Firm Diversity within Strategy Types: Substrategies and Performance Effects

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Abstract

Competitive strategy types are widely used to evaluate competitive advantage. The assumption is that member firms are extremely similar, even homogeneous. However, empirical evidence from group membership effects is mixed; it highlights a need for further refinement in strategy classification. This study relies on "substrategies" to group firms in the middle range between strategy types and individual firms. With data from 125 business units, we investigate variation in substrategies within strategy type and performance effects. Firms pursue different substrategies within competitive strategy types, but no individual substrategy produces superior performance.

Introduction

Strategy classification studies have assumed a prominent role in explaining performance differences among competing firms. They have developed groupings of firms based on similarities in their competitive behavior that encompass both intra-industry (strategic group) and cross-industry designs (cf. Miles & Snow, 1978; Porter, 1980). According to Harrigan, such analysis is intended to "focus attention upon salient differences in how competitors approach the marketplace" (1985, p. 55). However, differences among firms may be under-represented where strategy classifications are used to evaluate firm performance. It is a fundamental premise in empirical classifications that firms grouped into a strategy type are very similar--if not homogeneous--in their competitive behavior (McGee & Thomas, 1987). While aggregating firms in this way illuminates general patterns of firm behavior, business policy scholars emphasize distinctive competence in achieving market success. Literature reviews have found that strategy classification studies do not fully account for firm characteristics when explaining performance variance (Barney & Hoskisson, 1987; Hill & Lawless, 1988; Lawless, 1988; Slater & Brown, 1988). Empirical strategy classification is therefore widely used to analyze competitive behavior, yet discounts the notion of distinctive competence which is of high interest to strategists (Rumelt, 1981). Key differences in behavior, possibly affecting firm survival, may wash out as firms are aggregated. In this study, we look for a middle ground between individual firms and homogeneous strategy types. We subdivide firms within strategy types by technology substrategies to further specify their competitive behavior through groups smaller than typical with more precise distinctions. The focus is on three questions. Do firms following the same competitive strategy still follow different substrategies? What are the patterns to firms' substrategies within each competitive strategy type? Are within-type differences associated with performance variances among firms?

The assumption of similarity in the competitive behavior within groups is common to both theoretical and empirical analyses. Conceptually, strategy types are distinguished by likeness in strategy characteristics within each group relative to differences across groups (Hatten & Schendel, 1977; McGee, 1985). Each type

implies a shared "competence profile" (Hofer & Schendel, 1978), where investments in product innovation, production efficiency, customer service, and the like are common to members. Some scholars propose behavioral causes for these similarities. According to McGee (1985), goal congruence is strongest among strategic group members, and homogeneity of firms should be recognizable. Harrigan argues that the integrity of strategic groups is based on a shared outlook toward competing, "loose groups are more likely to face intragroup discord because their outlooks toward competition would be less homogeneous than those of a tight group" (1985, p. 66). Caves and Porter (1977) suppose that oligopolistic interdependence is recognized more fully within groups than between due to a common view toward competitive methods. The simple imitation of a successful strategy causes firms to appear similar as well (Rumelt, 1986).

A persistent theme in this literature, therefore, is that group membership has consequences for individual firm performance. Hill and Lawless (1988) call this the "differential profit hypothesis," but note that the evidence is conflicting at best. Cool and Schendel (1988) note that performance differences probably do exist among firms within strategic groups, but have not been addressed in the design of empirical studies. With few exceptions (Oster, 1982; Dess & Davis, 1984), studies have not found significant performance differences based on strategy types or strategic groups (Caves & Pugel, 1980; Cool & Schendel, 1987; Frazier & Howell, 1983; Miller, 1988). One possible explanation is that prior strategic differences among firms cannot be detected when they are grouped according to aggregate strategy characteristics common to all.

Technology Substrategy

We approach these issues through the construct of substrategies (Hofer & Schendel, 1978; Snow & Hrebiniak, 1980). A strategy type may be conceived as an array of substrategies--each one a set of activities related to a major strategic objective (Quinn, 1980). They are frequently formalized in organization structures as functional divisions. In fact, Hofer and Schendel argue that "functional area (substrategies)--marketing, production, R&D, and personnel--guarantee consistency of action throughout different levels of the organization" (1978, p. 13). Substrategies have an essential role in organizational structure (Lawrence & Lorsch, 1967; Rumelt, 1986), decision hierarchy (Miles & Snow, 1978; Schendel & Hofer, 1979), and implementation (Hrebiniak & Joyce, 1984; Quinn, 1980).

