

# **THE RELATIONSHIP BETWEEN ENVIRONMENTAL DYNAMISM AND SMALL FIRM STRUCTURE, STRATEGY, AND PERFORMANCE**

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This study describes the organization structures, strategic postures, business practices, and performance levels of small firms in stable and dynamic environments. Results suggest that environmental dynamism impacts the strategies chosen by small firms and moderates the relationships between organization structure, strategic posture, and firm performance.

Environmental dynamism is a widely-explored construct in the organization theory and strategic management literatures. This construct is manifest in the degree of instability or turbulence of such key operating concerns as market and industry conditions as well as more general technological, economic, social, and political forces (Emery and Trist, 1965; Dess and Beard, 1984; Sharfman and Dean, 1991). Dynamism has been empirically linked to such macro-organizational phenomena

as structural form (Burns and Stalker, 1961; Lawrence and Lorsch, 1967), strategic diversification (Keats and Hitt, 1988), the strategy-making process and strategy content (Miles and Snow, 1978; Miller, Droge and Toulouse, 1988), organizational "postures" toward innovation (Zahra and Pearce, 1994), and corporate goal structures (Bourgeois, 1985). These studies and others indicate that the environmental dynamism construct has great potential as an

explanatory variable in models and theories of organizational-level phenomena.

Most empirical studies of environmental dynamism have been based on samples of medium-to-large firms. Relatively little is known about how small firms respond to environmental dynamism, both structurally and strategically. Moreover, the few studies that have directly examined environmental dynamism's impact on small firm processes and outcomes (e.g., Box, White, and Starr, 1993; Zahra and Pearce, 1994; Wiklund, 1999) have had diverse foci, resulting in a set of very tentative, noncumulative, and scattered conclusions regarding dynamism's effects on small firms. Given that small firm management is often fundamentally different from large firm management (Cohn and Lindberg, 1972), many empirical findings based on samples of medium-to-large firms may not be pertinent in the small firm context. This fact indicates a need for environmental dynamism research studies using small firms to provide additional insights regarding the impact of dynamism on management structures and practices.

The research described in this paper broadly examines the issue of how small firms behave under different levels of environmental dynamism. Conceptually, this research was designed with two objectives in mind. The first was to investigate, using small firms, the relationship between environmental dynamism and organizational structure, strategic posture, and firm performance. The second was to go beyond extant research by identifying some specific modes of competition employed by small firms in stable and dynamic environments. Both of these objectives are strategic in nature and therefore responsive to several calls (e.g., Ireland and Van Auken's, 1987; Merz and Sauber, 1995) for more small firm research on strategic issues. Three research questions provided the specific focal points for this study:

- (1) Do small firms in stable and dynamic environments have different organizational structures and strategic postures, and do they employ different business practices?
- (2) Does environmental dynamism moderate the strength of the relationships between financial performance and both organization structure and strategic posture?
- (3) What individual business practices and overall patterns of business practices are characteristic of small firms in stable and dynamic environments?

This paper is organized in four sections. The following section presents the theoretical framework and specific hypotheses tested in the study. The sample characteristics, measures, and analytical techniques are described in the methods section. The results and conclusion sections present the key findings

and discuss the implications and limitations of the study, respectively.

## HYPOTHESES

### Organization Structure and Environmental Dynamism

Organization structure can take many forms ranging from highly mechanistic to highly organic. Mechanistic structures are typically highly formalized, non-participative, hierarchical, tightly controlled, and inflexible. Organic structure, on the other hand, are characterized by informality, decentralization of authority, open channels of communication, and flexibility (Khandwalla, 1977; Randolph, Sapienza, and Watson, 1991). A generally-accepted premise of organization theory is that environmental dynamism drives the structures of organizations (high-performing organizations, in particular) toward greater organicity (see, for example, Mintzberg, 1979). Firms in stable environments can often accurately predict such factors as raw material supplies, customer demand, and the amount of time required for particular operations. In such contexts, mechanistic structures which stress standardization and formalized control are especially common and often associated with superior performance (Burns and Stalker, 1961; Lawrence and Lorsch, 1967). The unpredictability of dynamic environments, on the other hand, can negate any benefit that would be derived through the adoption of mechanistic structures. In these latter contexts, firms must have the ability to rapidly respond to changing conditions. Accordingly, organic structures have been found to be particularly prevalent and effective in dynamic environments (Miller and Friesen, 1984).

