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WHAT HAVE WE LEARNED ABOUT GENERIC COMPETITIVE STRATEGY? A META-ANALYSIS

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The dominant paradigm of competitive strategy is now nearly two decades old, but it has proved difficult to assess its adequacy as a descriptive system, or progress its propositions about the performance consequences of different strategic designs. It is argued that this is due to an inability to compare and cumulate empirical work in the field. A meta-analytic procedure is proposed by which the empirical record can be aggregated. Results suggest that, although cost and differentiation do act as high-level discriminators of competitive strategy designs, the paradigm's descriptions of competitive strategy should be enhanced, and that its theoretical proposition on the performance of designs has yet to be supported. A considerable agenda for further work suggests that competitive strategy research should recover something of its former salience. Copyright © 2000 John Wiley & Sons, Ltd.

INTRODUCTION

Michael Porter's theory of generic competitive strategy is unquestionably among the most substantial and influential contributions that have been made to the study of strategic behavior in organizations (Porter, 1980, 1985). In essence, the theory contains two elements: first, a scheme for describing firms' competitive strategies according to their market scope (focused or broad), and their source of competitive advantage (cost or differentiation); and, second, a theoretical proposition about the performance outcomes of these strategic designs: that failure to choose between one of cost- or differentiation-leadership will result in inferior performance, the so-called 'stuck-in-the-middle' hypothesis.

Within a few years of publication, the theory was recognized as the dominant paradigm of competitive strategy (Hill, 1988; Murray, 1988). But, despite widespread interest and application, it has proved difficult to progress its representation of competitive behavior. In Kuhn's account, a paradigm gives a common platform and focus to subsequent empirical and theoretical investigation; it defines the scope of phenomena that are deemed to be important, and the methods used for investigation; and it becomes the received wisdom that is taught in the subject's textbooks (Kuhn, 1962). In the following paragraphs it will be shown that Porter's theory has played all these roles.

But it is the thesis of this paper that the paradigm has so far failed to open up a period of Kuhnian 'normal science,' in which a detailed and immensely productive dialogue is established between fact and theory. Failure to establish this dialogue threatens to leave the study of competitive strategy in a preparadigm state, as no more than a series of brave beginnings, none of which attract sufficient empirical or social support to make the phase transition to normal science. The

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impediment has been that there is no known way to compare or cumulate individual empirical studies of the type suggested by the paradigm. It is the objective of this paper to remove this impediment.

The dominant paradigm

The widespread acceptance of Porter's descriptive scheme by researchers can be seen in the wide range of its application. These include industries as diverse as shipping (Brooks, 1993), banking (Meidan and Chin, 1995), and hospital services (Kropf and Szafran, 1988); and countries as diverse as Ireland (McNamee and McHugh, 1989), Portugal (Green, Lisboa, and Yasin, 1993), Korea (Kim and Lim, 1988), and the People's Republic of China (Liff, He, and Steward, 1993).

The scheme has also been widely used by researchers studying relationships between firms' competitive strategy and other aspects of management: i.e., their human relations strategy (Schuler and Jackson, 1989); information technology (Huff, 1988); industrial engineering (Petersen, 1992); manufacturing strategy (Kotha and Orne, 1989); logistics (McGinnis and Kohn, 1988); environmental scanning (Jennings and Lumpkin, 1992); planning processes (Powell, 1994); management selection (Govindarajan, 1989; Sheibar, 1986); and managerial biases in perceptions of competitive strategy (Nystrom, 1994). The framework has also been used extensively in practice to structure managers' perceptions about their firm's strategy. With few exceptions (Bowman and Johnson, 1992), such applications are rarely reported.

The paradigm's theoretical propositions have also attracted intense debate. Early challenges to the 'stuck-in-the-middle' hypothesis (Karnani, 1984; Murray, 1988; Hill, 1988) argued that conditions which might favor cost-leadership (such as the reduction of transaction costs through vertical integration, process innovation and learning, and scale effects) were independent of conditions that might favor differentiation (such as consumer preferences, product innovation, and quality differentiation based on a firm's superiority in a particularly complex value system). Hence, external conditions provide no *a priori* reason to discriminate against mixed cost- and differentiation-strategic designs (Murray, 1988). Moreover, in conditions where differentiation strategies can be used to expand market share, and this in turn permits greater capture of economies of scale and scope, external conditions might actively favor mixed strategies (Hill, 1988; Phillips, Chang, and Buzzell, 1983). Conditions that have been considered in this way include the particular nature of retailing as against manufacturing industries (Cappel *et al.*, 1994); and the distinctive characteristics of an industry's technology (Oskarsson and Sjoberg, 1994).

Beginning with Hambrick (1983), a series of studies has also begun the task of exploring the paradigm's empirical validity. These have followed the paradigm's guidance to describe generic strategies as polythetic gestalts or designs (Miller, 1981; Hambrick, 1984; Rich, 1992), a task best undertaken using principal components analysis and cluster analysis (Hambrick, 1984; Harrigan, 1985; McGee and Thomas, 1986). However, these techniques result in classifications that are specific to the sample of participating firms and cannot be cumulated with other findings. Thus, it has not been possible to assess the accumulated weight of evidence on what generic competitive strategies look like in practice, nor how closely they accord with the paradigm's descriptive and theoretical elements. The study of competitive strategy is thus currently stuck in something of a dead-end of its own design.

Compounding these difficulties, there have evolved a number of different interpretations of the dominant paradigm's descriptive system, so that the paradigm's descriptive and theoretical propositions may take a number of forms. To date, these have not been systematically compared.

As a result of this impeded dialogue between paradigm and empirical investigation, the paradigm's scheme for describing competitive strategy has barely progressed in the two decades since it was first proposed. Attempts by Miller (1986) and Mintzberg (1988) to widen the set of strategic competitive behaviors that are held to be 'generic' have met with little success, despite recent empirical evidence which suggests that they offer a superior description of competitive behavior (Kotha and Vadlamani, 1995). Porter's scheme remains unaltered as the typology set out in most contemporary textbooks (Thompson and Strickland, 1995; Pearce and Robinson, 1994; Bourgeois, 1996).

The study reported in this paper was accordingly motivated to develop meta-analytic procedures with which to aggregate empirically derived descriptions of generic competitive strategy. Study One reports a meta-analysis of the principal component solutions in the empirical record; Study Two reports a meta-analysis of clustered categories of competitive strategy design. The resulting aggregates are compared to alternative interpretations of the classification system of the dominant paradigm. Study Three uses these aggregate descriptions to assess the paradigm's theoretical propositions on the performance of generic competitive strategies. To begin, alternative interpretations of the dominant paradigm and its propositions are discussed and formalized.

INTERPRETATIONS OF THE DOMINANT PARADIGM

Describing competitive strategy

All theory building requires a parsimonious way to describe the intractable variety of nature. This section examines the four approaches that have been used to interpret the dominant paradigm's descriptive system.

The taxonomic interpretation

The first approach is to interpret the system as a taxonomy, that is, a hierarchically ordered set of classifications, within which all designs can be allocated to a unique position, depending on the particular set of strategic elements involved (Chrisman, Hofer, and Boulton, 1988). In this approach, the bewildering variety of strategic designs is reduced to a parsimonious set of allocation 'rules' (Doty and Glick, 1994) by which a specific design for competitive strategy is classified within the hierarchy. This interpretation, clearly inspired by biological taxonomy, requires that allocation rules have a hierarchical structure, and that classifications be internally homogeneous, mutually exclusive, and collectively exhaustive (Chrisman *et al.*, 1988; Rich, 1992).

The order in which allocation rules enter into the hierarchy is shown in Figure 1. At the top is the paradigm's distinction between designs that place distinctive emphasis, relative to competitors, on pursuing some source of advantage, and designs that spread their efforts more evenly and become stuck-in-the-middle. The paradigm's theory of performance is based on this highest-level distinction. Within the class of distinctive emphasis designs, Porter's emphasis on the cost/differentiation dichotomy as 'two basic types of competitive advantage,' and as 'fundamentally different route(s) to competitive advantage' (Porter, 1985: 11), suggests that this allocation rule be placed above market scope in the rule hierarchy.

The life-science-inspired, taxonomic interpretation also places particular emphasis on the mutual exclusion of class memberships. An essentialist rationale for the sharp distinction between cost- and differentiation-emphasis would be that there are elements in the design of each that naturally repel the other. Each design has its own fundamental 'essence,' and attempts to mix them will be quickly terminated by the unnatural nature of the experiment (Miller, 1981; Hannan and Freeman, 1989). Mixed-emphasis designs are not completely ruled out, but will be rare.

These key features of the taxonomic interpretation are set out in Table 1, and stressed in the following proposition:

> *Proposition 1a:* All *competitive-strategy designs can be* precisely *allocated to a number of* hierarchically ordered *classes on the basis of (i) whether or not a design has some distinctive emphasis relative to competitors; (ii) whether that emphasis is towards cost- or differentiation-advantage; and (iii) the market scope adopted. Only a* very small number *of mixed-emphasis designs will exist.*

The empiricist interpretation

This second interpretation relaxes the restrictions of taxonomy. The approach is best typified in an extensive series of studies by Danny Miller, including studies of competitive strategy (Miller, 1992b; Miller and Friesen, 1986a, 1986b). The approach retains the assumption that the very large number of firm-level competitive-strategy designs can be reduced to a smaller number of classes (Miller, 1981), but it differs from a taxonomic interpretation in four ways (Table 1).

