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Environment -- Strategy Coalignment: An Empirical Test of Its Performance Implications

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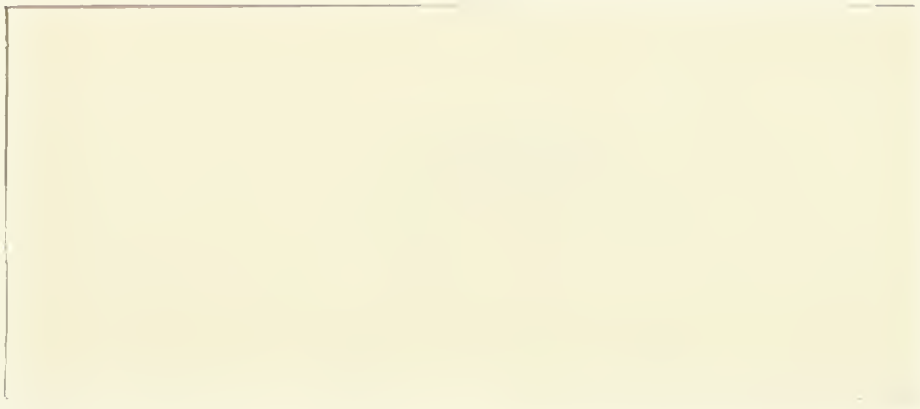

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Summary

The positive performance impact of a coalignment between a business' environment and its strategy is an important theoretical proposition in strategic management. In spite of its importance and intuitive appeal, the extent of empirical support is equivocal and riddled with problems of conceptualizing and testing for coalignment. This paper evaluates alternate approaches to testing such a proposition and argues in favor of specifying coalignment as 'profile deviation,' which states that coalignment is the degree to which strategic resource deployments adhere to an 'ideal profile' for a given environment. Subsequently, this proposition is tested across two time periods, and eight distinct environments in two different samples drawn from the PIMS database. Results, which were generally robust across the two periods, strongly support the proposition of a positive performance impact of environment--strategy coalignment. Implications and research directions are developed.

INTRODUCTION

Coalignment (also termed as consistency, contingency, or fit) is emerging as an important organizing concept in organizational research (Aldrich, 1979; Fry and Smith, 1987; Van de Ven and Drazin, 1985), including strategic management (e.g., Miles and Snow, 1978; Venkatraman and Camillus, 1984). In simple terms, the proposition is that the 'fit' between strategy and its context -- whether it is the external environment (Anderson and Zeithaml, 1984; Bourgeois, 1980; Hambrick, in press; Hofer, 1975; Hitt, Ireland, and Stadter, 1982; Jauch, Osborn, and Glueck, 1980; Prescott, 1986a) or organizational characteristics, such as structure (Chandler, 1962; Rumelt, 1974), administrative systems (Lorange and Vancil, 1977; Galbraith and Nathanson, 1978), and managerial characteristics (Gupta and Govindarajan, 1984) -- has significant positive implications for performance.

Within this general perspective, this paper is concerned with the performance impacts of environment--strategy coalignment. Specifically, it addresses a theoretical question: "Does a business that aligns its strategic resource deployments to the *specific* requirements of its environmental context (i.e., achieve an acceptable level of environment--strategy coalignment) perform significantly better than a business unit that does not achieve the requisite match?" While framing this question may appear to be relatively simple, the empirical testing is complex given serious *theoretical* (i.e., conceptualization of the specific form of coalignment) and *methodological* (i.e., statistical tests of coalignment) problems.

This study seeks to overcome some of the conceptual and methodological limitations of extant research on this topic, and conducts a strong, rigorous test of the performance impacts of environment--strategy coalignment through: (a) an explicit statement of the theoretical conceptualization of the coalignment between environment and strategy; (b) the operationalization of coalignment such that there is adequate correspondence between the conceptualization and its statistical tests; and (c) empirical tests conducted in two different samples to test the proposition as well as assess its robustness. Specifically, the use of the second sample serves as a replication of the initial results. Toward this end, we begin by

discussing the relative benefits and limitations of the two dominant approaches (reductionistic and holistic) to the conceptualizations of coalignment, and adopt the holistic perspective which reflects its multivariate manifestation. Subsequently, we test the performance impact of environment--strategy coalignment in two samples of business units, across two time-periods, drawn from the PIMS database.

THEORETICAL PERSPECTIVES

The general requirement of coalignment between environment and strategy is understood implicitly (Andrews, 1980; Bourgeois, 1980; Porter, 1980; Scherer, 1980; Miles and Snow, 1978; Snow and Miles, 1983) rather than in explicit functional forms. Thus, theoreticians postulate environment--strategy relationships using phrases such as: 'matched with,' 'contingent upon,' and 'congruent with' or more simply, 'aligned,' 'fit' and 'congruence,' without necessarily providing precise guidelines for translating such statements into the operational domain of empirical research and statistical tests. Consequently, strategy researchers performing empirical tests of the impact of environment--strategy coalignment choose an available (often convenient) functional form and perform statistical tests without examining the validity of the underlying assumptions. Since different conceptualizations imply different theoretical meanings and require the use of specific statistical testing schemes, a general lack of correspondence between the conceptualization of coalignment and its empirical tests is a serious weakness in strategy research (Venkatraman, 1987).

An additional issue pertains to the conceptualizations and measurements of the constituent elements to be coaligned, namely environment, and strategy, given that the specification of these concepts influences the choice of the testing scheme. For instance, if both the environment and strategy are viewed as categories, then coalignment can be specified as 'matching' and tested within a matching paradigm (Gillett, 1985), which may be inappropriate if environments and strategies are each specified using a set of underlying dimensions, and measured along interval scales. In this study, we recognize the diversity that exists in the conceptualizations of environment (Lenz and Engledow, 1986) and strategy (Ginsberg, 1984;

Hambrick, 1980; Venkatraman and Grant, 1986), and that these diverse viewpoints cannot be reconciled within this study (nor anywhere else). However, we ensure that our specifications of environment and strategy are consistent with our specification of coalignment and corresponding statistical testing of its impact on a criterion variable.

Our conceptualization of environment is based on Porter's (1980) generic environments, which serves to isolate a set of distinct relatively homogeneous contexts for testing the proposition of performance impacts of environment--strategy coalignment. A similar approach is followed in conceptualizing strategy, where we view it as a *pattern* of key strategic resource deployments (Mintzberg, 1978) and accordingly, select a set of variables that reflect key strategic resource deployments.

Previous research on environment--strategy coalignment can be categorized into: (a) the 'reductionistic' perspective; and (b) the 'holistic' perspective. The former typically views environment and/or strategy in terms of one or few dimensions, with coalignment conceptualized in terms of the set of their bivariate alignments. In other words, the dominant research practice has been to disaggregate environment and strategy into their constituent dimensions in order to examine the performance impact of pairwise interactions or alignments. In contrast, the latter retains the holistic nature of coalignment between environment and strategy in examining its overall effectiveness on performance. Table 1 compares the two perspectives, and the ensuing discussion focuses on each of these two perspectives.

INSERT TABLE 1 ABOUT HERE

The Reductionistic Perspective of Coalignment

The reductionistic perspective of coalignment is based on a central assumption that the coalignment between two constructs (such as environment and strategy) can be understood in terms of pairwise coalignment among the individual dimensions that represent the two constructs. Within this perspective, some researchers have focused on certain specific characteristics of environment and strategy to assess the performance implications of

coalignment. For example, Anderson and Zeithaml (1984) tested Hofer's (1975) proposition of the performance effects resulting from the alignment of business strategy to the stage of the product life cycle; and Hambrick, MacMillan and Day (1982), tested the performance implications of differentially developing strategy to the requirements of the market share and growth positions. The research questions underlying these studies reflect what Miller calls the "atomistic hypotheses... concerning the linear association among small sets of variables" (1981; pp. 1-2). Indeed, a greater proportion of strategy research studies have focused on the relationships among (or between) certain environmental attributes, strategy characteristics, and performance (Ginsberg and Venkatraman, 1985).