Because of its impact on competitive performance (Kantrow, 1980), technology is used here for the specific setting in which to investigate substrategy differences among firms that otherwise follow the same strategy. The connections between technology and strategy are widely discussed in the innovation literature. As a factor in both innovativeness and efficiency, technology directly affects market performance. In general, there is consensus that: 1) technology itself can be a potent competitive weapon (Maidique & Patch, 1980; Jelinek & Burstein, 1982), and 2) integration of technology management with strategy is necessary for market success. (Bright, 1964; Wheelwright, 1984). Despite the appeal of these arguments, empirical evidence is sparse. There is some anecdotal support (Ansoff & Stewart, 1967; Freeman, 1974). But Miller finds no significant correlation of technology with financial performance (1984, 1988).

Developing an unambiguous definition of technology is difficult. We rely on a review of the innovation literature and a panel of experts (described below) to operationalize the concept of technology substrategy. It is broadly defined as the activities involved in R&D, engineering, product and process innovation, and production. These functions produce a coherent set of technology dimensions that many scholars argue affect strategic success (Bitondo & Frohman, 1981; Frohman, 1982; Maidique & Hayes, 1984;

Pappas, 1984; Quinn, 1979; inter alia). The variables used in the survey to measure technology substrategy are found in Table 2. Each has multiple references in the innovation literature search, and was evaluated by the expert panel as relevant to the technology substrategy construct.

Hypotheses

In order to investigate variation within strategies, survey firms were clustered twice: into four strategy types, and into three technology substrategy types. (Methods are explained in detail below.) A crosstabulation was then made of strategies and substrategies, as displayed in Table 3. Our first hypothesis is based on the notion that strategy classifications may not account for significant substrategy differences. Each strategy-substrategy combination is a potentially viable mode of behavior that is not identified where strategy types alone are used. H1 proposes that significant differences in technology substrategies can occur among firms within the same strategy type.

H1: Firms following the same strategy type will pursue significantly different technology substrategies.

Hofer and Schendel (1978) argue that identifiable goals are associated with each competitive strategy type. Thus, strategy/substrategy combinations, if they are substantively different from each other, should vary in their objectives. Hypothesis 2 is tested by examining the significance with which strategic objectives and strategy/substrategy combinations are correlated.

H2: Strategic objectives will differ for various technology substrategies, given the same competitive strategy type.

Studies have proliferated that investigate the performance effects of strategy types. Common characteristics of members are posited to have consequences for firm profits within types, and for performance differences among types (Galbraith & Schendel, 1983; Hambrick, 1983a, 1984; Harrigan, 1985; Hawes & Crittenden, 1984). Due to its strategic importance, we expect technology substrategy to be among these common characteristics. One argument is that the technology substrategy associated with each strategy would be that which produces best performance. Other substrategies would be mismatched with the strategy, and discarded by firms as less profitable. On the other hand, shared characteristics reflected in a strategy type may not capture all viable within-type variations. If more than one technology substrategy actually fits a strategy type, then different strategy/substrategy combinations should produce comparable results. Hypothesis 3 is based on the premise that comparable performance among several substrategies--given a strategy type--can result.

H3: Different technology substrategies will have comparable performance, given the same competitive strategy type.

Measurement and Sample

Measures

In order to test the hypotheses, taxonomies of competitive strategy and technology substrategy are needed. Defining variables on which to base strategy types is the critical first step (Hall, 1972). One approach is to synthesize the previous research with an updated set of classifying variables. Our variables are strategy and technology "competences" drawn from a review of previous strategy typing studies (c.f., Galbraith & Schendel, 1983; Hitt & Ireland, 1985; McGee & Thomas, 1986; Roth & Pearce, 1986), and reviewed by five top managers in separate interviews. Miller (1986) lays out four criteria for selecting variables to enhance validity and parsimony in strategy classification: 1) relevance to strategy content, 2) identifiable and controllable by managers, 3) broad coverage of the range of possible strategies and complexity of each, and 4) conceptual and empirical precedent in the literature. These

factors guide selection of the variables from the total set taken from the literature.