Despite considerable evidence which suggests that dynamism and organicity are related among larger firms, it is possible that, among small firms, size might be a stronger determinant of organicity than environmental dynamism. The high level of informality and flexibility which typifies small firms may be nearly as pervasive in stable as in dynamic environments. In short, it is not at all clear that the previously described relationship between organicity and dynamism actually occurs in small firms. Accordingly, the following two hypotheses are offered:

- H1: The organization structures of small firms in dynamic environments are more organic than those of small firms in stable environments.
- H2: The correlation between a firm's organization structure score (i.e., its organicity level) and its performance is significantly more positive for small firms in dynamic environments than for small firms in stable environments.

## Strategic Posture and Environmental Dynamism

As conceptualized in this paper, the strategic posture of a firm is demonstrated by the extent to which top managers are inclined to take business-related risks, to favor change and innovation in order to obtain a competitive advantage for their firm, and to aggressively compete with other firms. As such, strategic posture can be viewed as a firm's placement along a continuum ranging from conservative to entrepreneurial (Karagozoglu and Brown, 1988). Firms with conservative strategic postures are risk adverse, non-innovative, and reactive. Firms with entrepreneurial strategic postures are risk taking, innovative, and proactive. These three components of strategic posture were argued by Miller (1983) to comprise a basic, unidimensional strategic orientation:

In general, theorists would not call a firm entrepreneurial if it changed its technology or product-line ("innovated" according to our terminology) simply by directly imitating competitors while refusing to take any risks. Some proactiveness would be essential as well. By the same token, risk-taking firms that are highly leveraged financially are not necessarily entrepreneurial. They must also engage in product-market or technological innovation. (p. 780).

Notably, this characterization of strategic posture along the conservative-to-entrepreneurial dimension has been well accepted in the strategic management and small firm management literatures (e.g., Schafer, 1990; Miles and Arnold, 1991; Zahra and Covin, 1995; Knight, 1997).

A growing body of evidence suggests that strategic posture varies with environmental dynamism. For example, in a study of 103 Canadian firms, Khandwalla (1977) found that environmental dynamism was highly correlated ( $r = -0.50$ ) with firms' propensity towards entrepreneurial behavior. Similarly, in a study of 52 U.S.-based firms, Miller (1983) found a correlation of  $r = -0.35$  between environmental dynamism and organizational-level entrepreneurial behavior. And Naman and Slevin's (1993) study of 87 manufacturing firms revealed that entrepreneurial "styles" (where style is operationalized as an organizational-level construct) are common in environments characterized by high levels of turbulence. The theoretical rationale for these findings was identical: organizations typically respond to challenging environmental conditions, such as those present in dynamic environments, by taking risks, innovating, and exhibiting proactive behaviors. These responses, as previously noted, indicate an entrepreneurial strategic posture. It is hypothesized that:

H3: The strategic postures of small firms in dynamic environments are more entrepreneurial than those of small firms in stable environments.

A related and perhaps more interesting issue is how dynamism affects the relationship between strategic posture and firm performance. In a separate analyses of 40 Canadian firms and 88 U.S. firms, Miller and Friesen (1983) corroborated the findings that increases in environmental dynamism promotes product innovation, risk taking, and proactivity (i.e., the adoption of entrepreneurial strategic postures) among high-performing firms, but not low-performing firms. Likewise, research by Zahra and Pearce (1994) revealed that entrepreneurial strategic postures have a higher performance payoff in dynamic than in more stable environments. These findings suggest that environmental dynamism moderates the strength of the relationship between strategic posture and firm performance. As such, it is hypothesized:

H4: The correlation between a firm's strategic posture score (i.e., its entrepreneurship level) and its performance is significantly more positive for small firms in dynamic environments than for small firms in stable environments.

## Strategic Patterns and Environmental Dynamism

Business strategy is the means by which a firm competes and attempts to achieve its goal within an industry. Strategy involves choices along a number of dimensions and is represented by a firm's overall collection of individual business-related decisions regarding such issues as product price, quality, and advertising. Consistent with this view of strategy, Galbraith and Schendel (1983) point out that the elements of strategy - the individual business-related decisions - are interdependent and interactive, therefore strategy can be accurately conceptualized and assessed as a "pattern" of strategic variables. Mintzberg (1990), Hambrick (1983), Dess and Davis (1984), and many others make the same point.

An objective of this research was to identify some strategic patterns and corresponding environmental settings (defined in terms of the stable-dynamic dimension) among a broadly defined cross-section of small firms. The identification of such patterns would provide a more complete picture of possible small firm strategic orientations under varying levels of environmental dynamism. Because of the limited amount of research in this area, it is difficult to hypothesize about specific small firm strategic patterns. However, past research which examined the link between business strategy and environmental dynamism provides broad support for the following proposition:

P1: Small firms in stable and dynamic environments have dissimilar strategic patterns.

