

# Getting Past the “Entrepreneurial Growth Ceiling”: A Longitudinal Study of IPO Firm Growth Through Solution Driven Strategies

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## Abstract

The premise of our paper is that prior to the IPO firms hit an “Entrepreneurial Growth Ceiling” (EGC), and this is part of the impetus for the IPO process. The EGC stems from the fact that entrepreneurial firms have problems associated with (1) managerial/employee capability, (2) product/market development, and (3) risk and uncertainty that cannot be solved without additional resources. With the cash infusion from an IPO, the additional resources are obtained that allows the IPO firm to engage in a growth strategy. Using longitudinal data (1992–1995) from a cohort of firms that went public in 1993, a set of hypotheses are tested. Results show that growth strategies appear to be solution driven strategies, but the relationship is more complex than we may have anticipated.

## Introduction

Organizational growth has become, in many ways, a “black box” in the field of entrepreneurship. What is growth? What is the most valid measurement of growth? Can growth be predicted? Are there planned growth strategies, or is growth an emergent feature resulting from the interaction of a complex set of organizational and environmental variables? The maze of questions is never-ending, yet the importance

of researching growth cannot be disputed because “growth is the very essence of entrepreneurship” (Sexton, 1997, p. 97).

Although there have been great efforts in the entrepreneurship literature to further our understanding of emerging growth companies, significant limitations continue to exist. Cooper (1993) cited varying research designs, inconsistent samples, theory shortcomings, and incongruent performance measures as barriers to proper interpretation of the extant literature. Sexton (1997) called for more quantitative studies rather than merely quantifying qualitative research. Evolution of the growth literature has led researchers to consider growth as strategy (e.g., Covin, Slevin, & Covin, 1990; Sexton & Bowman-Upton, 1991; Hoy, McDougall, & Douza, 1992; Ireland & Hitt, 1997), but further research is needed to develop more predictive rather than descriptive frameworks.

Our paper contributes to this literature in a number of ways. On one hand, we study growth and its attendant problems which require solutions. By doing so, we limit our discussion to two different measures of firm growth: growth in net sales and growth in number of employees. On the other hand, we examine growth strategies as solutions to attendant problems. This growth as strategy is labeled “solution driven strategy.” Focusing specifically on initial public offering (IPO) firms, we suggest that risk factors at the time of the IPO represent the key problems that the firm is trying to solve. Lastly, we study the relationship between growth strategy and growth in the value of the firm. Given that we are studying IPOs, we consider stock price growth to be a measure that represents the overall value of the firm.

### **The Entrepreneurial Growth Ceiling and the Decision to Go Public**

Edith Penrose (1959) emphasized the process and limits of firm growth. Her “theory of the growth of a firm” categorized three potential limits to growth. These limits include managerial ability (conditions within the firm), product or factor markets (conditions outside the firm), and uncertainty and risk (combination of internal attitudes and external conditions). Our study focuses on these three problem areas; however, because we will suggest that growth strategy is a solution to these problems, we update Penrose’s list and categorize the problems a bit differently.

The IPO represents a time when an organization encounters what we call the “Entrepreneurial Growth Ceiling” (EGC) where three categories of problems are found that limit the rate of firm growth. Although related to organizational life cycles (Kazanjian, 1988), the EGC does not occur only in given stages or phases in the life of a firm. Rather, barriers have been erected (the ceiling) preventing continuous growth.

