

ORGANIZATIONAL ALIGNMENT AS COMPETITIVE ADVANTAGE

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In explaining financial performance variance, strategic management researchers and industrial organization economists have emphasized industry factors, market share, generic strategy, and strategic group membership, whereas organizational contingency theorists have emphasized alignments involving environment and internal structure. This study integrates these perspectives, testing the financial performance consequences of organizational alignments, in context with the effects of industry, market share, and strategy. In an empirical study in two manufacturing industries, it is shown that some organizational alignments do produce supernormal profits, independent of the profits produced by traditional industry and strategy variables. The results are consistent with the resource view of the firm: to the extent that alignments result from skill rather than luck, it is reasonable to regard alignment skill as a strategic resource capable of generating economic rents. The article suggests that, by focusing on industry and competitive strategy variables, contemporary industrial organization and strategy research has understated the role of organizational factors in producing sustainable competitive advantage.

INTRODUCTION

For many years, contingency and configuration theorists have asserted a connection between organizational alignments and performance (Burns and Stalker, 1961; Woodward, 1965; Lawrence and Lorsch, 1967; Miles and Snow, 1978; Mintzberg, 1979; Miller and Friesen, 1984.) For example, in *Organization and Environment*, Lawrence and Lorsch reported their now familiar result that successful firms in uncertain environments adopted more differentiated structures than unsuccessful firms, and employed sophisticated integration devices (such as task forces and liaison devices) appropriate to this greater degree of differentiation. Successful firms in less uncertain environments adopted lesser differentiation and

used less sophisticated integration devices. The authors concluded that 'internal attributes of the organization, in terms of structure and orientation, can be tested for goodness of fit with the various environmental variables and the predispositions of members. Unit performance... emerges as a function of this fit (1967: 209).

However, in the 1980s, strategic management research on organizational performance was dominated not by the alignment approach, but by Porter's (1980) seminal work in competitive strategy, which stimulated a large body of empirical work investigating the sources of sustainable competitive advantage. Many of these studies adopted the generic strategy approach, examining the conditions under which cost leadership and differentiation strategies produce persistent, supernormal profits (e.g. Hambrick, 1983; White, 1986). Others adopted the strategic group approach, focusing on group formation,

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and on the role of mobility barriers in protecting competitive advantage from imitation or appropriation (see Thomas and Venkatraman, 1988).

Although the 'organizational alignment' and 'competitive advantage' approaches each employ financial performance as a key dependent variable, they have developed independently of one another, and have cultivated their own biases—the alignment approach emphasizes organization structure and environment, and neglects strategic positioning, whereas the competitive advantage approach emphasizes competitive strategy, and neglects internal organizational attributes. This article explores the intersection of these two perspectives by investigating whether organizational alignments can produce sustainable competitive advantage, i.e. whether they produce supernormal profits, over and above those attributable to industry, market share, generic strategy, or strategic group membership. The approach and findings support the resource view of the firm (Teece, 1982; Lippman and Rumelt, 1982; Rumelt, 1984; Wernerfelt, 1984), which is concerned with the unique competitive advantages of individual firms (rather than collectives), from whatever sources they may derive [e.g. organizational climate (Hansen and Wernerfelt, 1989) or culture (Barney, 1986a)]. The following section explores the theoretical connections between organizational alignment and performance, and subsequent sections present the hypotheses and empirical study.

ALIGNMENT AND COMPETITIVE ADVANTAGE

Contingency and configuration theories have received considerable attention, both in organization theory and in strategic management research. In general, contingency theorists assert that successful performance is the result of a proper alignment of endogenous design variables (such as organization structure or degree of planning formality) with exogenous context variables (such as environmental uncertainty, technology, or organizational size). Typologists and taxonomists, on the other hand, assert that—regardless of control or causality—successful organizations are aligned in a small number of typical patterns. In some instances, these configuration theorists provide *a priori* theoretical reasons why such

alignments should exist, including natural selection (i.e. the elimination of poorly aligned organizations), organizational inertia, and the tendency toward quantum change (Miller and Friesen, 1984).

Although profitable organizational alignments may be the result of chance, according to Lawrence and Lorsch these alignments require managers to demonstrate 'a high order of integrative capacity' (1967: 245), which the authors regarded as a valuable, but scarce, organizational skill. As such, alignment skill may, taking the resource view of the firm, constitute a rent-producing resource, or 'strategic factor'. Under the resource view, firms generate profits to the extent that they accumulate rent-producing resources that, in addition to providing economic value, meet the tests of scarcity, imperfect imitability, and imperfect tradeability in factor markets (Barney, 1986a, b; Dierickx and Cool, 1989; Peteraf, 1990). Organizational alignment skill would appear to meet these tests. Scarcity is suggested by the complexity and tacit nature of alignment skill (Polanyi, 1967; Nelson and Winter, 1982), along with the abundance and popularity of expensive books, seminars, MBA programs, and in-house training programs that claim to improve organizational skills. Imperfect imitability may result either from first mover advantages (e.g. co-opting managerial talent or industry expertise), or from 'causal ambiguity' (Lippman and Rumelt, 1982), i.e. the inability of competitors, or even the firm itself, to determine the true source of competitive advantage. Finally, the factor market tradeability of alignment skill may be impeded by the firm-specific character of organizational alignments (Doeringer and Piore, 1971), and by an organization's ability to absorb skills into its behavioral repertoires (Cyert and March, 1963; Hedberg, 1981; Winter, 1987), thereby reducing managers' bargaining power in claiming rents for these skills.