Testing Approach. In the reductionistic tradition, coalignment is typically specified as the *interaction* among the constituent variables. Tests of the effects are achieved through analysis of variance, subgroup analysis with tests of differences between the correlation coefficients across the various subgroups, and moderated regression analysis with a test of the statistical significance of the interaction term(s) and the incremental variance explained. Such testing schemes decompose the system of relationships between environment and strategy into distinct components of coalignment that are *independent* of one another. Let us consider the study of Jauch, Osborn, and Glueck (1980), which examined the financial implications of the environment -- strategy connection. In their study, coalignment was modeled as the *interactive* effects of eight strategic decision categories and nine environmental challenges. More specifically, coalignment was operationalized as a set of 72 interaction components in a multiple regression equation system. Since "none of the 72 possible interactions were significant at the 0.05 level ..." (1980; p. 55), they rejected the proposition of performance impacts of environment -- strategy coalignment.

While the failure of Jauch et. al. to support the theoretical proposition is an interesting empirical result that has important bearings on theory building, one should examine the statistical criteria used to test for coalignment. Suppose they had obtained a finite set of significant interactions (a number between 1 and 72), could they have argued for performance

implications of environment--strategy coalignment? More importantly, what guides this choice? Thus, a key issue is the lack of explicit criteria underlying the statistical tests in such disaggregations.

Prescott (1986a), using a different data set, the PIMS data base, reported that his set of 72 interaction terms (in this case, eight environmental categories and nine strategic variables) did not add significantly to the predictive power of the baseline regression equation of strategy on performance. Subsequently, he examined the specific nature of the role of environment on the strategy -- performance relationship, using Arnold's (1982) distinction between the *form* and *strength* of moderation, and concluded that the environment served as a homologizer which moderates the strength, but not the form of the strategy -- performance relationships.

Interpretations. What are the interpretations and conclusions from these two separate studies, that employed radically different databases? If these results convincingly establish that environment--strategy coalignment has no significant performance impacts, then they have serious implications for reassessing many theoretical perspectives in strategy research. An alternate interpretation is that the reductionistic perspective may be limited in its ability to reflect the true form of coalignment, and that the statistical tests of moderated regression -- even if they have been correctly applied -- are inadequate for assessing the impact of coalignment.

Our view is that it is premature to conclude the former given that the results could conceivably be affected by the choice of testing method and their application. The use of reductionistic analyses presumes that any individual bivariate interaction between a component of environment and a component of strategy will be strong enough to emerge as a statistically significant effect on performance, which is, at best, a questionable assumption[1]. Given that business strategy is best conceptualized as a multitude of interrelated resource allocation decisions, any individual component is merely a part of the overall package. Therefore,

[1]For a general discussion of the limitations of the reductionistic perspective, see Alexander (1964); Van de Ven and Drazin (1985).

individual bivariate interactions may be either suppressed by or amplified by other interactions (Joyce, Slocum, and von Glinow, 1982), and even an array of independent interactions may fail to capture the complex nature of coalignment.

Thus, it is important to pose a more fundamental question -- Is it theoretically meaningful to test for coalignment by disaggregating strategy--environment relationships into sets of bivariate interactions? An alternate version of this question is: How appropriate is one (or, even a set of) interaction term(s) in capturing the conceptualization of environment--strategy coalignment? The importance of such questions is best illustrated by Van de Ven and Drazin (1985), who noted that most "researchers find it hard to conceptualize fit as anything other than 'interaction' among pairs of individual variables. The use of this approach is so theoretically and phenomenologically pleasing that it has become part of our language and rhetoric." (1985; p.344).

Much of strategy research subscribes at least implicitly to this view. Two interrelated explanations can perhaps be offered, namely: (a) narrow conceptualization of the research problem in terms of one or two concepts (operationalized as single dimensions), and their relationships examined under *ceteris paribus* conditions (Ginsberg and Venkatraman, 1985; and Miller, 1981); and (b) the pervasive use of simple linear models such as the analysis of variance and multiple regression analysis (with interaction terms) as the dominant analytical techniques for statistical tests.

However, when environment and strategy are represented using an array of variables, the use of a set of pairwise interactions to capture coalignment reflects an error of 'logical typing' (Bateson, 1979). This is because, theoretically, any relationship between the individual interaction components and a criterion variable is meaningless given that the sum of individual components does not represent the whole. Hence, one can argue that a specification of coalignment using a multiplar model (namely, multiplying individual strategy variables with individual environmental variable) does not operationalize the theory of coalignment, if one assumes that the environment and strategy are multi-dimensional, which should be

operationalized and measured accordingly. Indeed, a careful review of the theoretical literature on environment--strategy coalignment indicates that the proponents of this view (Andrews, 1980; Bourgeois, 1980; Miles and Snow, 1978; Porter, 1980; Scherer, 1980) invoke the notion of coalignment metaphorically, and are hardly precise in specifying the functional form as joint, multiplicative effects of strategy and environment. While persuasive conceptual arguments have been offered for aligning strategies to the environmental context for improved performance, it is the empirical researcher who has translated such conceptualizations into a set of disaggregated multiplicative equations. Consequently, the non-existent multiplicative effects reported by Jauch et.al (1980) and Prescott (1986a), for example, are neither surprising nor indicative of the underlying proposition of the performance impacts of environment--strategy coalignment.

The Holistic Perspective of Coalignment

This perspective is based on a central premise that it is important to retain the holistic (i.e., systemic, gestalt) nature of environment-strategy coalignment. This follows Van de Ven's (1979) articulation of fit as: "that characteristics of environmental niches and organizational forms (that) must be joined together in a particular configuration to achieve completeness in a description of a social system -- like pieces of a puzzle must be put together in certain ways to obtain a complete image" (p.323). Thus, tests of the performance effects of coalignment should reflect the simultaneous and holistic pattern of interlinkages between strategy and environment.

Similarly, several researchers have recognized an alternative to disaggregation, and have called for a movement towards a multivariate, or systemic examination. Miller labels this movement as a "new contingency approach" that "seeks to look simultaneously at a large number of variables that collectively define a meaningful and coherent slice of (organizational) reality" (1981; p.8). This perspective is reflected by Hambrick (1984), who elaborated on a set of important conceptual and methodological issues for developing strategy taxonomies; Snow and Miles (1983), who proposed a general theory of organizations using several 'overlays'; Miller and Friesen's (1984) strategic archetypes; and Day, DeSarbo, and Oliva's (1987)

proposal for the development of 'strategy maps' to represent the combinatory effects of strategy within a particular competitive environment.

Testing Approach. The underlying logic and rationale for adopting a holistic, multivariate specification of coalignment cannot be questioned, but one limiting factor is the lack of appropriate operationalization schemes for systematically testing the existence and effect of coalignment. The common analytic approaches within this perspective are: cluster analysis (Hambrick, 1984) and q-factor analysis (Miller and Friesen, 1984). These *exploratory* approaches result in empirically-related multivariate interconnections interpreted through the language of the researchers. While these techniques move the analysis beyond bivariate reductionism, they still provide only implicit notions of coalignment rather than explicit specification and testing of a particular conceptualization of coalignment (Venkatraman, 1987). The main difficulty lies in the lack of a systematic scheme to calibrate the differences in the degrees of fit among the underlying variables across the clusters.

An alternative to the inductive, cluster-analytic route is the deductive, pattern-analytic approach (Drazin and Van de Ven, 1985; Van de Ven and Drazin, 1985) that serves as a more direct test of the central proposition in this study -- namely, that the degree of adherence to the specific requirements of the environment in resource deployments will be significantly related to performance. Its attractiveness lies in its capacity to recognize the multivariate deviation in the pattern of a business unit's resource allocation profile from an 'ideal' profile. Thus, if coalignment can be specified in terms of adherence to a specified profile, then pattern analysis provides a direct test. The basic thesis is that if a profile of strategic dimensions can be obtained for a set of high performing units (within an environment), then any deviations from this profile imply negative performance.