This study builds on the conceptual foundation of Hitt and Ireland's article (1985), which describes competitive behavior with 55 potential distinctive competences from previous research. We argue that firms use competitive strategy to align themselves with their markets, and add the condition that strategy variables should be related to specific market forces as outlined in Scherer's model (1980). This is a widely cited summary of the industrial organization literature. Resulting strategy variables are the abilities of firms to maintain and improve position among the market forces that they face. This is similar to Lenz's "matrix of technologies" (1981). Our list has 46 strategy variables, which are independently matched to Scherer's market forces by two researchers with 98% inter-rater agreement. They may be found with the findings in Table 1. Respondents rated each dimension on a seven-point Likert scale reflecting its importance to management. Lenz's "strategic depth" (1981) and Hofer and Schendel's "management emphasis" (1978) similarly weight strategy attributes to detect overall patterns. Measures of technology substrategy are drawn from a similar comprehensive review of the innovation literature. The 26 technology variables are presented with the findings in Table 2. An array of methods that enhances the validity of survey measures is applied to the list of competences (Churchill, 1979). They are embodied in a pre-test involving CEOs in 10 firms sampled from the Dun and Bradstreet Million Dollar Directory (1985). Additionally, all competences are pre-tested for clarity and relevance to the strategy-technology construct with a five-member panel of experts.

While the focus of this analysis is on strategy and substrategy, previous research indicates that environment cannot be disregarded when evaluating strategy. Market conditions are therefore a moderating variable for tests of financial performance. Two alternative constructs are used to measure them. First, Porter's market forces (1980)--buyer power, threat of new entrants, etc.--are rated by the survey respondents, then clustered into three market types. Next, four and eight firm concentration ratios and Herfindahl index are computed for each SIC code using data from Ward's Business Directory of Largest US Companies (1986). Each is an indicator of market competitiveness (Hill & Snell, 1988).

Performance is measured by six representative accounting indicators familiar in strategy studies (Venkatraman & Ramanujam, 1986)--total revenue, total net income, net income on sales, net income on equity, sales on plant and equipment, and sales on working capital. Three firm value measures are also taken--price-earnings ratio, stock price, and dividends per share (Chakravarthy, 1986). Observations on all measures are drawn from the DISCLOSURE data base (1986), and merged with the survey data base to avoid problems with self-reported financial measures. Firm-level data are adjusted to the SBU-level using the ratio (SBU revenue/firm revenue). Performance is reported for a full year after the survey to account for implementation and other delayed effects. A total of 81 firms in the survey are also on DISCLOSURE.

Sample

Each case represents one SBU in one firm - that with largest 1984 sales volume. Sampling is random within four-digit SIC manufacturing industries (Ansoff & Stewart, 1967; Maidique & Hayes, 1984). The sampling list is drawn from Dun and Bradstreet's Million Dollar Directory (1985) and Billion Dollar Directory (1985). CEOs are most familiar with overall market position and with other strategic issues that cut across functional lines, so they are chosen as respondents (Snow & Hrebiniak,1980). Due to specialized knowledge, access to addressees, and resources available for the survey, there is one respondent per firm. Interviews with pre-test respondents indicate all questionnaires were

completed by the addressees, and there was no evidence that responses were completed by persons other than the CEOs to whom the survey was addressed. The response rate is 23.5%. In total, 125 useable responses are obtained from 530 mailed questionnaires in SIC industries with responses. This is considered an adequate ratio of data points to variables for a stable factor solution for strategy types, and favorable for technology and market types. All subsequent cluster analysis was performed on the factor scores, with 25 or more data points for each factor. Comparisons of company size and revenues using data from Ward's Business Directory of Largest US Companies (1986) show no significant differences between respondents and non-respondents.