Whether alignments result from skill or luck, their performance consequences have not been adequately addressed in the modern industrial economics and strategic management performance literatures [although the idea was not foreign to earlier economists—see, for example, Walker (1887), Marshall (1920), Secrist (1923), and Taussig (1924) on the economic rents to 'business ability']. Prior to 1980, many studies in industrial

organization examined the correlates of firm profitability (see Weiss, 1974, and Scherer, 1980, for reviews), but none explicitly considered organizational factors as a correlate. Most of these studies took an industry-level perspective, explaining interindustry profitability differences as the outcome of market power, buttressed by entry barriers such as scale economies. Then, in the 1980s, strategic management researchers began to examine intraindustry profitability differences, often explaining these differences as the outcome of strategic group differences, supported by mobility barriers (e.g. Hawes and Crittenden, 1984; Hatten and Hatten, 1985). Only recently—and, in part, under the resource view—have researchers begun to examine firm-level (in some cases, intrastrategic group) profitability differences (e.g. Schmalensee, 1985; Wernerfelt and Montgomery, 1988; Cool and Schendel, 1988; Lawless, Bergh, and Wilsted, 1989).

The financial performance picture remains incomplete, however, since there is apparently a good deal more to superior performance than merely strategic positioning. To address this shortcoming, there exists a need for additional research, along the lines of the Hansen and Wernerfelt (1989) study, that examines the performance consequences of organizational variables, taken in context with the variables employed in traditional industrial economics and strategic management research. The study reported here attempts to address this shortcoming by investigating the financial performance consequences of organizational alignments, over and above the effects of industry, market share, generic strategy, and strategic group membership. To the extent that such alignments reflect organizational skill, or 'integrative capacity', this research is also concerned with organizational skill as a strategic resource, i.e. a resource that generates supernormal profits, and thereby constitutes a source of sustainable competitive advantage.

HYPOTHESES

Of central interest in this research is Lawrence and Lorsch's proposition that organizational performance is a function of the fit between an organization's structural differentiation and integration. This proposition, which emerged

from the authors' empirical work in 10 organizations, reflects the strong influence of earlier work by Udy (1959), Burns and Stalker (1961), Woodward (1965), and Emery and Trist (1965), and, in turn, has influenced the work of Galbraith (1973; 1977), Miles and Snow (1978), and many others in both the contingency and configuration schools. Lawrence and Lorsch's proposition suits the purposes of the current research not only because of its prominence in the 'fit' literature, but also because the differentiation-integration fit appears to involve tacit, complex, difficult-to-imitate organizational skills (including, according to Lawrence and Lorsch, creativity, interpersonal skills, tolerance of ambiguity, and the ability to engage in multiple leadership styles). This proposition is given in hypothesis form as follows (statistical measures of 'fit', and operational definitions for the variables for all hypotheses, are given in the measurement section):

H1: The better the fit between organizational differentiation and integration, the greater the supernormal profits.

Perhaps the most frequently-studied context variable in the contingency and configuration research, and a critical organizational variable since Weber's (1947) initial studies of bureaucracy, is organizational size. The Aston researchers found that size is closely associated with formalization, being a strong predictor of reliance on paperwork, and the use of formal procedures (Pugh, Hickson, and Hinings, 1969). Blau (1970) noted that larger organizations adopt more formal procedures in order to improve control, since personal control becomes problematic as size increases. This has led to the proposition that the size-formalization match has important performance consequences for organizations (Blau and Schoenherr, 1971; Mintzberg, 1979). Although size is readily observable by managers, designing and implementing the size-structure match requires an in-depth appreciation of organizational resources and capabilities, and appears to be a subtle, dynamic, and complex task in all but the simplest and most static organizations (Kimberly, 1976).

Using similar reasoning, it has been advanced in the decision-making and strategic management literatures that strategy-making processes are a critical organizational design variable that must

be shaped in accordance with context (Pearce, Freeman, and Robinson, 1987). Thus, it has been argued that an important organizational skill is the ability to align organizational size and strategic decision-making (or strategic planning) formalization (Mintzberg, 1973; Miles and Snow, 1978; Fredrickson, 1984). The research suggests that—since increased size brings greater environmental demands and internal complexity—comprehensive, formal strategy-making processes are required in large organizations, whereas less comprehensive, informal strategy-making processes are sufficient in smaller ones. Like matching size and structure, the size-planning alignment appears to require complex, tacit skills in all but the simplest contexts (Miles and Snow, 1978). And, despite having received considerable research attention, the performance consequences of these size-based alignments have never been tested against those of industry or strategy content variables. These alignments are given in hypothesis form as follows:

H2: The better the fit between organizational size and structural formalization, the greater the supernormal profits.

H3: The better the fit between organizational size and formal planning comprehensiveness, the greater the supernormal profits.

A large number of 'fit' studies have followed Burns and Stalker's (1961) lead in identifying environmental variability as a critical contextual factor in organizational design (Duncan, 1972; Child, 1972; Khandwalla, 1973; Miller and Friesen, 1984). The central proposition in these studies is that different levels of environmental variation require different levels of structural formalization—whereas formal, mechanistic structures are appropriate in stable environments, informal, organic structures are appropriate in unstable environments. Khandwalla (1973) has argued that, although this proposition is relatively familiar, simple, and intuitive, the alignment task itself is complex and difficult, requiring ongoing environmental scanning and interpretation, and insight into the organization's goals, strategies, structure and resources.