This scheme is fundamentally dependent on the development and justification of the 'ideal' profile, which can be derived either theoretically or empirically (Ferry, 1979). The test for the performance impacts of coalignment is provided by the correlation between the degree of

deviation from the 'ideal' profile and performance. A *negative*, and (statistically) significant correlation provides a systematic test of the proposition within this perspective.

We propose adopting the holistic perspective operationalized through pattern analytic approach to test the performance impacts of environment--strategy coalignment for the following reasons:

(a) this scheme retains the holistic, systemic nature of the environment--strategy coalignment and thus, avoids the error of logical typing; yet it overcomes the subjectivity that underlies the interpretation of clusters in terms of the language of coalignment;

(b) this scheme is flexible in terms of varying the theoretical conceptualization of coalignment; for instance, the relative importance of the constituent strategy dimensions can be incorporated into the measure of coalignment based on theoretical and empirical reasoning; and

(c) a multivariate (interval-level) measure of coalignment is obtained that can be used to examine relationships with a variety of criterion measures, which differs from the cluster-analytic approach that treats coalignment in categorical (or, at best, ordinal) terms.

Specific Conceptualization of the Research Question

Thus, the central research question of 'environment--strategy coalignment' and its performance impacts can be conceptualized as follows: For any given business unit, if one can specify the strategic resource deployments needed for effectiveness (based on its specific environmental context), then a deviation from this pattern of resource allocation represents a misalignment between environment and strategy. This misalignment should be significantly and negatively related to performance. Testing this specific conceptualization involves (a) the identification of distinct, homogeneous environments; (b) the specification of 'ideal' resource deployments for each environment; and (c) testing the performance effects of environment--strategy coalignment. It is important to discuss the specification of the 'ideal' profile for each environment before discussing the methods, tests and results.

Following Porter's (1980) arguments for environment-specific strategic resource deployments, and Spender's (1979) notion of 'industry recipes', our underlying theoretical perspective is that effectiveness within a given competitive environment is dependent on

adopting strategies that are best suited for the specific contextual requirements. Accordingly, businesses that adhere to such patterns of resource deployments are more likely to be successful than those that deviate from the requirement. However, the *operational* task of specifying such a profile with numerical scores along a set of underlying areas of resource allocations is a difficult, if not near-impossible task. Indeed, as noted in Table 1, this is a major distinction from the classical 'bivariate' approaches, where one can develop a more precise functional form of the link between *one* area of strategic resource deployments and *one* dominant environmental contingency (under *ceteris paribus* conditions) and even hypothesize specific differences across the environments. Within the holistic view of coalignment, it is possible to develop only a general view of environment--strategy coalignment, recognizing that we should demonstrate the distinctive characteristics of the environments. Our approach to specifying the 'ideal' profile of strategies for each environment is through a 'calibration sample' of best performing businesses within each environment. Details are provided in the next sections.

METHODS

Sample

The Profit Impact of Marketing Strategy (PIMS) research database was selected for this study. This choice was guided by the consideration that it contains relevant data on a variety of environmental, strategic, and performance variables for over 2000 individual strategic business units (SBUs). A variety of strategy research questions have been examined using this database (Buzzell and Gale, 1987; Ramanujam and Venkatraman, 1984), but its limitations such as the range of strategic variables available as well as the pre-specified operationalization of the variables are to be recognized (Anderson and Paine, 1978; Scherer, 1980). Over the years, several examinations of the data quality (Phillips, and Buzzell, 1982; Phillips, Chang, and Buzzell, 1983; and Marshall, 1987) have provided support for the contention that the overall quality and reliability of the data is adequate for research purposes.

The study was conducted in two phases across two time-periods with a view to assess the stability and robustness of the findings. The first phase used data for the four-year period, 1976-1979 and the second phase used the data for the four-year period, 1980-1983. In both phases, the average values across four years were used to reduce the effect of any non-recurring influences. The sample domain for the first phase was a total of 1638 SBUs, while the second phase had a sample domain of 821 SBUs. The decline in the number of SBUs in the second phase was a reflection of the general trend of decline in the number of businesses participating in the data base relative to previous years.

Constructs and their Measures

Environments. As mentioned earlier, an eight-environmental typology interpretable in terms of Porter's generic environments was used to represent the environments. Such a categorization has been operationalized previously within the PIMS database (Prescott, 1986a; Prescott, Kohli, and Venkatraman, 1986). The typology was developed through cluster and discriminant analysis of seventeen environmental variables, and interpreted as: global exporting, fragmented, stable, fragmented with auxiliary services, emerging, mature, global importing, and declining environments. Detailed steps of the development of these environments as well as a comparative profile of the seventeen variables across the environments are provided in Appendix I. Tables A-1 and A-2 (in the Appendix) present the mean values for each variable across the eight environments for the 1976-1979 and the 1980-1983 samples respectively[2], highlighting those variables which significantly ($p < .01$) differentiate an environment from the overall sample. The intercorrelations among the seventeen variables show that there were only two correlations above 0.30 in the 1976-1979 sample, namely: materials cost growth and wage rate growth ($r=0.30$) and end user concentration and purchase-frequency of end-user ($r=0.40$). There were no correlations above 0.30 in the 1980-1983 sample.

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[2]All the one-way analysis of variances for the seventeen independent variables are significant at $p<.05$ levels, which argue for the distinctiveness of the environments. However, it is important to recognize that this is not to be construed as a rigorous test of the cluster patterns as we would expect that the clusters do differ on the variables that were used as input to generate the clusters. Details available on request.

Strategy. Consistent with the conceptualization of strategy in this study as a *pattern* of strategic resource deployments in key areas, seventeen variables were selected. Our view is that the scores along these seventeen variables collectively define and describe strategy, although their relative role may vary across environments. In other words, some strategy variables, such as the degree of vertical integration or relative price, may be critical in some environments and not in others. Thus, in developing a profile of effective strategy within an environmental context, only a relevant subset is considered as described later. The variable selection is consistent with previous strategy research using this database (Buzzell and Gale, 1987; Hambrick, 1983; Prescott, 1986a), and the variables are representative of the four strategy dimensions identified by Hambrick (1983). Tables 2 and 4 list the variables when presenting the regression results[3].

A major limitation in operationalizing strategy as a vector of scores is the assumption of equal importance, which is difficult to justify. Given that strategy involves a deployment of resources that is consistent with the strategic choice of management, it is unlikely that all the variables will be equally important. Indeed, an effective pattern of resource deployments require differential emphasis to the underlying dimensions of strategy based on the environmental context. In order to overcome this limitation, we develop and employ differential weights (based on their relative impact on performance) for the seventeen variables such that strategy is operationalized as a vector of scores which reflect the relative (differential) roles of the seventeen variables within each of the environments.

Performance. Conceptualization and operationalization of performance is a thorny issue in strategy research (Venkatraman and Ramanujam, 1986). In this study, an efficiency

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[3] The intercorrelations among the strategy variables for the 1976-1979 sample show the following five correlations above 0.30: receivables/revenue and total inventory/revenue (r=0.35); total inventory/revenue and investment intensity (r=0.38); relative product breadth and relative market share (r=0.35); relative product quality and relative price (r=0.40); and relative price and relative direct cost (r=0.37). In the 1980-1983 sample, the following six correlations were above 0.30: total inventory/revenue and total R&D/revenue (r=0.37); relative product breadth and relative market-share (r=0.36); relative product quality and relative price (r=0.35); relative product quality and relative market share (r=0.38); and relative price and relative direct cost (r=0.38). None of these correlations are excessively high to warrant any concern. Further details on the descriptive statistics can be obtained by writing to the authors.

view of performance is adopted and operationalized as the return on investment (ROI) of the business unit. ROI is a widely used measure of business performance (Hofer, 1983), and is strongly correlated with other relevant performance measures such as return on sales (r=0.85) within this database (Buzzell and Gale, 1987).