First, it is no longer asserted that all designs can be so classified, just that a 'large proportion' can (Miller, 1986: 236). Room is left for idiosyn-

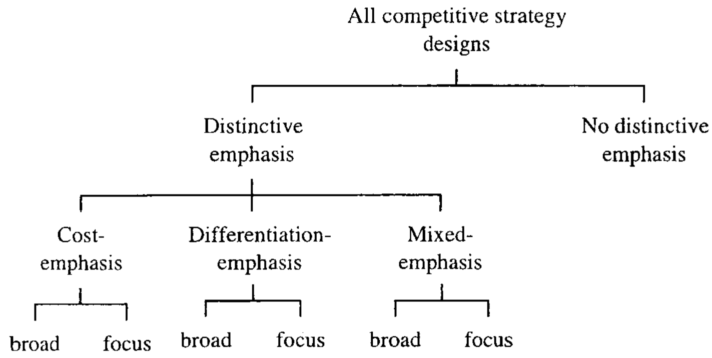

Figure 1. The taxonomic description of generic competitive strategy

cratic designs to flourish around the more commonly observed classes. Secondly, the allocation of each individual design to a class is no longer determined exactly by a precise set of allocation rules, but is in part stochastic. This uncertainty can be reduced with more refined classification, so that a balance must be struck between a larger number of more homogeneous classes, and a more parsimonious, but possibly less meaningful, classification (Doty and Glick, 1994; Hambrick, 1984; Miller, 1981). Thirdly, although all empirically derived clusters are associated together in hierarchies of similarity, an empiricist interpretation does not impose an *ex ante* requirement that cost and differentiation be high-level discriminators in that hierarchy. Finally, the empiricist interpretation does not anticipate a near-prohibition on mixed-emphasis designs, *ex ante*, but rather allows whatever common designs exist to emerge from the data.

This less restrictive interpretation of the dominant paradigm can be summarized as follows:

Proposition 1b: Most *competitive-strategy designs can be* meaningfully *allocated to a number of classes on criteria that include whether or not a design has some distinctive emphasis relative to competitors; whether that emphasis is towards cost- or differentiation-advantage; and the market scope adopted.*

The nominalist interpretation

In this view, generic competitive strategies are taken to represent ideal 'types,' and the 2 × 2 classification system of the dominant paradigm is interpreted as a general typology (Doty and Glick, 1994).

Correspondence between real designs and ideal types will be both imperfect and variable (Mayr, 1969; Rich, 1992), so that classifications will be neither fully homogeneous nor mutually exclusive (Table 1). Also, the nominalist interpretation does not require the four ideal types to be collectively exhaustive. To the contrary, and unlike all other interpretations of the dominant paradigm, the approach seeks only to describe a limited number

Table 1. Interpretations of the dominant paradigm

Interpretation:	Taxonomic	Empiricist	Nominalist	Dimensional
Hierarchically ordered descriptions?	Yes	No	Yes	No
Homogeneity of class members	Identical	Approximate	Variable	n/a
Mutually exclusive classification?	Yes	Approximate	Approximate	No
Mixed designs?	Very few	Yes	Very few	Yes
Collectively exhaustive?	Yes	Large proportion	No	Large proportion

of ideal types based on a few aspects of competitive-strategy design, selected for their importance to the paradigm's theory of performance.

The nominalist approach is hierarchical in that the limited number of characteristics chosen to describe ideal types are held to be fundamentally important to the design and performance of competitive strategies, and to be the basis on which to distinguish more richly described designs (Bakke, 1959; Rich, 1992; Porter, 1980: 40–41). All differentiation designs share the characteristic of pursuing a price premium; cost designs are oriented to economy as the path to profit. This essentialist distinction between ideal types is common to both the nominalist and taxonomic interpretations and means that both expect the number of mixed designs to be small (Doty and Glick, 1994).

The nominalist interpretation of the dominant paradigm is accordingly formalized as follows:

> *Proposition 1c: Competitive-strategy designs can be likened* to a greater or lesser extent *to one of two fundamentally different archetypes: one emphasizing advantage from costs, the other from differentiation, each with broad and focused market scope variants. Only a* very small number *of mixed-emphasis designs will exist.*

Generics interpreted as dimensions of competitive-strategy design

The fourth approach interprets the characteristics of market scope, cost-, and differentiation-emphasis as independent dimensions of a multivariate space encompassing most of the variation in competitive-strategy designs (Karnani, 1984; Miller and Dess, 1993). Distinctive features of this interpretation are summarized in Table 1.

Unlike all other interpretations of the dominant paradigm, the dimensional approach does not define classes of competitive-strategy designs, so that the question of class homogeneity does not arise. Rather, the approach is restricted to describing the space in which classes may be defined. The distinction is essentially that drawn between two of Pepper's 'world hypotheses': formism, which describes the world in categories; and mechanism, which describes the world in elements and the relationships between them (Pepper, 1942).

Because all designs are positioned relative to both cost- and differentiation-dimensions, the presence of one emphasis does not exclude the other, and unrestricted scope is allowed to mixed-emphasis designs (Miller and Dess, 1993; Parker and Helms, 1992). Even the extreme archetypal designs of cost- and differentiation-emphasis cannot be adequately described in their own terms alone, but must be positioned relative to both parameters: cost leaders must not lose touch with the competitive standards of differentiation, and vice versa. The descriptive parameters are expected to be independent of each other and without hierarchical rank.

This fourth interpretation of the paradigm's descriptive system can be stated as follows:

> *Proposition 1d:* Most *competitive-strategy designs can be* meaningfully *positioned in the three-dimensional space described by (i) relative emphasis on cost advantage; (ii) relative emphasis on differentiation advantage; and (iii) the market scope adopted.*

The paradigm's theory of performance

The fundamental theorem of the dominant paradigm is that above-average performance can only be achieved by adopting one of the four generic designs. Performance is defined as above-average rate of return (Porter, 1980: 35), sustained over a period of years (Porter, 1985: 11). This theorem is formalized in different ways, depending on the interpretation of the paradigm's descriptive system. The dimensional interpretation is primarily concerned with defining the space in which competitive strategy designs may be described. To support the paradigm's theoretical propositions, some classification of designs within this space is required, using one of the other approaches.

Taxonomic and empiricist approaches that attempt a comprehensive classification of all designs specify those classes with high-performance attributes:

> *Proposition 2a: Classes of competitive-strategy design will show above-average performance that are characterized by a distinctive emphasis, relative to competitors, on one of cost advantage, or differentiation advantage; and are either broad or focused in*

market scope. Only a small number of mixed-emphasis designs will show above-average performance. The class of designs that fail to achieve distinctive emphasis relative to competitors will record average or below-average performance.

The nominalist approach does not attempt comprehensive classification, but rather posits a small number of ideal types. Performance will improve as actual designs approximate these ideals:

Proposition 2b: The incidence of above-average performance will increase as competitive-strategy designs approach one of two fundamentally different archetypes: one emphasizing advantage from costs, the other from differentiation, each with broad and focused market-scope variants. Only a small number of mixed-emphasis designs will show above-average performance. As designs depart from these ideals and fail to achieve distinctive emphasis relative to competitors, they will record average or below-average performance.

As discussed above, measuring the distance between actual and ideal involves not only identifying distinctive emphasis in terms of one ideal, but also measuring proximity to competitors' standard in the other.

Both versions of the theory stem, as we have seen, from interpretations that emphasize the essentialist differences between strategies designed to support cost advantage and differentiation advantage. Failure to choose between them is theorized to violate their distinctive requirements and to lead, in turn, to lower performance.

In a similar way, failure to choose either a strategy adapted to a broad market scope, spanning many segments, or one that focuses on one or a few segments, is theorized to produce lower performance. An important aspect of this choice is that it defines the scope of competitors against which the firm seeks to be distinctive. Failure to define competitive scope results in poorly targeted designs and middling performance. The paradigm's theory of performance is thus U-shaped with respect to market scope, positing higher performance when designs are well adapted to either broad or focused target markets, and average or below-average performance for intermediate designs. The authors of the PIMS study pointed out that this U-shaped relationship with respect to market *scope* was not necessarily inconsistent with their clear result that performance improves with market *share*, because PIMS defines share relative to the firm's 'served market,' and this can be either broad or focused in Porter's terms (Buzzell and Gale, 1987: 85–86). For both Porter and PIMS, successful competitive strategies are likely to produce strong market share in the served market.

STUDY ONE: META-DIMENSIONS OF COMPETITIVE STRATEGY

This section describes the meta-analytic method developed for this study, and applies it to summarizing the dimensions of competitive strategy, as described in the empirical record.

Meta-analysis method

Meta-analysis is the term used to describe a structured, quantified analysis of a body of empirical literature on a theorized relationship. Relative to literatures in applied psychology and organization behavior from which meta-analysis emerged, use of these techniques has been slow to spread to management disciplines. Marketing has been an early adopter (Farley, Lehmann, and Sawyer, 1995), and there are a handful of meta-analyses on relationships of interest to strategic management, i.e., the effect of formal planning on performance (Schwenk and Shrader, 1993); the association between industry concentration and performance (Datta and Narayanan, 1989); the effect of mergers and acquisitions on shareholder wealth (Datta, Pinches, and Narayanan, 1992); and the influence of a number of proposed drivers on innovation (Damanpour, 1991).

Methods of meta-analysis

Several meta-analytic methodologies have been developed (see Raju, Pappas, and Williams, 1989, and Hunter and Schmidt, 1990: 468–489, for introductions to the main methods). A distinction can be drawn between those methods that seek to produce a consistent aggregation of the empirical evidence on a relationship, and those which further seek to draw inferences from these aggregations on the size and variance of relationship effects in a population. Among the most widely used methods, the meta-analysis introduced by Glass and colleagues (Glass, McGaw, and Smith, 1981) is of the first, descriptive, type (Hunter and Schmidt, 1990: 479); and that developed by Schmidt and Hunter (Hunter and Schmidt, 1990) is of the inferential type.