A variant of the environment-structure proposition has appeared in the strategic management literature, suggesting that different levels of

environmental variation require different degrees of decision-making comprehensiveness (Fredrickson, 1984; Fredrickson and Mitchell, 1984), or strategic planning formality (Mintzberg, 1973). Although the performance consequences of these environment-planning alignments remain somewhat unclear (Miller and Friesen, 1983), it does appear that an organization's strategy-making process is a key design variable, and that matching strategy-making formalization to environmental variability is a critical organizational alignment skill (Fredrickson, 1986). The alignments involving environmental stability as a context variable are given in hypothesis form as follows:

H4: The better the fit between environmental stability and structural formalization, the greater the supernormal profits.

H5: The better the fit between environmental stability and formal planning comprehensiveness, the greater the supernormal profits.

Since top managers are presumed to exercise considerable influence on organizational alignments, it is also appropriate to include an additional hypothesis dealing with Chief Executive Officer (CEO) attributes. It has been shown elsewhere that CEO internal locus of control—i.e. a strong free-will orientation wherein CEOs believe they control organizational outcomes by their own designs—is the critical CEO attribute in producing appropriate organizational alignments, particularly within single-business firms (Miller and Toulouse, 1986). Therefore, the following hypothesis is included as a separate measure of organizational skill:

H6: The greater the internal CEO locus of control, the greater the supernormal profits.

Statistical model

The independent variables in this research were divided into two sets: (1) The *economic* set, containing the following variables: an industry dummy variable, generic strategy measures (production costs, product differentiation, innovation, market breadth), firm size, and firm age; and (2) The *organization alignment* set, which contains the independent variables named in H1

through H6 (described in more detail in the measurement section).

The statistical model used to test these hypotheses is relatively simple, and resembles those employed in previous profitability studies (e.g. Schmalensee, 1985; Hansen and Wernerfelt, 1989). Formally stated, the null hypothesis is:

$$\begin{aligned} r_{y1 \cdot A} &= r_{y2 \cdot A} = r_{y3 \cdot A} = r_{y4 \cdot A} = \\ r_{y5 \cdot A} &= r_{y6 \cdot A} = 0, \text{ where:} \end{aligned}$$

$r_{yi \cdot A}$ = the correlation between a profitability measure (y) and the variable i given in Hypothesis 1, when the effects of set A (the economic set), and relevant main effects, are partialled from each.

The null model predicts, for example, that the correlation between profitability (Y) and the differentiation-integration fit (H1), when the variables in the economic set (set A) are held constant, does not differ significantly from zero. Stated in variance terms, it predicts that the differentiation-integration fit explains no significant profitability variance, over and above the variance already explained by economic variables.

In their conclusion, Hansen and Wernerfelt (1989:409) wrote 'It would be interesting to move beyond variance decomposition and consider various interactions (contingencies) between economic and organizational variables.' The principal difference between the model proposed here and those used in previous studies is that, rather than focusing on the decomposition of profitability variance, this model focuses on partial correlations, i.e. the correlations between measures of alignment skill and profitability when the economic set is partialled from each. To evaluate these correlations, analysis of covariance is used, with economic variables comprising the covariate set. The statistical method employed is hierarchical regression (a generalization of analysis of covariance), which resembles stepwise regression, except that independent variables are evaluated in a sequence theoretically predetermined by the researcher on theoretical grounds, rather than in order of magnitude of correlation (Cohen and Cohen, 1983). This method was chosen not only to facilitate the evaluation of partial correlations through analysis of covariance, but also to impose the most rigorous possible tests on the variables in H1 through H6, since, in variance terms, any profitability variance

shared between economic and alignment variables is credited entirely to economic variables. This shared variance may prove to be slight (as in Hansen and Wernerfelt, 1989), but this cannot be known in advance, since the economic and alignment variables in this study have not been tested in the same model.

DATA AND MEASURES

Sample

The empirical study is focused in two 4-digit SIC-code industries, chosen according to the following criteria: (1) The four-digit codes were narrowly-defined industries with natural competitors, rather than broad groups or miscellaneous industry categories; (2) The industries were sufficiently fragmented to generate a large sample size in each [each had at least 250 firms listed in the combined Dun and Bradstreet (1988b) and Standard and Poor's (1986a, b) directories]; (3) The two industries contrasted as much as possible on measures of competitive and market stability, but were otherwise similar (e.g. both manufactured consumer products); and (4) At least 80 percent of the firms in the industries were undiversified firms competing primarily in that industry, according to Dun and Bradstreet's (1988b) *Million Dollar Directory*. [Note: this fourth criterion was added because most profitability studies have used published data bases that pool firms from heterogeneous industries, and that do not distinguish between single-business and diversified firms. Although most studies control for industry differences, they do not control for diversification differences. This procedure is not generally valid. A fundamental principal of strategic management is that single-business and diversified contexts give rise to entirely different strategic and structural concerns (Hofer and Schendel, 1978). This is a serious concern in profitability research, since nearly all the key single-business variables—including industry membership, market share, and generic strategy—become either diluted or meaningless in diversified contexts.]

A stable industry was defined as one that met the following criteria: (a) a variance in average annual change in total shipments significantly below the median for all four-digit codes; (b) an average annual change in total shipments near

the median for all four-digit codes; (c) a relatively low variance in average annual industry employment over an extended period; and (d) supporting anecdotal data from industry experts and participants.