Environment--Strategy Coalignment. As discussed earlier, coalignment is conceptualized in terms of the degree of adherence to an 'ideal' profile specified for a given environment[4]. The implication is that a unit deviation from such an ideal profile reflects a unit of misalignment, and should have corresponding negative relationships with performance. Coalignment is operationalized as a *weighted euclidean distance* from the ideal profile along those variables considered significant within an environment. This is an indication of the degree of misalignment between the strategies of each business unit in the study sample and the strategies of the high performing business units within the same environment. This measure, more appropriately conceptualized as misalignment (rather than as coalignment) is termed as MISALIGN, and is calculated as follows:

$$\text{MISALIGN} = \sum_{j=1} (b_j(X_{sj} - \bar{X}_{cj}))^2 \qquad (1)$$

where, X_{sj} = the score for the business unit in the study sample for the j^{th} variable;

$\bar{X}_{cj}$ = the mean score for the calibration sample (or, the 'ideal' type) along the j^{th} variable;

b_j = standardized beta weight of the OLS regression equation for the j^{th} variable in the environment; and

j = 1,n where n is the number of strategy variables that are significantly related to ROI in that environment.

The measure of coalignment is derived as a weighted euclidean distance of a business unit from the environment-specific ideal profile. Equation (1) builds on Van de Ven and Drazin

[4] This research study is based on an assumption that there is only one ideal profile of resource deployments within a given environment. This does not imply that there is only one successful strategy. Different combinations of resource deployment patterns employing this study's operationalizations of fit can be equally successful or unsuccessful. Our assumption is necessary for empirical reasons given the relatively small size of the calibration sample within a given environment. Future studies that focus on some of the larger environments within this database may be able to pursue the route of specifying multiple ideal profiles consistent with the theory of generic strategies (or, equifinality). Indeed, it is a useful line of future inquiry.

(1985), but has been adapted to (a) consider only those variables that are critical (significantly related to ROI) for a given environment; and (b) reflect the differential weights of the strategy variables both within and across the environments.

Analytical Procedure

The procedure for testing our research question involves three sequential stages each for the original sample (Phase One) and the replication sample (Phase Two). Figure 1 is a schematic representation of the steps involved in the construction of the multivariate coalignment measure and the assessment of its performance impacts in this study. Below is the description of each stage for the two phases of the study.

INSERT FIGURE 1 ABOUT HERE

Stage I: Separate Analysis Within Each Environment. While the specific procedure for addressing the research question was invariant across the eight environments, the analysis had to be separately carried out for each environment and the total sample.

Stage II: Measuring the Degree of Coalignment. The operationalization of the procedure for the measurement of coalignment involved three steps: First, the test of coalignment requires the identification of a set of strategy variables that are important for *each* environment. For this purpose, within each environment, separate OLS regressions are estimated with the seventeen strategy variables as the predictors, and ROI as the criterion. Only those strategy variables found to be significantly ($p < .05$) related to ROI in each environment are used for the measurement of coalignment.

The second step involved the development of the calibration sample. For this purpose, within each environment, the business units are ranked in terms of their ROI values, and the top 10% of the businesses selected for the calibration sample. The remaining 90% could conceivably be used as the study sample for each environment. But, if the distribution of the criterion variable, ROI, is non-normal, removal of the top 10% could bias the subsequent analysis of the performance impacts of coalignment, since the mean value will shift lower.

Specifically, if ROI is negatively-skewed, it biases the results in favor of the hypothesis (Type I error); if ROI is positively-skewed, then it biases the results against the hypothesis (Type II error). Even if ROI is normally distributed, it is necessary to remove the bottom 10% (along the ROI scale) to arrive at an unbiased sample domain for testing the coalignment proposition. Thus, the study sample is the total sample (in a given environment) less the top 10% (i.e., calibration sample) as well as the bottom 10% (removed to reduce the bias in restricting the range)[5].

The third step pertains to the derivation of the ideal point. For this purpose, within the calibration sample, the standardized, mean scores along the significant ($p < .05$) strategy variables are calculated to specify the 'ideal' profile. The 'ideal' profile is a vector of standardized scores along a set of significant strategy variables.

Stage III: Assessment of the Performance Impact of Coalignment. This involves testing the significance of the zero-order correlations between MISALIGN and ROI for each of the environments in the study sample. As noted before, the coalignment proposition is supported if the correlation coefficient is negative, and statistically significantly different from zero. While this serves as a *necessary* condition, it is not sufficient to argue convincingly that the results imply a strong relationship between coalignment and performance.

This is mainly because the power of this test is unknown. Let us compare our intended procedure to discriminant analysis, where the power of the discriminant function is reflected by its ability to differentiate among specific groups developed using a set of predictor variables. For this purpose, the classification accuracy of a set of discriminating variables is compared to a baseline 'chance' model (Morrison, 1969), and this value is an important indicator in this type of analysis. Similar comparison is necessary to provide additional support for the power of the pattern-analysis test. In other words, the rival question is: what is the likelihood of obtaining a statistically significant negative correlation, when MISALIGN is calculated as the deviation

[5] We thank one of the reviewers for pointing this out.

from a baseline profile as opposed to the profile of the high-performing organizations (i.e., calibration sample)?

To address such a concern, we should demonstrate that this correlation coefficient is significantly higher than a coefficient between performance and a measure of coalignment calculated as a deviation from a *baseline* profile. For this purpose, a baseline measure of coalignment (termed as BASELINE) was developed using those variables that were *not* significantly related to performance in each environment (see stage I; step I) -- reflecting a model where resource deployments focus on non-critical areas.

Specifically, our expectation was that (a) the deviation along those variables not critically related to performance would have no significant effect on performance, namely the relationship between ROI and BASELINE would not be different from zero; and (b) the correlation between MISALIGN and ROI (r_1) would be significantly stronger than the correlation between BASELINE and ROI (r_2). In this context, it is important to note that the original set of seventeen strategy variables were chosen not only due to their theoretical relevance and importance but also because they were individually correlated with ROI. Thus, the BASELINE measure developed here was a stringent one. It is stringent because a strictly random set of strategy variables from the PIMS database (excluding the seventeen variables) would have had lower correlations with ROI, resulting in a stronger likelihood of accepting our hypothesis.

The Use of Two Different Samples for Assessing Robustness

As mentioned before, the tests are carried out in two different samples, one covering the 1976-1979 period, and another covering the 1980-1983 period. The latter serves as a cross-sectional, replication sample as we believe that the use of a different sample domain (using a different time period within the PIMS database) serves to enhance the confidence that can be placed on the results. This phase involved the use of 899 businesses drawn from the period -- 1980-1983. If the analysis and results are to be directly comparable, it is necessary to ensure that the characteristics and the number of environments be the same, although a business unit may shift from one environment to another either due to strategic actions or environmental

changes. Thus, the set of discriminant functions developed in phase one (refer step 5 in Appendix I) was used to assign a business to a particular environment in phase two.

The discriminant functions assign a probability estimate for each business indicating the likelihood that the business belongs to a particular environment. 78 business units were dropped from further consideration because their probability of being classified into any particular environment was less than .50. Of the 821 remaining business units, the average likelihood probability of being assigned to a particular environment was .88. These 821 business units served as the sample domain.

A comparison of the environmental characteristics for the 1976--1979 sample (Table A-1 in the Appendix) with the 1980--1983 sample (Table A-2 in the Appendix) indicated four significant changes. The two most fundamental changes over the two time periods were (a) a strong decrease in real market growth coupled with (b) a sharp rise in the total share instability of the businesses within the sample. The other two changes, decrease in industry exports, and a decline in minimum capacity investment required for a business, were less pronounced. These changes have face validity given the general economic trend during the 1980-1983 period. While these changes are important in their own right, they do not influence the tests of coalignment which is the focus of this study, as we treat the second phase as an independent replication of the research question.