Methods

The hypothesis tests call for separate taxonomies for competitive strategies and technology substrategies. The same method is used for both. First, principal components analysis with varimax rotation is performed with SPSSx (1985), reducing the variables to orthogonal factors. (Results are available from the author.) Next, two-stage cluster analysis is performed on the factor scores for 125 firms in the sample. Four different agglomerative techniques (Ulrich, 1982) are compared for the first stage. Each approach is tested for fit to the input data set using cophenetic correlation (Sneath & Sokal, 1973; Ulrich, 1982). Ward's method with squared Euclidian distance (McKelvey, 1982) is used to choose the optimal number of clusters and estimate centroids. The number of solution clusters for strategies and substrategies is determined by a stopping rule (Mojena, 1977; Wishart, 1982), which is more rigorous than visual inspection. Based on these parameters, k-means iterative partitioning is used to develop the final cluster solution with SPSSx (1985) and CLUSTAN (Wishart, 1982). The two-stage cluster method is recommended by Punj and Stewart (1983), Milligan (1980), and Hartigan (1975). Iterative partitioning methods resist spurious effects better than agglomerative methods alone (Friedman & Rubin, 1967), but require non-random selection of clusters and centroids. The two-stage method permits effective use of iterative partitioning. To statistically validate the clusters, Aldenderfer and Blashfield (1984) argue for significance tests on variables not used to generate the cluster solution. Significant differences on F-scores and Scheffe tests from one-way ANOVAs are found among strategic objectives, increasing confidence in the statistical validity of the cluster solution. These results are shown in Table 4.

Findings

Competitive Strategies

Four competitive strategy types are identified among 125 firms. Descriptive profiles are derived by interpreting factor scores from the principal components analysis, and descriptive statistics for each cluster. The strategy types, along with mean and standard deviations for each of the strategy variables, are displayed in **Table 1.**

Product Innovation. This strategy leads the market with state-of-the-art products with high value-added, and makes frequent improvements in them. The innovation process, including evaluation of new products, is important. Response to changes in customer needs, quality control training for employees, and product quality had highest mean importance of all strategy types. They tend to de-emphasize efficiency and control, and sales and marketing.

Promotion & Distribution. This type emphasizes reaching a large portion of the overall market in a way similar to Porter's "Differentiation" generic strategy (1980). The Sales and Distribution factor has most emphasis. Promotions and advertising--both corporate and for individual products--in specialized media are priorities. Distribution is also part of the strategy, both through a large number of outlets and wide geographical coverage. Personal selling by representatives and presence at trade shows and

TABLE 1
COMPETITIVE STRATEGY TYPES AND STRATEGY VARIABLES[1]
(Mean and Standard Deviation)