An extensive review of all four-digit SIC codes resulted in the selection of SIC code 2512 (wood upholstered furniture) as the stable industry, and code 2335 (women's dresses) as the unstable industry. Using the criteria for industry stability, the furniture industry ranked as one of the most stable of all the manufacturing industries reviewed; in a recent U.S. Department of Commerce (1987) study of 219 four-digit industries, it had the eighth lowest variance of total shipments between 1973 and 1987, it ranked exactly at the median of all industries studied (110th of 219 industries studied) in average change in annual shipments between 1972 and 1987, and its variance in annual employment was low in comparison to other industries (a variance of 13,700 on a mean of 280,500). The women's apparel industry, on the other hand, ranked in the upper 20 percent of industries in variance in total shipments, had average annual changes in shipments (-2.6%) far below the median, and had a high variance in annual employment (a variance of 90,250 on a mean of 119,200). Moreover, data obtained in interviews with industry participants, consultants, and analysts supported these objective assessments; anecdotal data suggested that the entrepreneurial orientation and fashion-consciousness of the women's apparel industry contrasted significantly with the product and market stability typical of the furniture industry. Finally, *post hoc* support for these assessments was found in a subsequent mailing to participant firms; in the apparel industry, 10.8 percent of all firms had either moved or gone out of business since the mailing lists had been published less than a year earlier, whereas only 4.6 percent of furniture firms had done so, indicating a considerable difference in competitive stability in the two industries.

Data collection

As shown earlier, the statistical model includes a large number of independent variables, necessitating a large sample size. Furthermore, the sampling design requires data from privately-held firms, data from firms that are widely dispersed

geographically, and other organizational data that are not publicly available. Because of the constraints imposed by these factors, the mail survey method was adopted. However, because mail surveys are vulnerable to a wide range of measurement and methodological pitfalls, special care was taken in designing and administering the instrument. These procedures are outlined in this section, and further details, along with the complete survey, are available from the author.

The mail survey was designed in booklet form and administered according to the principles of the Total Design Method (Dillman, 1978). The survey was exhaustively pretested—through personal interviews with academics, industry participants, consultants, and industry experts—and was pilot-tested in a sample of 30 firms. The final survey was then mailed, along with a personal cover letter, to the CEOs of all firms listed in Dun's *Million Dollar Directory* (1988b) and Standard and Poor's *Register* (1988b) for SIC codes 2512 (furniture) and 2335 (apparel). A follow-up postcard was sent 1 week after the initial mailing, a second survey and cover letter were mailed 2 weeks after the initial mailing, and nonrespondents were called beginning in the fourth week.

Of the 544 firms receiving the survey, 113 responded, for a response rate of 20.8 percent (23.1 percent in the furniture industry, 18.0 percent in apparel). This response is consistent with those of other published studies using a similar methodology, and met the expectations for this research design, considering its requirement for direct CEO involvement, the sensitivity of much of the requested information, and the high proportion of privately-held firms in the population. Furthermore, the two industry samples represented not 20 percent of a large, heterogeneous collection of firms (e.g. the *Fortune* 500, which resemble one another only in size), but 20 percent of two relatively homogeneous populations to which findings could be generalized legitimately. To establish further the external validity of these industry samples, the median firm size and profitability of sample firms were compared to known population parameters in each industry (analysis available from the author). These data showed only very slight differences between the sample statistics and population parameters, strongly supporting the external validity of the sample data for

both industries. Although the industries are fragmented, the range of firm sizes (from 20 to 11,000 employees) and revenues (from \$850,000 to \$500 million) are broad, and the mean number of employees (742.5) and revenues (\$39.5 million) would not seem to bias the sample unduly toward small firms.

An attempt was made to establish inter-rater reliability among multiple respondents in a subsample of firms, but, although the results suggested excellent inter-rater reliability, the response among this subsample was insufficient to establish conclusive results. Among the six firms for which two responses were obtained per firm, the mean of the six intrafirm correlations was $r = 0.70$, compared to a mean of $r = 0.27$ for the interfirm correlations. Furthermore, 81 percent of all intrafirm responses (306 of 378 items) fell within a single point of one another on the five and six-point scales employed, compared to the 55 percent (208 of 378) that would be expected by chance. Although these data are suggestive of inter-rater reliability, they cannot be considered conclusive because of the small subsample of firms involved. However, since all respondents were CEOs, and most firms were relatively small and undiversified, it seems reasonable to believe that the respondents were well-informed about their firms, and that response or function bias was minimal.

Measurement

Reliable scales existed for most of the variables in this research, and these scales, or slightly modified versions of them, were employed in the survey. The structure scales (controls, formalization, standardization, liaison devices, centralization, automation, overall integration, and overall differentiation) were abridged from the Aston studies (Inkson, Pugh, and Hickson, 1970), Khandwalla (1977), and Miller (1987), and the formal planning scales (goal-setting, scanning, analysis, and overall comprehensiveness) were based on those employed by Miller (1987). The scale for CEO locus of control was an abridged version of the original scale designed by Rotter (1966). The measures of strategy content (production cost, differentiation, innovation, and market breadth) were original to this research, but were based on attributes of strategy identified by Andrews (1980), Porter (1980), Hofer and

Schendel (1978), and Steiner (1979). Firm size was measured by the natural logarithm of the number of full-time employees (Blau and Schoenherr, 1971; Miller, 1987), firm age was measured by the number of years since incorporation, and industry membership was measured as a dichotomous variable (apparel industry = 0, furniture industry = 1).