## METHODS

### The Sample

The senior-most executives in 1225 non-diversified, independently-owned firms were asked to complete a detailed research questionnaire designed to investigate numerous strategic issues. All of these firms were clients, members, or affiliates of three organizations which share the purpose of promoting entrepreneurship and economic development in the northeastern region of the United States. Those firms which did not respond to the initial request for information were contacted a second time. Usable responses were eventually obtained by 344 (28.1 % response rate) firms.

A comparison of the early- and late-responding firms showed that these groups do not differ on any variable examined in this study. If it is assumed that those firms that responded to the second request for information would not have responded had the request not been sent, then the similarities between the early and late responders can be interpreted as suggesting the absence of response bias.

Three criteria were used to select the sub-sample of firms examined in this study. First, the firm had to be involved primarily in manufacturing activities. This insured some degree of similarity in type of business operations. Second, the firm had to be small. Firms with more than 500 employees were omitted from this study. This figure is consistent with the operational definitions of small firms adopted by other researchers (Miller, 1980; Malekzedah and Nahavandi, 1985) as well as the Small Business Administration's definition of a small manufacturing firm. Third, the firm had to be unambiguously classifiable as operating in either a stable or dynamic environment.

### Environmental Classification

The environmental contexts of the responding firms were classified as either stable or dynamic using Miller and Friesen's (1982) 5-item, 7-point environmental dynamism scale (see Appendix). Firms were classified as existing in stable environments if their dynamism scores were less than 3.5. Firms were classified as existing in dynamic environments if their dynamism scores were greater than 4.5. Firms with dynamism scores of 3.5 to 4.5 on the 7-point scale could not be unambiguously classified and were not included in this research.

Based on the preceding criteria, 134 of the sampled firms were chosen for this study. Ninety-six of these firms operate in stable environments; 38 operate in dynamic environments. Approximately 25 different industries are represented in this subsample. The manufacturers produce a wide range of products including gun barrels, lamps, coil springs, printed

circuit boards, factory automation equipment, windows, and hearing aids, just to name a few. The average number of employees, annual sales revenue, and age of these 134 firms are 66.21 (SD =84.87), \$6.76 million (SD = 9.70 million), and 28.05 years (SD = 26.42 years), respectively.

### The Measures

**Structure.** The firms' structural forms were assessed with a 7-item scale that measures organicity - that is, the extent to which firms are structured in organic versus mechanistic manners (Burns and Stalker, 1961) (see Appendix). This scale was developed by Khandwalla (1977). The respondents were asked to indicate on 7-point Likert-type scales the extent to which each item of the measure characterizes the structure of their firms. Each firm's mean rating on these 7 items was used as that firm's organicity index. The higher the index, the more organic the firm's structure.

**Strategic Posture.** A 9-item, 7-point scale was used to measure strategic posture (see Appendix). This scale contains items that assess a firm's tendency toward product innovation, proactivity vis-à-vis competitors, and risk taking. This scale, derived from measures proposed by Khandwalla (1997) and Miller and Friesen (1982), has been employed in a number of studies by various researchers (e.g., Miles and Arnold, 1991; Dean, 1993) and has been found to be reliable and valid across diverse research contexts (Knight, 1997). The mean rating on the scale items was used as the firm's strategic posture score. The higher the score, the more entrepreneurial the firm's strategic posture.

**Strategic Pattern Variables.** A list of strategic variables relating to a firm's business strategy was generated following a review of pertinent strategic and small business management literature. This list was then modified by a panel of managers and academicians with expertise in the area of small business management. The strategic variable instrument used in this research consisted of 25 statements. These statements formed the basis for the 16 single and multi-item scales shown in the Appendix.

**Performance.** Financial performance was measured with a modified version of an instrument developed by Gupta and Govindarajan (1984). The respondents were first asked to indicate on a 5-point Likert-type scale, ranging from "of little importance" to "extremely important," the degree of importance their firm attaches to each of the following financial performance criteria: sales level, sales growth rate, cash flow, return on shareholder equity, gross profit margin, net profit from operations, profit to sales ratio, return on investment, and ability to fund business growth from profits. The respondents were then asked to indicate on another 5-point Likert-type scale, ranging from "highly dissatisfied" to

"highly satisfied," the extent to which their firm's top managers are currently satisfied with their firm's performance on each of these same financial performance criteria. These "satisfaction" scores were multiplied by the "importance" scores in order to compute a weighted average performance index for each firm. This approach to measuring performance was employed by Zahra (1993) in his study of the financial effects of new product introductions.

A subjective measure of performance was chosen over objective data for several reasons. First, small firms are often very reluctant to provide "hard" financial data (Fiorito and LaForge, 1986). It was, therefore, felt that more complete financial information could be obtained with a subjective measure. Second, objective financial data on the sampled firms were not publicly available, making it impossible to check the accuracy of any reported financial performance figures. Third, assuming that accurate financial data were reported, such data on small firms are difficult to interpret (Cooper, 1979). Finally, absolute scores on financial performance criteria are affected by industry-related factors (Sapienza, Smith, and Cannon, 1988). Given the diverse industry settings represented in this sample, directly comparing objective financial data could be misleading.