Inferential meta-analyses have become a powerful tool for reducing estimated variance in a parameter (Hunter and Schmidt, 1990: 485) and hence uncovering nonzero effect sizes which had formerly been hidden by type II errors in individual studies (Schmidt, 1992). However, the benefits of inferential meta-analysis are gained at the cost of stringent requirements for the consistency of data (see Hunter and Schmidt, 1990: 480–481), several of which are not met in the empirical literature on generic competitive strategy. First, it must be possible to interpret each study as a random sample from a population. Where one study reports more than one analysis on the same data (as in Hambrick, 1983; Galbraith and Schendel, 1983; and Douglas and Rhee, 1989), use of both analyses violates the independence assumption. Second, the studies must use the same variables in their specification of the relationship. Violation of this requirement is empirically important: failure to use identical model specification across studies has been found to represent the largest source of effect-size variance in meta-analyses in marketing (Farley *et al.*, 1995). Third, where regression coefficients (or factor coefficients) are to be used, cumulation into a meta-analysis requires that these be measured using exactly the same scales (Hunter and Schmidt, 1990: 203–204).

Noncomparability of scales and model specification across studies is an inevitable feature of the comparative novelty of studies into competitive strategy, and its research designs. As shown above, Porter's paradigm of generic competitive strategy has been cast in a number of different interpretations, and researchers have had good reason to expand the list of elements of competitive strategy they wish to include in their analysis, and have often devised their own scales for these constructs.

Furthermore, the polythetic nature of the concept of generic competitive strategy suggests research designs involving principal component analysis and cluster analysis. As with regression coefficients, scale noncomparability across studies makes the use of factor coefficients in a Schmidt–Hunter type meta-analysis problematic. More fundamentally, what is of interest in a meta-analysis of this literature is the cumulation of multivariate *patterns* of association between many elements of competitive strategy, and not one single effect size in a relationship. There are no established meta-analytics of the inferential type to deal with this situation.

A descriptive meta-analytic procedure for factor and cluster analysis

Although the barriers to an inferential meta-analysis appear insuperable at present, the methods developed for this study permit a descriptive meta-analysis of the empirical literature on competitive strategy. By constructing a consistent aggregation of the patterns of competitive strategy design, the full weight of the empirical record can be applied to assess the validity of the paradigm's descriptive and theoretical propositions. Hence a descriptive meta-analysis is sufficient for the purpose of establishing a dialogue between the dominant paradigm and the empirical record, and the further development of the paradigm. Also, the research questions posed by the paradigm attach greater importance to the existence or otherwise of multivariate patterns than to the degree of closeness in those patterns. The additional precision in estimation of effect sizes, which is an important advantage of inferential meta-analyses, is of secondary importance here.

The first step in building the required meta-analysis is to produce consistent aggregates of the principal component solutions that are used to summarize and describe competitive strategy. Studies use principal component factor analysis to represent many elements of competitive strategy with a smaller number of factors, each of which represents an orthogonally independent dimension of competitive-strategy design (Kim and Mueller, 1978). The estimated factor coefficients also identify those elements which are most closely associated with each dimension.

The primary aim of a meta-analysis over several such studies should be to identify dimensions which best describe the totality of orthogonal factor solutions in the empirical literature. It is natural to refer to these as meta-dimensions of competitive strategy. The procedure assumes the presence of an unknown number of these orthogonal dimensions in the population of all competitive strategy designs. Each study's factor solution is taken as a sample estimate of these population dimensions, and each study's estimate of the elements most closely associated with each factor is taken as a sample estimate of the elements most closely associated with a meta-dimension.

Because of the above-noted variability in constructs and measures, cumulation of factor scores across studies is not meaningful. What amounts to a voting procedure is used instead. Each vector of factor coefficients reported in a study is transformed to a vector of 'votes': elements which show significant nonzero coefficients on the factor are coded 1; others coded 0. Each vote vector is taken as a sample record that identifies those elements that are significantly associated with a meta-dimension of competitive strategy. Cluster analysis is then used to aggregate these multi-element vote vectors across studies into commonly occurring patterns. Each cluster of similar vote patterns, indicating which elements of competitive strategy are most often associated together with an orthogonal factor, are taken as the best aggregate description of a meta-dimension that can be derived from the empirical literature. Taken together, the set of clusters describe the number of orthogonal meta-dimensions of competitive strategy that have been isolated.

Finally, the incidence of 'votes' for each element clustered together in a meta-dimension is compared to its overall frequency, using as a metric the standard test statistic for differences in proportions. As is well known, the use of cluster analysis to create categories violates the assumptions required to use these statistics to draw inferences from the sample of studies to a population. As discussed below, other methods must be used to assess the validity of the cluster solution (Ketchen and Shook, 1996). The statistic is used here for the simpler purpose of focusing the description of each meta-dimension on those elements of competitive strategy that are most distinctive of that dimension in the available empirical record.

The method follows the same logic, in a multivariate context, as the statistically correct bivariate procedure of vote counting, in which the proportion of studies with significant effect sizes is compared to that expected under a null hypothesis of no relationship between the variables (Hunter and Schmidt, 1990: 473). As Hunter and Schmidt note, a majority of nonzero effects is typically not needed to reject the null hypothesis, and it is the use of the majority criterion that is responsible for the errors associated with vote counting as a meta-analytic procedure. The focus of vote counting on the existence, rather than the effect size, of relationships is a recognized limitation of the method in univariate meta-analyses, but is appropriate for the purpose of isolating patterns of relationships, as in this case between elements of competitive strategy.

One step in this procedure prohibits its use as an inferential meta-analysis, that is, the use of cluster analysis to aggregate vote vectors, and the consequent violation of the assumptions required to draw inferences to the population of all competitive strategies. Instead, the procedure produces a descriptive aggregation of the accumulated evidence on the independent dimensions of competitive strategy, as they have emerged in the empirical record to date. More universal claims must await more powerful procedures.

When assembling multiple studies into a meta-analysis, the question arises whether or not to weight each study by sample size. Monte Carlo simulations suggest that large samples are to be preferred for their lower exposure to artifactual variation (Koslowsky and Sagie, 1994). On the other hand, when a meta-analysis includes studies that follow a skewed distribution of sample sizes, with outliers of very large or small samples, Osburn and Callender (1992) recommend the use of unweighted results, and conclude that there is little to be gained from sample-size weighting in most meta-analyses. The empirical literature on competitive strategy is highly skewed towards sample sizes of less than 100, with a long tail reaching out to $n = 2578$ (see Table 2). Accordingly, this meta-analysis uses vote vectors unweighted for sample size.

Methods of clustering appropriate to this meta-analysis

Use of cluster analysis in strategic management research has been critically reviewed by Ketchen and Shook (1996). They conclude that the design of these analyses must be careful to match the analysis to the type of data involved, and to assess the reliability of results by 'triangulating' the results of several distinct clustering methodologies together. Following their advice, the distinctive demands placed on cluster analysis within the present meta-analytic methodology are now examined.

Since vote vectors involve binary data, the more familiar measures of similarity such as Euclidian and Mahalanobis distances are inappropriate. Of the binary measures of similarity, the Jaccard coefficient was selected because it includes only common occurrences of a pair and ignores common absences (Aldenderfer and Blashfield, 1984: 29). This is appropriate to the data because not all studies of competitive strategy include all elements, so that the absence of an element can be due to differences in study design rather than strategic behavior.

The ultimate choice of clustering algorithm should be guided by the clusters' shape in the *n*-dimensional space used to describe the data, and variation in cluster sizes (Aldenderfer and Blashfield, 1984: 59–62). It is therefore advisable to explore several methods as a means of enlightening the structure of the data (Aldenderfer and Blashfield, 1984: 45; Miller, 1981; Ketchen and Shook, 1996).

Judgments on the shape of clusters and choice of algorithm should also be guided by theory. The algorithm most often applied in the empirical literature on generic competitive strategy is hierarchical agglomeration, using Ward's method to link successive cases to the closest cluster. It is known that this algorithm produces, and is most appropriate to, clusters which are of approximately equal size and are uniformly spread over the various dimensions of analysis as hyperspheres. Such shapes cannot be ruled out *ex ante*, and hierarchical agglomeration is used as one approach to representing the data of this study.

However, this algorithm is inconsistent with the dominant paradigm's assertion that each design must emphasize a subset of strategies in which it will seek a distinctive advantage. Designs consistent with this assertion will form ellipsoids aligned to those dimensions of competitive strategy that are emphasized within the cluster. Attempts to represent such data using hierarchical agglomeration have led to some famous failures of cluster analysis in fields such as astronomy (Wishart, 1969). Also, there is no reason to expect designs to be equally popular, or clusters to be of equal size. There are thus reasons to prefer the density analysis algorithm (Wishart, 1969, 1987: 64), which is better suited to the identification of ellipsoidal clusters, and which also protects small, dimensionally focused, clusters from being merged with larger neighboring hyperspheres.

The study accordingly applied both these algorithms to the data, together with an iterative relocation algorithm which optimizes within-cluster similarities and between-cluster dissimilarities. Like hierarchical agglomeration, iterative relocation is most suited to representing clusters that form hyperspheres (Aldenderfer and Blashfield, 1989: 48). The CLUSTAN procedures HIERARCHY, DENSITY, and RELOCATION were used (Wishart, 1987). Hierarchical agglomeration used the average linking rule in place of the more familiar Ward's method on the grounds that it best preserves the structure of the data space (Aldenderfer and Blashfield, 1984: 45; Milligan, 1980). Density analysis estimated the density surrounding each case as the average of distances to its seven nearest neighbors, as recommended by Wishart (1987: 66) for this size of data set.

Data

This section discusses the measures of strategy used in the empirical record, assessing their comparability, and their ability to support the meta-analysis.