Financial performance was measured by three survey questions concerning profitability, sales growth, and overall financial performance over the most recent three fiscal years. The profitability measure was employed as the dependent variable in this study. Although the use of subjective performance measures is widespread in organizational research and has been justified elsewhere (e.g. Lawrence and Lorsch, 1967; Dess, 1987), their use does invite explanation. In this research, subjective measures were employed for the following reasons: (1) given differences in accounting conventions, especially concerning inventory valuation, depreciation, and officers' salaries and expenses (particularly in smaller firms), it is not clear that financial measures are more accurate, or more comparable across firms, than subjective evaluations; (2) since all respondents were CEOs, it could be assumed that they were reasonably well-informed of their firms' financial positions; (3) many of the firms were privately-held, and would not have provided confidential information from their financial statements as a matter of policy; (4) no survey identification numbers were used, removing respondents' incentives to provide misleading subjective assessments; (5) irrespective of the convergent validity between objective and subjective performance measures, CEO perception of performance can be regarded as an important independent variable in and of itself.

Despite these justifications, it was decided to establish the convergent validity of the subjective measures by obtaining objective performance measures from a subset of firms in the overall sample. These firms were asked to provide detailed information from their financial statements for three fiscal years, including total sales, total assets, and net income after taxes for each year. From this information, average ROA and sales growth were computed for each responding firm. Of the total of 113 respondents, a subset of 52 firms provided both the subjective and objective financial information, and the corre-

lation between these two measures was computed as a test of the convergent validity of the subjective measures. For sales growth, the correlation between the subjective and objective measures was 0.69, and, for the profitability measure used in this study, the correlation was 0.58 (each is significant at $p < 0.001$). These coefficients were taken as strong evidence that, although the two measures were not identical, objective financial performance constituted a key element of the CEOs' subjective assessments of their firms' financial performance.

With the exception of single-item measures and the scale for CEO locus of control (which its developer designed as an additive, rather than correlative, measure), it was possible to establish the internal consistencies of the modified scales using Cronbach's alpha (Cronbach, 1951). Although no acceptable range has been established for this index, Van de Ven and Ferry (1979) have suggested that, for a scale of three items, alpha should fall between 0.70 and 0.90 for a narrow construct, between 0.55 and 0.70 for a moderately broad construct, and between 0.35 and 0.55 for a very broad construct. In order to establish Cronbach reliabilities for the modified scales, a pilot test was conducted in a sample of 30 firms in a variety of industries, alphas were computed, and the scales were fine-tuned as necessary. In the pilot study, the Cronbach alphas ranged from 0.62 to 0.85 and, in the field study, from 0.60 to 0.84, and in no instance did a coefficient change by more than 0.06 from the pilot test to the field study. Not only were all reliability coefficients acceptable in both the pilot test and the field study, but their similarities under the two different testing conditions suggested that the scales were robust with respect to changes in experimental settings. The final measurement scales are given in Appendix 1, and descriptive statistics and correlations for the variables are given in Appendix 2.

Measuring organizational alignments

Because the measurement of organizational alignments, particularly under the contingency theory approach, has been subject to debate and criticism (e.g. Tosi, Aldag, and Storey, 1973; Schoonhoven, 1981; Venkatraman and Camillus, 1984), the measures used in any contingency-based research require explanation and justifi-

cation. A number of measurement options are available, depending on a researcher's purposes: statistical analyses could employ moderated regression analysis, subgroup analysis, analysis of variance, analysis of residuals, deviation score analysis, or path analysis. As Venkatraman (1989) observed, few contingency studies have explicitly identified their approach, choosing apparently based on analytical convenience, or by accident. However, as Schoonhoven (1981) and others make clear, this choice should not be left to chance or convenience, since—in general—different approaches yield different results.

In this study, H1 is based on Lawrence and Lorsch's internal consistency hypothesis, which contends that high-performing firms employ structural integration only to the extent required by their structural differentiation. Too little integration and the organization is chaotic. Too much integration and the organization is stifled. Although this concept has intuitive appeal, it has, unfortunately, never been rigorously specified either by Lawrence and Lorsch, or by subsequent researchers. Lawrence and Lorsch's concept of fit could plausibly be interpreted either from a 'moderation' perspective, with differentiation moderating the integration–performance relationship, or from a 'matching' perspective, with the integration–differentiation match enhancing performance. The former would imply statistical interaction analysis, whereas the latter would imply deviation score or residuals analysis.

On a close reading of the text, the latter seems closer to the authors' original intent, for two reasons: (1) both differentiation and integration are treated by the authors as endogenous, or 'design', variables that managers can control as they see fit; and (2) the authors' concept of internal structural fit tends to focus more on the importance of adopting similar levels of integration and differentiation, rather than on their joint effects.

Hence, a matching perspective, and deviation score analysis, were used to measure internal structural fit. Using the deviation score method, all firms were ranked on structural integration and differentiation, and the correlation between profitability and the absolute value of the firms' rank differences was observed. This method, unlike interaction terms, produces a measure of structural fit that is theoretically independent of either integration or differentiation.

The remaining 'fit' hypotheses (H2–H5), because they each include one exogenous context variable, are better interpreted as measuring the joint effects of the given alignments. For example, the firm size/strategy-making hypothesis (H3) suggests that profitability is enhanced by the size-planning interaction, rather than by a matching of planning styles and organizational size. Using the interaction method, the joint effects of any two alignment variables on profitability were measured by testing the significance of the partial correlation between profitability and a multiplicative interaction term, from which both the economic set, and main effects of the interaction variables, have been partialled (Cohen and Cohen, 1983).

RESULTS

Table 1 gives the zero-order correlations between profitability and each variable in the economic and organization alignment sets, along with their standardized beta coefficients, and the multiple R , R^2 , and adjusted (or 'shrunk') R^2 (denoted $adjR^2$, the estimated population R^2 based on the sample R^2 and the degrees of freedom, assuming an infinite population). The upper portion of the table shows that two of the generic strategy variables—production costs and market breadth—correlate significantly with profitability at $p < 0.05$, along with firm age, which correlates negatively with profitability. The upper portion also shows that, with $R = 0.45$, the economic set explains about 20 percent of profitability variance (and $adjR^2 = 0.15$), significant at $p < 0.001$.