The first category of problems found in the EGC, we think, should be *managerial/employee capability*. Managerial shortcomings involve the inability of top management to pursue desired objectives. The top management team is lacking necessary skills to move the firm forward or maintain desired growth levels. The inability by management to delegate related to dogmatism has been found to be a source limiting growth (Meyer & Dean, 1990), as well as the firm outgrowing the founder’s capacity to manage (Willard, Krueger, & Feeser, 1992). Meyer and Dean (1990) labeled this management capacity the “Executive Limit.” Furthermore, complexity increases and there are greater “interrelationships among tasks required to effectively and efficiently administer operations” (Covin & Slevin, 1997, p. 106). In addition to management capability, we posit that employees present problems that entrepreneurial firms need to solve. Employee-related problems stem from the entrepreneurial firm becoming a more professionally managed organization as considerable staff additions are made to handle the business growth (Welbourne & Andrews, 1996). Employee relations suffer due to the increase in number of employees without immediately putting the necessary procedures and controls in place to handle the

additional layers of management and staff. New employees are often lost in the turmoil while existing employees may be resistant to the addition of new organization members who have not paid their dues in the early years (Hambrick & Crozier, 1985).

We label the second category of problems found in the ECG *product/market development*. Limitations of product-market development pertain to the inability to develop and introduce new products and/or the dependence on an existing single product that can easily be imitated or made obsolete in the competitive marketplace. Cash shortages can prevent the firm from allocating resources on research and development, experimenting with new products, marketing and selling existing products, and monitoring the movements in the marketplace. The potential for imitation (Barney, 1991), obsolescence, and an unwanted inertial state from resource shortages (Hannan & Freeman, 1984) can be the demise of young, high-growth firms.

Our third category captures Penrose's notion of the *overall level of risk and uncertainty* that is apparent in high-growth firms. Uncertainty is defined as "the entrepreneur's confidence about estimates or expectations" (Penrose, 1959, p. 56), whereas risk is the potential loss resulting from taking specific actions. These are normal characteristics for entrepreneurial firms (Ireland & Hitt, 1997), but the lack of information and speed of change leading to high levels of risk and uncertainty contribute to the growth limit. Many risks are associated with the newness of the firm, the relative lack of resources, and the uncertain future market value associated with many start-up firms.

We believe that the decision to do an IPO is often the point in time when a firm reaches its EGC. As such, it should be an opportune time to study the relationship between firm problems and growth as a solution driven strategy. The IPO provides cash for a firm to pursue its strategy, which should be designed to solve the problems that exist at the time of the IPO. Prior research suggests that all three categories of problems: (1) managerial/employee, (2) product/market, and (3) overall risk and uncertainty are problems of entrepreneurial firms that can inhibit growth. We suggest that those firms that engage in an overall fast growth strategy (and are able to do so from the infusion of cash) at the time of the IPO are trying to solve problems that fall into all three categories.

*Hypothesis 1:* Firms that engage in a fast-growth strategy at the time of the IPO are doing so to solve problems that stem from: (1) manager/employee, (2) product/market, and (3) risk and uncertainty.

The three categories of problems map to three different growth strategies (See [Table 1](#)). Growth in sales can be viewed as a solution to product/market problems, while growth in employees can be seen as a solution to management/employee problems. Lastly, growth in stock price growth can be viewed as a way to minimize overall uncertainty and risk and increase overall firm value. This is true for the sample of firms that we study, and it may not apply equally to other types of firms. But for IPO firms, growth in stock price represents acceptance in the market, creates an environment where the firm can raise additional capital, helps attract new customers (e.g. more comfortable doing business with a firm that has a good track record), and creates an environment where recruiting new managers and employees is enhanced (e.g. stock options are worth something).

Therefore, that after the IPO, we suggest firms which expressed problems with products/markets before the IPO will be more likely to experience higher growth in sales. Firms that expressed problems in the management/employee arena will be more likely to grow via number of employees. And, lastly, we believe that growth through sales and employees results in overall reduced risk and uncertainty. As the firm grows and adds additional resources, its overall risks are reduced and firm value is increased. Therefore, stock price growth should be related to the firm's growth strategies.

*Hypothesis 2:* Managerial and employee problems will be positively associated with an employee growth strategy after the IPO.

*Hypothesis 3:* Product and market problems will be positively associated with a sales growth strategy after the IPO.

