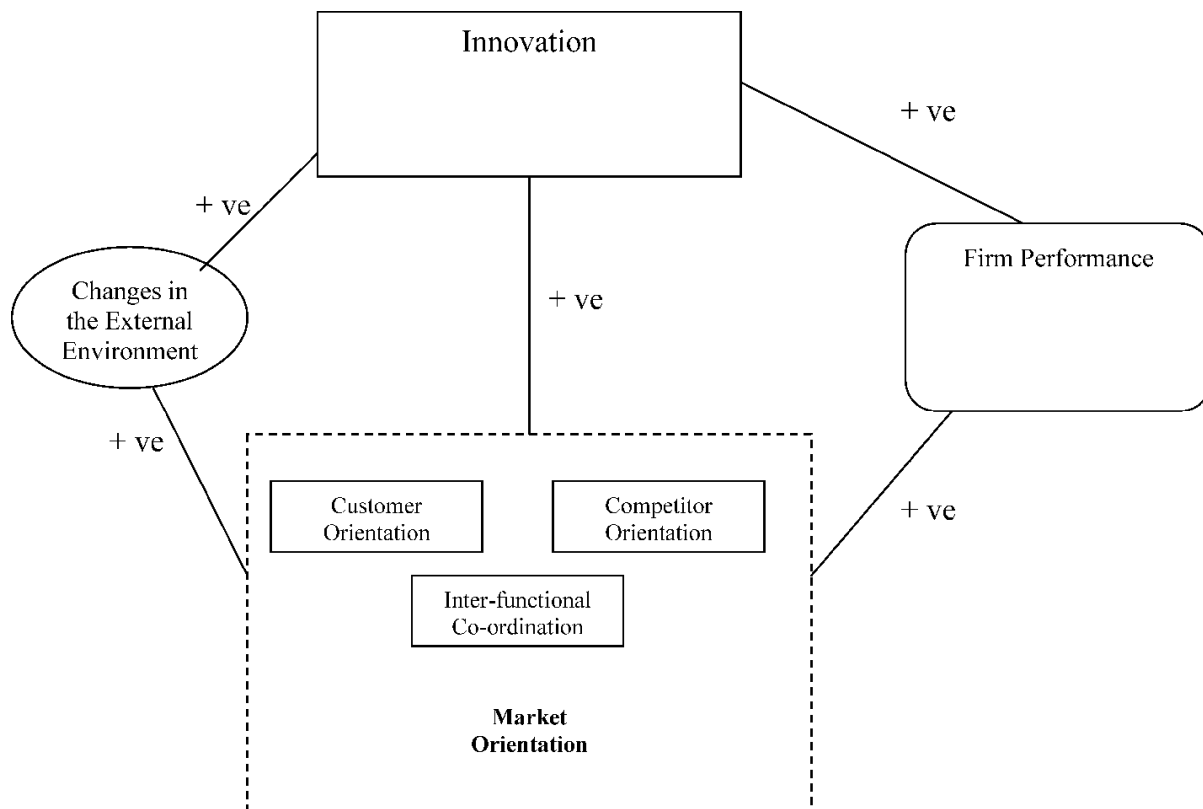
Figure 1 Correlation relationships found in the analysis of the data

Spearman's rho		Marketing practices	Technology turbulence	R&D	Competitor predictability	Competitor hostility	Competitor activities
Innovativeness	Corrd. coeff.	0.175	0.153	0.130	−0.037	0.254*	0.006
	sig (2-tailed)	0.145	0.203	0.281	0.761	0.032	0.958
	no.	71	71	71	71	71	71
Entrescale	Corrd. coeff.	0.207	0.215	0.192	0.038	0.209	−0.046
	sig(2-tailed)	0.083	0.071	0.109	0.75	0.08	0.703
	no.	71	71	71	71	71	71
Customer orientation	Corrd. coeff.	0.184	0.290*	0.198	−0.014	0.271*	0.198
	sig(2-tailed)	0.125	0.014	0.098	0.907	0.022	0.097
	no.	71	71	71	71	71	71
Inter-functional co-ordination	Corrd. coeff.	0.21	0.184	0.187	−0.122	0.080	0.090
	sig(2-tailed)	0.079	0.124	0.118	0.310	0.506	0.453
	no.	71	71	71	71	71	71
Market orientation	Corrd. coeff.	0.258*	0.105	0.173	−0.069	0.047	0.112
	sig(2- tailed)	0.031	0.385	0.153	0.572	0.699	0.356
	no.	71	71	70	70	70	70