The analysis in this phase followed the same three stages as in phase one, except that two of the environments -- global exporting and global importing -- had sample sizes of 18 and 19, which are inadequate for the analysis, and were excluded. Hence, the analysis and results in this phase pertain to six environments and the total sample.

RESULTS

Performance Impacts of Coalignment: Phase One

Table 2 summarizes the results of the nine regression equations (one for each of the eight environments and one for the total sample) in the 1976-1979 sample. The strategy variables in the 1976-1979 sample account for a minimum of 42% variance in performance

across the environments (the level of explained variance ranges from a low of 42% to a high of 60%). Further, it is important to note that the directionality of the impact the individual strategy variables have on performance is unchanged across the environments (except for vertical integration). Additionally, not all the variables are equally critical in all environments. In the discussion section, we explore some of the important patterns and implications of these results.

INSERT TABLE 2 ABOUT HERE

Table 3 summarizes the results of the correlational analysis between (a) MISALIGN and performance (r_1) and (b) BASELINE and performance (r_2) for each of the eight environments and the total sample domain. It also reports the results of a test for the *difference* in the magnitude of the correlation coefficients between (r_1) and (r_2)[6].

INSERT TABLE 3 ABOUT HERE

Three important patterns emerge from Table 3. *First*, as shown in column (1), the relationship between MISALIGN and performance (r_1) is negative and statistically significant as expected in *all* the environments, and in the total sample. The values of (r_1) range from a lower value of (-) 0.29 to a high of (-) 0.49 indicating strong and consistent results across the environments. The implication is that the deviation from an empirically determined environment-specific 'ideal' profile of strategic resource deployments has negative implications for performance. Thus, it provides a necessary (but not sufficient) test of the impact of environment-strategy coalignment on performance.

The *second* pattern relates to the results using the baseline model. It is interesting and important to note that not all the correlations between BASELINE and performance are close to zero as expected. As shown in column (B), in two environments (global importing and declining), the values of (r_2) are negative and significantly different from zero, implying that deviation from a baseline profile could have a negative (and significant effect) on performance.

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[6]This is a test for the difference in the dependent correlations (Bruning and Kintz, 1987; p.228).

The ability of a baseline model to perform as well as the theoretical model in two environments further bolsters the need for the use of a baseline model for assessing the predictive power of the analysis, and test for the superiority of the specified 'ideal' profile over the baseline profile. This is achieved by comparing the correlation coefficient using the 'ideal' profile and the coefficient using the 'baseline' profile.

The *third* important pattern relates to the test for the difference in the magnitude of the two correlations (r_1) and (r_2). Eight out of the nine t-tests (except in the fragmented environment) are significant, and in the hypothesized direction. It is particularly interesting and important that in the two environments where (r_2) also emerged as significant and negative, the differences between (r_1) and (r_2) are significant and in the hypothesized direction, thus supporting the performance impacts of coalignment.

The three patterns taken together provide strong support for the central research question in this study. However, the generalizability of the results has not yet been established. In other words, the external validity of these results to a different sample domain is not known. Ideally, external validity requires that the proposition be tested in a database other than the PIMS database. However, some preliminary support for external validity can be provided by replicating the analysis in a different time period within the same data base as it would test the robustness of the results. For this purpose, we assess the pattern of results from phase two.

Performance Impacts of Coalignment: Replication Sample

Table 4 summarizes the results of the seven regression equations for the 1980-1983 sample. The level of R^2 ranged from 0.46 to 0.71 across the environments, which is consistent with the 1976-1979 sample in phase one. While there is an overall consistency in the sign of the beta weights for the variables across the two time-periods, there are several interesting shifts in their levels of significance within individual environments. In the discussions section, we explore some of the possibilities and implications of these results. Since the aim is to compare the results across the two phases, we focus on the same three patterns as in phase one. The results are reported in Table 5.

INSERT TABLES 4 AND 5 ABOUT HERE

First, the correlation coefficient between MISALIGN and ROI (r_1) is negative and statistically significant in six out of seven cases (except the fragmented environment). While the lack of any performance effects within the fragmented environment cannot be dismissed, it is more important to note that the results are as expected in six of the seven cases. Specifically, the significant values ranged from a low of (-) 0.28 to a high of (-) 0.63 indicating strong and consistent results as in the first phase. *Second*, none of the correlation coefficients between BASELINE and ROI (r_2) are significantly different from zero at p-values less than .01, while two (auxiliary services and emerging environments) are marginally significant at p-levels better than .05. This is generally in line with the results obtained in phase one. *Third*, the pattern of t-tests for the differences in the magnitude of correlations between (r_1) and (r_2) are not as strong as in phase one, possibly due to the smaller sample size in this phase, which influences the t-test of differences. As in phase one, the fragmented environment did not reveal significant differences. In addition, the auxiliary services and emerging environments (both of which had significant baseline correlations) did not exhibit significant t-test differences. However, in four of the seven tests, including the overall sample (n=654), the t-tests are as expected, and thus provide general support for the stability of results across the phases[7]

Collectively, the results of the second phase provide strong support for the generalizability of the results obtained in the first phase. Indeed, results from both phases taken together strongly support the theoretical proposition of the performance impact of environment--strategy coalignment.

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[7]An alternative procedure to test the generalizability of our results would be to use the set of significant strategy variables and the beta weights from the 1976-1979 sample, in the spirit of cross-validation. When this is done, the results are entirely consistent with the reults presented in Table 5. We chose to represent the results as we do in Table 5 because it represents an *independent* test of the proposition as Tables 2 and 4 indicate that the set of significant strategy variables across the two phases within a given environment are different due to the fundamental difference in the macro economic characteristics. Further, reporting that set of results would invoke assumptions about the stability of the functional form of fit across the two time-periods, with which we are less comfortable.

DISCUSSIONS

The discussion section is organized around two major themes -- one relating to the performance implications of environment--strategy coalignment, and the other focusing on the patterns of effective strategies for the different environments across the two time periods.

Performance Implications of Environment--Strategy Coalignment

The general notion of coalignment is a central anchor for strategic management research (Andrews, 1980; Miles and Snow, 1978; Venkatraman and Camillus, 1984). Its use in theory construction is limited unless considerable attention is provided to link the articulation of the theoretical position with appropriate operationalization schemes (Venkatraman, 1987). Specifically, in researching the effects of environment--strategy coalignment, two important issues emerge -- (a) the problems surrounding the conceptualization and operationalization of environments and strategy; and (b) the development of an appropriate analytical scheme (given the specific conceptualizations of environment and strategy) for systematically measuring the degree of coalignment and its impact on performance.

The contribution of this paper is in its linkage of the above two issues. It developed a conceptualization of environment--strategy coalignment as deviations in ideal patterns of strategic resource deployments and provided strong empirical support for the general proposition. In adopting this particular perspective, we strongly argued that the use of a multiplicative model for testing environment--strategy coalignment is weaker, given the lack of theoretical meaning to the interaction term(s) as well as the possibility of committing an error of 'logical typing.'

The performance implications of environment--strategy coalignment is an intuitively appealing and generally-accepted axiom, but we are not aware of a research study that has

provided consistent and systematic empirical support for this proposition. For instance, Hofer (1975) argued for strategy--product life cycle alignment that has received some empirical support (e.g., Anderson and Zeithaml, 1984; Harrigan, 1980; Thorelli and Burnett, 1981); and Schendel and Patton (1978) argued for and empirically demonstrated the need to align strategic resource deployments to the specific requirements of the strategic group within the brewing industry. However, no study, in our opinion, adopted broader conceptualizations of environment and strategy, as well as developed appropriate schemes to operationalize coalignment, in assessing the implications of coalignment. Thus, this paper provides empirical support for an important, unquestioned axiom in strategy research. At a theoretical level, it reinforces the importance of 'domain navigation' (namely, developing business strategies given a specific 'domain definition') in strategic management research.