*Hypothesis 4:* Employee and sales growth strategies will be positively associated with growth in the firm's stock price after the IPO. The highest stock price growth will be associated with implementing both growth strategies after the IPO.

## Research Methods

### Sample of IPO Firms

The sample consists of firms that implemented their IPO in 1993. Although a total of about 700 firms are in the overall sample, the final sample for this study is 530 IPO firms after deleting those firms that did not have a product/service, employees or that were real estate trusts. Data sources include 1) firm prospectuses, 2) surveys sent to top managers of companies being studied, 3) financial data from COMPUSTAT, and 4) related IPO data from *The IPO Reporter* and the Security Data Corporation database. The average age of the companies under study is 7.88 years and had 972 employees at the time of the IPO. Each U.S. geographic area is represented and approximately 7 percent of the sample is headquartered in a foreign country.

### Dependent Variables

In order to test hypothesis 1 (which is not focused on a particular type of growth strategy), we use survey data collected from managers at the IPO firms included in this study. The survey was sent to these managers in 1995, and we asked whether, at the time of the IPO, they pursued a fast-growth strategy, a moderate growth strategy, or a stable, no growth strategy. We received responses for 350 companies in the sample. Therefore, the analysis using the survey data uses a somewhat smaller sample size (after missing data the  $n = 260$ ). For purposes of our hypothesis test, we use only the fast-growth variable. It is coded as 0 if they said they did not pursue a fast-growth strategy and 1 if they indicated they did pursue that type of strategy.

Hypotheses 2 and 3 required measures of specific growth strategies. Rather than use survey data, we used financial data collected from archival sources. Sales growth is measured by the logged percent change in sales from 1992–95. Employee growth is measured by the logged percent change in number of employees from 1992–95. Lastly, stock price growth is measured by the logged percent change in stock price from the issue date through year end 1995. We use stock price growth as the measure that represents the most general solution set because analysts and investors view stock price growth as a measure of financial health, and it is the most used measure of firm performance in the IPO literature (see Ibbotson & Ritter, 1995, for a review). Other accounting measures used in measuring growth such as earnings per share, cash flow, or ROA were not used in our analysis because these can be easily manipulated in fiscal and tax reporting (Lev & Thiagarajan, 1993). [Table 2](#) includes the means, standard deviations, and correlation matrix for all three growth measures. Correlations with risk factors are available from the authors (we did not include due to space limitations).

### Independent Variables

In order to test our hypotheses, we needed measures of problems at the time of the IPO. We conducted a

content analysis of the risk section of the firm's prospectus. In the risk section, firms are obligated to list any risks that are faced by the organization. It is critical that the firm is forthcoming with this information because failure to disclose a risk can lead to lawsuits after the IPO. We think that the risks represent the key problems faced by the firm, and we coded a number of risk factors that we thought represented factors in the three categories of interest to us: managerial/employee, product/market, and general risk and uncertainty.

We included the following risk factors for the employee growth solution equation: dependence on employees (risk of losing or not being able to attract important employees), managerial inexperience, limited underwriter experience, and competitive labor market. For sales growth we coded the existence of the following risks: competitive risk, customer dependence, new products or services, product dependence, losing or not getting a patent, seasonal business, supplier dependence, and technological change or obsolescence. We included two additional risk factors that seemed to be related to both growth strategies (legal proceedings, and limited operating history). Each risk variable is coded 1 if it appeared in the prospectus and 0 if it did not appear. [Table 3](#) includes the percentage of companies where the risks were found in the prospectus.

### Control Variables

In addition to the independent variables, we included a series of dummy variables for industry. Given that we are predicting growth rates, we did not include measures of size or profitability. See [Table 4](#).