Notes: *Correlation is significant at the 0.05 level (2-tailed); **correlation is significant at the 0.01 level (2-tailed)

Table I Correlations between changes in the competitive environment factors and scales measured

		Innovativeness	Pro-activeness	ENTRESCALE
Customer orientation	Correl. coeff.	0.199*	0.300**	0.242*
	Significance no.	0.046	0.005	0.020
		73	73	73
Competitor orientation	Correl. coeff.	0.347**	0.216*	0.284**
	Significance no.	0.001	0.034	0.008
		72	72	72
Market orientation	Correl. coeff.	0.281**	0.226*	0.255*
	Significance no.	0.008	0.028	0.029
		72	72	72

Notes: *Correlation is significant at the 0.05 level (2-tailed); **correlation is significant at the 0.01 level (2-tailed)

Table IICorrelations between the scales

Performance measure	Scale	Pearson statistic	df	Asymp. sig (2-sided)
Return on investment (ROI)	Innovativeness	52.037	18	0.000
ROI	Pro-activeness	45.515	18	0.000
ROI	ENTRESCALE	39.373	18	0.003
ROI	Customer orientation	40.512	18	0.002
New product success rate	Market orientation	25.641	12	0.012

Table IIIChi-square test of relatedness between scales and firm performance measures (summary results)

		Return on investment	New product success rate	Gross profit margin	Inventory turnover
Innovativeness	Correl. coeff.	−0.325		0.329	−0.290
	Significance no.	0.003		0.009	0.025
		73		73	73
Proactiveness	Correl. coeff.		0.228		
	Significance no.		0.032		
			73		
ENTRESCALE	Correl. coeff.		0.206	0.263	
	Significance no.		0.047	0.031	
			73	73	
Customer orientation	Correl. coeff.	−0.211			
	Significance no.	0.04			
		73			
Competitor orientation	Correl. coeff.			0.388	
	Significance no.			0.003	
				73	
Market orientation	Correl. coeff.			0.255	
	Significance no.			0.037	
				73	

Table IV Significant correlations found between constructs and measures of firm performance

	Group 1			Group 2		Group 3	
Financial measure	GP	GP	GP	Inventory turnover	Asset turnover	ROI	ROI
Self reported?	No	No	No	No	No	Yes	
Construct	Innovation	Market orientation	Competitor orientation	Innovation	Market orientation	Innovation	Market orientation
Correlation	Positive	Positive	Positive	Negative	Negative	Negative	Negative
Measure of	Profitability	Profitability	Profitability	Efficiency	Efficiency	Profitability	Profitability

Table V Summary of correlations between performance measures and constructs

References

Armstrong, S., Overton, T.S. (1977), "Estimating non-response bias in mail surveys", *Journal of Marketing Research*, Vol. 14 No.August, pp.396-402.

Atuahene-Gima, K. (1996), "Market orientation and innovation", *Journal of Business Research*, Vol. 35 pp.93-103.

Australian Bureau of Statistics (2002), "Summary of industry performance, 2000-01 8140.0.55.002", Australian Bureau of Statistics, Canberra, .

Banbury, C., Mitchell, W. (1995), "The effect of introducing important incremental innovations on market share and business survival", *Strategic Management Journal*, Vol. 16 pp.161-82.

Beardon, W.O., Netemeyer, R.G. (1999), *The Handbook of Marketing Scales*, Sage, Thousand Oaks, CA, Vol. 2.

Boer, H., During, W. (2001), "Innovation, what innovation? A comparison between product, process and organisational innovation", *International Journal of Technology Management*, Vol. 22 No.1, pp.83-107.

Caves, R., Ghemawat, P. (1992), "Idenifying mobility barriers", *Strategic Management Journal*, Vol. 13 pp.1-12.

Christensen, C.M. (1999), *Innovation and the General Manager*, McGraw-Hill, Boston, MA, Covin, J., Slevin, D. (1989), "Strategic management of small firms in hostile and benign environments", *Strategic Management Journal*, Vol. 10 No.January, pp.78-87.

Damanpour, F. (1991), "Organisational innovation: a meta-analysis of effects of determinants and moderators", *Academy of Management Journal*, Vol. 34 No.3, pp.555-90.

Damanpour, F., Fariborz, W.M. (1984), "Organisational innovation and performance: the problem of organisational lag", *Administrative Science Quarterly*, Vol. 29 No.3, pp.392-411.