#### The Analytical Techniques

The hypotheses were tested using a variety of statistical techniques. Hypotheses 1 and 3 were tested using discriminant analyses which compared the mean structure (i.e., organicity) and strategic posture scores across the environmental settings. Discriminant analyses were also used to compare the firms in stable and dynamic environments in terms of the 16 individual strategic pattern variables. The testing of hypotheses 2 and 4 required the computation of correlation coefficients between firm performance and both organicity and strategic posture. A modified version of the Fisher Z transformation statistic, advocated by Schmidt, Hunter, and Pearlman (1981), was then used to determine if these coefficients significantly differ between firms in stable and dynamic environments.

Ward's method of hierarchical cluster analysis was used to test the research proposition, P1. This technique clusters cases having similar patterns across a set of clustering variables (Everitt, 1974), and it is increasingly being employed in studies of managerial activities in small firms (e.g., Hanks, Watson, Jansen, and Chandler, 1993; Merz and Sauber, 1995). The clustering variables used in this study were the 16 strategic pattern variables. In order to allow for the possible identification of strategic patterns which may be common to both stable and dynamic environments, the cluster analysis was performed using the entire sample of 134 firms rather than separately within each subgroup. Finally, one way ANOVAs were used to identify overall, intercluster

differences in terms of the individual strategic pattern variables, organization structure, strategic posture, and firm performance.

## RESULTS

The means, standard deviations, and alpha coefficients (where appropriate) of the research variables are shown in Table 1. Each multi-item scale has an alpha coefficient exceeding the minimum standard suggested by Nunnally (1967).

TABLE 1  
SUMMARY STATISTICS FOR THE RESEARCH VARIABLES

Variable	Mean	S. D.	Alpha
Structure	5.17	1.10	0.81
Strategic Posture	4.34	1.25	0.87
Strategic Pattern Variables			
-Long-Term Financial Orientation	3.94	0.93	-
-External Financing	2.77	1.19	0.63
-Customer Credit	2.87	1.12	-
-Service/Support	4.22	0.86	-
-Warranties	3.37	1.04	-
Advertising	2.81	0.97	0.81
-Innovative Marketing	3.07	1.06	-
-High Price	2.81	1.15	-
-Wide Product Range	3.37	1.20	-
-Product Quality	4.29	0.67	0.73
-Patents/Copyrights	2.71	1.30	-
-New Product Developments	3.63	1.00	-
-Innovative Operations	3.87	0.94	-
-Operating Efficiency	4.08	0.73	0.72
-External Independence	4.07	0.77	0.58
-Industry Awareness	3.56	0.77	0.74
Performance	11.52	4.06	0.88

The mean number of employees, sales revenue, and age of the firms in stable and dynamic environments are shown in Table 2. There is no significant difference in the number of employees or sales revenue of firms in stable and dynamic environments. Firm age, however, differs significantly ( $p < .01$ ) for these subgroups. This difference could potentially impact the relationships under investigation. Accordingly, firm age effects were controlled in subsequent analyses. In order to be conservative, the possibility of a size effect was also considered in the analysis. This was accomplished using stepwise discriminant analyses. Specifically, firm age and size (i.e., number of employees and sales revenue) were entered into discriminant functions before the key research variables. This has the effect of "partialling out" the influence of age and size from the ability of the focal variable to discriminate between small firms in the two environmental settings.

#### Discriminant and Subgroup Analysis Findings

Table 3 presents the performance, organicity, and strategic posture scores of firms in the two subgroups. Consistent with hypothesis 1, the structures of small firms in dynamic environments are significantly ( $p < .01$ ) more organic than those of small firms in stable environments. Consistent with

hypothesis 3, the strategic postures of small firms in dynamic environments are significantly ( $p < .001$ ) more entrepreneurial than those of small firms in stable environments.

