A Replication and Extension of Organizational Growth Determinants

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Although the management literature contains an impressive volume of studies attempting to identify factors that precipitate organizational growth, fragmented theory has developed because of the absence of replicative studies that integrate multiple levels of determinants. Previous studies have shown that exclusive use of either industry, strategy, or top management determinants can individually influence sales growth, but no existing research has empirically demonstrated the simultaneous effects of all three levels of determinants. Using a representative sample of 193 firms from 48 industries, this study replicated findings from several tangentially related studies to provide empirical support for the simultaneous influence of all three levels of determinants. Relative comparisons among the three levels of determinants showed organization strategies to be most significant, followed by top management characteristics and industry attributes. Interactions between industry/strategy determinants and strategy/top management determinants were also found to be significant. J BUSN RES 2000. 48:35–41. © 2000 Elsevier Science Inc. All rights reserved.

Organizations can benefit from growth in many ways, including greater efficiencies through economies of scale, increased power, the ability to withstand environmental change, increased profits, and increased prestige for organizational members. A review of the management literature on organizational growth yields an extensive stream of research on consequences of growth, but only a limited bibliography on determinants that precipitate growth. Although earlier research has suggested a number of determinants of organizational growth, strategy and organization theory researchers have been unable to gain consensus regarding factors leading to organizational growth; therefore, creating fragmented theory (Davidsson, 1991; Kazanjian, 1990; Whetten, 1987).

This lack of consensus may in part, result from the absence of replicative studies that attempt to integrate multiple levels of determinants to examine simultaneous effects. For example, several researchers have exclusively examined the influence of strategy factors on organizational growth (Donaldson, 1987; Grinyer, McKiernan, and Yasai-Ardekani, 1988; Hamilton and Shergill, 1992; Johnson and Thomas, 1987). Others have examined relationships between characteristics of top management and organizational growth (Gupta, 1984; Hambrick and Mason, 1984; Norburn and Birley, 1988).

Several studies have tried to examine the impact of two levels of determinants on organizational growth. Researchers have found concurrent effects of strategy and top management characteristics on organizational growth (Feese and Willard, 1990; Miller and Toulouse, 1986), strategy and industry characteristics on organizational growth (Mcdougall, Robinson, and DeNisi, 1992; Romanelli, 1989), and industry and top management characteristics on organizational growth (Eisenhardt and Schoonhoven, 1990). However, all of the studies that examined growth determinants at two levels used restricted samples such as single industry samples or samples consisting only of small businesses.

Although previous studies have shown that exclusive use of either industry, strategy, or top management attributes can individually influence organizational growth, researchers have yet to develop a unified model of organizational growth that provides concurrent empirical support for all three levels of determinants. Moreover, limited attempts have been made to investigate interactions among organizational growth determinants.

In an attempt to combine growth determinants from tangentially related studies into a single convergent model, findings from past research are replicated to develop a multilevel model. We triangulate the simultaneous influences of industry attributes, portfolio-level and competitive-level organizational strategies, and characteristics of top management teams by testing main effects, interaction effects, and relative comparisons among sets of determinants. In addition, to overcome sampling limitations from previous research examining multiple levels of determinants, this study uses a broad-based sample of organizations from multiple industries to increase the generalizability of findings.
Theoretical Framework

The variables chosen to be replicated in this study are not intended to represent all possible growth determinants. Based upon an exhaustive review of the literature from 1985 to 1994, the variables replicated in this study comprise the most commonly studied determinants in the management literature used to examine organizational growth. The journals reviewed include *Academy of Management Journal*, *Academy of Management Review*, *Administrative Science Quarterly*, *Entrepreneurship Theory and Practice*, *Journal of Business Research*, *Journal of Business Venturing*, *Journal of Management Studies*, *Journal of Small Business Management*, *Management Science*, *Organization Science* (1990 to 1994), and *Strategic Management Journal*. Three sets of determinants were identified: industry attributes, organization strategies, and top-management characteristics.