Selection of studies

A search of the ABI-Inform data base was conducted in late 1995, yielding 126 entries for 'competitive strategy' and 84 for 'generic strategy.' From these records, and subsequent references, 17 studies were identified that described competitive-strategy designs using principal component factor analysis and cluster analysis. With two exceptions (Miller and Friesen, 1986a; Wright *et al.*, 1991), elements of competitive strategy are first aggregated into a smaller number (*n*) of dimensions of strategic design using principal component factor analysis. Thirteen of the studies use cluster analysis to isolate common designs within that *n*-dimensional space. Ten studies also examined the performance of designs. Table 2 identifies which study applied each analysis.

It has been found that the selection of studies is the most important source of difference

Table 2. Empirical studies of the dominant paradigm

	Sample			Factors		Clusters	Performance measures			
Study		Sample size	Basis for rating strategies	No. of factors identified	Report factor S.D.	No. of clusters identified	Financial return	Growth	Period of years	Scale
Carter *et al.* (1994)	New ventures	2578	Internal	6		6				
Davis and Schul (1993)	Pulp & paper	180	Internal	6	Yes	3	v	v	5	Continuous
Dess and Davis (1984)	Paint industry	78	Internal	3	Yes	4	v	v	n/a	Interval
Douglas and Rhee (1989)	PIMS U.S. domestic	250	Competitors	7		6	v		n/a	Continuous
	PIMS European	187	Competitors	7		6	v		n/a	Continuous
Galbraith and Schendel (1983)	PIMS consumer products	?600	Competitors	6		6	v	v	5	Continuous
	PMS industrial products	?600	Competitors	6		4	v	v	5	Continuous
Green *et al.* (1993)	Portugese manufacturers	68	Internal	4						
Hambrick (1983)	PIMS industrial products	400	Competitors	17	Yes	10	v		4	Category
Kim and Lim (1988)	Korea electronics	54	Competitors	4	Yes	4	v	v	3	Continuous
Kotha *et al.* (1995)	SIC 34–39	177	Internal	6						
Miller (1992b)	Single-industry SME	45	Competitors	4	Yes	5				
Miller and Friesen (1986a, 1986b)	PIMS consumer durables	102	Competitors		Yes	10	v	v	n/a	Continuous
Morrison and Roth (1992)	Global competition	306	Internal	5		4	v	v	3	Interval
Nayyar, 1993	Product managers	496	Internal	3						
Parker and Helms (1992)	Declining industry	87	Internal	3	Yes					
Prince (1992)	Canadian construction	240	Competitors	7		4				
Robinson and Pearce (1988)	Various industries	97	Internal	4		5	v	v	5	Interval
Wright *et al.* (1991)	Screw machine products	56	Competitors		Yes	3	v	v	5	Continuous

between pairs of meta-analysis (Wanous, Sullivan, and Malinak, 1989). Here, both computer-assisted and manual methods were used to identify relevant studies, so that the only restriction was that a study be published before or during 1995. Three limitations for the meta-analysis follow. First, the analysis is open to any publication bias in favor of positive associations between elements of competitive strategy.

Second, the configurations of competitive strategy that emerge will be descriptive only of the kind of firms that have been studied to date. It can be seen from Table 2 that certain types of firm are likely to be overrepresented in the empirical record: manufacturing as against service sectors; and large enterprises. With the exception of Kim and Lim (1988), all studies are also of Western management practice, with imperfect validity in other cultures (Kotha, Dunbar, and Bird, 1995). There is a clear need to widen the range of contexts in which competitive strategy is studied.

The frequent use of the PIMS data base is evident, particularly for those studies that evaluate performance. Repeated sampling from the PIMS data base raises concerns that the meta-analysis will be subject to a common methods bias, producing greater convergent validity in associations between strategy elements than independent samples would display. The analysis is not as exposed to this bias as Table 2 suggests, where nearly half of the factors in the empirical record stem from PIMS data. For reasons discussed below, only 54 of the factors listed in Table 2 are used in the meta-analysis, and of these 17 (31%) derive from PIMS-based studies. These in turn have sampled different sections of the data base (consumer or industrial corporations; U.S. or European), and at different times, reducing the danger of spurious convergence. In only six cases (11% of the factors used) are factors based on samples drawn from the same data (Galbraith and Schendel's and Hambrick's 1983 studies of U.S. industrials), and here a consolidation of the results of these two studies is suggested. However, removal of either study made no difference to the resulting meta-analysis, and both are retained in the following report.

The period covered also limits the range of competitive behaviors to those which have been investigated so far. The consequences of this constraint are explored in the next section.

Measures of the elements of competitive strategy

The elements of competitive strategy that are used in the meta-analysis must be comparable across studies, but not necessarily identical. To maximize the use of the information in the empirical record, elements were included providing only that they appeared in a minimum of two studies—a bare minimum for clustering purposes. Aspects of the selection of variables are of concern to both meta-analysis and cluster analysis methodologies, and are discussed in turn.

Given the ability of cluster analysis to extract groups of similar attributes regardless of any rationale for the grouping (Ketchen and Shook, 1996), it is advisable to begin with variables that have a theoretical association with competitive strategy. Table 3 shows the variables that have been isolated from the empirical record as the basis for this meta-analysis. All of these elements have been cited as contributing to competitive strategy, whether in Porter's work, or in the PIMS program (Buzzell and Gale, 1987). Current interpretations of several of these elements would now distinguish them as elements of the firm's resource portfolio, rather than its strategies. Skilled workforce, modern plant, reputation, and channel influence are variables of this kind. Their use here may be justified as proxies for the strategies used to create each resource: strategies of acquisition and investment in human, physical, reputational, and relational assets.

Another concern is the use of only those elements associated with the small number of factors which each study has isolated from its data. Factors with low eigenvalues that have been discarded take with them information which is therefore lost to this analysis—information which might influence the grouping of strategy elements into clusters. To assess the magnitude of this loss, the proportion of variance in each element that is explained by factors was averaged over the studies in which the element appears. This ranges from 0.4 for 'skilled workforce' and 'refining existing products' to 0.66 for 'low prices,' with a mean over all elements of 0.53. The common dimensions of strategic design represented by these factor solutions thus leave nearly one-half of the variance in strategic elements unexplained. Interpretations of the dominant paradigm that seek powerful common descriptors of strategic design are weakened by this result: particularly the taxonomic approach (Proposition 1a); but also the empiricist and dimensional approaches (Propositions 1b and 1d).

Meta-analysis is similarly concerned with the selection of variables (Wanous *et al.*, 1989; Bullock and Svyantek, 1985). As already noted, differing model specifications have been found to make the largest contribution to interstudy variance in effect sizes (Farley *et al.*, 1995). As a new field of investigation, it is likely that an important limitation of this meta-analysis is its restriction to variables used in the published record as of 1995. It can be seen from Table 3 that the elements available offer a good coverage of strategies in the domain of marketing, operations, products, and market scope. However, the meta-analysis must omit many important strategies which are explored, and which achieve significance, in one study only: capacity utilization (Morrison and Roth, 1992); economies of scale (Kim and Lim, 1988); receivables management (Hambrick, 1983); backward integration (Galbraith and Schendel, 1983); and patents (Miller, 1992b). These omissions are particularly evident in the domains of technology strategy and cost-emphasis strategies. The latter play a central part in the dominant paradigm, and have evidently not been studied to the degree appropriate, or possible (Amit, 1986; Fisher, Westney, and Gupta, 1994).

It has also been suggested that the scope of competitive behaviors explored in the empirical record is too narrow (Miller, 1992a). Strategies that have received little attention to date include information management (Doll, 1989; Pyburn, 1991); logistics (Christopher, 1993); and speed to market (Dess and Rasheed, 1992; Blackburn, 1990; Stalk, 1989; Stonich, 1990). Of particular importance to the paradigm's descriptive system is the very limited attention given to organizational aspects of competitive-strategy design. As discussed above, organizational constraints are the principal reason for expecting cost- and differentiation-emphasis designs to be mutually exclusive. The omission is particularly important given the considerable evidence that organizational arrangements mediate and enhance the relationship between strategy and performance (Davis and Schul, 1993; Govindarajan and Fisher, 1990; Powell, 1992, 1993; Gupta, 1987; Miller, 1986, 1987, 1988; White, 1986; Treacy and Wiersema, 1995).

Another judgment call of a meta-analysis is the extent to which variables that are given different names in studies are treated as identical (Wanous *et al.*, 1989). In the empirical literature

Table 3. Proportional frequency of strategy elements within meta-dimensions of competitive strategy

Elements of competitive strategy: (relative emphasis on)	Meta-dimensions of competitive strategy					
	Marketing	Sales	Quality reputation	Product innovation	Operations	Market scope
1: advertising	0.70**	0.83**		0.09		
2: brand identification	0.70**					
3: channel influence	0.80**					
4: marketing innovation	0.60**				0.11	
5: promotion		1.00**		0.09	0.11	
6: sales force		1.00**				
7: reputation	0.10		0.42*	0.09	0.22	
8: high prices	0.10		0.25	0.82**		
9: new products	0.20			0.45**		
10: refine products				0.18	0.22	
11: specialty products			0.08	0.73**		
12: product quality	0.10		0.83**		0.11	
13: quality control			0.08	0.09	0.33*	
14: service quality	0.20		1.00**			
15: procurement			0.08	0.09	0.44**	
16: skilled workforce	0.10		0.25		0.56*	
17: manufacturing innovation			0.08		0.56**	
18: operating efficiency					0.78**	
19: unit cost reduction				0.09	0.22*	
20: modern plant					0.33**	
21: product breadth	0.10					1.00**
22: customer breadth						1.00**
8a: low prices	0.10				0.11	

**Significant at 0.01 level
*Significant at 0.05 level

on competitive strategy, there is a large degree of consistency in variables across studies because many studies have used the PIMS data base (see Table 2), and many others have used the set of strategy elements developed by Dess and Davis (1984), which are themselves closely comparable to the PIMS measures. Beyond these identical elements, some closely related keywords were also grouped together: 'image' with 'reputation;' 'customized products' with 'specialty products;' 'customer service' with 'service quality;' 'raw materials' and 'relations with suppliers' with 'procurement.' The element 'skilled workforce' brings together a number of keywords associated with quality human resources: 'high caliber,' 'trained,' 'experienced,' 'skilled.' Also included here are elements used in one study to describe management quality (Prince, 1992).