### Results

Hypothesis 1 was tested with a logistic regression, predicting whether the firm engaged in a fast-growth strategy at the time of the IPO. All risk factors, in addition to the SIC codes, were entered into the analysis. The overall equation is significant (Chi-square = 45.78,  $p < .01$ , Overall Percent Correct = 69.4%). Five of the risk factors were significant. Companies that were dependent on a product, on their employees, and that had legal proceedings against them were more likely to engage in a fast-growth strategy. Firms that were dependent on their suppliers were least likely to engage in a fast-growth strategy. See [Table 5](#).

Hypothesis 2, 3, and 4 were tested using hierarchical regression analysis. The first regression predicts growth in sales from year-end 1992 to year-end 1995 with the entire set of risk factors included as the independent variables in addition to dummy variables representing industry. The overall equation is significant ( $R^2 = .19$ ,  $F = 3.88$ ,  $p < .000$ ). Although not included in the table, one of the industry codes was significant. Firms in the construction industry experienced lower sales growth. In addition, several risk factors were significant and in the positive direction. They are: being dependent on employees, having a limited operating history, being dependent on the product, and risk of supplier dependence. One variable, risk of seasonal business, was significant but in a negative direction. See [Table 6](#).

The analysis for growth in number of employees was also significant ( $R^2 = .12$ ,  $F = 2.25$ ,  $p < .001$ ). Again, one industry code was significant. Companies in the wholesale trade business were less likely to engage in employee growth strategies. Two risk factors were significant in a positive direction, and they are risk of supplier dependence and risk due to limited operating history. Additionally, risk due to being dependent on product was significant but in a negative direction.

Reviewing the results from both regression growth equations (sales and employees), two variables were significant and positive in both. Those are limited operating history and supplier dependence. Risk due to product dependence is positively related to sales growth and negatively related to employee growth.

Being dependent on employees is related to sales growth and not to employee growth (we anticipated it being positively related to employee growth). The results show that growth strategies do seem to be solution driven strategies, but the relationship is more complex than we may have anticipated.

In our third equation, we predict change in stock price from the time of the IPO to year-end 1995. We include the same industry codes, change in employees, change in sales, and an interaction term for change in sales and employees. The equation is significant ( $R^2 = .19$ ,  $F = 6.81$ ,  $p \# .000$ ). Both change in sales and change in number of employees are significant. In addition, the interaction term is significant at the .05 probability level.

We plotted the interaction term by deriving the mean of stock price growth for firms in each of four categories, which were calculated using the medians for each growth term: (1) low change in sales, low change in number of employees, (2) low change in sales, high growth in employees, (3) high change in sales, high growth in employees, and (4) high change in sales, low growth in employees. As can be seen in Table 8, the fastest growth firms are those that use both growth strategies. However, we also see that firms that have low sales growth are growing faster (growth of 11% vs. 5%) when they experience high growth in employees rather than low growth in number of employees. Although growing employees is a cost, the firms' ability to use employee growth as a solution set creates benefits recognized by shareholders. See [Table 7](#).

## Discussion

The premise of our paper is that prior to the IPO firms hit what we call the "entrepreneurial growth ceiling," and this is part of the impetus for the IPO process. The reason they reach this ceiling stems from the fact that entrepreneurial firms have problems associated with managerial/employee capability, product/market development, and risk and uncertainty that cannot be solved without additional resources. With the cash infusion from an IPO, the additional resources are obtained that allows the IPO firm to engage in a growth strategy.

Our first hypothesis looked at the determinants of an overall growth strategy, and we suggested that firms pursuing a fast-growth strategy will have problems in all three major categories (managerial/employee, product/market, uncertainty and risk). The results from our logistic regression support this hypothesis in that three risk factors were positively associated with pursuing a fast-growth strategy at the time of the IPO. Those variables are dependence on employees, the existence of legal proceedings against the firm, and product dependence. In all three cases the existence of the problem or risk at the time of the IPO was positively related to having a fast-growth strategy. It is important to note that the direction of the beta is critical for supporting our hypothesis. If the direction were negative, our interpretation would be that the particular problem hindered growth. And in that case, growth would be a measure of success not necessarily a strategy. In other words, our results indicate that firms with product and employee dependence as well as legal problems appear to use IPO proceeds to apply resources to solve the problems through growth.