Variables	Competitive Strategy Clusters							
	Product Innovation		Promotion Distribution		Customer Service		Customer Support	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Technically-Skilled Sales Force	6.206	.978	6.167	1.098	5.049	1.413	4.500	1.832
Precise Customer-Segment Definition	5.070	1.681	5.667	1.328	4.073	1.738	3.312	1.575
Special Media Advertising	3.647	1.668	4.611	1.501	3.146	1.442	1.906	1.279
Large Production Capacity	4.029	1.834	4.944	1.162	3.732	1.415	4.353	1.308
Plant Location Close to Customers	2.287	1.782	3.833	1.790	2.000	1.360	3.673	1.981
Plant Location Close to Suppliers	1.776	1.160	3.944	1.626	1.756	.943	2.962	1.838
Employee Compensation by Salary	5.024	1.219	5.778	.878	4.678	.877	4.181	1.056
Employee Compensation by Incentives	5.471	1.376	5.333	1.749	4.829	1.202	4.406	1.214
Scanning Competitors' Moves	5.824	1.114	6.333	.767	5.122	1.229	4.195	1.407
Long-Range Planning	5.735	1.214	6.000	0	5.195	1.249	3.847	1.611
Reliance on Explicit Mission Statement	4.919	1.795	5.278	1.320	4.347	1.493	2.789	1.525
New Product Introduction Hurdles	5.647	1.346	6.003	1.026	4.904	1.158	4.067	1.588
Licensing Products from Other Firms	3.027	1.732	4.222	1.833	2.902	1.338	2.025	1.278
Contracting for Product Components	3.824	2.081	5.550	1.505	3.854	1.711	3.118	1.770
Coordination of Marketing & Production	6.008	.793	6.056	1.474	5.146	1.131	4.439	1.753
Efficiency-Oriented Budgeting	4.588	1.654	5.278	1.320	4.585	1.341	3.603	1.476
Process Control Systems	4.158	1.579	5.667	1.414	4.390	1.447	3.815	1.629
Output Control Systems	4.635	1.367	5.722	1.227	4.512	1.325	4.044	1.726
Quality Control Training	6.206	.978	6.000	1.495	5.512	1.325	4.965	1.297
Joint Venture with Suppliers	2.029	1.267	4.667	2.029	3.098	1.546	1.976	1.303
Joint Venture with Customers	2.735	1.831	4.833	1.948	3.976	1.823	2.345	1.421
Product Features	6.618	.604	6.111	1.568	5.659	1.063	4.925	1.657
Product Quality	6.735	.567	6.278	1.565	6.268	.949	6.250	1.016
State of the Art Products	6.147	1.105	6.278	.826	5.252	1.240	4.031	1.823
Low Price Per Unit[2]	4.195	1.529	5.500	1.581	4.723	1.466	4.469	1.646
Delivery Speed	5.588	1.234	6.000	1.328	4.024	1.129	5.156	.987
Delivery Dependability	6.324	.806	5.667	1.680	4.670	1.222	5.531	1.107
Frequent Product Improvements	5.353	1.454	6.111	.963	4.366	1.109	3.510	1.526
Tie-Ins with Other Firms Products	4.141	1.894	5.333	1.680	3.634	1.959	2.719	1.764
Large Number of Distribution Outlets	2.647	1.756	4.944	1.924	2.463	1.598	3.063	2.015
Wide Geographical Distribution	5.206	1.711	5.556	1.917	3.756	1.908	4.204	1.875
Product Support and Service	6.588	.609	6.222	1.517	5.356	1.174	4.469	1.849
Mass Media Advertising	2.118	1.684	4.389	1.577	1.886	.956	1.938	1.564
Product Guarantees or Warranties	5.206	1.366	5.222	1.700	4.439	1.379	3.688	1.595
Customer Training Programs	4.677	1.804	5.566	1.653	4.268	1.550	2.188	1.355
Personal Selling by Reps[3]	4.809	2.008	5.444	1.723	4.073	2.005	4.219	1.979
Reps at Conventions & Trade Meetings	4.029	1.642	4.444	1.542	3.171	1.447	2.875	1.680
Corporate Advertising	2.794	1.513	4.556	1.580	2.341	1.087	2.250	1.270
Individual Product Advertising	3.824	1.783	4.944	1.626	3.512	1.502	2.938	1.585
Special Sales Promotion	2.588	1.690	4.611	1.614	2.951	1.448	2.531	1.606
Special Price Discounts	2.324	1.296	4.444	1.199	2.927	1.506	2.778	1.754
Find New Markets for Existing Products	5.412	1.234	5.889	1.491	4.976	1.440	4.661	1.698
Respond to Changes in Customer Needs	6.559	.660	6.278	1.447	5.927	1.127	5.942	1.076
Meet Full Range of Customer Needs	5.206	1.553	6.000	1.414	5.073	1.539	5.291	1.590
Sell to Specialized Customer Groups	6.147	1.019	5.778	1.353	5.073	1.694	5.172	1.527
High Value Added to the Product	5.971	1.193	6.000	1.138	5.341	1.315	4.071	1.571

[1]All significant at .01 level, except as noted; [2]Significant at .05 level; [3]Not significant at .05 level.

conventions are important.

Customer Service. This strategy is generally to respond to buyer needs, and to change with them. Market competences for firms in this type correspond most closely with the responsiveness and service factor in the principal components analysis. They include delivery dependability and product service. The strategy also emphasizes long range planning and coordination between marketing and production.

Customer Support. This type is like Customer Service, but not as well defined in terms of the descriptive statistics in Table 1. Standing alone, this type emphasizes competences that load heavily on the responsiveness and service factor. They include delivery dependability and delivery speed.

Due to the variables used, some new aspects of strategic positioning emerge in this taxonomy--for example, relying on promotion and distribution or on customer service. However, this classification reinforces previous findings as well. Elements of these competitive strategies--like innovation--do have precedents (eg., (Miles & Snow 1978; Hambrick 1983b)). Other similarities are also found with existing studies (Smith, Guthrie, & Chen, 1986) in differentiation, and in production efficiency and control (Porter, 1980; Dess & Davis, 1984; Snow & Hrebiniak, 1980).

Technology Substrategies

The analysis produces three technology substrategies, descriptively titled "Integrated Innovator," "Technology Follower," and "Lagged Manufacturing Specialist." Two factors that differentiate these technology substrategy types are found in the principal components analysis: level of innovativeness and degree of strategy/technology integration.