The 17 studies use two distinct bases of rating in measuring the importance of each element to a respondent's competitive strategy, as shown in Table 2. One rates emphasis on each element of strategy relative to competitors (the PIMS approach); the second relative to other elements of the firm's strategy. Only the first is consistent with the descriptive and performance-theoretic propositions of the dominant paradigm. The second could be quite a poor proxy in that an emphasis on some element of competitive strategy that is distinctive for a firm may be well short of distinguishing the firm from its competitors. Use of this proxy might therefore be expected to lead to an overstatement of distinctive-emphasis designs, with a consequential understatement of no-distinctive-emphasis designs, relative to classifications using the more appropriate comparison with competitors. As reported below in Study Two, this bias was not evident in the data.

Significance criterion for vote vectors

In contrast to other meta-analysis procedures where coding has been found to be a source of error (Wanous *et al.*, 1989; Bullock and Svyantek, 1985), the coding of variables into vote vectors was straightforward. Studies use different criteria for significance, however, the most conservative requiring a minimum factor matrix coefficient of 0.5, as used by Carter *et al.* (1994), Dess and Davis (1984), and Green *et al.* (1993). For consistency, the most conservative criterion is applied uniformly to all studies. The result of this conservatism is that the meta-analysis acknowledges a relatively sparse degree of interconnectedness in meta-dimensions of competitive strategy.

The empirical record contains 54 factors with a minimum of two loadings of 0.5 or higher on the 23 common elements shown in Table 3. Thus there are 54 samples from which to estimate an unknown number of population dimensions of competitive strategy design.

Results

The three clustering algorithms produced nearly identical results. Of the 54 cases classified in a six-cluster solution, 53 (98%) were given the same classification by each algorithm. This high agreement indicated high levels of reliability in the meta-analytic descriptions of dimensions of competitive strategy (Ketchen and Shook, 1996). The iterative relocation solution was chosen because it optimizes the closeness of association within clusters. Further, the close agreement between methods strongly suggests that this optimum is a global one.

The six-cluster solution was preferred because it provided a 'clean' separation of elements: with one exception, elements are associated with one cluster only. This is desirable since the clusters are to represent meta-dimensions that are orthogonal to each other. The exception was advertising strategy, which is associated with both marketing and sales dimensions, and leads to the merger of these dimensions in the five-cluster solution. The six-cluster solution is nevertheless preferred because of the clear distinction between marketing and sales on all other elements.

Table 3 shows the proportional frequency of elements within each cluster in the iterative relocation six-cluster solution. The significance levels of differences between this and the element's overall frequency is used to focus on those elements of strategy which are most distinctive of each meta-dimension in the empirical record. Two elements which do not display distinctive associations are discarded at this stage: refine products (10), and low prices (8a).

The marketing dimension is distinguished from sales by the long-term nature of the relational assets targeted by these strategies: influence in the channel, and consumer brand loyalty. The association of marketing innovation with this dimension suggests that such assets require sustained attention to retain their value.

Quality is identified as a distinct dimension of competitive strategy, independent of operations strategy (and quality control), and involves attention to both product and service quality. The association of quality control with operations strategy and not the quality meta-dimension was unexpected. It suggests that quality control is mostly perceived as a component of internal operating processes, and that these can vary independently of a customer's perception of the quality of product or service.

The association of a firm's reputation with the quality dimension replicates an association found in the PIMS study (Buzzell and Gale, 1987). The link indicates the importance of quality for creating and sustaining one of the firm's most distinctive competitive assets (Kay, 1994) and a source of long-term competitive advantage.

The strategy of high pricing is shown to be associated most strongly with product innovation, although there is some association with quality also, consistent with the findings of the PIMS study. Market scope, which embraces breadth in both product lines and consumer segments, is clearly independent of other dimensions of competitive strategy. The strategic decision to be active in a broad range of the market is shown to be invariably associated with a broad product range. Products within the range do not, however, have to be distinguished from those of competitors. Specialist products are associated instead with the meta-dimension of product innovation.

The meta-dimensions are broadly similar to the descriptive system proposed by Mintzberg, albeit with some differences (Mintzberg, 1988). Mintzberg's generics of quality, product design, marketing image, and low price/low cost, correspond to the meta-dimensions of quality reputation, product innovation, marketing, and operations. The differences are, first, that the meta-analysis isolates a distinct dimension of sales strategy, independent of marketing. The meta-analysis also suggests that marketing leadership involves not only the management of image (as suggested by Mintzberg) through branding and advertising, but also the building of channel power. Thirdly, the meta-analysis does not find a dimension analogous to Mintzberg's 'support' generic. Instead, the broad product scope that is one characteristic of 'support' is found to be closely associated with a broad range of customer segments in the single dimension of market scope. Accepting these differences, the meta-analysis suggests that the empirical record has more in common with Mintzberg's more elaborate descriptive system than that of the dominant paradigm.

The accumulated evidence of the empirical record suggests that the use of Porter's three dimensions of cost emphasis, differentiation emphasis and market scope to define the space of competitive strategy is insufficient to meaningfully describe the range of competitive strategy designs. The dimensional interpretation of the dominant paradigm, formalized in Proposition 1d, is not supported. Instead, the record suggests that adequate descriptions of competitive strategy require attention to each of six independent meta-dimensions. Within this descriptive system, the distinction between types of differentiation is as important as the distinction between any one of them and operations-cost leadership.

Nominalist and taxonomic interpretations can accommodate this variety while continuing to assert that cost and differentiation act as high-level discriminators of competitive strategy designs. These claims are assessed in Study Two.

STUDY TWO: META-DESIGNS OF COMPETITIVE STRATEGY

Description and classification of competitive-strategy designs: The nominalist interpretation

The meta-dimensions isolated in Study One provide a common language with which to describe competitive strategy designs. Study Two uses these constructs to produce consistent descriptions of the designs found in the empirical record. Because of differences in their interpretation of the dominant paradigm, descriptions sought by the nominalist approach are developed first; those of the taxonomic and empiricist approaches, in the next section.

Thirteen studies use cluster analysis to produce descriptions of competitive strategy designs. Eleven of these use factor scores as the input to clustering, and two form clusters directly from elements of competitive strategy (Miller and Friesen, 1986a; Wright *et al.*, 1991). A total of 80 clusters is reported (Table 2).

Studies report the differences between clusters in a table of J rows by K columns, showing for each of the factors isolated in the study f_j ($j = 1, \ldots, J$), and for each cluster c_k ($k = 1, \ldots, K$), the average factor score for respondents included in that cluster, C_{jk}. When clusters are formed directly from I elements of competitive strategy, e_i ($i = 1, \ldots, I$), the table reports the average element score for respondents, C_{ik}.

Neither the units of measurement of C_{jk} or C_{ik}, nor the factors, nor the clusters are directly comparable across studies. To proceed, the meta-analysis must define variables and units of measurement that are common to all.

Variables

As for Study One, the closest comparability between studies is in the individual elements of competitive strategy, 21 of which can now be used to describe each design in terms of one or more of the six meta-dimensions of competitive strategy.

Two of the 13 studies report the required element scores, C_{ik}, directly. For the remainder, cluster descriptions must be restated from factor scores, C_{jk}, to elements. This was done by taking the relative score of a factor over K clusters, C_{jk} ($k = 1, \ldots, K$), to index the relative score of each of its constituent elements. In the few cases of conflict, e.g., where a factor includes elements that are associated with two different meta-dimensions, the conflict was resolved in favor of the element with the highest factor loading.

These consistent descriptions are gained, however, at the cost of descriptive coverage: of the 91 factors used by studies to describe clusters, only 59 (65%) are associated with common meta-dimensions. The taxonomic interpretation of the dominant paradigm, which seeks comprehensive description and classification of competitive strategy designs, is again weakened by this limited coverage.

Units of measurement

For the purposes of the dominant paradigm, the relevant characteristic of a competitive strategy design is its success in achieving distinctive emphasis on some aspects of strategy relative to competitors' designs. This is operationalized as the maximum over K clusters in a study of element scores C_{ik}, or their associated factor scores C_{jk}. Distinctive emphasis on an element is coded 1, otherwise 0. Elements 1–12 and 14 (Table 3) define the differentiation archetype, and elements 13 and 15–20 define cost emphasis from operations strategies.

But Hambrick and others widen the definition of cost emphasis to include clusters with distinctively low emphasis on strategies leading to differentiation advantage (Hambrick, 1983), reflecting Porter's view that 'differentiation is usually costly' (Porter, 1985: 18). To operationalize this definition, elements associated with differentiation were represented with two variables, one each for distinctively high and low emphasis. These are listed in Table 5. Distinctively low emphasis on an element of competitive strategy is measured as the minimum over K clusters of element scores C_{ik}, or equivalent factor scores C_{jk}.

These additional dimensions of cost advantage are an attempt to capture the full scope of that concept in Porter's account. However, it is open to question whether distinctively low emphasis on, for example, marketing strategies can always be equated with a focused effort to specify and eradicate unnecessary marketing cost. Hence, these measures seem likely to overstate the extent of cost-emphasis strategies among responding firms, and consequently understate the number of no-distinctive-emphasis, stuck-in-the-middle, designs.

Finally, each of the two elements of strategy design that describe market scope are also operationalized as two variables: one to describe distinctive breadth (elements 21 and 22), the other to describe distinctive market focus (elements 21a and 22a). A complete description of the distinctive features of a cluster, relative to others in a study, is then produced as a vector of binary values over all 35 variables shown in Table 5, showing 1 for those elements in which the cluster displays distinctively high or low emphasis, otherwise 0.