**TABLE 2**  
A COMPARISON OF FIRM SIZE AND AGE IN STABLE AND DYNAMIC ENVIRONMENTS  
Means (SDs)

Variable	Stable Environments (n=96)	Dynamic Environments (n=38)	t-value
Number of Employees	62.00 (78.90)	76.84 (98.74)	0.83
Sales Revenues (millions)	6.49 (8.98)	7.43 (11.46)	0.45
Firm Age (years)	32.22 (26.06)	17.61 (24.64)	2.97**

\*\* $p < 0.01$

**TABLE 3**  
A COMPARISON OF THE RESEARCH VARIABLES ACROSS STABLE AND DYNAMIC ENVIRONMENTS  
Means (SDs)

Variables	Stable Environments (n=96)	Dynamics Environments (n=38)	F-Value when the Effects of Age and Size are Controlled
Performance	11.45 (3.85)	11.67 (4.58)	0.37
Organicity	5.01 (1.13)	5.59 (0.84)	6.48**
Strategic Posture	3.93 (1.17)	5.37 (0.76)	34.02***

\*\* $p < 0.01$

\*\*\* $p < 0.001$

The subgroup analysis results are shown in Table 4. The correlation between organicity and performance is more positive for firms in dynamic environments than for those in stable environments. Although the statistical significance of this finding is not particularly high ( $p < .10$ ), the data do support hypothesis 2. As such, the utility of an organic structure appears to vary between stable and dynamic environments. Hypothesis 4 is also supported by the data. The correlation between strategic posture and performance is more positive ( $p < .05$ ) in dynamic than in stable environments.

**TABLE 4**  
ZERO-ORDER CORRELATIONS BY ENVIRONMENT TYPE

Zero-Order Correlations:	Firms in All Firms	Firms in Stable Environments	Firms in Dynamic Environments	Modified Fisher Z Comparison to r values: Stable vs Dynamic Environments
Performance and...				
Organicity	-0.05	-0.13	-0.17	1.49@
Strategic Posture	0.01	-0.08	0.25	1.67*

@ $p < 0.1$

\* $p < 0.05$

Table 5 shows the results of the strategic pattern variable comparisons across the environmental settings. Relative to small firms in stable environments, those in dynamic environments 1) emphasize long-term profitability to a marginally greater extent, 2) rely to a greater extent on external financing, 3) offer better product warranties, 4) rely on advertising to a greater extent, 5) rely on innovative marketing practices to a greater extent, 6) offer products that are priced marginally higher, 7) are marginally more concerned about relative product quality, 8) rely to a greater extent on product patents, 9) emphasize new product development to a greater extent, 10) rely on more innovative operating techniques or technologies, and 11) are more concerned about staying in touch with market and industry trends.

**TABLE 5**  
A COMPARISON OF THE STRATEGIC PATTERN VARIABLES ACROSS STABLE AND DYNAMIC ENVIRONMENTS  
Means (SDs)

Variable	Stable Environments (n=96)	Dynamic Environments (n=38)	F-Value when the Effects of Age and Size are Controlled
Long-Term Financial Orientation	3.84 (0.89)	4.18 (0.98)	2.62 @
External Financing	2.48 (1.10)	3.49 (1.10)	18.21***
Customer Credit Service/Support	2.95 (1.08)	2.68 (1.21)	1.82
Warranties	4.16 (0.91)	4.37 (0.71)	2.39
Advertising	3.20 (1.06)	3.79 (0.88)	8.96**
Innovative Marketing	2.61 (0.97)	3.31 (0.79)	9.29**
High Price	2.93 (1.06)	3.42 (0.98)	4.98*
Wide Product Range	2.70 (1.19)	3.11 (0.99)	2.68@
Product Quality	3.30 (1.20)	3.52 (1.22)	1.43
Patents/Copyrights	4.23 (0.63)	4.45 (0.74)	2.46 @
New Product Development	2.44 (1.23)	3.37 (1.24)	8.63**
Innovative Operations	3.42 (0.98)	4.16 (0.86)	17.29***
Operating Efficiency	3.73 (0.96)	4.24 (0.79)	6.37**
External Independence	4.08 (0.66)	4.09 (0.89)	0.09
Industry Awareness	4.11 (0.75)	3.97 (0.82)	0.34
	3.42 (0.75)	3.93 (0.72)	9.42**