Industry Determinants of Growth

Such market characteristics as product differentiation, monopolistic economies of scale, and capital requisites create barriers to entry; thereby, protecting incumbents from the threat of new entrants (Scherer, 1980). The model developed here replicates studies that considered three common entry barriers: advertising intensity, research-and-development (R&D) intensity, and competitive concentration. Advertising expenditures raise barriers to entry by creating economies of scale thresholds below which advertising impact would diminish. Similarly, R&D expenditures may deter new entrants by increasing initial capital expenditures and creating a potentially complex knowledge base. Competitive concentration can also erect entry barriers, because high concentration protects incumbent firms from potential new entrants (Hamilton and Shergill, 1992).

When barriers to entry are high, firms within the industry have increased protection against the possibility that new entrants may deplete the environment of critical resources necessary for existing firms to achieve growth. Therefore, firms located in an industry with high entry barriers are expected to achieve higher levels of growth relative to firms located in industries with low entry barriers.

Strategy Determinants of Growth

Researchers have shown that organizational strategies are important determinants of organizational success (Feese and Willard, 1990; Grinyer, McKiernan, and Yasai-Ardekani, 1988; Palepu, 1985). This study replicates findings from two central approaches to organizational strategy: portfolio-level strategies and competitive-level strategies.

Portfolio-Level Strategy. Portfolio-level or primary strategies address the selection of industries in which a firm diversifies to define its domain (Bourgeois, 1980). Related diversification strategies build on synergies of existing businesses to achieve growth. Because related diversification is a growth strategy that builds upon existing synergies, a firm has existing knowledge of the product and market in which it operates (Palepu, 1985). Conversely, if a firm undertakes an unrelated diversification strategy, typically through acquisitions, the firms will have limited knowledge, and, thus, will face increasing uncertainty (Varadarajan and Ramanujam, 1987). Researchers have shown that related diversification strategies outperform unrelated diversification strategies in terms of overall performance, including growth; whereas unrelated diversification strategies decrease variability of sales growth (Palepu, 1985).

Therefore, related diversification strategies should increase the likelihood of organizational growth relative to unrelated diversification strategies, when controlling for acquisitions. This assertion does not imply that unrelated diversification will prevent a firm from achieving short-term growth. However, a related diversification strategy will enable a firm to achieve a higher growth rate than would an unrelated diversification strategy.

Competitive-Level Strategy. Competitive-level or secondary strategies address how a firm competes within a particular industry (Bourgeois, 1980). Several researchers have suggested or shown that strategic aggressiveness to pursue Porter’s (1980) competitive strategies is positively associated with organizational performance (Feese and Willard, 1990; Grinyer, McKiernan, and Yasai-Ardekani, 1988; Romanelli, 1989). A firm can aggressively pursue a low-cost strategy by decreasing its cost base relative to competitors and pursue a differentiation strategy by offering a product or service perceived as unique by consumers. Aggressive firms may create such competitive advantages as increased customer awareness and brand loyalty (Feese and Willard, 1990). Romanelli (1989) suggested that aggressive organizations had a better chance of surviving, because aggressive firms will acquire the resources necessary to withstand competitive pressures and achieve growth. Thus, aggressive strategies should lead to increased growth.

Top Management Determinants of Growth

In the organization theory and strategy literatures, beliefs and characteristics of powerful individuals in organizations are thought to have a pronounced impact on the initiation of strategic change and organizational growth. Specifically, this study replicates research initiated by Hambrick and Mason (1984) and Gupta (1984). These authors contended that top management team (TMT) characteristics that may influence organizational growth include heterogeneity and age of the top management team.