For hypotheses 2 and 3 we anticipated growth rate would be predicted by problems associated with that particular type of growth strategy (e.g. growth in employees should be associated with manager/employee risks). The results are not as we predicted; however, they do lend support to the idea that growth is strategy. Both forms of growth were positively associated with a firm having a limited operating history. This particular risk is more general, and it can be solved by both growth in employees and sales. The same can be argued for supplier dependence. If the firm hires employees, it may be making a choice to bring some of what the supplier does internal to the firm, thus reducing dependence on the supplier. In addition, by increasing sales, the firm should be in a position to negotiate with other

suppliers or use the income to bring the process into the firm. Product dependence was positively associated with only sales growth. This is in the predicted direction.

Dependence on employees, however, was positively associated with growth in sales and not with growth in employees. This is counter to what we would have expected. However, growth in sales results in the firm becoming more financially viable, thus allowing it to attract additional people and then reduce its dependency. Or, perhaps dependency on employees is not actually a problem; it may create a situation where employees are loyal and therefore highly productive in the firm. This may then lead to increased sales. An additional interpretation may be that employees are considered assets given their desired knowledge levels or skill sets which may be sources of competitive advantage in more technical industries.

Hypothesis 4 stated that both growth in sales and growth in number of employees would affect stock price growth. In addition, because we claim that this strategy solves more problems we expect that using both growth strategies would result in the highest stock price growth. This is the case, as seen by examining the results of the interaction effect. Companies that grew via both strategies had an average stock price growth rate of 85%, while those growing only via employees experienced an average 11% increase, and those growing via sales only had 40% average stock price growth. Therefore, if you choose just one form of growth strategy, growth in sales seems to be superior to growth in number of employees.

However, it is interesting to note that if a company does not experience high sales growth, they still perform better with a high employee growth strategy (11% vs. 5%). Given the costs associated with hiring new employees, this is a bit surprising. However, if employee growth solves problems faced by the firm, then it does increase its overall value. In addition, if employees are viewed as a resource and not a cost, then adding employees can have a positive effect on future firm performance. By hiring employees, these firms may be setting themselves up for higher future sales growth, which is anticipated by the company's shareholders. If the employees hired are managerial or technical individuals with strong external reputations, the effect described above would certainly make sense.

Overall, our results indicate support that entrepreneurial firms reach their EGC and the implementation of a growth strategy is necessary in overcoming this obstacle. This is due to the fact that we found problems at time 1 that had a positive relationship to growth at time 2. We argue that if the risk is positively related to growth, then a problem is being overcome through growth. Thus, a growth strategy is implemented. If a risk is negatively related to growth, the problems are still having a negative effect on firm performance as they did prior to the IPO.

### **Limitations & Directions for Future Research**

The results must be considered in light of the limitations of this research. First, there is an inadequate amount of theoretical work on the concept of growth as strategy; therefore, our hypotheses were limited in our ability to provide a strong theoretical basis for direction and causation. In addition, growth is complex. Future research needs to account for the relationship between employee and sales growth strategy, rather than looking at them independently as we did. Perhaps looking at sales growth and employee growth as dependent variables simultaneously will enhance our predictive power. Then, it may be valuable to consider growth strategies in terms of the four quadrants we identified in the interaction effect (See [Table 8](#)).

The use of the firm prospectus may limit our complete understanding of the problems or risks encountered by IPO firms. There may be "hidden problems" that are undisclosed; however, this is

unlikely given the potential liability of a firm not disclosing this information. But, there may be problems unknown to the firm or considered unimportant. A common example is the nondisclosure of employee and management problems that, to the IPO firm, are not perceived as problems at all.

