

Product Innovation in Small Firms: An Empirical Assessment

John C. Palmer
Quincy University

Robert E. Wright
University of Illinois at Springfield

While a large number of studies have examined predictors of innovation in large firms, relatively few studies have examined predictors of innovation in smaller firms. This is true despite the fact that innovation processes in smaller firms tend to be much less structured and are more constrained by resource scarcity. This study examines predictors of product innovation in a group of small firms. Findings indicate that, while, proactive entrepreneurial strategies and more organic organizational structures were positive predictors of product innovation, availability of resources and perceptions of environmental hostility were not significant predictors of innovation.

INTRODUCTION

Innovation is an important source of competitive advantage for small firms (see, for example, Figenbaum & Karnani, 1991; Merdith, 1987). Through innovation, small firms may become more responsive to customer needs (Kanter, 2008), gain first mover advantages in industries (Kallenberg, 1986), or create new markets for goods or services (Berthon et. al., 2008). Thus, innovation may be crucial to the success and viability of many small businesses (see, for example, Wolff and Pett, 2006).

Relatively few studies have examined factors associated with innovation in smaller firms. But as Peterson (1988) noted, processes leading to innovation in smaller firms may vary significantly from those leading to innovation in larger firms. For example, he noted that innovation in larger firms tends to be a very structured process in which adaptations to products or processes are based on formal mechanisms such as research and development initiatives and/or on extensive market analyses. In contrast, innovation in smaller firms tends to be much less formalized and based more on the inspiration and preferences of owners and managers. Moreover, significant resource constraints may severely limit the extent to which smaller firms may engage in innovation regardless of competitive opportunities and/or threats that may exist (p. 27). Thus, findings from past studies examining innovation in large firms may not accurately portray innovative processes in smaller firms.

PURPOSE

The purpose of this study is to identify factors associated with product innovation in small firms. Specifically, this research examines the potential influences of resource availability (i.e., munificence),

competitive environments, organizational structure, and organizational strategy on the frequency with which small firms engage in innovative behavior. Below, each of these variables is discussed.

Environmental Hostility

Generally, researchers have reported positive relationships between environmental hostility and innovation in larger firms (for example, see Flaherty, 1983 and Miller and Freisen, 1982). Similarly, Covin and Slevin (1989) found that small businesses operating in hostile competitive environments, characterized by intense rivalry among firms and weak or diminishing competitive opportunities, tended to adopt innovations with greater frequency than firms operating in more benign competitive settings. Innovations leading to the creation of a differential product or service advantage were crucial to the successes of these firms.

However, a more recent study by Wolff and Pett (2006) reported non-significant relationships between levels of environmental hostility and both product and process improvements in small firms. The authors indicated that perhaps the hostile competitive conditions prompted firms to act in a more defensive way by conserving organizational resources rather than adopting a proactive, more innovative orientation.

Munificence (Resource Availability)

Munificence refers to the availability of scarce resources in a firm's environment (March & Simon, 1958). Because innovations often require substantial expenditures of time and money, munificence may impact innovation by firms. Moche and Morse (1977) found a positive relationship between revenues and innovation in hospitals. Meyer and Goer (1988) also found that public hospitals located in affluent areas were more frequent innovators than those located in less affluent areas. In public health organizations, Aiken and Hage (1971) found rates of innovation to be related to increases in budgets. Westwood and Sekine (1988) also found that innovation was positively related to capital availability.

Organizational Structure

Previous research has shown that the structure of firms is related to innovation (for example, see Daft, 1978 and Kimberly & Evanisko, 1981). Structural elements that may impact innovation include centralization and formalization. Centralization relates to the locus of decision making authority in an organization (Pugh, Hickson, and Hinings, 1969), and refers to the extent to which participants in an organization are involved in decision making processes (Hage & Aiken, 1967). Formalization is the extent to which activities of an organization are closely controlled by specified rules and procedures (Pugh et al., 1969).

Kanter (2008) noted that flexibility and empowerment in organizations are key to promoting change in organizations and that bureaucratic rules and procedures may hinder such efforts. A study by Olson, Slater, and Hult (2005) also reported that flexible organizational structures characterized by low levels of formalization and centralization best promoted innovation within firms. Likewise, in a study of the nuclear power industry, Marcus (1988) also reported that high levels of formalization resulted in using rules and procedures, even when not appropriate, which in turn, hindered the ability of firms to respond to external market conditions. In a study of small businesses Peterson (1988) also found that a vast majority of innovations resulted from informal group processes, with few innovations resulting from more formal work rules.