Heterogeneity of Top Management Teams. Eisenhardt and Schoonhoven (1990) suggested that industry heterogenei-
ity of top management team members produces constructive conflict. They argued that this form of heterogeneity would provide better decision making, because TMT members with many years in a particular industry can offer insights based upon rich experience; whereas, newcomers can provide fresh perspectives. Additionally, heterogeneity of functional experience may affect the growth rate of an organization. Functional heterogeneity can produce constructive conflict, wherein team members with different functional backgrounds provide checks and balances in decision making (Hambrick and Mason, 1984). Therefore, organizational growth may be positively related to the level of top managers’ industry and functional heterogeneity.

**AGE OF TOP MANAGEMENT TEAM MEMBERS.** Hambrick and Mason (1984) proposed that age of the upper echelon would affect the growth rate of an organization, where older executives tend to be more conservative and have a bias for maintaining the status quo. Perhaps executives in the latter years of their careers would not feel as mobile as younger executives and, therefore, would not want to take the risks often necessary when seeking to increase firm growth. Younger executives typically take more risks, so youthfulness of executives leads to organizational growth (Hambrick and Mason, 1984).

**Control Variables**

An organization’s growth rate is closely related to the growth rate of its industry (Kotha and Nair, 1995). Therefore, this study controls for industry growth rates, because the sample uses firms from multiple industries. In addition, the number of companies acquired and/or sold during the period of observation was considered as a control variable for the diversification measure, because organizations may grow or decline simply because of acquisitions or divestitures. Organizational slack, defined as excess assets after debts have been satisfied, was also considered as a control variable. Eisenhardt and Schoonhoven (1990) showed that organizational slack was positively related to growth.

Although previous studies have not been able to show the simultaneous effects of all three levels of determinants, replicating findings from tangentially related research provides a strong theoretical foundation for examining these simultaneous influences. Therefore, to extend previous research, we examine the proposition that organizational growth is influenced simultaneously by industry attributes, organizational strategies, and TMT characteristics.

**Methods**

**Data Collection Methods**

Data were collected from multiple sources: Standard & Poor’s COMPSTAT data tapes, Standard & Poor’s Corporate Records, Predicast’s F&I Index, Moody’s Industrial Manual, Moody’s OTC Manual, Moody’s Unlisted OTC Manual and Dun and Bradstreet’s Reference Book of Corporate Managements. All firms on the COMPSTAT database reporting quarterly figures for sales, advertising expenditures, and research and development expenditures for 20 consecutive quarters from the first quarter of 1987 to the fourth quarter of 1991, and reporting top management data were included in the sample. This yielded a sample of 193 firms from 48 industries, based upon primary Standard Industrial Classification (SIC) codes. Power analysis (Cohen, 1977) indicated that a minimum of 168 firms would be needed for this study.

**Measurement of Variables**

To replicate previous research, this study operationalized growth variables using measures commonly found in the organization theory and strategy literatures.

**ORGANIZATIONAL GROWTH.** This study used a modified version of the ordinary least-squares beta coefficient approach used by Grinyer, McKiernan, and Yasai-Ardekani (1988) and Hamilton and Shergill (1992) over 20 quarterly observations (adjusted for seasonality) to measure sales growth. Sales data were chosen for reasons of replicability, because most recent studies in our literature review used sales data to measure growth. In addition, the beta coefficient approach was chosen as the appropriate operationalization, because it captures the fine-grained fluctuations of sales data better than other methods commonly used to measure growth, and it dampens the effects of outliers (Weinzimmer, Nystrom, and Freeman, 1998). Growth rates were also standardized for the size of each organization by dividing the beta coefficient by the mean size of an organization over the period of observation (cf. Dess and Beard, 1984; Grinyer, McKiernan, and Yasai-Ardekani, 1988). Therefore, the estimated slope of the regression line (B’) of sales over time represents the rate of change (growth) of an organization. Specifically, growth is operationalized as (Equation 1).

\[
\text{GRW}_j = \frac{\left[\left(\sum_{i=1}^{n} i Z_{ij} - \left(\sum_{i=1}^{n} i^2\right) \left(\sum_{i=1}^{n} Z_{ij}\right)\right) / \left(\sum_{i=1}^{n} i^2\right)\right]}{\mu_i \delta_i}
\]

where: \(\text{GRW}_j\) = growth rate for jth firm; \(Z_{ij}\) = sales of the jth firm the ith period; \(i\) = time period; \(\delta_i\) = discount rate for inflation during the ith period; \(\mu_i\) = mean size of the jth firm, discounted for inflation; and, \(n = 20\) consecutive quarters from 1987 to 1991.