The lower portion of Table 1 gives the results of the hypothesis tests, showing the partial correlations between profitability and each variable in the organization alignment set. The table shows that H1, H2, H3, and H6 could not be rejected: two of the variables—Lawrence and Lorsch's internal structural fit ($pr = 0.32$) and CEO locus of control ($pr = -0.29$)—are significant at $p < 0.01$, and the other two—the size-planning interaction ($pr = 0.22$), and the size-structure interaction ($pr = 0.19$)—are significant at $p < 0.05$. The results are less certain for H4 and H5, the two interactions with industry stability, which are significant only at $p < 0.10$. Table 1 also shows that the multiple partial correlation ($pR = 0.46$), incremental R^2 (0.21), and incremental $adjR^2$ (0.16) are quite similar to

Table 1. Results

	r	β
Economic set		
Industry (IND)	-0.02	-0.08
Production costs (PRCOST)	-0.27***	-0.26***
Product differentiation (PRODIF)	0.11	0.15
Innovation (INNOV)	0.13	0.07
Market breadth (BREDTH)	-0.23**	-0.20**
Firm size (LN SIZE)	0.08	0.06
Firm age (AGE)	-0.25**	-0.22**
$R = 0.45$		
$R^2 = 0.20$		
$adjR^2 = 0.15$		
$F = 3.75\dagger$		
Organization alignment set	pr	
H1—Internal structural fit (SFIT)	0.32***	
H2—Size structure fit (SSFIT)	0.22**	
H3—Size-planning comps. fit (SPFIT)	0.19**	
H4—Industry-structure fit (ISFIT)	-0.17*	
H5—Industry-planning comps. fit (IPFIT)	-0.17*	
H6—Locus of control (LOCUS)	-0.29***	
$pR = 0.46$		
$pR^2 = 0.21$		
$adjpR^2 = 0.16$		
$F = 4.02\dagger$		

pr = partial correlations between profitability and the variables given, i.e. the correlations when the economic set and relevant main effects are held constant.

pR = multiple partial correlation between profitability and the organization alignment set and relevant main effects, i.e. the multiple correlation when the economic set is held constant.

$\dagger = p \leq 0.001$; *** = $p \leq 0.01$; ** = $p \leq 0.05$; * = $p \leq 0.10$. (All t -tests are two-tailed).

those obtained for the economic set, and are all highly significant ($p < 0.001$). It was also found that the two sets explained virtually independent proportions of profitability variance—the summed incremental $adjR^2$ values for the two sets was 0.31, whereas $adjR^2$ for the combined regression model was 0.30.

It was noted earlier that the measures for the contingency variables in this study were chosen based on the theoretical assumptions underlying each hypothesis, and that different measures generally produce different results. However, in order to test the robustness of the findings, correlations were computed for alternative measures of both the independent and dependent



variables. The results are given in Table 2. In Table 2, column 1 gives the original correlations for the organization alignment set, column 2 gives the correlations when alternative measures for the independent variables are used (the measures are reversed from those described in the measurement section: for H1, a statistical interaction term is used to measure integration–differentiation fit, and deviation scores are used for H2 through H5), and column 3 gives the results when the original measures are used for the independent variables, but the dependent variable is overall performance, rather than profitability.

The results show that H1, H3 and H6 remain significant under all three scenarios, and that H2 and H5 are significant under two of the three scenarios. Only H4, the fit between industry stability and structural integration, which was marginally significant in the original test, does not remain significant under either alternative scenario (although its sign is unchanged). The results suggest that the original findings are robust with respect to changes in variable specification—all of the signs remain unchanged, the three columns correlate highly with one another (mean $r = 0.96$), and the strongest hypotheses under the original scenario (H1, H2, H3, and H6) are also the best-supported in the alternative scenarios.

DISCUSSION

The results support the notion that some organization alignments generate supernormal profits to the firm, and constitute an important source

of competitive advantage. Although it is possible that the profitable alignments were produced by chance, the three-year time horizon employed in the study should have normalized this effect to some degree. To the extent that the alignments resulted not from luck, but from administrative skill, alignment skills stand alongside industry and strategic positioning as key sources of competitive advantage.

Of particular interest is the strong partial correlation between profitability and Lawrence and Lorsch's internal structural fit. Because the calculation of this variable was indirect, unknown to respondents, and relatively complex (involving ranking all firms on both differentiation and integration, and standardizing the absolute value of the difference between the two ranks), it seems unlikely that this correlation was the result of 'conscious correlation' by the respondents (as may be the case in studies where correlations are taken between two direct measures—such as formal planning and profitability—provided subjectively by respondents). Furthermore, the fact that structural fit explains a significant increment of profitability variance, over and above the increment explained by economic variables, suggest that it acts as a source of competitive advantage independent of industry and strategy content. This is the first large sample empirical study that tests Lawrence and Lorsch's consistency hypothesis against alternative perspectives, and the results appear to corroborate Lawrence and Lorsch's findings.