@ $p < 0.1$

\* $p < 0.05$

\*\* $p < 0.01$

\*\*\* $p < 0.001$

**TABLE 6**  
**AN INTER-CLUSTER COMPARISON OF THE STRATEGIC PATTERN VARIABLES**  
Cluster Means (SDs)

Variable	1 (n= 1 7)	2 (n= 1 5)	3 (n=7)	4 (n= 19)	5 (n=14)	6 (n=22)	7 (n=37)	ANOVA F-Value
L-T Financial Orientation	4.35 (0.70)	4.00 (0.53)	4.14 (0.38)	4.11 (1.05)	4.14 (0.66)	2.86 (1.13)	4.19 (0.66)	8.24***
External Financing	3.06 (0.81)	1.27 (0.53)	1.93 (1.02)	3.18 (1.03)	2.71 (1.10)	2.14 (0.93)	3.64 (0.94)	15.69***
Customer Credit	2.59 (0.80)	2.27 (1.28)	4.14 (0.69)	2.05 (0.78)	3.36 (1.15)	3.27 (0.98)	3.00 (1.08)	6.27***
Service/Support	4.53 (0.51)	4.67 (0.62)	4.57 (0.53)	3.84 (0.76)	3.43 (1.22)	3.95 (1.00)	4.49 (0.61)	5.79***
Warranties	3.18 (0.81)	3.67 (0.62)	3.57 (0.79)	2.74 (0.93)	2.00 (0.88)	3.23 (0.87)	4.22 (0.71)	16.43***
Advertising	3.26 (0.62)	2.25 (0.91)	2.93 (0.49)	2.89 (1.08)	2.14 (0.87)	2.49 (1.07)	3.22 (0.85)	4.82***
Innovative Marketing	3.47 (0.62)	2.40 (0.99)	3.29 (1.11)	3.47 (0.90)	2.43 (0.76)	2.36 (1.09)	3.59 (0.90)	7.95***
High Price	2.53 (1.07)	3.07 (1.16)	3.29 (1.25)	3.16 (1.12)	1.50 (0.65)	2.77 (1.11)	3.13 (1.03)	5.08***
Wide Product Range	4.24 (0.44)	4.33 (0.49)	1.71 (0.49)	2.05 (0.78)	3.79 (0.80)	3.00 (1.11)	3.62 (1.19)	17.23***
Product Quality	4.26 (0.56)	4.53 (0.52)	5.00 (0.00)	4.11 (0.61)	3.93 (0.47)	3.98 (0.84)	4.55 (0.54)	5.49***
Patents/ Copyrights	2.53 (0.72)	2.13 (1.19)	2.14 (1.07)	1.74 (0.56)	1.79 (0.80)	2.18 (1.05)	4.24 (0.60)	31.83***
New Product Development	4.12 (0.49)	3.87 (0.64)	4.29 (1.11)	2.89 (1.10)	3.00 (0.88)	2.95 (1.00)	4.19 (0.70)	10.72***
Innovative Operations	3.65 (0.86)	4.27 (0.88)	4.71 (0.49)	3.89 (0.81)	3.36 (0.93)	2.95 (0.84)	4.43 (0.55)	11.84***
Operating Efficiency	4.32 (0.58)	4.37 (0.58)	4.29 (0.76)	4.08 (0.63)	4.14 (0.77)	3.59 (0.85)	4.12 (0.71)	2.63*
External Independence	4.00 (0.85)	4.40 (0.66)	4.50 (0.76)	4.03 (0.74)	4.39 (0.49)	3.66 (0.96)	4.08 (0.65)	2.48*
Industry Awareness	3.51 (0.47)	3.60 (0.70)	4.00 (0.61)	3.65 (0.77)	3.24 (0.58)	2.80 (0.79)	4.03 (0.64)	8.77***

\* p < 0.05      \*\*\* p < 0.001

## Strategic Patterns

As previously mentioned, cluster analysis was used to group small firms with similar strategic patterns. Results of this analysis suggested that a seven cluster solution best fits the data. (Due to incomplete data, 3 of the 134 firms are omitted from this seven cluster solution.) In other words, there appear to be seven relatively distinct strategic patterns - strategies - among the small firms examined in this research. The cluster scores (i.e., means and standard deviations) on the strategic pattern variables are shown in Table 6. There are significant ( $p < .05$ ) intercluster differences (as determined using one way ANOVAS) on all 16 of the strategic pattern variables.

Table 7 shows the average firm performance score, organicity score, strategic posture score, number of employees, sales revenue, and firm age in each cluster. The one way ANOVAs indicate no overall differences in performance, number of employees, sales revenue, and firm age. There are, however, overall differences in organicity ( $p < .05$ ) and strategic posture ( $p < .001$ ) across the seven clusters.

A chi-square comparison of observed versus expected environmental representation within each cluster, shown in Table 8, revealed that stable and dynamic environment firms are not randomly distributed throughout the clusters. Rather, the cluster analysis tended to group firms facing similar levels of environmental dynamism. Clusters 1 and 7 are composed of a disproportionate number of dynamic environment firms.