Competitive Strategy

Firms must have a sustainable competitive advantage in the marketplace in order to survive and prosper. Strategy is the means by which an organization aligns with its environment in order create and maintain this competitive advantage (Saloner, Shepard & Podolny, 2001). Results of past studies have generally reported positive associations between proactive competitive strategies and innovation by firms. For example, Slater and Mohr (2006) reported that firms with proactive, market-oriented strategies were more likely to be innovative and to introduce new products that were commercial successes. Slater and Mohr (2006) also found that firms adopting proactive strategies had the highest levels of innovation and customer orientation. Likewise, Teo and Pian (2003) reported positive relationships between the adoption of proactive strategies

and organizational investments into new technology. Thus, results provide strong evidence that proactive competitive strategies are associated with higher levels of innovation by firms.

METHOD

Names and addresses of 1293 small businesses in a major metropolitan area were obtained from a business communication data base. All of these firms were non-retail and each had annual sales of less than \$500,000. Of these establishments, 721 were confirmed to be still in operation in the area. Out of the questionnaires sent to these businesses, 183 were returned, for a response rate of 25.4%.

Resource availability was measured utilizing a four item scale developed by Miller and Friesen (1986). Respondents were asked to rate how abundant capital, skilled labor, material supplies, and managerial talent were to their firms. In this study, this scale had a coefficient alpha of .68.

The nature of competitive environments was measured utilizing a three item environmental hostility scale first developed by Khandwalla (1976/77) and later adopted by Covin and Slevin (1989). Respondents were asked to report levels of agreement with statements indicating degrees to which competitive environments were risky, difficult for firms to keep afloat in, and the extent to which firms controlled their own destinies within these environments. This scale had a coefficient alpha of .74.

Strategy items on the questionnaire came from an entrepreneurial orientation scale also developed by Khandwalla (1977) and Covin and Slevin (1989). The strategy scale asked respondents to report items such as the extent to which their firms were willing to accept market risk, the degree to which firms had adopted an "undo the competitor" orientation, and the degree to which firms assumed a proactive strategic posture. The scale consisting of strategic orientation items had a coefficient alpha of .70.

The structure scale was adopted from items developed by Hage and Aiken (1967) and asked respondents questions related to the extent to which employees are involved in decision-making processes and the degree to which formal rules and procedures guide organizational processes and initiatives. The scale had an alpha coefficient of .83.

For the dependent variable (i.e., product innovation), the questionnaire also contained three items from the Khandwalla (1977) and Covin and Slevin (1989) entrepreneurial orientation scale that related directly to innovation in firms. Questions included asking respondents the degree to which R&D, technological leadership, and innovation are stressed in their firms, the number of new product lines introduced within the past five years, and whether changes in product lines were generally of a major or minor nature.

RESULTS

Results of OLS regression analysis are reported in Table 1. Surprisingly, neither factors related to the perceived hostility evident in a firm's competitive environment, nor a firm's access to critical resources had a statistically significant influence on rates of innovation by firms in the sample. This result is particularly surprising given the fact that firms in the sample were relatively small and thus (presumably) most had significant financial constraints that would have been expected to impact rates of innovation in some manner. Moreover, the degree to which firms assumed either a proactive or reactive strategic orientation was also unrelated to both environmental hostility and munificence. This latter result calls into question the degree to which small business owners and managers in the sample reacted directly to competitive conditions within the external environment or significantly adjusted competitive strategies based on internal resource considerations.

Structure was a marginally significant predictor of innovation ($p < .10$), with less centralized and less formalized firms innovating with somewhat greater frequency than firms with more rigid structures. This finding provides some support for past studies that have frequently reported positive relationships between less rigid organizational structures and innovation by firms. These types of structures seem to promote flexibility and the sharing of ideas conducive to the promotion of innovative processes.

As expected, firms that adopted more proactive competitive postures innovated with greater frequency than firms with more reactive strategies. This result provides additional support for a number of previous studies that reported similar strategy/innovation relationships in firms.

TABLE 1
SUMMARY OF SIMULTANEOUS REGRESSION EQUATION PREDICTING INNOVATION
(N=169)

Variables	<u>B</u>	SE <u>B</u>	<i>B</i>
Environmental Munificence	0.066	0.078	0.059
Environmental Hostility	0.003	0.078	0.003
Structure	0.077	0.039	0.148*
Strategy	0.334	0.057	0.425**
R ² (Total)		.25	
R ² (Adjusted)		.24	
F		13.95****	

* p < .10	** p < .05	*** p < .01	**** p < .001

MANAGERIAL IMPLICATIONS

Contrary to findings of many past studies, results of this study suggest that innovation in small firms had little to do with external competitive conditions or resource availability. Thus, it is possible that small business owners and managers developed an initial strategy, structure, and preference for innovation for their business based on their intuition and/or preferences and then maintained this orientation despite changes in the marketplace or changes in resource levels. This view seems consistent with that of Hirsch, Peters, and Shepherd (2008) who indicated that many entrepreneurs are inherent risk-takers who frequently engage in behavior based primarily on who they perceive themselves to be and what they know (i.e., effectuation) rather than starting with a desired outcome and then establishing the means to achieve that outcome based on a more systematic step by step process.