Similar claims can be advanced, albeit with a low confidence level, with respect to the size-structure and size-planning hypotheses. Since

Table 2. Hypothesis testing using alternative measures

Organization alignment set	pr^1	pr^2	pr^3
H1—Internal structural fit (SFIT)	0.32***	0.22**	0.25**
H2—Size-structure fit (SSFIT)	0.22**	0.14	0.20**
H3—Size-planning comps. fit (SPFIT)	0.19**	0.22**	0.17*
H4—Industry-structure fit (ISFIT)	-0.17*	-0.10	-0.07
H5—Industry-planning comps. fit (IPFIT)	-0.17*	-0.21**	-0.07
H6—Locus of control (LOCUS)	-0.29***	-0.29***	-0.31***

pr^1 = partial correlations between profitability and the variables given using the original measures (same as in Table 1).

pr^2 = partial correlations between profitability and the variables given, reversing the original measures for the contingency hypotheses (H1 is a statistical interaction, and H2 through H5 are standardized difference scores).

pr^3 = partial correlations between profitability and the variables given, using overall performance (rather than profitability) as the dependent variable.

*** = $p \leq 0.01$; ** = $p \leq 0.05$; * = $p \leq 0.10$. (All t-tests are two-tailed).

these variables were calculated using multiplicative interaction terms, it is unlikely that respondents positively biased the results by manipulating responses—in fact, an attempt to produce conscious bivariate correlations could easily have biased the correlations with interaction terms downward. Furthermore, the obtained correlations were, once again, independent of industry and strategy effects, suggesting that these interactions do confer independent competitive advantage.

The industry interactions, although significant, generated the least powerful results and, because of the small industry sample, do not convincingly demonstrate the effects of the industry-structure or industry-planning fits. The results support the hypotheses, but corroboration will be needed within a larger industry sample to improve confidence in these findings.

Although the study explains less than half the total profitability variance, the $\text{adj}R^2$ value (0.30) compares reasonably well with those obtained in earlier studies by Schmalensee (1985: $R^2 = 0.17$) and Hansen and Wernerfelt (1989: $R^2 = 0.46$). Furthermore, the findings seem to contradict the earlier's conclusion and support those of the latter, i.e. that organizational factors can act as sources of competitive advantage independent of traditional industrial organization variables. Whereas Hansen and Wernerfelt suggest that goal emphasis and human resource emphasis can act as sources of competitive advantage, the current study suggests that importance of additional organizational factors, particularly the alignment of key variables. Because of the consistency of these findings using different research designs and sampling methodologies, empirical support for the importance of organizational factors appears to be accumulating.

CONCLUSIONS

The findings of this study are tentative, but suggestive—the concept of competitive advantage need not be confined to traditional economic variables, but may be extended to such nontraditional variables as organizational alignment. And, since alignment hypotheses are drawn largely from organization theorists, the study can claim some measure of success in integrating multiple perspectives, particularly those from

industrial organization, strategy, and organization theory. Lawrence and Lorsch's consistency hypothesis was proposed over 20 years ago—and, indeed, was built on foundations laid even earlier by Burns and Stalker (1961), Woodward (1965), and others—and yet only now are researchers beginning to integrate this hypothesis with those found in industrial organization and strategy. This study is only a small step, but it does begin to integrate long-standing, disparate perspectives on organizational performance.

In the current study, the researcher instituted a number of controls to avoid pitfalls common to the survey methodology, including sampling from two homogeneous populations of undiversified firms, extensive pretesting and pilot testing, the use of proven, reliable scales, testing for inter-rater reliability, testing for the convergent validity of the performance measure, and comparing sample statistics with population parameters. To avoid Type I error, i.e. overstating the importance of the organizational alignment variables, only partial correlations were used, an infinite population was assumed, and alternative measures were tested.

Nonetheless, the study is open to a number of fair criticisms. One criticism concerns the external validity of the findings. Because this study deals only with firms in two industries, the profitability variance explained by the industry dummy variable, which is near zero, cannot be regarded as representative—in a larger industry sample, industry affiliation may have explained a larger proportion of profitability variance (see Rumelt, 1991). Furthermore, because these two industries are similar in many respects (e.g. mature, fragmented, consumer products manufacturing industries), results from the hypothesis-testing should be generalized with caution. The author is aware of no reason why organizational alignment would have less importance in other environments, and would, in fact, suggest that this factor may take on even greater importance among larger firms in more complex industries. Still, it has not been shown that alignment is important in other types of industries, e.g. oligopolies, growth industries, or industries in the service, transportation, or retail sectors. Also, since most firms in the industries sampled employed either simple or machine bureaucratic structures, a similar study among more organic, adhocratic organizations would prove useful.

A more serious problem, and one shared with other profitability studies, concerns the cross-sectional design of the study. It can be argued that cross-sectional designs are excusable in exploratory studies testing emerging theoretical perspectives, but this does not escape the general problems associated with the design. This study has given considerable attention to theory, attempting to demonstrate the theoretical plausibility of the implied causation from organizational alignment to profitability, but it is clear that only correlation, and not causation, has been proven in the empirical study. The study also has not shown that the organization-based advantages have been sustained over extended time periods, nor has it addressed the survivor-bias problem—if alignment caused organizations to fail, this study would not have detected it, since no non-surviving organizations were studied. It is customary to call for longitudinal research to corroborate cross-sectional findings, and this study must resign itself to repeating that call.

This study may have important implications not only for future integrative organizational research, but also for managers and strategic planners. In one sense, the findings confirm the importance of strategic positioning, since low cost and market niche strategies both correlate significantly with profitability. On the other hand, it suggests that the emphasis placed on industry and strategic positioning, in the popular Porter framework and elsewhere, may be misplaced, understating the importance of organization-based competitive advantages. This study has tried to shift the focus back to organizational factors, showing how alignment-creation may produce sustainable competitive advantage. If the findings are a good first approximation to reality, then organizational factors are at least as important as the traditional industry and strategic factors that have dominated strategic management research and practice over the past decade.