Additional work is needed to help clarify the relationship between growth strategy and other forms of strategy. In addition, more work on the measurement of problems could be useful to further this research. The number of independent variables used in our analysis encompasses many of the most pressing problems faced by entrepreneurial firms, yet our use of dichotomous variables may limit the generalization of our findings.

## Conclusion

We, along with many researchers in the field of entrepreneurship, have an unyielding desire to understand and predict the growth of the firm. The atheoretic literature to date limits our ability to build upon previous research. As a result, this paper represents our beginning in building the necessary theory to supply the foundation for future research. As Dubin (1969) pointed out, “theorizing is an integral part of empirical investigation” (p. 7).

We have introduced the “Entrepreneurial Growth Ceiling” as a categorical set of fundamental problems limiting firm growth, and we have begun to test hypotheses to explain how a firm can implement growth strategies to pass through the ceiling and continue its momentum. We have taken a somewhat different view of growth – growth as a solution driven strategy. If we say that “strategy” is why firms outperform other firms, then growth as strategy makes sense. Additionally, if we argue that growth strategies are implemented to solve specific problems as seen in the EGC, then we have organizational variables that can be obtained and measured.

As our analysis illustrates, growth is a very complex phenomenon requiring more rigorous study. We have shown support that management/employee problems can be solved with an employee growth strategy, and product/market problems can be solved with a sales growth strategy. Most importantly, we have shown the significant interaction between growth in sales and growth in employees predicting growth in stock price, perhaps the ultimate measure of firm value. Overall, we have shown that all three categories of problems can be addressed by growth strategies. However, there is still much work to be done, and this paper represents the beginning of a new research orientation to studying the growth of entrepreneurial firms.

Understanding firm growth has considerable public policy implications. Schumpeter’s (1942) notion of “creative destruction” has again become a focal point of economic discussions pertaining to entrepreneurial activities. His idea of discontinuous change results in the destruction of existing markets, products, production methods, supply sources, and industries. All of these changes are instigated by entrepreneurs who enjoy a period of rapid growth and above-average returns. But let us take creative destruction a bit further. What are the implications for the entrepreneurial firm that has “creatively destroyed” markets, products, and methods? Initial opportunities are exploited, but the firm soon finds that without additional resources there is a growth limit—the firm hits the EGC. Various problems ensue such as those we have mentioned relating to managerial/employee capability, product/market development, and risk and uncertainty. The fear of these firms is not that they will be destroyed in Schumpeterian terms; rather, these firms face self-destruction unless specific problems are overcome.

As scholars in search of practical answers, we may not be able to avoid the situation where firms are dissolved when markets, products, and methods are creatively destroyed, but we can help prevent entrepreneurial firms from self-destructing. We have argued that implementing growth as a solution

strategy will allow the entrepreneurial firm to continue its growth path and maintain its economic position. Premature destruction of existing growth firms can have serious economic implications. Schumpeter stated creative destruction fuels the economy and capitalism, and we agree. However, self-destroyed companies are not immediately replaced as the creatively destroyed companies are which, on a grand scale, can cause serious economic problems relating to employment and wealth creation.

Edith Penrose (1959) gave rise to the first theory of firm growth from an economist perspective and her seminal work should not be discounted in future research. She used the growth of a tree as an analogy to the growth of the firm. The growth of the tree upon initial reflection seems like a simple and explainable process, but the process is far more complex than we would have anticipated. It seems appropriate to close with her analogy:

The problem is not unlike the problem of diagnosing the prospects for the growth of, say, a tree. Upon examination, one can say for example that the tree will not grow unless certain identifiable conditions are corrected and certain environmental conditions are satisfied—but one can never certify in advance whether the tree will or will not survive all possible vicissitudes and how they will affect its growth—the next winter may be severe, the spring rains may fall, or blight may set in. (Penrose, 1959, p. 8)