Small business owners and managers might be better advised to examine the external competitive conditions and resource availability prior to developing their strategic focus. They might then be better able to align their strategies with the external environment and the resources available. If managers and owners are such inherent risk takers that they feel a need to focus on innovation, they should attempt to do so in a market where conditions are most likely to result in the success of such a strategy.

FUTURE RESEARCH

Future studies may wish to focus on the potential moderating influences of individual characteristics of owners and managers on relationships examined in this study. For example, it is possible that variables such as educational levels and experience may significantly influence the extent to which variables examined in this study impact innovation. Moreover, past successes and/or failures of owners and managers may also have an impact on the degree to which variables such as environmental hostility and resource availability impact the frequency with which firms innovate.

Finally, relationships examined in this study may be impacted by the degree to which various innovations are viewed as risky. For example, less costly, incremental innovations may have been adopted by many small firms without much in the way of a formal environmental assessment being conducted. But, in contrast, these same firms may have undertaken more thorough assessments of competitive environments and internal resource constraints when the adoption of more risky innovations was considered.

REFERENCES

- Aiken, M. and Hage, J. (1971). "The organic organization and innovation." Sociology, 5: 63-82.
- Berthon, P., Ewing, M., & Napoli, J. (2008). Brand management in small to medium-sized enterprises. Journal of Small Business Management, 46, 27-45.
- Covin, J. & Slevin, D. (1989). Strategic management of small firms in hostile and benign environments. Strategic Management Journal, 10, 75-87.
- Daft, R. (1978). A dual-core model of organizational innovation.. Academy of Management Journal, 21: 193-210.
- Figenbaum, A. and Karnani, A. (1991). "Output flexibility - A competitive advantage for small firms." Strategic Management Journal, 12: 101-114.
- Flaherty, M. (1983). Market share, technology leadership, and competition in industrial semiconductor markets. In Technological Innovation, Management, and Policy. R. Rosenbloom (ed.), London: JAI Press.
- Hage, J. and Aiken, M. (1967). Program change and organizational properties- A comparative analysis. American Journal of Sociology, 72: 503-519.
- Hirsch, R., Peters, M., and Shepherd, D. (2008). Entrepreneurship, 7th ed. McGraw-Hill.
- Kalleberg, A. (1986). "Entrepreneurship in the 1980s: A study of small businesses in Indiana." In Advances in the Study of Entrepreneurship, Innovation, and Economic Growth. G. Libecap (ed.), London: JAI Press.
- Kanter, R. (2008). Transforming giants: What kind of company makes it its business to make the world a better place? Harvard Business Review, 43-52.
- Khandwalla, P. (1977). Some top management styles, their content and performance. Organization and Administrative Sciences, 7: 21-51.
- Kimberly, J. & Evanisko, M. (1981). Organizational innovation: the influence of organizational and contextual factors on hospital adoption of technological and administrative innovations. Academy of Management Journal, 24, 689-713.
- March, J. and Simon, H. (1958). Organizations. New York: J. Wiley.
- Marcus, A. (1988). Responses to externally induced innovation: Their effects on organizational performance. Strategic Management Journal, 9: 387-402.
- Meyer, A. and Goes, J. 1988. "Organizational assimilation of innovations: A multilevel contextual analysis." Academy of Management Journal, 31: 897-923.

Meredith, J. (1987). The strategic advantages of new manufacturing technologies in small firms. Strategic Management Journal, 8, 249-258.

Miller, D. & Freisen, P. (1982). Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. Strategic Management Journal, 3, 1-25.

Miller, D. & Toulouse, J. (1986). Strategy, structure, CEO personality, and performance in small firms. American Journal of Small Business, 10, 47-62.

Moche, M. and Morse, E. (1977). Size, centralization, and organizational adoption of innovations. American Sociological Review, 42: 716-725.

Olson, E., Slater, S., and Hult, G. (2005). The performance implications of fit among business strategy, marketing organization structure, and strategic behavior. Journal of Marketing, 69: 49-65.

Peterson, R. (1988). An analysis of new product ideas in small businesses. Journal of Small Business Management, 26: 25-31.

Pugh, D.; Hickson, D.; and Hinings, C. (1969). An empirical taxonomy of structures of work organizations. Administrative Science Quarterly, 14: 115-126.

Saloner, G., Shepard, A. & Podolny, J. (2001). Strategic Management. New York: John Wiley & Sons, Inc.

Slater, S. & Mohr, J. (2006). Successful development and commercialization of technological innovation: Insights based on strategy type. Journal of Product Innovation Management, 23: 26-33.

Teo, T. & Pian, Y (2003). A contingency perspective on Internet adoption and competitive advantage. European Journal of Information Systems 12, 78-92.

Westwood, A. and Sekine, Y. (1988). Fostering creativity and innovation in an industrial R&D laboratory. Research Management, 31: 16-20.

Wolff, J. and Pett, T. (2006). Small-firm performance: Modeling the role of product and process improvements. Journal of Small Business Management, 44: 268-284.