Integrated Innovator. This substrategy emphasizes leading-edge technology and integrating technology with strategy formulation. Firms place high importance on all variables related to leading-edge technology competence: forecasting, R&D--both basic and applied, highly-skilled R&D personnel, and product development. The approach extends to management practices as well. Product development teams, innovation champions, and innovation incentives are part of the substrategy. Heaviest emphasis of the three clusters is placed on measures to integrate technology with competitive strategy formulation, especially soliciting technology input to strategic planning and involving top management with technology plans.

Technology Follower. These firms monitor environmental change, move quickly after a new technology is developed, and put less importance on strategy/technology integration. Most of the same competences as Integrated Innovator are emphasized, but with lower mean importance across the board. Other variables, mostly reflecting leading edge technology, are de-emphasized, including basic R&D, innovation incentives, and technology forecasting. In production, process R&D and coordinated manufacturing operations have low mean values. Other mean values indicate less emphasis on ties between R&D and other functional areas (finance in particular) than the Integrated Innovator type.

Lagged Manufacturing Specialist. Firms in this cluster are very different from the other two. This type emphasizes efficiency over innovation, and downplays strategy/technology integration. Heaviest emphasis is placed on production competences: simple, adaptive manufacturing, QC monitoring, and technically-skilled production personnel. The type also stands out because of the low level importance put on most R&D and innovation competences. Another contrast is the small role given to strategy/technology integration. Technology's relations with other functional areas and with overall competitive strategy formulation are de-emphasized. Production competences are the focus of this type.

Table 2

Technology Substrategy Types and Technology Variables[1]

Technology Variables	Integrated Innovator		Technology Follower		Lagged Manufacturing Specialist	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Top Management Involved in Technology Plans	6.326	0.865	5.955	0.952	4.316	2.091
Technologists in Top Management	6.744	0.441	5.439	1.229	3.787	2.071
Technology Input to Strategic Plan	6.581	0.626	5.606	1.288	4.384	1.990
Technically Skilled R&D Personnel	6.698	0.558	5.955	1.044	3.992	2.122
Applied R&D	6.419	0.633	6.419	0.663	3.627	1.881
Scanning of Technological Change	6.163	0.785	6.163	0.785	3.855	2.061
New Product Design	6.349	0.720	5.379	1.092	4.132	2.122
New Product Development	6.512	0.668	5.572	0.911	4.660	1.832
Product R&D	6.395	0.583	5.402	1.368	3.952	1.944
Technology Forecasting	5.465	1.453	4.197	1.629	3.092	1.854
Incentives for Innovation	5.512	1.242	4.015	1.364	3.973	1.841
Product Development Teams	5.953	1.090	4.833	1.505	3.509	1.834
Systems Engineering	5.744	1.347	4.758	1.599	3.290	1.901
Prototype Development	6.093	0.781	4.833	1.235	4.211	1.882
Process R&D	5.977	0.913	5.977	0.913	4.248	1.793
Basic R&D	4.814	1.763	2.985	1.603	2.384	1.293
Innovation Champions	5.952	0.976	4.681	1.480	3.558	1.927
Technically Skilled Production Personnel	6.047	0.950	4.697	1.347	4.581	1.901
Test Marketing	4.302	1.767	3.288	1.567	2.695	1.574
Simplified Manufacturing Operations	5.791	1.125	4.591	1.347		
Quality Control Monitoring	6.558	0.734	5.636	1.118	5.039	1.555
Coordinated Manufacturing	5.605	1.218	4.288	1.567	3.988	1.770
Adaptible Manufacturing	5.767	1.130	4.904	1.501	4.603	1.762
Coordination of R&D with Production	6.372	0.787	4.788	1.365	3.479	1.753
Coordination of R&D with Finance	5.326	1.375	3.742	1.471	2.717	1.565
Coordination of R&D with Marketing	6.302	0.887	5.485	1.099	3.662	1.812

[1] All significant at .01 level.

Characteristics of technology substrategies coincide closely with previous classifications of competitive strategy. In particular, responsiveness to change, innovativeness, and strategy/technology integration are familiar characteristics of strategy isolated here in technology substrategies (Maidique & Hayes, 1984; Miles & Snow, 1978; Smith, Guthrie, & Chen, 1986).