More general implications for strategy research include the need to be more precise in articulating the nature of 'fit' and ensuring that there is adequate correspondence between the verbal domain and the operational domain of empirical research and statistical tests. The absence of such correspondence weakens the link between theory-building and theory-testing and contributes to methodological invalidity.

Limitations. A major limitation is that the study reflects what Venkatraman and Camillus (1984) call 'external fit' -- namely, the formulation of strategy in alignment with the environmental context. Given that effective strategic management involves both formulation and implementation, it would have been desirable to consider a broader set of variables that reflect organizational context and implementation issues. However, the limitation is due to the availability of data in the PIMS program. Reflecting industrial organization economics and marketing perspectives of competitive strategy, this database has not yet been enlarged to contain relevant organizational variables. This enlargement would have enabled one to test Thompson's (1967) view of administrative coalignment as well as Miles and Snow's (1978) view of the strategic adaptation of concurrently and consistently solving three problem domains.

We hope that future research would be predicated on systematic empirical tests of important untested theoretical propositions that are rooted in the concept of coalignment.

Pattern-Analytic Approach: Methodological Extensions. As we move away from bivariate fit under *ceteris paribus* conditions towards conceptualizing and operationalizing fit in its multivariate holistic manifestation, the pattern-analytic approach will have its appeal beyond the specific theme of 'environment--strategy' coalignment. This analytic scheme is intuitively appealing, but its effective use in empirical strategy research rests on two critical methodological issues. The first pertains to the development of a multi-dimensional 'ideal' profile that reflects differential weights for the underlying dimensions because the assumption of equal importance is generally untenable. In this research, we used one possible approach for the derivation of the weights, namely the beta weights of the regression equation of strategy variables on performance. Other possible approach includes the use of multi-dimensional scaling methods as well as obtaining the weights from the managers (where feasible).

The second issue relates to the statistical power of the test of performance impact of coalignment. Given that the statistical power is unknown, it weakens the interpretations and conclusions that we can derive from it. In order to partially overcome this limitation, we explicitly developed a baseline model for comparison. Its use enhances the confidence that can be placed on the results by discounting a plausible, rival explanation of a baseline model. The baseline model that we employed is not a strict random model since it was developed by using a set of those seventeen variables not found to be significantly related to ROI when all the variables are included in the regression equation within each environment. The fact that a particular variable did not emerge as being significant in a multivariate regression context does not imply that the variable and ROI was uncorrelated. However, it is clear that this is a conservative measure of baseline that strengthens the results and the degree of confidence that can be placed on them. While we cannot recommend a generic approach to the development of a baseline referent for model comparison, we argue that in the absence of a *logically defensible*

baseline model, the power of this approach for testing the impact of coalignment is considerably weakened.

Effective Strategies -- Cross-Sectional Patterns

The patterns of effective strategies within each environment can be discerned from Tables 2 and 4, and are similar to the findings of previous research in this stream. The seventeen strategy variables can be classified into four broad dimensions of competitive strategy, following Hambrick (1983): *cost efficiency* -- the degree to which the cost per unit is low; *asset parsimony* -- the degree to which assets per unit are few; *differentiation* -- the degree to which a product and its enhancement are perceived to be unique; and *scale/scope* -- the relative size and range of activities of a business within its industrial context.

Phase One: Across all the environments in the first phase, asset parsimony (as reflected through investment intensity) and minimizing costs were significantly related to performance. Relative quality was significantly related to performance in all but the declining environment. In the global exporting environment, quality is important but having a large scale and/or scope is not. This can be contrasted with the global importing environment, where vertical integration (both forward and backward) is significantly related to performance. Possibly many of the businesses receive component parts and then manufacture and/or assemble parts relative to the imported ones.

The declining environment requires extreme emphasis on maintaining asset parsimony, low costs, and a wider scale/scope, with differentiation playing a small role. The mature environment, while similar to the declining environment in terms of cost control and scale/scope, requires more attention to both maintaining high relative product quality as well as low relative price to enhance ROI. The stable and auxiliary service environments both have a large set of significant strategy variables that cover all the four dimensions, but differ primarily in their emphasis and impact of vertical integration. Forward vertical integration is positively related to performance in the auxiliary services environment, while it is negatively related in the stable environment. Exercising control over costs and developing a wide scale/scope appear to

be more important in the auxiliary services environment. These findings are consistent with the expectation that a high level of service must be maintained with the customer base in the auxiliary services environment.Since relative price is not significantly related to performance in the auxiliary service environment, the ability to differentiate through low price or recover costs expense through high price seems less feasible. Thus, cost control becomes a necessary strategy.

The emerging environment is characterized by high level of cost control as well as differentiation and a variety of variables from which to choose. However, scale/scope is not significantly related to ROI. The fragmented environment is similar with regard to the scale/scope dimension, but few options seem to exist in comparison to the emerging environment. It is worth noting that maintaining high quality is important in fragmented industries.

Phase Two: In the second phase, we observed significant differences in the pattern of important strategy variables. Across the six environments, investment intensity as in phase one, is negatively related to performance, but in the fragmented environment, the coefficient is not significant. Employee productivity is positively related to ROI in four of the six environments. In the fragmented environment, scale/scope as reflected by minimizing forward vertical integration and enhancing market share are critical, while maintaining low relative price. Thus, it appears that in this relatively difficult, economic period, businesses in this environment tend to prefer buying market share through price concessions.

The mature and declining environments have a similar pattern with emphasis across all the four theoretical dimensions of strategy. Two notable exceptions are that in the mature environment, relative compensation is positively related to performance, and in the declining environment, maintaining high employee productivity is significant. While both influence costs of the business operations, they work in opposite directions.

The auxiliary services environment is very similar to the previous phase, with three exceptions. Relative market share is not significant in this period and forward vertical

integration is significant. Additionally, there is a reduction in the variety of significant variables, although they do cover all the four theoretical dimensions. The same pattern was also found in the emerging environment -- where the overall pattern was consistent, but the number of significant variables was fewer.

The stable environment, as in phase one, has significant variables across all the four dimensions of strategy. However, backward vertical integration is negatively associated with ROI, and there is a positive relationship with R&D and relative price. This is the only environment in which R&D was significantly related to ROI. Given the relative 'unfavorable' climate during this time period, it may reflect the emphasis to enhance the products and/or processes of a business.

Need for Time-Sensitivity in Strategy Research. The discussion, thus far, highlights the need to increase the extent of 'time-sensitivity' in the research design, especially if the time periods represent differences in macro economic characteristics.

First, if we characterize the 1976-1979 period as a 'favorable' economic period (average GNP growth: 4.4%), then the 1980-1983 period is relatively more 'unfavorable' (average GNP growth: 0.7%). It is highly likely that the key determinants of success changes across the economic periods. This is consistent with the observations made by Ravenscraft and Scherer (1982), which state that a systematic modeling of the lag structure between R&D and return was complicated by the different economic periods. At a first glance, one may be tempted to call the reliability of the database into question. But such a conclusion is premature. Indeed, our regression results suggest the need to replicate and reexamine many of the strategy findings that have emerged from this database using a different time-frame, reflecting a different macro economic period.

Second, it could be that the sample in phase two is different from the sample in phase one. But, there seems to be no strong evidence to support this view, except in the fragmented and stable environments, which exhibited the largest number of changes. In both these types of environments, concentration levels rose and market growth rates fell during the 1980-1983

period. In addition, the stable environment experienced a drop in total share instability, which ran counter to the overall trend during this period. However, given the strong discriminant analysis results, the possibility appears to be low.