**ENTRY BARRIERS.** A composite score was calculated for each four-digit SIC code using advertising intensity, R&D intensity, and a four-firm concentration ratio. Entry barrier measures may not be comparable among different industries, given characteristics endogenous to different markets. Therefore, these measures were standardized before the variables were summed to calculate height of entry barriers (cf. McDougall, Robinson, and DeNisi, 1992).
PORTFOLIO-LEVEL STRATEGY. This study uses Davis and Duhaime’s (1992) entropy measure of diversification to investigate the influences of related diversification from 1987 to 1991.

STRATEGIC AGGRESSIVENESS. This study used Fombrun and Ginsberg’s (1990) composite approach to measure strategic aggressiveness. To calculate differentiation aggressiveness, ratios of advertising expenditures to sales and product R&D expenditures to sales were used. To calculate low-cost aggressiveness, ratios of expenditures for new plant and equipment to sales and process R&D expenditures to sales were used. Industry effects were controlled by dividing firm ratios by average industry ratios to assess firm-level aggressiveness relative to competition.

HETEROGENEITY OF TOP MANAGERS. Top managers are defined as all officers above the level of vice president (Michel and Hambrick, 1992). Industry heterogeneity was measured by computing the coefficient of variation, defined as the standard deviation divided by the mean (cf. Wiersema and Bantel, 1992). Functional heterogeneity was measured by the number of functional disciplines currently represented by top management members divided by the size of the TMT using a nine-point scale offered by Michel and Hambrick (1992).

AGE. Age is measured by mean age in years of top managers (Norburn and Birley, 1988).

CONTROL VARIABLES. To measure industry growth, sales for each 4-digit SIC code were regressed over time and the corresponding standardized coefficient (β̂) was used as a measure of industry growth (cf. Dess and Beard, 1984). Organization slack was measured as assets/debt (Eisenhardt and Schoonhoven, 1990). Net acquisitions/divestitures for each organization was a continuous variable, ranging from −n to n acquisitions during the period of 1987–1991.

Analytic Procedures
To replicate findings from previous research, this study used multiple-lagged ordinary least-square (OLS) regression analysis to recognize the effects of time, because all previous growth studies used correlation or regression analysis to test the significance of determinants. To ensure that the OLS multiple regression model fit the dataset, comprehensive diagnostic tests were performed to check for both randomness and normality of the residuals (cf. Weinzimmer, Mone, and Alwan, 1994).

Results
Descriptive Statistics and Correlations
Initial analysis revealed several significant correlations between independent variables, suggesting the need to check for multicollinearity in the regression models. A two-stage process was used to adjust for multicollinearity (cf. Berry and Feldman, 1990). Means, standard deviations, and correlations of variables are presented in Table 1.

OLS Multiple Regression Analysis
Table 2 presents OLS regression results. Model 1 tests for the simultaneous effects of all three levels of determinants, and Models 2 and 3 test for interaction effects. Multiple regression results from Model 1 show a significant positive association between organization growth and industry entry barriers (p < 0.001), suggesting that an industry with high entry barriers will lead to organizational growth. Results for strategy-level determinants in Model 1 show a significant positive association between organizational growth and related diversification (p < 0.05) and strategic aggressiveness (p < 0.001), suggesting that strategies pursued by a firm are significant in explaining growth. Finally, the data suggest strong empirical support for several top management team determinants, including significant positive associations between organizational growth and the degree of TMT heterogeneity in terms of industry experience (p < 0.10), the level of TMT heterogeneity in terms of functional backgrounds (p < 0.001) and a significant negative association between organizational growth and average age of the TMT (p < 0.05).