Dawes, J. (2000), "Market orientation and company profitability: further evidence incorporating longitudinal data", *Australian Journal of Management*, Vol. 25 No.2, pp.173-99.

Deshpandé, R., Farley, J.U. (1999), "Executive insights: corporate culture and market orientation: comparing Indian and Japanese firms", *Journal of International Marketing*, Vol. 7 No.4, pp.111-27.

Dobni, C.B., Luffman, G. (2000), "Market orientation and market strategy profiling: an empirical test of environment-behavior-action coalignment and its performance implications", *Management Design*, Vol. 38 No.8, pp.503-22.

Erdil, S., Erdil, O., Keskin, H. (2004), "The relationships between market orientation, firm innovativeness and innovation performance", *Journal of Global Business and Technology*, Vol. 1 No.1, pp.1-11.

Hair, J.F., Anderson, R.E., Tatham, R.L., Black, W.C. (1998), *Multivariate Data Analysis*, Prentice-Hall, Englewood Cliffs, .

Han, J.K., Kim, N., Srivastava, R.K. (1998), "Market orientation and organizational performance: is innovation a missing link?", *Journal of Marketing*, Vol. 62 pp.30-45.

Khandwalla, P. (1977), *The Design of Organisations*, Harcourt Brace, New York, .

Knight, G.A. (1997), "Cross-cultural reliability and validity of a scale to measure firm entrepreneurial orientation", *Journal of Business Venturing*, Vol. 12 pp.213-25.

Kohli, A.K., Jaworski, B.J. (1990), "Market orientation: the construct, research propositions, and managerial implications", *Journal of Marketing*, Vol. 54 No.2, pp.1-18.

Kohli, A.K., Jaworski, B.J., Kumar, A. (1993), "MARKOR: a measure of market orientation", *Journal of Market Research*, Vol. 30 No.4, pp.467-77.

Low, D.R., Chapman, R.L., Sloan, T.R. (2005), "Market orientation and innovation performance within Australian SMEs", paper presented at 6th International CINet Conference, .

Miles, R.E., Snow, C.C. (1978), *Organizational Strategy, Structure, and Process*, McGraw-Hill, New York, .

Narver, J.C., Slater, S.F. (1990), "The effects of a market orientation on business profitability", *Journal of Marketing*, Vol. 54 No.4, pp.20-35.

Pelham, A.M. (2000), "Market orientation and other potential influences on performance in small and medium-sized manufacturing firms", *Journal of Small Business Management*, Vol. 38 No.1, pp.48-67.

El Sawy, O., Eriksson, I., Raven, A., Carlsson, S. (2001), "Understanding shared knowledge creation spaces around business processes: precursors to process innovation implementation", *International Journal of Technology Management*, Vol. 22 No.1, pp.149-73.

Schaper, M., Colery, T. (2003), *Entrepreneurship and Small Business: A Pacific Rim Perspective*, John Wiley, Brisbane, .

Shapiro, B.P. (1988), "What the hell is market orientated?", *Harvard Business Review*, Vol. 66 pp.119-25.

Slater, S.F., Narver, J.C. (1994), "Market orientation, customer value and superior performance", *Business Horizons*, Vol. 37 No.November-December, pp.1-8.

Tauber, E.M. (1974), "How market-research discourages major innovation", *Business Horizons*, Vol. 17 No.3, pp.22.

Teece, D.J. (2002), *Managing Intellectual Capital*, Oxford University Press, Oxford, .

Veal, A.J. (2005), *Business Research Methods: A Managerial Approach*, Pearson Addison-Wesley, South Melbourne, .

Verhees, J.H.M., Meulenberg, M.T.G. (2004), "Market orientation, innovativeness, product innovation and performance in small firms", *Journal of Small Business Management*, Vol. 42 No.2, pp.134-55.

Whitehall, G., Lukas, B., Doyle, P. (2003), *Marketing Management: A Strategic Value-Based Approach*, Wiley, Brisbane, .

Yamin, S., Gunasekaran, A., Mavondo, F. (1999), "Innovation index and its implications on organisational performance: a study of Australian manufacturing companies", *International Journal of Technology Management*, Vol. 17 No.2, pp.495-503.

Zahra, S.A., Covin, J. (1993), "Business strategy, technology policy and firm performance", *Strategic Management Journal*, Vol. 14 No.6, pp.451-78.

Zaltman, G., Duncan, R., Holbek, J. (1973), *Innovations and Organizations*, Wiley, New York, .

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