Classification

The nominalist interpretation of the dominant paradigm requires that the 80 clusters of the empirical record be allocated to one of four categories: the two 'ideal' types of distinctive cost- and differentiation-emphasis; a category of mixed-emphasis designs, which is expected to be small in number; and a category of nonideal designs that do not achieve distinctive emphasis of either type (stuck-in-the-middle). The classifications resulting from the above descriptions are summarized in Table 4. Of the 80 clusters, 34 show one form or other of cost emphasis, and 26 show some form of differentiation emphasis. As noted, the number of designs classified as cost emphasis seems likely to be an overstatement, and the number of no-emphasis designs understated.

While it is thus possible to aggregate the various forms of cost- and differentiation-emphasis together, consistent with Proposition 1c, the validity of this aggregation across independent dimensions of competitive-strategy design is now open to question. The nominalist interpretation of the dominant paradigm nevertheless insists that the two archetypes are the fundamental basis on which all distinctive designs are constructed. Results of the following analysis shed further light on this view. Also, relative to other interpretations, the nominalist view is less concerned with descriptive accuracy and most concerned with the performance consequences of departures from the normative ideal. The nominalist interpretation must therefore be assessed primarily on its predictive validity. This is reported in Study Three.

As predicted by Proposition 1c, the number of mixed-emphasis designs is small, representing 11 percent of the total. Distinctive emphasis on market scope is also rare, and most designs (62 of 80) are neither clearly broad nor narrow in scope.

Concern that the different bases of rating strategic emphasis in these studies (internal or relative to competitors) might lead to biases in the description of competitive-strategy designs proved to be unfounded. A chi-squared test of the incidence of single-, mixed- and no-emphasis designs in the two types of measure showed no significant difference between them.

Table 4. Summary descriptions of clusters of competitive strategy

Meta-dimensions*	Cost emphasis (economy in/from)	Differentiation emphasis
Sales	10	8
Marketing	8	7
Product innovation	20	19
Quality reputation	15	15
Operations	13	–
Market scope	Broad	Narrow
	9	9
Archetypes	Totals	
Cost emphasis	34	
Differentiation emphasis	26	
Mixed emphasis	9	
No emphasis	11	
	80	

*Entries in this part of the table do not sum to totals below due to multiple entries.

Meta-designs of competitive strategy: Taxonomic and empiricist interpretations

The empiricist and taxonomic interpretations of the dominant paradigm seek to identify commonly occurring, or generic, classes of competitive-strategy design. Consistent description of all clusters in the empirical literature permits a search for these meta-designs.

Method

Cluster analysis was used to identify the most common patterns in the binary vectors that describe the distinctive features of each cluster, using the same procedures as those used in Study One. These meta-analytic estimates, which best summarize the cluster solutions of the empirical record, are naturally referred to as meta-designs of competitive strategy.

Of the 80 clusters, only 63 show distinctive emphasis on two or more of the 35 variables used to describe them, a bare minimum for the polythetic gestalts that are expected to describe generic designs. In the density analysis clustering, a range of k-means was explored because the number of modal clusters formed proved to be very sensitive to this parameter. Values greater than 4 produced a single-cluster solution; $k=2$ produced 16 modal clusters. The preferred solution of 6 modal clusters was produced at $k=3$. This number of clusters suited the summative objectives of a meta-analysis, but still produced clusters that were distinct from each other and interpretable in terms of the meta-dimensions of competitive strategy.

Results

The six modal clusters produced by density analysis are reported in Table 5. The table shows the proportional frequency of elements within each cluster, and the result of significance tests of differences between this and the element's overall frequency. As before, these are used as an indicator of those features of each design which most distinguish it from others in the empirical record.

Table 5. Proportional frequency of strategy elements within meta-designs of competitive strategy

	Meta-designs of competitive strategy					
Elements of competitive strategy:	D1 Innovation and ops leadership $n = 10$	D2 Cost economy $n = 26$	D3 Focused quality economy $n = 7$	D4 Sales leadership $n = 5$	D5 Broad quality and sales leadership $n = 10$	D6 Focused quality leadership $n = 5$
Emphasis on:						
1: advertising	0.10	0.12		0.80**	0.30	
2: brand identification		0.08		0.20		
3: channel influence		0.19				
4: marketing innovation		0.12		0.20		
5: promotion				0.80**	0.40**	
6: sales force				0.80**	0.40**	
7: reputation	0.20	0.12			0.30	0.40
8: high prices	0.80**	0.04			0.30	0.80**
9: new products	0.80**	0.04		0.60*	0.10	
11: specialty products	0.60**	0.04			0.10	
12: product quality	0.10	0.08			0.40*	1.00**
13: quality control	0.10	0.04				
14: service quality	0.10	0.12			0.50**	1.00**
15: procurement	0.10	0.04				
16: skilled workforce	0.20	0.08				0.20
17: manufacturing innovation	0.20*	0.08				
18: operating efficiency	0.20**					
19: unit cost reduction	0.10	0.04				
20: modern plant	0.10	0.08	0.14			
21: product breadth	0.10		0.14		0.60**	
22: customer breadth		0.04		0.14	0.70**	
Economies in/from:						
1a: advertising		0.31*	0.14		0.20	
2a: brand identification		0.08				
3a: channel influence	0.10	0.19				
4a: marketing innovation	0.10	0.08				
5a: promotion		0.23	0.14		0.20	0.20
6a: sales force		0.19	0.14		0.20	0.20
7a: reputation		0.23	0.14		0.10	
8a: low prices	0.10	0.42*	0.57*			
9a: new products		0.35**			0.10	
11a: specialty products		0.19			0.20	
12a: product quality		0.15	0.72**		0.20	
14a: service quality		0.23	0.71**		0.10	
21a: product focus			0.71**	0.20*	0.10	0.20*
22a: customer focus		0.04	0.71**	0.20	0.10	0.40**

**Significant at 0.01
*Significant at 0.05

In this analysis, the three clustering algorithms produced substantially different solutions. A cross-tabulation of the meta-designs derived by density analysis and hierarchical agglomeration showed only 25 of the 63 designs (40%) were placed in equivalent clusters by the two methods. A choice between these two clusterings is not clear cut. Hierarchical agglomeration isolates a marketing- and operations-leadership cluster which the density algorithm subsumes within the cluster of cost-economy designs (D2), due to a single shared characteristic of distinctively low prices. The failure of the density algorithm to distinguish this from archetypal cost-economy designs is an important shortcoming.

In other respects, however, the density solution is to be preferred. As discussed in Study One, it is better suited to the ellipsoidal, dimensionally focused shapes which theory predicts that competitive strategy designs will take; and it is capable of isolating locally dense swarms of very similar designs from surrounding and more diffuse clusters. Hence a large agglomeration of quality and innovation leadership designs produced by hierarchical agglomeration is partitioned in the density solution into distinct innovation (D1) and quality-leadership designs, the latter in turn differentiated into broad and focused variants (D5 and D6) which have no parallel in the average-linkage solution. The density solution was accordingly chosen as the best representation of the empirical record.[1] Its major limitation of confusing a marketing- and operations-leadership design with cost economy is compensated for in Study Three.

Two cost-economy meta-designs are isolated, both associated with low prices, as Mintzberg (1988) suggests. A very large cluster, 'cost economy' (D2) is most distinguished by its low emphasis on advertising and product innovation, but also with economies in a broad range of other sources of differentiation (elements 3a, 5a–14a). The 'focused-economy' meta-design (D3) is distinctive for low emphasis on the quality meta-dimension. In addition to the low prices that it shares with the more broadly defined 'cost economy', it appears that the design also involves the further competitive protection of a limited market scope.

[1]A tabulation of the average-linkage solution is available from the author.

Neither of these cost-economy meta-designs is associated with operations leadership, as both nominalist and taxonomic interpretations might lead us to expect. Operations leadership is instead associated most strongly with leadership in product innovation (D1). This meta-design is the only example of a mixed-emphasis design produced by the density algorithm; although it should be recalled that a marketing- and operations-leadership cluster (involving six cases) was also isolated by hierarchical agglomeration. The 10 cases included in D1 represent 16 percent of the 63 designs included in the analysis (rising to 25% if the other six-case mixed design is added), consistent with the expectations of both nominalist and taxonomic interpretations that the frequency of mixed designs will be low.

The remaining three modal clusters involve distinctive emphasis on a source of differentiation advantage. 'Broad quality and sales leadership' (D5) displays distinctive emphasis on the quality and sales dimensions of competitive strategy, and is the only design to apply its strengths to a distinctively broad market scope. Distinguished from this design are two small clusters, each displaying distinctive emphasis on just one of these two dimensions: 'sales leadership' (D4), and 'focused quality' (D6). Both also show some evidence of being associated with focused-market strategies, in contrast to the broad scope of the larger cluster.

'Focused quality' (D6), and 'innovation- and operations-leadership' (D1), are the only two designs in the empirical record to support distinctively high prices. The ability of quality to support a price premium has been found in the PIMS study (Buzzell and Gale, 1987: 110), and the importance of commanding a premium for innovative products in order to maintain high levels of internal reinvestment has been a feature of the strategies of firms such as Hewlett-Packard, Intel, and others.