Model 2 shows a significant positive relationship between growth and the multiplicative interaction between aggressiveness and TMT age. Similarly, Model 3 shows a significant positive relationship between growth and the multiplicative interaction between aggressiveness and industry growth.

Relative Effects Among Different Levels of Determinants
Given the strong empirical evidence for the simultaneous influence of all three levels of determinants, highlighting the relative importance for each level of determinants may provide additional insights. To determine the relative importance of one set of determinants over another, we used a χ²-test procedure replicating methods used by other researchers comparing the relative importance of variables to each other (cf. Kotha and Nair, 1995).

Each of the three levels of determinants provided significant improvements over the base model consisting of the control variables. However, strategy-level determinants provided the largest improvement (Δχ² = 87.43; p < 0.001; adj-R² = 0.27), followed by top management team level determinants (Δχ² = 51.49; p < 0.001; adj-R² = 0.25) and industry-level determinants (Δχ² = 11.05; p < 0.005; adj-R² = 0.17). This suggests that all three levels of determinants are individually significant in explaining organizational growth, with strategy being the most significant relative to TMT- and industry-level determinants. However, the simultaneous presence of all three levels of determinants provides the best explanation of organi-
organizational growth, in terms of explained variance, as compared to any of the restricted models.

**Discussion**

Previous studies have shown that either industry, strategy, or top management attributes individually influence organizational growth. Using measures and analytic methods from previous research, this study replicated these findings and confirmed many of these individual relationships using a generalizable sample. However, no research has demonstrated the concurrent effects of all three levels of determinants. Therefore, findings from this study in some ways contradict previous research that studied the effects of industry, strategy, and top management variables in explaining organizational growth. Eisenhardt and Schoonhoven (1990) concluded that, although industry and managerial factors influence organizational growth, strategy characteristics do not. A possible explanation for inconsistencies between this study and Eisenhardt and Schoonhoven’s (1990) study is these authors only used a

**Table 1. Descriptive Statistics and Correlations**

| Variable               | Mean | SD   | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1. Firm growth         | 1.13 | 2.60 |      |      |      |      |      |      |      |      |      |      |
| 2. Entry barriers      | 0.12 | 0.15 | 0.23* |      |      |      |      |      |      |      |      |      |
| 3. Diversification     | 0.05 | 0.28 | 0.11* | 0.10 |      |      |      |      |      |      |      |      |
| 4. Aggressiveness      | 0.46 | 0.70 | 0.13** |      |      |      |      |      |      |      |      |      |
| 5. Industry heterogeneity | 1.98 | 1.28 | -0.12* | -0.01 |      |      |      |      |      |      |      |      |
| 6. TMT age             | 51.33 | 5.23 | -0.25* | -0.03 | -0.01 | -0.12* | -0.02 |      |      |      |      |      |
| 7. Functional heterogeneity | 0.65 | 0.19 | 0.11* |      | 0.03 | 0.02 | 0.09 | 0.14* | -0.17* |      |      |      |
| 8. Industry growth     | 6.02 | 8.65 | 0.22** | -0.08 | 0.03 | 0.03 | 0.11* | -0.14 | 0.01 |      |      |      |
| 9. Net acquisitions    | 1.21 | 2.34 | 0.26** | 0.11* | -0.09 | 0.12* | 0.01 | 0.00 | -0.03 | 0.01 |      |      |
| 10. Slack              | 26.36 | 35.07 | 0.11* | 0.06 | 0.01 | -0.04 | -0.09 | -0.16* | 0.04 | -0.07 | -0.03 |      |