Third, there is a possibility of changes in strategies and/or environment, resulting in transitionary states even during a four year period. For example, Prescott (1986b) reported that only 128 of a sample of 702 business units could be classified into the same category of generic strategy and environment over a six-year period. This implies a general movement across environments as well as shift in strategies.

These results indicate the need to explore longitudinal and quasi-longitudinal designs that permit modeling environment--strategy coalignment along a 'dynamic' mode. While such schemes are not easily managed, it is clear that a major challenge, and an area of opportunity is in the development of appropriate analytical schemes that permit an evaluation of the theory of coalignment over time.

CONCLUSIONS

This paper addressed the performance impacts of coalignment between environment and strategy using two different samples drawn from the PIMS database. While this is a central issue, the extant research is limited by virtue of inappropriate operationalizations of coalignment. In this paper, we employed a systemic approach to the conceptualization of coalignment as the degree of adherence to an ideal profile of strategic resource deployments within a particular environment. The results of the tests carried out here strongly support the thesis that the attainment of an appropriate match between environment and strategy has systematic implications for performance.

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Appendix 1: Development of Environments

The empirical development of eight environments is based on seventeen market structure (i.e., environmental) characteristics. It is based on cluster analysis and discriminant analysis, and interpreted in terms of Porter (1980). The detailed steps are outlined below for the first phase.

Step 1: Selection of 17 environmental variables based on theory and previous research (Scherer, 1980) and lack of multicollinearity.

Step 2: Random selection of 311 business units.

Step 3: Cluster analysis of the 311 business units (Ward's method).

Step 4: Choice of number of clusters; the criteria were: (a) examination of sharp changes in error sum of squares when the number of clusters is changed, and (b) visual inspection of the dendogram.

Step 5: Cross-validation through discriminant analysis and the increase in sample size to 1638 business units.

Step 6: Chow test ($F = 3.48, 8,502, p < 0.01$) for the equality of a full set of regression coefficient for the 16 strategy variables across the eight groups. Thus, it is not appropriate to pool the environments for analysis. This supports the need to carry out environment-specific analysis of the performance impacts of coalignment.

Step 7: Development of profiles for each environment based on both natural and standardized means scores of the 17 environmental variables.

Step 8: Interpretation of the environments in terms of Porter's (1980) typology of generic industries.

The accompanying Tables contains the values of each of the seventeen variables for the eight environments for the two phases. Table A1 for Phase one (1976-1979) and Table A2 for Phase two (1980-1983).

Table A1: Summary of the Competitive Environments (1976-1979)

ENVIRONMENTS	Total Sample	Global Exporting	Fragmented Std. Product	Stable Non Fragmented	Frag. W/ Aux.Serv	Emerging	Mature	Global Importing	Declining
VARIABLES									
Industry Concent.	56.61	64.17	44.4 *	58.74	45.38 *	58.40	68.11 *	74.35 *	60.35
Life Cycle Stage	2.81	2.58 *	2.89	2.68	2.91	2.45 *	2.91	2.81	3.05 *
Tot. Share Instab	12.85	13.93	13.23	10.25*	11.59	18.18	12.72	12.79	14.03
LT Ind. Growth	9.08	12.34*	8.81	7.99	7.54	13.71*	12.54*	11.43*	7.21
Ind. Exports	7.31	30.53*	3.63 *	4.67	9.09	4.80	6.61	6.05	4.82
Ind. Imports	4.80	5.04	4.53	2.22	5.23	3.18	4.05	30.71*	3.82
Mat. Cost Growth	9.32	9.40	6.66	10.16	7.54	6.79	19.65*	9.69	8.56
Wage Rate Growth	8.59	7.85	8.28	7.38	7.59	9.04	16.89*	9.32	8.00
Min. capacity Inv	17.86	23.23	11.08	15.77	16.20	14.25	25.54	16.41	21.82
Real Mkt. Growth	4.26	10.4*	2.04	3.65	1.32	18.9 *	0.23	4.64	0.79
Ind Val.add/employee	25.85	25.85	24.10	26.57	21.28	23.48	28.02	24.13	31.75*
% emp. unionized	42.42	33.44	38.01	46.25	33.38	26.75*	57.95*	51.57	52.92
End-user fragment	20.85	20.17	36.22*	10.04*	29.68*	23.04	19.56	21.98	20.68
Pur.Freq-End-user	3.37	3.73	4.46 *	2.56 *	4.54 *	4.07 *	3.00	3.57	2.44 *
Freq. prod. change	3.71	3.68	1.53 *	3.84	3.82	3.65	3.88	3.84	3.92
Dev.Time -New Prod	2.86	2.72	2.39	2.25 *	2.89	2.38 *	2.73	3.24	3.98 *
Import. of Aux.Serv	1.03	1.54 *	0.77	1.01	1.46	1.32	0.87	1.06	0.41 *
Sample Size	1638	93	88	402	376	167	127	62	323

* p<.01 from the mean for the sample.

Table A2: Summary of the Competitive Environments (1980-1983)

ENVIRONMENTS	Total Sample	Global Exporting	Fragmented Std. Product	Stable Non Fragmented	Frag. W/ Aux.Serv	Emerging	Mature	Global Importing	Declining
VARIABLES									
Industry Concent.	58.25	60.11	53.77	61.18	49.00*	57.51	65.53*	67.53	59.79
Life Cycle Stage	2.90	2.83	3.00	2.84	3.03*	2.60*	2.87	3.05	3.01*
Tot. Share Instab	23.09	16.39*	20.97	8.80*	11.52*	67.47*	17.16*	30.84	22.57
LT Ind. Growth	8.80	9.71	10.30	8.55	7.71*	9.93*	9.53	8.23	8.44
Ind. Exports	6.81	25.37*	3.89*	6.51	8.29*	6.04	6.96	6.40	5.86*
Ind. Imports	4.76	3.17	5.56	3.98*	4.24	4.15	4.61	29.53*	4.15*
Mat. Cost Growth	8.59	7.38	8.87	8.98	7.15	8.14	11.80*	7.41	8.36
Wage Rate Growth	9.48	8.09*	9.50	8.17	8.27*	9.41	17.19*	9.23	8.83*
Min. capacity Inv	15.19	12.89	17.16	14.80	13.14	11.19*	20.23	12.84	7.07
Real Mkt. Growth	1.29	7.44	1.82	0.14	-2.3*	13.28*	0.22	1.34	-0.79*
Ind Val.add/employee	26.95	24.18	23.03*	26.38	23.57*	26.88	25.60	29.48	29.66*
% emp. unionized	44.34	21.89*	38.96	52.07	31.03*	27.79*	62.39*	40.32	52.30*
End-user fragment	21.79	18.11	32.00*	10.67*	31.35*	23.30	20.48	21.05	21.34
Pur.Freq-End-user	3.18	3.56	4.25*	2.67*	4.72*	3.91*	2.71*	3.05	2.35*
Freq. prod. change	3.68	3.72	1.50*	3.87*	3.65	3.67	3.89*	3.84	3.89*
Dev.Time -New Prod	2.97	3.00	1.98*	2.27*	2.68	2.42*	3.03	3.37	4.00*
Import. of Aux.Serv	0.88	1.17	0.77	1.00	1.41*	1.02	0.80	1.00	0.49*
Sample Size	821	18	44	150	133	117	76	19	264

* p<.01 from the mean for the sample.