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APPENDIX 1: MEASUREMENT SCALES

Planning Comprehensiveness. Respondents were asked to indicate, on a scale of 0 to 5, the accuracy of 11 statements concerning their firms' strategy-making processes. The scale was anchored at either extreme with the words 'Very Accurate' or 'Not at all Accurate'. The statements, with the variable being measured in parentheses, were as follows:

1. We have broad, long-range goals known to all managers (GOALS)
2. We have specific, short-term goals known to all managers (GOALS).
3. Our firm's actions are based more on formal plans than on intuition (ANALYS).
4. We have a manager or department devoted exclusively to formal planning (ANALYS).
5. We hold regular managers' meetings to discuss overall strategy (ANALYS).
6. We use mathematical and computer models as planning aids (ANALYS).
7. We have a written plan for the next 12 months (ANALYS).
8. Our planning outlook is more long-term than short-term (ANALYS).
9. We search systematically for information about our competitors (SCANNING).
10. We use special market research studies (SCANNING).
11. We search systematically for new products, acquisitions, and investments (SCANNING).

CEO Locus of Control. The CEOs were asked to indicate, on a scale of 0 to 5, the accuracy of five statements concerning their own values and attitudes. The scale was anchored at either extreme with the words 'Very Accurate' or 'Not at all Accurate'. The statements were as follows:

1. Becoming a success is a matter of hard work; luck has little or nothing to do with it.
2. Getting ahead largely means being at the right place at the right time.
3. For the most part, my firm's success is controlled by forces too complex to understand or control.

4. I have found that I can control my firm's environment to a large extent.
5. Many times I feel I have little or no influence over what happens inside my firm.
9. Standardized salary review and promotion procedures
10. A formal management training program
11. A time clock for hourly employees
12. Permanent planning or decision-making committees, consisting of managers from different departments in the firm (such as marketing, production, and finance)
13. Temporary teams or task forces consisting of managers from different departments for collaboration on a specific project
14. Regular meetings of key managers from different departments to discuss major policy decisions
15. A person or department devoted exclusively to coordinating the efforts of different departments

Generic Strategy. Respondents were asked to indicate, on a scale from 1 to 5, the accuracy of five statements concerning their firms' strategies. The scale was anchored at either extreme with the words 'Very Accurate' or 'Not at all Accurate'. The statements, with the variable being measured added in parentheses, were as follows:

1. We command a higher price than other firms by making a distinctive, high quality product (PRODIF).
2. Our prices are among the lowest in the industry (PROCOST).
3. We are often first to introduce innovative products (INNOV).
4. We spend more heavily on R&D than our competitors (INNOV).
5. We focus on a narrow, specific customer group (BREDTH).

Structural integration. Respondents were asked to indicate, on a scale of 0 to 5, the extent to which their firms use various rules, operating procedures, and other methods of structural integration. The scale was anchored at either extreme with the words 'Used to a great extent' or 'Not used at all'. These items were as follows:

1. Written budgets
2. A quality control system for production, using sampling or other methods
3. Cost centers or profit centers
4. Regular performance appraisal for employees
5. An information system that generates reports on firm performance compared to its goals
6. Regular inventory of materials on hand
7. A cost accounting system
8. Standardized ordering procedures for supplies and materials

Structural Differentiation. This variable is a function of organizational dispersion and complexity, and was measured using 11 survey items. Respondents were first asked one question each concerning the distribution of physical facilities and decentralization of decision-making authority in the firm. They were then given three questions in which they were asked to indicate, on a scale from 1 to 5, the extent to which their firm is automated in its information system, manufacturing process, and overall (a measure of structural complexity). Finally, they were asked to consider six decisions, and to indicate the organizational level at which each decision would be made in their firm. The levels given were: (1) Owner or CEO, (2) Upper management, (3) Middle management, (4) Lower management, and (5) Nonmanagement. The six decisions were:

1. Setting delivery dates for orders
2. Choosing the type or brand of new computer equipment
3. Policy concerning overtime to be worked by shop workers
4. Accounting methods to be used
5. Suppliers to be used
6. Whether to introduce a new product

APPENDIX 2: DESCRIPTIVE STATISTICS AND CORRELATIONS

No. Variable	m	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
1. Planning comprehensiveness	2.42	1.01	1.00											
2. CEO Locus	2.66	0.81	-0.33	1.00										
3. Product differentiation	3.58	1.03	0.31	-0.05	1.00									
4. Production cost	3.21	0.98	-0.13	0.26	0.16	1.00								
5. Innovation	2.73	1.04	0.38	-0.11	0.31	0.01	1.00							
6. Market breadth	2.85	1.38	0.00	0.01	-0.07	0.07	-0.05	1.00						
7. Structural integration	3.01	0.96	0.73	-0.39	0.24	-0.13	0.45	0.07	1.00					
8. Structural differentiation	2.60	0.46	0.61	-0.25	0.23	-0.16	0.30	0.14	0.57	1.00				
9. Size (In Employees)	5.41	1.33	0.55	-0.19	0.13	-0.13	0.15	0.11	0.55	0.73	1.00			
10. Industry	0.60	0.40	0.22	-0.10	0.17	-0.21	0.18	0.21	0.25	0.17	0.11	1.00		
11. Age	4.36	0.98	-0.01	0.05	0.12	0.16	-0.08	-0.04	0.01	-0.01	0.03	-0.01	1.00	
12. Profitability	3.38	1.04	0.20	-0.35	0.11	-0.27	0.13	-0.23	0.15	0.16	0.08	-0.02	-0.25	1.00

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