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**Table 1**  
**Growth Strategies**

| <b>Growth / Solution Strategy</b> | <b>Problems That Are Addressed</b>                                    |
|-----------------------------------|-----------------------------------------------------------------------|
| Sales Growth                      | Product/Market                                                        |
| Employee Growth                   | Management/Employees                                                  |
| Stock Price Growth                | Overall value of the firm —obtained by both employee and sales growth |

**Table 2**  
**Correlation Matrix of Growth Variables**

|                                                | <b>Mean</b> | <b>SD</b> | <b>(1)</b> | <b>(2)</b> | <b>(3)</b> |
|------------------------------------------------|-------------|-----------|------------|------------|------------|
| (1) % change in stock price (IPO through 1995) | 39          | 1.47      | 1.000      |            |            |
| (2) % change in net sales (1992–1995)          | 295         | 8.39      | .258*      | 1.000      |            |
| (3) % change in # of employees (1992–1995)     | 212         | 7.61      | .310*      | .441*      | 1.000      |

\*p.#.01

**Table 3**  
**Percentage of Companies Reporting Risk in Prospectus**

|                                     | <b>% of Firms Reporting Risk in the Prospectus</b> |
|-------------------------------------|----------------------------------------------------|
| <b>Risk Factors</b>                 |                                                    |
| <i>Employee Growth Risk Factors</i> |                                                    |
| Dependence on employees             | 82.9                                               |
| Managerial inexperience             | 4.2                                                |
| Limited underwriter experience      | 4.6                                                |
| Competitive labor market            | 32.1                                               |
| <i>Sales Growth Risk Factors</i>    |                                                    |
| Competitive risk                    | 94.9                                               |
| Customer dependence                 | 65.1                                               |
| New product or service              | 27.9                                               |
| Product dependence                  | 11.6                                               |
| Losing patent / not getting patent  | 37.4                                               |
| Seasonal business                   | 19.8                                               |
| Supplier dependence                 | 31.9                                               |
| Technological change / obsolescence | 39.6                                               |
| <i>General Risk Factors</i>         |                                                    |
| Legal proceedings                   | 7.5                                                |
| Limited operating history           | 24.8                                               |

**Table 4**  
**SIC Industries Used in Analysis**

| <b>Industry</b>                                  | <b>% of Sample</b> |
|--------------------------------------------------|--------------------|
| Agriculture, Forestry, Fishing                   | .2%                |
| Mining                                           | 3.1%               |
| Construction                                     | 2.0%               |
| Manufacturing                                    | 50.5%              |
| Transportation, Communications, Electric,<br>Gas | 7.5%               |
| Wholesale Trade                                  | 5.3%               |
| Retail Trade                                     | 8.6%               |
| Finance, Insurance, Real Estate                  | 4.0%               |
| Services                                         | 18.9%              |

**Table 5**  
**Logistic Regression Analyses**  
**Dependent Variable = Pursuit of Fast-Growth Strategy at Time of IPO**

| Risk Factors (all dichotomous variables) | Fast Growth Strategy at Time of IPO (0/1) |          |
|------------------------------------------|-------------------------------------------|----------|
|                                          | \$                                        | s.e.     |
| <i>Employee Growth Risk Factors</i>      |                                           |          |
| Dependence on employees                  | 1.08                                      | .41 **   |
| Managerial inexperience                  | .13                                       | .69      |
| Limited underwriter experience           | -.54                                      | .67      |
| Competitive labor market                 | -.24                                      | .36      |
| <i>Sales Growth Risk Factors</i>         |                                           |          |
| Competitive risk                         | 1.05                                      | .78      |
| Customer dependence                      | -.12                                      | .33      |
| New product or service                   | .39                                       | .37      |
| Product dependence                       | .92                                       | .55 +    |
| Losing patent / not getting patent       | -.59                                      | .38      |
| Seasonal business                        | -.12                                      | .38      |
| Supplier dependence                      | -.84                                      | .36 *    |
| Technological change / obsolescence      | .99                                       | .38 **   |
| <i>Additional Risk Factors</i>           |                                           |          |
| Legal proceedings                        | 1.08                                      | .57 +    |
| Limited operating history                | .62                                       | .40      |
| Constant                                 | -3.76                                     | 1.53 **  |
| Chi-square                               |                                           | 45.78 ** |