Substrategy Variation

Comparison of firms by joint membership in strategy-substrategy clusters reveals variation within strategy types. Table 3 shows the crosstabulation of competitive strategy/technology substrategies. Except for Promotion and Distribution, each competitive strategy has high frequency in two different substrategy cells. Chi-square tests indicate that competitive strategy has no statistical relation to technology substrategy at the .05 level. Therefore, we conclude that more than one technology substrategy is associated with the Innovation, Customer Service, and Customer Support competitive strategies. Based on these results, H1, which asserts that different substrategies are compatible with the same competitive strategy type, is supported.

Several other tests and comparisons are made to further substantiate the variety of substrategies within strategy types. First, two cluster solutions are compared, one in which technology substrategies are clustered separately from competitive strategies (as shown in Table 3); the other in which both strategy and technology variables are grouped together. The same data and method are used in each analysis. The combined solution produces three strategy clusters with a high level of dispersion. There is a large number of outliers, larger fusion coefficients, and delineation of the clusters is weak compared with results in Table 3. A more precise classification in terms of content is obtained where competitive strategies are further stratified by technology substrategy. Second, the k-means method, used to develop the clusters in Tables 1 and 2, maximizes the likelihood of a non-random solution structure, and of qualitative differences among strategy/substrategy groups (Punj & Stewart, 1983). Third, Eta-square statistics in Table 3 show a strong relation between strategy/substrategy cells and strategic objectives. Finally, significant f-scores in subsequent ANOVAs for strategic

Table 3

Competitive Strategy/Technology Substrategy Combinations
By Frequency and Percent of Responding Firms

Competitive Strategy	Technology Substrategy							
	Integrated Innovator		Technology Follower		Lagged Manufacturing Specialist		Total	
	n	%	n	%	n	%	n	%
Product Innovation	17	13.6	16	12.8	1	0.8	34	27.2
Promotion and Distribution	14	11.2	3	2.4	1	0.8	18	14.4
Service and Responsiveness to the Customer	12	9.6	29	23.2	0	0.0	41	32.8
Weak Service	0	0.0	18	14.4	14	11.2	32	25.6
Total	43	34.4	66	52.8	16	12.8	125	100.0

objectives statistically validate the clusters, also suggesting that H1 is supported. Thus we conclude that qualitatively different technology substrategies are present within the competitive strategy types.

Substrategies and Objectives

Based on the premise that each strategy/substrategy combination is a distinct strategic approach (Hofer & Schendel, 1978), H2 posits that strategic objectives differ by technology substrategies, given a competitive strategy type. The hypothesis is supported based on results of one-way ANOVAs presented in Table 4. Competitive strategy/technology substrategy combinations are tested for differences in 13 strategic objectives with significant differences at the .05 level or below. Additionally, eta-square statistics are relatively large for virtually all the ANOVAs (Lawless & Nelson, 1987), indicating a strong relation between the combinations and strategic objectives. Scheffe tests further suggest that importance of varying levels is given to differentiation, brand loyalty, and company reputation; control of supply and distribution; dividend and earnings policy; and profits versus innovation (Norusis, 1985). In short, strategy/substrategy combinations are distinguished by strategic objectives, indicating substantively different competitive behavior within strategy types.

Performance Effects

We are unable to find significant differences in the nine performance measures (listed previously) based on competitive strategy, technology substrategy, or joint strategy/substrategy membership. ANOVAs with market as a covariate are used for the tests. First, the four competitive strategy types developed here are not a means to explain financial results of firms in the survey. They produce no significant performance differences. Second, in regard to H3, our tests indicate that financial outcomes for different technology substrategies within each strategy type cannot be distinguished, regardless of the measure. On the basis of these results, H3--proposing that strategy/substrategy combinations cannot be differentiated on financial outcomes, and that no individual combination clearly outperforms others--is supported.