Table 1: A Comparison of the Reductionistic and Holistic Perspectives of Coalignment Between Environment and Strategy

Characteristics	Reductionistic Perspective	Holistic Perspective
Dominant Approach to the Specification of Fit	Fit between a few characteristics of environment (e.g., life-cycle) and a few characteristics of strategy (e.g., resource allocation areas).	A broader conceptualization of coalignment between several characteristics of strategy and several characteristics of environment.
Strengths	Ability to isolate precisely specified theoretical links, and impacts; systematic replication and extensions could lead to cumulative knowledge.	Ability to retain the complex, inter-related nature of linkages; systemic view is maintained.
Weaknesses	Specification Errors due to invoking *ceteris paribus* conditions; inability to isolate conflicting contingencies -- high likelihood of 'logical typing' error due to disaggregation.	Complex nature of coalignment makes it difficult to hypothesize the nature of coalignment; difficulty of generalizations.
Common Analytical Methods	Multiple Regression Analysis with interaction terms; ANOVA; subgroup analysis.	Cluster Analysis; Pattern-analysis (i.e., profile-deviation) canonical correlation analysis, second-order factor analysis.

Table 2: Strategy Variables Significantly Related to ROI in Each Environment -- Phase I (1976-1979)

Environment	Exporting	Fragmented	Stable	Aux.Services	Emerging	Mature	Importing	Declining	Total Sample
STRATEGY VARIABLES									
Recivables/Revenue	0.04	0.13	0.01	0.01	0.20**	0.01	0.09	0.16**	0.08**
Total Inventory/Rev	-.01	0.04	-.08*	-.13**	-.13**	-.16**	-.12	-.05	-.06**
Investment Intensity	-.45**	-.56**	-.39**	-.33**	-.40**	-.26**	0.60**	-.33*	-.38**
Vertical Integ - Backward	0.12	-.17	0.00	0.04	0.02	-.19**	0.22 *	0.11**	0.04
Vertical Integ - Forward	-.04	-.12	-.09**	0.08 *	-.07	0.05	0.18 *	0.02	0.01
Capacity Utilization	0.17	0.32**	0.11**	0.10 *	0.11*	0.10	0.08	0.16**	0.13**
Emp. Productivity	0.33**	0.14	0.22**	0.02	0.12*	0.16**	0.04	0.26**	0.18**
Rel. Compensation	-.12	-.02	0.02	-.12**	0.07	0.04	-.22**	0.01	-.02
% Purch-3 suppliers	0.00	-.07	0.05	0.01	-.04	-.06	0.1	0.06	0.02
Rel. Product Breadth	0.05	-.03	-.03	-.03	0.04	-.11	-.12	0.08 *	0.02
Rel Product quality	0.18*	0.17 *	0.12*	0.16**	0.18**	0.12 *	0.32**	0.02	0.13**
Relative Price	-.04	-.01	0.20**	-.03	0.03*	-.17*	-0.05	0.04	0.03
Relative Direct Cost	-.11	-.21*	-.17**	-.30**	-.20**	-.30**	-0.20*	-.18**	-.13**
Manufact/Revenue	-.22**	-.05	-.17**	-.30**	-.20**	-.30**	-.20*	-.18**	-.21**
R&D/Revenue	-.11	-.10	0.01	0.01	-.15**	-.05	-0.11	0.05	-.01
Marketing/Revenue	-.08	-.10	-.13**	-.18*	-.24**	-.10	-0.11	-.15*	-.17**
Relative Market Share	0.06	0.11	0.10**	0.21**	0.06	0.22**	0.01	0.17**	0.13**
Adjusted R-squared	0.60	0.51	0.44	0.49	0.48	0.57	0.59	0.42	0.42
Sample Size	93	88	402	376	167	127	62	323	1638

** $p < .01$; * $p < .05$

Table 3: The Relationship Between Coalignment Measure and Performance: Phase 1 (1976-1979)

ENVIRONMENT	Sample	Corr. Coeff. of Performance With MISALIGN (A) (r1)	With BASELINE (B) (r2)	t-test between (A) and (B)
Global Exporting	75	(-) 0.40 **	(-) 0.19	1.64 *
Fragmented	70	(-) 0.29 *	(-) 0.13	1.06
Stable	324	(-) 0.34 **	(-) 0.17	2.67 **
Aux. Services	300	(-) 0.43 **	(-) 0.07	5.37 **
Emerging	134	(-) 0.49 **	(-) 0.06	5.36 **
Mature	101	(-) 0.42 **	(-) 0.12	2.42 **
Global Importing	50	(-) 0.44 **	(-) 0.31 **	2.66 **
Declining	260	(-) 0.39 **	(-) 0.21*	1.64 **
FULL SAMPLE	1305	(-) 0.36 **	(-) 0.07	8.57 **

* p <.05; ** p <.01

NOTE:
1. The sample size reflects the total sample in a given environment, less 20% (top 10% for calibration purposes and the bottom 10% to ensure that the sample is not skewed downwards because of the removal of the top 10%)

2. Difference in the correlation coefficients is tested as a t-statistic following Bruning and Kintz, 1987; p.228.

Table 4: Strategy Variables Significantly Related to ROI in Each Environment -- Phase II (1980-1983)

ENVIRONMENT / STRATEGY VARIABLES	Fragmented	Stable	Aux. Serv	Emerging	Mature	Declining	Total Sample
Recivables/Revenue	0.06	0.01	-.05	0.02	-.11	0.04	0.03
Total Inventory/Rev	0.12	0.12	-.10	-.08	0.19*	-.01	-.01
Investment Intensity	-.21	-.45**	-.42**	-.43**	-.49**	-.47**	-.50**
Vertical Integ - Backward	-.14	-.16**	0.14*	-.01	-.13	0.05	0.01
Vertical Integ - Forward	-.42*	-.02	-.03	-.01	-.11	-.04	-.05*
Capacity Utilization	0.02	0.04	0.11	0.12*	-.08	-.05	0.04
Emp. Productivity	0.08	0.25**	0.18*	0.38**	0.12	0.31**	0.26**
Rel. Compensation	0.17	0.09	-.12	-.01	.23**	0.06	0.03
% Purch-3 suppliers	0.07	0.15**	-.01	-.02	-.03	-.01	0.01
Rel. Product Breadth	0.01	0.10	-.08	-.03	-.04	-.07	-.04
Rel Product quality	0.11	0.07	0.22*	0.24**	0.12	0.04	0.12**
Relative Price	-.52**	0.20**	-.04	0.14	-.11	0.06	0.06*
Relative Direct Cost	0.06	-.26**	-.04	0.06	-.39**	-.14*	-.11**
Manufact/Revenue	-.05	-.11	-.26**	-.10	-.17**	-.28**	-.20**
R&D/Revenue	-.19	0.22**	-.04	-.02	-.08	0.05	0.03
Marketing/Revenue	-.18	-.18**	-.16*	-.50**	-.37**	-.18**	-.23**
Relative Market Share	0.53**	0.02	0.12	0.05	0.27**	0.19**	0.18**
Adjusted R-squared	0.66	0.46	0.47	0.55	0.71	0.48	0.42
Sample Size	44	150	133	117	76	264	821

** $p < .01$; * $p < .05$

Table 5: The Relationship Between Coalignment Measure and Performance: Phase 2 (1980-83)

ENVIRONMENT	Sample	Corr. Coeff. of Performance With MISALIGN (A) (r1)	With BASELINE (B) (r2)	t-test between (A) and (B)
Global Exporting	18	na	na	na
Fragmented	36	(-) 0.01	(-) 0.12	0.50
Stable	120	(-) 0.32 **	(-) 0.01	2.73 **
Aux. Services	106	(-) 0.28 **	(-) 0.22 *	0.56
Emerging	93	(-) 0.31 **	(-) 0.22 *	1.00
Mature	60	(-) 0.63 **	(-) 0.17	3.42 **
Global Importing	19	na	na	na
Declining	210	(-) 0.39 **	(+) 0.06	4.93 **
FULL SAMPLE	654	(-) 0.39 **	(-) 0.05	6.98 **

NOTE:
1. The sample size reflects the total sample in a given environment, less 20% (top 10% for calibration purposes and the bottom 10% to ensure that the sample is not skewed downwards because of the removal of the top 10%)

2. Difference in the correlation coefficients is tested as a t-statistic following Bruning and Kintz, 1987; p.228.

Figure 1: The Analytical Procedure