**TABLE 7**  
AN INTER-CLUSTER COMPARISON OF THE RESEARCH VARIABLES

Variable	Cluster Means (SDs)							ANOVA F-Value
	1 (n=17)	2 (n=15)	3 (n=7)	4 (n=19)	5 (n=14)	6 (n=22)	7 (n=37)	
Performance	11.85 (5.24)	10.80 (4.23)	11.56 (3.47)	11.51 (4.00)	10.52 (3.07)	12.20 (4.09)	11.67 (4.11)	0.32
Organicity	5.15 (1.18)	4.77 (0.96)	5.47 (1.11)	5.68 (1.02)	4.84 (1.20)	4.66 (1.03)	5.44 (1.04)	2.64*
Strategic Posture	4.37 (1.36)	4.19 (1.10)	4.52 (0.98)	4.39 (0.93)	3.34 (1.21)	3.44 (1.15)	5.21 (0.92)	8.50***
Number of Employees	55.12 (60.03)	72.87 (125.62)	48.14 (64.78)	42.37 (31.74)	62.07 (78.15)	43.68 (46.73)	99.78 (109.23)	1.63
Sales Revenues (millions)	5.66 (6.29)	5.50 (7.28)	6.49 (8.12)	5.31 (3.28)	3.83 (3.59)	7.05 (14.12)	9.23 (11.98)	0.74
Firm Age (years)	27.29 (26.83)	35.73 (30.99)	30.86 (26.43)	21.06 (25.62)	32.64 (25.65)	33.36 (23.28)	23.08 (27.68)	0.85

$p < 0.05$        $p < 0.001$

**TABLE 8**  
DISTRIBUTION OF STABLE AND DYNAMIC ENVIRONMENT FIRMS ACROSS THE CLUSTERS

Environment Type	Cluster						
	1 (n=17)	2 (n=15)	3 (n=7)	4 (n=19)	5 (n=14)	6 (n=22)	7 (n=37)
No of Stable Environmental Firms	8	14	6	15	14	21	16
No. of Dynamic Environmental Firms	9	1	1	4	0	1	21
* Primary Composition of Cluster	D	S	S	X	S	S	D

\*Based on a comparison of observed versus expected environmental representation within each cluster.

Chi-square = 35.91 (df = 6,  $p < 0.001$ )

S = Stable environment firms are dominant

D = Dynamic environment firms are dominant

X = Mixed - no disproportionate representation of stable or dynamic environment firms



Clusters 2, 3, 5 and 6 are composed of a disproportionate number of stable environment firms. The proportion of stable and dynamic environment firms in cluster 4 is not significantly different from that of the overall sample. Accordingly, cluster 4 is labeled a "mixed" cluster.

Overall, the clusters of firms can be clearly categorized as stable or dynamic environment clusters despite the fact that the cluster analysis was performed on the unsegregated sample rather than within each environmental setting. This finding suggests that small firms in stable and dynamic environments engage in competitive strategies that are, to a large extent, unique to those settings. Furthermore, the fact that stable and dynamic environment firms are each dominant in several different clusters suggests that there are several common modes of competition, or generic competitive strategies, within each environmental setting. In short, these findings indicate that small firm strategy varies significantly across, as well as within, environmental settings. Collectively, the data provide broad support for the research proposition that small firms in stable and dynamic environments have dissimilar strategic patterns.

Using the information presented in Tables 6, 7, and 8, the seven clusters can be described as follows:

**Cluster 1: Competitive, Future-Oriented Firms.** The forward-looking orientation of cluster 1 firms is evident in their heavy emphasis on long-term profitability. The competitive nature of these firms has several manifestations. Most notably, cluster 1 firms offer a relatively wide array of products backed by strong customer service and support. The strong emphasis on new product development activities and operating efficiency concerns may promote long-term competitive viability. Although not heavily emphasized, advertising is more heavily relied on by these firms than by those in the other clusters. Cluster 1 firms are particularly common in dynamic environments.

**Cluster 2: Efficiency-Seeking, Full-Line Firms.** Like cluster 1 firms, cluster 2 firms have wide product lines and heavily emphasize customer service and support and operating efficiency concerns. Unlike cluster 1 firms, advertising is de-emphasized as a business strategy component by firms in this cluster. These firms are further distinguished by their strong reliance on the internal financing of operations and their strong aversion to accepting dependencies on single suppliers and customers. Stable environments are the typical contexts of cluster 2 firms.

**Cluster 3: Operations and Product-Centered Firms.** Cluster 3 firms offer a narrow range of high quality, relatively high-priced products. These firms extend generous customer credit, offer superior customer service and support, use

innovative operating techniques or technologies, and emphasize new product development activities. The minimization of dependencies on single suppliers and customers is strongly emphasized by firms in this cluster. There is also a strong concern for maintaining an awareness of industry and market trends. These firms are usually found in stable environments.

**Cluster 4: Specialized, Mature-Product Firms.** Relatively narrow product lines, the absence of product patents, and a de-emphasis on new product development activities define cluster 4 firms. Accordingly, these firms appear to serve specialized, mature market niches. Cluster 4 firms are particularly averse to extending generous customer credit. Like firms in many of the other clusters, these firms actively seek to improve operating efficiency and minimize dependencies on single suppliers and customers. The structures of these firms are, on average, more organic than those of firms in the other clusters. Cluster 4 firms are common to both stable and dynamic environments.