+ p # .10; \* p # .05; \*\*p # .01; \*\*\*p # .001

Unstandardized Beta coefficients are reported. Dummy variables for SIC code were included in the analysis, but are not reported due to space limitations.

**Table 6**  
**Regression Analyses**  
**Dependent Variables = Growth in Net Sales & Growth in Employees**

|                                          | Growth in Net Sales |          | Growth in Employees |          |
|------------------------------------------|---------------------|----------|---------------------|----------|
|                                          | \$                  | t        | \$                  | t        |
| Risk Factors (all dichotomous variables) |                     |          |                     |          |
| <i>Employee Growth Risk Factors</i>      |                     |          |                     |          |
| Dependence on employees                  | .09                 | 1.70 +   | .04                 | .72      |
| Managerial inexperience                  | -.03                | -.62     | .05                 | .90      |
| Limited underwriter experience           | .03                 | .56      | .06                 | 1.12     |
| Competitive labor market                 | .05                 | 1.03     | .04                 | .75      |
| <i>Sales Growth Risk Factors</i>         |                     |          |                     |          |
| Competitive risk                         | -.02                | -.43     | .02                 | .38      |
| Customer dependence                      | .03                 | .56      | .002                | .04      |
| New product or service                   | -.03                | -.50     | -.004               | -.08     |
| Product dependence                       | .08                 | 1.68 +   | -.10                | -1.86 +  |
| Losing patent / not getting patent       | -.04                | -.55     | -.06                | -.91     |
| Seasonal business                        | -.11                | -2.15 *  | -.04                | -.81     |
| Supplier dependence                      | .13                 | 2.32 *   | .13                 | 2.30 *   |
| Technological change / obsolescence      | .03                 | .54      | .04                 | .63      |
| <i>Additional Risk Factors</i>           |                     |          |                     |          |
| Legal proceedings                        | -.07                | -1.41    | -.06                | -1.19    |
| Limited operating history                | .26                 | 5.09 *** | .15                 | 2.96 **  |
| R <sup>2</sup>                           |                     | .19      |                     | .12      |
| F                                        |                     | 3.88 *** |                     | 2.25 *** |

+ p # .10; \* p # .05; \*\*p # .01; \*\*\*p # .001

Standardized Beta coefficients are reported. Dummy variables for SIC code were included in the analysis, but are not reported due to space limitations.

**Table 7**  
**Results of Regression Analysis**  
**Dependent Variable = Stock Price Growth**

| Factors                   | Growth in Stock Price |           |
|---------------------------|-----------------------|-----------|
|                           | \$                    | t         |
| % change in employees (E) | .31                   | 4.09 ***  |
| % change in net sales (S) | .25                   | 4.09 **** |
| E x S (Interaction)       | -.15                  | -2.15 *   |
| R <sup>2</sup>            |                       | .19       |
| F                         |                       | 6.81 **** |

\* p # .05; \*\*p # .01; \*\*\*p # .001

Standardized Beta coefficients are reported. Dummy variables for SIC code were included in the analysis, but are not reported due to space limitations.

**Table 8**  
**Interaction of Employee Growth and sales Growth Predicting Stock Price Growth (% change)**

|                      | <b>Low Growth<br/>in Number of Employees</b> | <b>High Growth<br/>in Number of Employees</b> |
|----------------------|----------------------------------------------|-----------------------------------------------|
| Low growth in sales  | .05                                          | .11                                           |
| High growth in sales | .40                                          | .85                                           |