Figure 2 shows the dendogram of the density solution's final five cluster fusions. These expose the hierarchy of associations between the six meta-designs. With the exception of 'focus quality leadership,' it is evident that the hierarchy of associations assembled in this meta-analysis is consistent with that predicted by the taxonomic interpretation and Proposition 1a's hierarchical classification rules (compare Figure 2 with Figure 1). The behavior also supports the nomi-

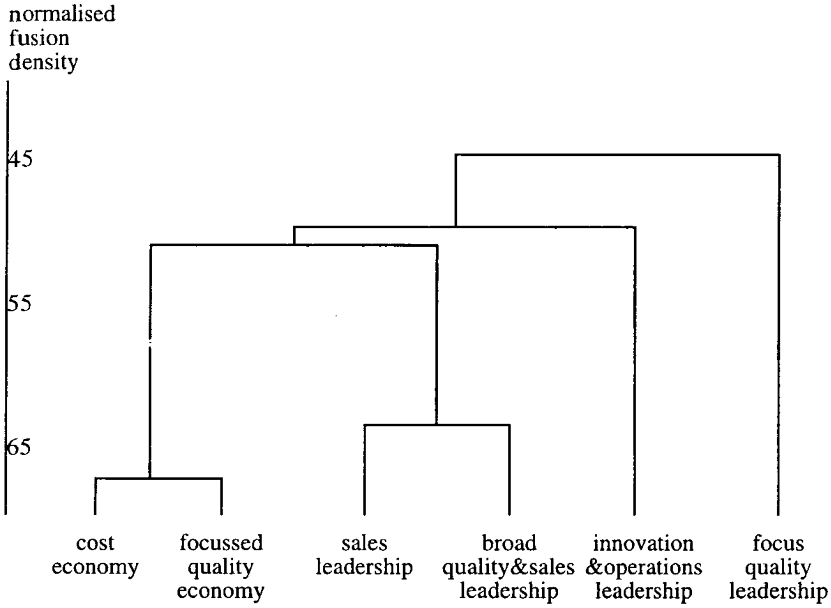

Figure 2. Hierarchical classification of metadesigns

nalist view that cost and differentiation are fundamental, high-level discriminators between competitive strategy designs. Cost-economy designs cluster together, as do differentiation designs, before either type is combined with the other, or with the mixed design of 'innovation- and operations-leadership.'

The reason why 'focused quality leadership' is excepted from this hierarchy is that it is a very homogeneous and dense cluster. Density analysis protects the distinct identity of this cluster until all of the other, more diffuse, clusters have been joined. In other respects, as Table 5 shows, the cluster is most similar to the two differentiation-based designs, D4 and D5.

The empirical record is thus consistent with both of the essential features of the nominalist interpretation: the frequency of mixed designs is relatively low; and cost and differentiation do act as high-level discriminators of competitive strategy designs. Proposition 1c is supported.

The same two features also characterize the taxonomic interpretation. In other respects, however, the requirements of a taxonomic interpretation are not met. As Table 5 shows, no design displays features which are universally distinctive of their members and uniquely distinguishing of the cluster (i.e., elements common to 100% of a cluster but with no incidence elsewhere). The allocation of individual designs to meta-design classes is thus stochastic rather than deterministic. The limited coverage of the population of competitive strategies that is possible with these meta-designs, as discussed above, also fails to support the universal ambitions of the taxonomic approach. Proposition 1a is not supported.

This study's success in deriving meta-designs that display distinctive strategic emphasis, and embrace all of the clusters isolated in the empirical literature to date, is, however, consistent with the less restrictive requirements of the empiricist interpretation. Proposition 1b is supported.

STUDY THREE: PERFORMANCE OF GENERIC COMPETITIVE STRATEGIES

The dominant paradigm's central theorem proposes an association between competitive-strategy designs and financial performance, the latter classified into above average and average-or-less. The empirical literature has also explored the effect on growth performance. The empirical tests have invariably taken the form of a simple model linking competitive strategy designs to performance, with no mediating variables or contingencies built into the model specification. In part this has been due to the limited degrees of freedom available to each study, and in part to the limited articulation of these effects into the dominant paradigm's theory of performance. The empirical record thus offers only a first step towards testing the paradigm's theory, in a partial model where the direct effects of interest to theory may be swamped by indirect effects operating through associations between strategy and other variables affecting performance.

Method

The effect of competitive strategy design on the relative odds of a grouping of designs being in the above-average category, as against average-or-less, was estimated by logistic regression (Agresti, 1990) using various definitions of design as regressors. The choice of regressors was varied to represent the different interpretations of the paradigm. The use of these more powerful techniques of categorical data analysis, permitting more precise modeling of the propositions of the dominant paradigm, is one of the advances over individual studies made possible by meta-analysis.

The nominalist interpretation, which seeks to describe individual competitive strategy designs in terms of proximity to an ideal, was operationalized by the fourfold archetype classification described in Study Two (Table 4). The nominalist interpretation further requires a measure of how close to cost standard are differentiation-emphasis designs, and vice versa. Considerable effort was spent in devising a measure of competitive proximity from the empirical record; but this variable proved to be highly collinear with archetype classification, and had to be omitted. The logistic regression was designed to evaluate the log-odds of performance of single- and mixed-emphasis categories relative to the no-emphasis category. Proposition 2b requires both coefficients to be positive.

Performance models for the taxonomic and empiricist interpretations (Proposition 2a) are framed in terms of generic classifications. Regressors for these models were the six meta-designs of competitive strategy that emerged from Study 2 (Table 5). Because the cost-economy meta-design has been found to confuse within it a cluster of marketing-and-operations-leadership designs, these were isolated as a seventh meta-design in a separate estimation of the model. The logistic regression was again designed to evaluate the log-odds of performance of these meta-designs relative to clusters with no distinctive strategic emphasis. Proposition 2a requires each of these coefficients to be positive.

Data

Ten of the 17 studies investigate performance differences between the clusters they identify. The measures used are the average over a period of years in financial return, and in sales growth. Both measures are used in this meta-analysis. Table 2 identifies which studies assess the performance of generics, and which measure is used. Of the 80 clusters isolated in the empirical record, 65 include a measure of financial performance, and 43 a measure of growth performance. For reasons explained in Study Two, not all of these could be included in the analysis of meta-designs, and these regressions were based on 61 and 33 cases respectively. Although a variety of scales are used, all are capable of identifying above-average performance, which is all that is required for the performance propositions of the dominant paradigm.

The measures are subject to the well-known limitations of accounting measures of performance. Also, performance is typically self-assessed. Several studies attempt to assess the accuracy of these assessments from public sources and find correlations ranging up from 0.4 (Morrison and Roth, 1992; Robinson and Pearce, 1988). At the lower end, therefore, these measures are of marginal value, explaining less than 20 percent of the variance in true performance. Third, the period of years covered by performance data, which is typically 5 years, is towards the low end of what would be regarded an acceptable period for measurement of long-run sustained performance. Studies using a 3-year period offer a less reliable estimate. All of these limitations mean that the results of this analysis must be treated with some caution. The models nevertheless assemble all of the evidence that has been accumulated so far on the explanatory power of the dominant paradigm. They can claim, on this basis, to offer the best test of this theory to date.

The measure of sales growth is subject to further reservations, on grounds of both measurement consistency and theoretical validity. Some studies standardize for industry growth and record growth in market share; others use unstandardized sales growth. Growth performance is therefore subject to an important inconsistency between studies. Equivalent standardizations for industry profitability are not made, however.

Also open to question is the validity of using growth measures in place of the financial returns specified by the theory. Profits, and the competitive balance between cost and price premiums, are central to the paradigm. Hence there are theoretical as well as measurement reasons for this meta-analysis to prefer financial return over growth as a measure of performance.

Results

Effects on performance of meta-designs

Table 6 shows the results of logistic regressions of meta-designs on financial and growth performance. Two specifications are reported for each performance measure: one using the no-emphasis design as the basis of comparison; the other using average performance over all meta-designs. In models of growth performance, some categories were omitted due to small membership size.

By Proposition 2a, both empiricist and taxonomic interpretations require a positive coefficient in the logistic regressions reported in the left-hand column of Table 6. As can be seen, only two metadesigns show this effect on financial performance: innovation and operations leadership (D1), and broad quality and sales leadership (D5). For growth performance, only the latter shows the expected effect. In no case are the odds of above-average performance significantly positive.

Several meta-designs record negative coefficients, exactly contrary to theory; although in only one case is the coefficient significant, at the 0.1 level. In the case of cost economy, some part of this result may be attributed to inadequate measurement in the empirical record, as discussed above. But this concern does not apply to the other metadesigns which also produce lower odds of above-average performance.

In Study Two it was found that the metadesigns produced by density analysis confused a subset of marketing- and operations-leadership designs with the cost economy metadesign. The logistic regressions reported in Table 6 were accordingly rerun with this subset identified as a separate category.[2] The category showed positive, but not significant, coefficients for both financial and growth performance, relative to the no-distinctive-emphasis design. The residual cost-economy category showed larger negative coefficients than reported in Table 9, for both measures of performance, both of which were significant at the 0.05 level.

Overall, the models have very limited explanatory power: chi-square tests show no significant improvement in log-likelihood due to the model, and only two-thirds of each model's classifications are made correctly. Proposition 2a is not supported. An alternative interpretation would be that the poor predictive performance of these models is evidence of poor criterion validity in these meta-designs (Ketchen and Shook, 1996), particularly in view of doubts about the reliability of classifications derived using different clustering methods. However, the next section of the paper reports essentially the same result using classifications of competitive strategy design which circumvent the process of clustering designs. The inability of the empirical record to display the behavior predicted by the dominant paradigm does not appear to be an artifact of this particular clustering solution.

Instead the empirical record suggests that the odds of the no-emphasis design producing above-average financial and growth performance are close to the average for all designs (as reported in the right-hand columns of Table 6). Only one meta-design, innovation and operations leadership, shows significantly higher-than-average odds of superior financial performance, at the 0.1 level. With that exception, the analysis suggests that any competitive strategy design is as capable as any other of producing above-average performance. Importantly, the conclusion applies equally to no-distinctive-emphasis designs.

Effects on performance: Archetypes

Table 7 reports a model of the essential feature of the nominalist interpretation of competitive performance: that single-emphasis designs, and a

[2]Full results are available from the author.