**Cluster 5: Low-Priced, Low Value Firms.** The low prices charged by Cluster 5 firms suggest that these firms are most concerned with maintaining price competitiveness. This competitiveness, however, may not be indicative of high value to the customer. Cluster 5 firms offer relatively low quality products, weak warranties, and poor customer service and support. Advertising is de-emphasized while the minimization of dependencies on single suppliers and customers is stressed. These firms have the most conservative strategic postures and the lowest performance levels. They are typically found in stable environments.

**Cluster 6: Complacent, Noninnovative Firms.** Cluster 6 firms are least concerned with long-term profitability and the active prediction of industry and market trends. These attributes suggest a secure or complacent attitude toward the future. Unlike firms in the other clusters, operating efficiency is not a major concern of these firms, nor is the minimization of dependencies on single suppliers and customers. Cluster 6 firms employ no innovative operating techniques or technologies, and new product development activity is de-emphasized. The structures of cluster 6 firms are more mechanistic than those of firms in the other clusters. The average performance level is the highest of any individual cluster. Stable environments are typical contexts for these firms.

**Cluster 7: Aggressive, Entrepreneurial Firms.** The aggressive nature of cluster 7 firms is evident in their heavy reliance on external financing, emphasis on long-term profitability, and strong concern for maintaining an awareness of market and industry trends. These firms offer high quality products backed by superior warranties and strong customer

service and support. Product patents and innovative operating techniques technologies are widely used by firms in this cluster. New product development activities are stressed. These firms have the most entrepreneurial strategic postures. Dynamic environments are the most common contexts for cluster 7 firms.

## CONCLUSION & MANAGERIAL IMPLICATIONS

Analysis of data collected from small manufacturing firms revealed their structural and strategic responses to environmental dynamism. The specific findings of this research can be collapsed into a set of more general conclusions. First, environmental dynamism appears to promote organic structures even among small firms. In addition, the relationship between dynamism and structure seems to relate to performance. Although the results only show a statistically significant difference in correlation coefficients, it seems intuitively plausible that organic structures correlate positively with performance in dynamic environments and negatively with performance in stable environments. This implies that a contingency theory of organic structure-dynamism fit may make sense for the practicing small firm manager. Specifically, in the presence of dynamism an organic structure should be used, while a mechanistic structure may be more appropriate for optimal performance in a stable environment.

Similarly, an entrepreneurial strategic posture appears to relate most strongly to performance under particular environmental circumstances. The findings indicate that entrepreneurial strategic postures are more prevalent among small firms in dynamic environments, while stable environments seem to favor more conservative strategic postures. Going beyond a strict interpretation of the results, it might be suggested that an entrepreneurial strategic posture "works better" in a dynamic environment, whereas a conservative strategic posture is typically more effective in a stable environment. The significance for the practitioner is once again to "fit" the strategic posture to the environmental realities faced by the firm.

Overall, the preceding results are consistent with prior research which examined samples of larger firms (Harvey, 1968; Khandwalla, 1977; Miller, 1983; Dean, 1993).

Accordingly, firm size does not appear to influence how firms respond, along some structural and strategic dimensions, to environmental dynamism.

Another conclusion relates to the performance levels achieved by small firms in stable and dynamic environments. Specifically, dynamism does not appear to directly affect small firm performance. There was a negligible difference in the average performance level of the two subgroups. Clearly environmental dynamism need not generally preclude small firms from achieving high performance, nor does it appear to promote such performance. Perhaps this is not too surprising. The fit between environmental conditions and a firm's choice of strategy and structure would seem a stronger determinant of small firm performance than any of these variables considered independently.

Finally, the business practices of small firms in stable environments appear to differ greatly from those of small firms in dynamic environments. There were overall differences between the two subgroups in terms of 11 of the 16 strategic pattern variables. Those variables which differed are long-term financial orientation, external financing, warranties, advertising, innovative marketing, high price, product quality, patents copyrights, new product development, innovative operations, and industry awareness. Moreover, the cluster analysis revealed that the patterns of the individual strategic variables, which collectively depict business strategy, are generally different for small firms in stable and dynamic environments. This finding, while predicted, is still rather remarkable in that it suggests that how small firms *configure* their business practices (rather than simply the business practices *per se*) may be unique to the environments in which these firms operate.

Promising topics for similar future research are numerous. For example, researchers could examine the influence of other environmental dimensions, such as complexity or munificence, on the structures and strategies chosen by small firms. Another possibility would be to examine how the structural and strategic configurations of small firms evolve as environmental conditions change. Data collection for such efforts can be difficult. However, these types of studies should enable researchers to hasten the development small firm theories and taxonomies that have descriptive power, predictive utility, and managerial relevance.

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