Discussion

Our analysis of substrategies is motivated by the mixed evidence that has accumulated for the profit impacts of strategic group membership. Our findings demonstrate first that competitive strategy types are not a means to explain the performance of firms in the survey. Consistent with most previous studies of strategy type and performance, the profit impact of group membership is not supported by the results. Second, the findings bear out variety in competitive behavior within strategy types. Substantively different competitive behavior, embodied in technology substrategies, is found among firms that otherwise appear very similar. This suggests the substrategy dimension can be useful as a complement for strategy classification--particularly where competitive behavior of firms is evaluated. Apparently, the range of competitive behavior is wider than can be detected where the level of analysis is the strategic group or type.

Third, firms obtain comparable performance with different strategy/substrategy combinations, so there is not a single technology substrategy appropriate to each competitive strategy. Since more than one substrategy can be successful, the assumption that firms behave and perform alike within groups is subject to question. Previous research, where technology has been found not to have a significant effect on performance, has proposed that strategies may be equifinal (Miller, 1988). This reasoning fits our results, and points to a more moderate view of group membership as an influence on firm performance (Cool & Schendel, 1988).

In fact, even the substrategy construct may aggregate firms too broadly to pinpoint sources of performance variance. The benefit of gener-

Table 4

Competitive Strategy/Technology Substrategy Types
by Strategic Objectives[1]

Strategic Objectives	Customer Support Technology Follower		Customer Support Manufacturing Specialist		Product Innovation/ Integrated Innovator		Product Innovation/ Technology Follower		Promotion & Distribution/ Integrated Innovator		Customer Service/ Integrated Innovator		Customer Service/ Technology Follower		eta[2]
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D	
Company Reputation	5.111	1.323	5.786	.893	6.644	.789	6.313	.946	6.357	1.082	5.750	1.055	5.653	1.044	.189
High Profit Margin	4.278	1.565	4.832	1.540	5.882	.928	6.125	.719	5.714	1.204	5.667	.985	5.207	1.048	.216
Regular Dividends[2]	2.816	1.790	2.978	1.842	2.059	1.983	3.313	2.575	3.643	2.405	2.917	1.975	1.771	1.216	.110
High Retained Earnings[2]	4.075	1.058	3.740	1.335	5.059	1.919	5.000	1.897	5.071	1.141	4.167	2.167	3.783	1.772	.110
Control of Supply Sources	4.594	1.105	2.764	2.107	4.000	1.837	2.813	1.682	4.786	1.888	3.557	1.725	3.276	1.601	.161
Control of Distribution Outlets	2.806	1.637	2.893	2.114	2.765	2.166	4.532	2.109	4.571	2.065	2.250	1.138	3.690	1.650	.160
Long Production Runs Between Changes	3.833	1.917	3.660	1.723	3.647	1.902	2.813	1.642	5.214	1.477	4.167	1.992	3.241	1.504	.138
Constant Manufacturing Volume	3.667	1.715	4.141	1.791	5.059	1.519	2.875	1.821	5.214	1.578	3.500	1.446	3.655	1.396	.192
Create Demand for New Products	4.000	1.782	3.687	1.840	4.765	1.821	4.875	1.586	5.929	.829	5.083	1.621	4.241	1.704	.142
Produce Patentable Products	2.611	1.883	2.116	1.366	3.765	1.855	2.750	1.693	4.357	2.240	4.000	2.089	3.483	1.455	.143
First Mover With New Products	3.889	2.026	4.206	1.965	5.588	1.417	4.813	1.682	6.143	1.167	4.750	1.765	5.069	1.132	.165
Differentiate Products From Substitutes	3.889	1.779	3.936	2.022	5.529	1.625	6.000	1.095	5.786	1.805	4.833	1.850	5.276	1.601	.179
Develop Brand Loyalty[2]	4.333	2.351	4.400	2.221	5.471	1.586	6.000	.966	6.286	1.204	4.917	1.975	5.345	1.396	.136

[1] Significant at .01 level unless noted.
[2] Significant at .05 level.

alizing on the behavior of several firms--even to the level of substrategies--causes the loss of some information concerning their distinctive competences. Further refinement of our methods is needed so that the effects of individual firm competences and strategies are fully represented in models of performance. We believe that substrategy analysis is a step in that direction.

Strategy classifications--both strategic groups and cross-industry--help to order the diverse ways in which firms compete. To date, taxonomic research emphasizes similarity in behavior within strategy types, and performance consequences of membership. This study suggests that important variations are found through more specific analysis of strategic groups and competitive strategy types. The added refinement may be useful in future studies of competitive behavior and performance.

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