*a n = 193.
* p < 0.05.
** p < 0.01.
*** p < 0.001.
single measure for strategy, technological innovation. This study found both portfolio-level and competitive-level strategies to be significant in explaining growth. Similarly, Kotha and Nair (1995) found environmental-level variables to be significant in explaining growth, but concluded that strategy variables had no impact on growth. A possible explanation for this inconsistency is that these authors used single-dimensional measures for strategy, including individual measures for efficiency, capital expenditures (low-cost strategies), and advertising intensity (differentiation strategy). Our study used a multidimensional measure of strategic aggressiveness from a composite of both low-cost and differentiation strategies. Hill (1988) showed that concurrent pursuit of both low-cost and differentiation strategies can create competitive advantage. Therefore, when examining determinants of organizational growth, a composite aggressiveness measure may capture over-all strategic orientation better than individual measures.

Conclusion and Directions for Future Research

Although the replication approach used in this study provided support for previously identified relationships between growth and individual levels of determinants, contributions from this study come from the theoretical and empirical convergence of previously tangentially related studies to provide a unified explanation of organizational growth. This study was able to show simultaneous effects for all three levels of determinants using a triangulation approach—including tests of main effects, interactions, and relative comparisons among sets of determinants.

In addition to examining the direct effects of these factors on growth, subsequent analysis found strong empirical evidence for interrelationships among predictor variables. Analysis provided support for the relationship between organizational growth and the correct alignment of strategic aggressiveness and TMT age. A high-risk strategy needs support from top managers to be successful. This association suggests that having the correct alignment between strategic aggressiveness and average age of the TMT, rather than merely implementing an aggressive strategy or having a young top management team, will have a positive impact on organizational growth. Specifically, this implies that when a firm pursues an aggressive strategy, support of top management will lead to organizational growth. Past studies have not empirically tested this relationship, so the positive association between the interaction of strategic aggressiveness and TMT age with organizational growth provides empirical evidence for Gupta’s (1984) theoretical propositions.

The analysis also provided support for the relationship between organizational growth and the correct alignment of industry growth and strategy. When a firm is located in a growing industry, resources should be aggressively allocated to that industry to exploit growth opportunities. Conversely, as industry growth slows, firms should decrease aggressive commitment to that particular industry to allow for the reallocation of resources to other growth-oriented industries. This finding implies that when a firm is in a growing environment, investment into this industry in the form of advertising, research-and-development and plant-and-equipment will lead to organizational growth. Although no research exists on the interaction between strategic aggressiveness and industry growth and its influence on organizational growth, findings of this study parallel previous empirical research. Previous research has examined the extent to which a particular strategy best matches a particular type of environment (Romanelli, 1980). This study, however, presents the first evidence for a relationship between strategy and industry growth fit on organizational growth. This finding suggests that certain strategies align a firm better with a particular industry, and, thereby, enable it to achieve growth.

Interactions of Determinants

In conclusion, by using variables identified in previous studies and replicating analytic methods and measures, this study provided clear evidence that all three levels of determinants from the strategy and organization theory literature are significant concurrently. This approach provides a better explanation of organizational growth, as compared to exclusively studying a single level of determinants. This implies that, as researchers study organizational growth in the future, examination of one or even two sets of determinants will not suffice, but that all three sets of determinants should be studied together. This study also yielded support for the idea that interactions among determinants add significantly to explaining organizational growth. It also used a sample that included diverse firms and a cross section of 48 industries to increase generalizability over previous studies using restricted samples.

Finally, these findings may provide new insights for other areas of research, such as organizational life-cycle (OLC) theory. Kazanjian (1990) contended that OLC research is limited because of a lack of identifiable determinants of growth. He argued that the growth literature lacks theoretical models of factors that lead to a firm’s position in a particular stage of growth. He suggested that, although life-stage models add to our understanding of the rather complex phenomenon of
growth, these models suffer a deficiency, because the determinants precipitating growth are, at best, implied. Additionally, because our study did not discriminate between growing and declining firms, where growth could be either positive or negative, findings may also contribute to the organizational decline literature.

References