Table 6. Performance differences among meta-designs

Dependent variable: Basis category:	Financial return ($n = 61$) No distinctive emphasis		Financial return ($n = 61$) Average of all designs	
	Regression coefficient	Significance	Regression coefficient	Significance
D1 Innovation and ops leadership	1.25	0.118	1.23	0.099
D2 Cost economy	–0.76	0.096	–0.77	0.086
D3 Focused quality economy	–0.41	0.657	–0.44	0.602
D4 Sales leadership	–1.10	0.341	–1.15	0.250
D5 Broad quality and sales leadership	0.69	0.327	0.67	0.314
D6 Focused quality leadership	0.00	1.000	–0.04	0.966
No distinctive emphasis	–	–	0.05	–
–2 log-likelihood	76.38	0.030	75.88	0.033
Model chi-square	8.19	0.225	8.68	0.192
% correct classifications	67.21%		67.21%	

Dependent variable: Basis category:	Growth ($n = 33$) No distinctive emphasis		Growth ($n = 33$) Average of all designs	
D1 Innovation and ops leadership	–0.51	0.484	–0.55	0.409
D2 Cost economy	–0.79	0.144	–0.81	0.115
D5 Broad quality and sales leadership	1.10	0.341	1.01	0.235
No distinctive emphasis	–	–	0.35	–
–2 log-likelihood	41.89	0.073	41.70	0.076
Model chi-square	3.86	0.277	4.04	0.257
% correct classifications	66.67%		66.67%	

Table 7. Performance differences among archetypes

Dependent variable: Basis category:	Financial return ($n = 65$) No distinctive emphasis		Growth ($n = 43$) No distinctive emphasis	
	Regression coefficient	Significance	Regression coefficient	Significance
Single-emphasis archetype	–0.29	0.319	–0.69	0.061
Mixed-emphasis archetype	0.29	0.706	0.41	0.657
–2 log-likelihood	88.96	0.017	55.67	0.063
Model chi-square	1.15	0.564	3.94	0.140
% correct classifications	58.46%		65.12%	

few mixed-emphasis designs, will outperform the no-emphasis, stuck-in-the-middle category. The results show no support for this Proposition 2b: the models explain very little of the variance in either financial or growth performance, and neither single nor mixed-emphasis categories show a significantly higher frequency of above average performance. Indeed, the growth performance of single-emphasis archetypes is significantly lower than no-emphasis designs at the 0.1 level.

Although Study Two has found support for the nominalist distinction between cost and differentiation as high-level discriminators of competitive strategy designs, this analysis finds no support for the crucial nominalist claim that performance is improved as designs approximate one of these two archetypes.

The ability of this meta-analysis to create consistent descriptions of a large number of clusters of strategic design means that this is one of a relatively small number of studies to evaluate the central hypothesis of the dominant paradigm of competitive strategy. Most studies in the empirical literature have not isolated stuck-in-the-middle clusters, and hence have not been able to assess their performance relative to others. Among those that do, results have been inconclusive, showing inferior performance on growth but not on financial return (Dess and Davis, 1984), or performance inferior to some designs, but not all (Robinson and Pearce, 1988). The present meta-analysis accords with these conclusions: there is no clear evidence here that no-distinctive-emphasis designs are any more or less capable of above-average performance than other archetypes.

Given the limitations of measurement and model specification that have been discussed, the results of Study Three do not yet provide conclusive evidence of failure in the paradigm's theory of performance, although significant doubts have been raised. The study should, however, provide ample incentive to move on to a phase of normal science in the study of competitive strategy. If improvements in measurement and model specification fail to uncover an association between performance and distinctive emphasis in competitive strategy designs, other attributes of competitive strategy will have to be considered. It may transpire that the two routes towards higher profits posited by a simple profit function, namely a price premium or a cost advantage, turn out to be not the most powerful way to model the performance effects inherent in competitive behavior. In the concluding paragraphs, some directions for that research agenda are suggested.

DISCUSSION

Implications for theory

The expectation of the dominant paradigm that cost and differentiation play a high-level role in discriminating between the many possible designs of competitive strategy has been supported, as has the expectation that designs that mix the two types are relatively rare.

But the failure of the paradigm's theory of performance to provide one universal explanation, based on the presence or absence of specialization in competitive strategies, suggests that contingency theories of performance may now offer more powerful insights into the origins of effective competitive strategy. The meta-dimensions of competitive strategy isolated in Study One offer a point of focus for these investigations, by isolating contextual conditions likely to reward leadership (or economy) to each dimension of strategy.

The results of Study Three may be taken as support for the body of theoretical work that has investigated contexts in which 'stuck-in-the-middle' designs may be superior to strategic specialization. These have pointed to demand conditions that do not support attempts at differentiation beyond a standard readily achievable by most competitors (Murray, 1988; and technological and organizational systems that, through new organization structures (Faulkner and Bowman, 1992), information technologies (Westbrook and Williamson, 1993; Schlie and Goldhar, 1995), and quality strategies (Reitsperger *et al.*, 1993; Kohoutek, 1988; Handfield and Ghosh, 1994; Wright *et al.*, 1991), do not impose a trade-off in differentiation to achieve lower costs. These propositions encourage a reconceptualization of the no-distinctive-emphasis design, from its current status as the 'lemon' of competitive strategy, to an 'all-rounder' design that is well adapted to a specified set of competitive conditions.

The patterns of association displayed in meta-designs of competitive strategy, as described in Study Two, offer several further points of focus for theoretical and empirical investigation. First, it may be proposed that shared technological competencies are responsible for the association of product innovation and operations leadership in the D1 design. Second, it appears that extremes of competitive quality both require restricted market scope: focus being required both to protect a firm from low quality, and also to achieve a price premium from quality alone.

Third, the result that the only design to be distinctive for its broad market scope involves both quality and sales leadership, whereas leadership in either alone is associated with market focus, suggests some positive synergies between these two dimensions of competitive strategy that may be worthy of further investigation. A sales-leadership position opens up economies of scope over some range of product variety. It may be proposed that only when a firm's quality reputation spans this product scope will consumer support allow these scope economies to be captured.

Fourth, differences in the organizational attributes required to support operations leadership, as against cost economy, may provide an explanation for the somewhat surprising lack of association between the two in this meta-analysis, and encourage a clear distinction between them in future. To characterize the question, it may be important to distinguish the skills of the operations manager from those of the cost accountant, even though both are expected to lead to a cost advantage.

Of the various interpretations of the dominant paradigm, the stochastic approach to classification of nominalism and empiricism is consistent with the accumulated empirical record; but the universal and exact aspirations of taxonomy seem unlikely to be met. Hence, the ability of any set of meta-designs to adequately represent the full variety of competitive strategies is likely to be limited. The dimensional approach offers a much more powerful language with which to describe competitive strategy. The six meta-dimensions isolated in Study One represent a richly defined space within which a great variety of designs can be placed.

Implications for method

A number of developments in methodology have been suggested. First, this study has suggested that, as a rule, density analysis is better suited to isolating the ellipsoidal and dimensionally focused clusters that competitive strategy theory predicts.

Second, there is scope for a very substantial increase in the number of empirical studies of competitive strategy design. The 17 studies used in this meta-analysis represent a tiny pool of empirical work relative to the hundreds of studies that support meta-analyses in other fields (Hunter and Schmidt, 1990). Monte Carlo simulations suggest further that large sample sizes, of three digits rather than two, will be the most powerful means to improve the accuracy of effect-size estimation (Koslowsky and Sagie, 1994; Raju *et al.*, 1989). Studies outside manufacturing and Western economies would be especially valuable.

Third, empirical studies might productively follow either one of two objectives. The first would seek to produce multiple replications of principal component solutions using identically specified and measured elements of competitive strategy. A body of work of this kind will permit an inferential meta-analysis to draw conclusions about the population of all competitive strategies, and in turn provide a more rigorous test of the paradigm's theory of performance.

But given the importance of expanding the range of strategic and organizational variables that have so far been included in the empirical record, this may be the more important objective for empirical work. The ability to assemble these studies into a descriptive meta-analysis of the type developed for this study ensures that they will add to a cumulating body of knowledge. This review has suggested that particular focus be given to strategies of cost advantage (capacity utilization, economies of scale, asset management); vertical integration; technology management; speed to market; logistics; relationship to suppliers; and use of alliances. Furthermore, it is likely that variables of organizational design and management will continue to have special importance to theory. From such studies, we should expect additional meta-dimensions and meta-designs to be isolated, and richer descriptions of them to be developed.

Implications for measurement

Some improvements in measurement have become apparent through the wider perspective of a meta-analysis. More objective measures of performance, over a period of at least 5 years, would undoubtedly add to the accuracy of tests of the paradigm's theory of performance. It has also become apparent that measurement of cost economy strategies needs to be more direct, and a distinction drawn between these and simply giving low emphasis to some dimension of competitive strategy. Also, distinctive emphasis in competitive strategy should always be defined relative to competitors.

CONCLUSION

The size of the above agendas for theory, method, and measurement is testimony to the long period in which progress in competitive strategy research has been impeded. Competitive strategy remains crucial to the study of strategic management and deserves the prominence Porter gave it 20 years ago. For all the great value that has been added to our understanding of competition by the resource-based view of the firm, the insights we now have into the deep organizational sources of advantage must be matched by knowledge on the strategies-in-action through which these assets realize value in the market. Although this study has affirmed that cost and differentiation do play a high-level role in discriminating between competitive strategy designs, its cumulation of the empirical record has uncovered a richer and more fine-grained descriptive system than that originally proposed, and has focused attention on the need for a more complete, and possibly different, specification of the link between competitive strategy and firm performance. A mutually enriching dialogue between theory and experiment is a mark of any progressing science. It is hoped that this study has removed one obstacle to such a dialogue in the study of competitive strategy.

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